

Inside: Brian Van Bower on Visualizing

WATER SHAPES

Design • Engineering • Construction

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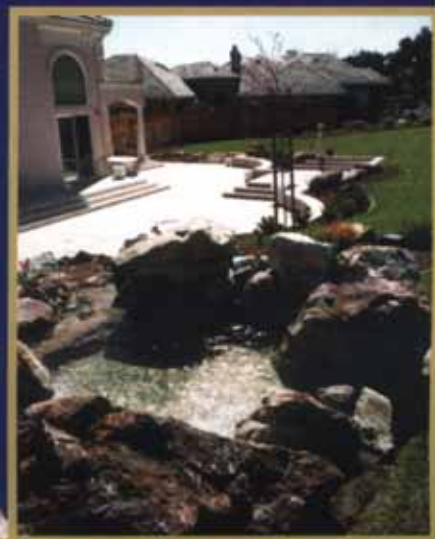
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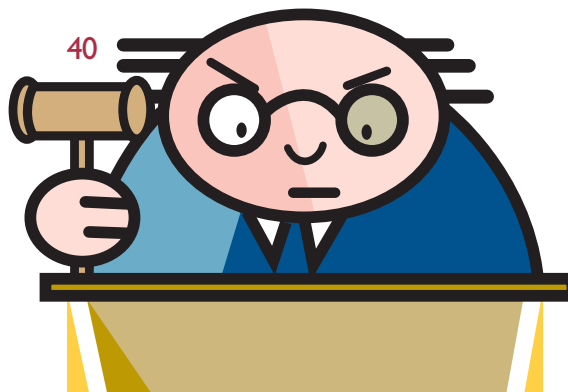
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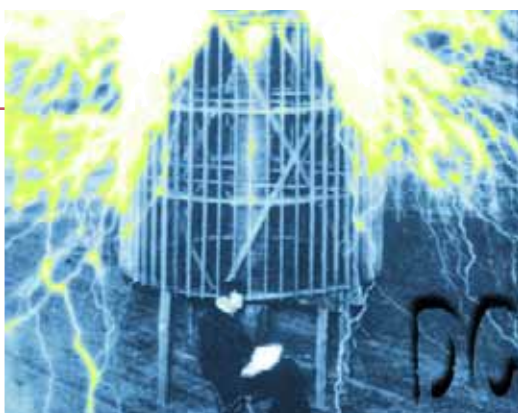
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On the cover:

Photo by Keith Davitt,
Gardens, Brooklyn, N.Y.

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Blissful Visions

For as long as I can remember, I've fantasized about owning my own swimming pool.

I suppose such daydreams are the natural byproducts of spending much of my life in Southern California, a place where backyard pools and public plunges are as much a part of the landscape as the freeways and palm trees.

To own a pool, of course, you need a place to put one – and until recently, I never lived in a place that fit the bill.

That changed in June of this year, when my wife Teresa and I purchased our dream home. It's an old Craftsman-style house, built in 1926, perched on a gently sloping quarter-acre lot in a peaceful neighborhood in Fullerton. Along with all the stresses, strains, excitement, long-term decisions and short-term poverty that goes along with buying a home, we've spent a good bit of time tossing around ideas about the various things we'd like to do with our property.

From the first day we set foot in our new home, in fact, we've been talking about the pool we hope will eventually play host to the sorts of fun and frolicsome behavior that so clearly defined so much of our childhoods. (Teresa and I grew up in the same area and swam in many of the same backyard pools.)

We're so engaged in the process that we've already picked the spot in the yard and have already started discussing what we want it to look like. And we've indulged all this planning knowing that it may be a good two or three years or even ten years before we come anywhere close to breaking ground.

I know my job as editor of *WaterShapes* puts me in an unusual position when it comes to visualizing what might become of our backyard. Through all of the conjuring and dreaming, I'm definitely trying to apply the design principles we've covered in the pages of this magazine, trying things on for size.

Already, we see a whole slew of aesthetic issues that will need to be addressed – everything from the basic style of the vessel itself to the type of footpaths and plantings we'll eventually select to go with it. Right now – and even though we know it's likely our ideas and sense of what's possible will change before we get that far – we're leaning at this point toward a rectilinear pool that reflects the angular architecture of the home. We also know we'll want a host of warm, rustic textures that will reflect the quiet surroundings.

As I say, I imagine we'll change our minds a thousand times before we land on a workable plan. Even at this early stage of the process, however, I can already see what a wonderful and profound thing it will be to have a custom watershape of our very own.

Next to the house itself, the pool at "Casa de Herman" will likely be the biggest purchase we ever make. And as these warm summer months have rolled along, Teresa and I have both spent a lot of time imagining what it will be like – and wish that the pool was already there, waiting for us at the end of the day or, on a hot Saturday afternoon, welcoming us to cold ones in the cooler and warm edibles on the grill.

Sure, we know it'll take a while for us to save up the shells and trinkets we'll need to make the big purchase. But in our hearts, we've already signed on the dotted line.



WATER SHAPES

Editor

Eric Herman — 714.449-1996

Associate Editor

Melissa H. Anderson — 315.457-0504

Contributing Editors

Brian Van Bower Jim McNicol
Stephanie Rose Rick Anderson

Art Director

Rick Leddy

Production Manager

Robin Wilzbach — 818.783-3821

Circulation Manager

Simone Sanoian — 818.715-9776

Director, Marketing and Sales

Stephanie Behrens — 818.715-9776

National Sales Manager

Camma Barsily — 310.979-0335

National Sales Representative

Sherry Christiaens — 505.421-3100

Publisher

James McCloskey — 818.715-9776

Publishing Office

McCloskey Communications, Inc.
P.O. Box 306
Woodland Hills, CA 91365
Tel: 818.715-9776 • Fax: 818.715-9059
e-mail: main@watershapes.com
website: www.watershapes.com

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IN THIS ISSUE

SEPTEMBER'S WRITERS

Keith Davitt is owner and principal designer for Gardens, a landscape design/build firm based in the Park Slope area of Brooklyn, N.Y. Davitt has been designing gardens for upscale clients across the United States for the past 20 years, with services including horticultural consultation, site analysis, landscape design, project management and all aspects of landscape construction. He is also a garden writer and photographer for magazines including *Fine Gardening*, *Gardening How To* and *Horticulture*, to name a few, and is currently writing a series of books about landscape design.

Erich Altwater is president of Atlantic Fountains of New Haven, Conn., and has

worked for more than 20 years as a systems engineer in the design and construction of fountains and other waterfeatures. His firm specializes in the design and construction of watershapes for architectural settings (including musical and animated fountains) as well as in the installation of aerators and floating fountains for natural environments.

Lisa Berosh is marketing coordinator for Otterbine Barebo, a manufacturer of fountains and other waterfeatures in Emmaus, Pa. She focuses on serving the needs of landscaping, recreation and bio-augmentation industries for the family-owned and operated firm, which has been making surface-spray and sub-surface aeration systems for lakes and



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ponds for more than 40 years.

Curt Straub has been active in the pool industry since 1962, when he joined his family's construction company as a laborer working on backyard installations in the greater Kansas City, Kan., area. In 1970, Straub moved into the front office and headed up the company's design and sales teams, a position he held until 1990, when he founded Aquatic Consultants. A specialist in pool and spa design, he offers mediation and conflict-resolution services along with his emphasis on structural evaluation. Straub is a longtime member of the American Concrete Institute's Kansas Chapter and is past chairman of ACI's swimming pool committee. He

is also a past board member of the Master Pools Guild.

Maria Hetzner began her career as part of the Orcal distribution operation 11 years ago, joining a family business that has participated in the pool and spa industry for nearly 40 years — at times in the service, repair, construction and retail sectors but most prominently as distributors for the past 20 years. She currently works for Orcal's Custom Cascades unit, which supplies waterfall systems from its base in Bloomington, Calif. Hetzner focuses on customer service, executive sales and public relations, and her work includes close interaction with a variety of contractors and designers in a range of pool and waterfeature projects.



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Bringing Visions to Life

By Brian Van Bower

I remember several years ago, back before it was really fashionable to build completely naturalistic pools, that I decided this was *exactly* what I wanted to do. This was in the very early 80s, when you'd see maybe some rocks on the bond beam or a waterfall on the end of the pool – but that was about as natural as it got back then.

My new idea was to create environments that were completely natural, stem to stern. I tried presenting the concept to a number of potential clients, explaining how we could do things like angle the top of the pool and install rocks all around the edge and create natural formations that looked like benches and incorporate all of this integrated landscaping.

Nobody was buying.

I'm convinced now that the reason I ran into such resistance was because no one was building these pools and none of my potential customers had any frame of reference. They just couldn't *visualize* what I was talking about, so I was out of luck – until, that is, I decided to build a model pool in my own backyard (see the photograph on page 11).

Breaking Through

I poured all of my energy and ideas into this one pool, bringing in rock guys to build a massive waterfall and a six-foot natural spa overlooking the rest of the pool. I installed a bunch of lush tropical landscaping, too, and built little winding footpaths through it.

By today's standards, I suppose most of that sounds trite, but at the time in my market it was genuinely cutting-edge stuff. In fact, an old friend of mine from the pool industry saw it and told me, "This is the coolest pool I've ever seen."

At the time, I agreed wholeheartedly with him, and so did a whole bunch of other people. And because I now had this thing in place in my backyard, I could show other people what I meant when I was talking about "naturalistic

swimming pools."

It worked like a charm: Pretty soon – and I really mean within a very short period of time – it seemed that *everybody* wanted exactly that pool, with no variation. And it worked because my customers were able to step into the environment and immediately visualize themselves in their own pools.

But their vision was limited and they didn't want to take any chances, so I ended up being asked to replicate the same pool over and over again. In that sense, you might say that my marketing idea had worked a little too well. And being the person I am, I was getting bored doing the same thing over and over again. Heck, if I'd wanted to build the same pool dozens of times, I could've gone to work for one of my cookie-cutter competitors.

I'm not really complaining, because I definitely enjoyed building these lush, tropical-looking pools. But for a long time, I was typecast as "the guy who built the tropical, lagoon-style pools." That was fine for a while, but I no longer saw myself as being on the cutting edge, where I always wanted to be.

At the same time, it was occurring to me that to be on the cutting edge means you have to be able to communicate ideas to customers – ideas they might never have seen or considered before.

Lesson Learned

Building a pool in your own backyard is a pretty extreme way to communicate a concept to a potential client. (You'd have to move too



I am, in effect, selling an experience, one that they will enjoy over and over again in a whole variety of ways.

many times or go through far too many divorces to make that strategy work in more than a limited way.) This meant that I'd have to come up with some other way to bring my ideas across.

Before long, I was thinking about exactly what it is that clients are buying. After mulling it over and listening to what other people had to say about the art of selling, I landed on two specific things: First, clients are buying *you*, investing in the faith they have that you are a professional and will do what you say you will do. Second, clients buy what they can *visualize*.

There's a tremendous amount that can be said on both those fronts. Selling yourself as a professional, as a craftsman and, indeed, as an artist, is equal parts state of mind and spirit coupled with technical and creative ability — something I've discussed in past columns and won't repeat here. Helping your clients visualize the product means giving them the means to do



so — preferably without turning your backyard into a showroom.

Before I get into specific suggestions about visual communication, it's important to consider just how important this process is to our clients. A water-shape, which in my case typically means a custom backyard swimming pool and all the stuff that goes with it, is a place

where people spend time and interact with their surroundings.

I am, in effect, selling an experience, one that they will enjoy over and over again in a whole variety of ways.

The process of helping them visualize the experience of standing next to the pool, sitting in the spa, mixing drinks at the swim-up bar or doing yoga next to



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the waterfall – or whatever else it is that they want to do in their backyard – is the most direct route to stirring their passions.

Architects have known this for a long time, by the way. That's why they do things like build models and create virtual tours of buildings that don't yet exist. They go to all this effort because the process helps the client become personally vested in the project: The structures become real, immediate and exciting.

Ways to See

Drawings are essential in this process of visualization, starting with the most basic plan view or site plan. Whether you're using a blueprint, brown line or pen and ink, the image you create shows the proposed pool in the existing space. Another way to look at it is that the overhead view depicts an unfamiliar object (the watershape) in a familiar setting. This helps the client relate the design to things already known.

This is why it's very important to call out specific details on the plan itself (as seen in the illustration on page 14) – or point them out verbally. Either way, you communicate very basic and important bits of information, such as the fact that the waterfall will be five feet to the right of the fence, or the children's play equipment will be on the side of the yard nearest the house and the pool will be in the far corner – and that a pathway will connect the two areas.

If you know your stuff, you also have the ability to communicate about materials, contrasts between materials, what happens where different materials meet and how surfaces relate to one another. In the hands of someone with talent, a drawing can be a most powerful tool.

I've already discussed the need to be a detective in initial client meetings. You can and should use things you've learned about their homes, families and lifestyles to create various details on even the most basic drawings. If you know, for instance, that your clients like to barbecue twice every weekend, then show where the barbecue will go. If you know that having the spa just outside the French doors leading from the master bedroom is a big deal, put the spa near the bedroom and point it out on the drawing.

Even these fundamental physical orientations will go a long way in helping clients visualize a new reality, especially if you present it with their experience in mind.

Now, just think about what will happen if you add color and detail. In another column, I talked about learning to draw – a skill I consider very useful in creating watershapes. When you add color to your drawings, the effects you can communicate are truly stunning. You can use stencils to create rocks and trees; you can show texture in the hardscape; you can even show frothing water and indicate depth with shadings of color.

Stepping up a level, there's little that compares for impact with a three-dimensional rendering: By seeing the job from a primary focal point, clients get an immediate impression of depth and dimension in the design. It all becomes very real as you account for the position of the sun and create shadows and reflective surfaces.

To my mind, in fact, these eye-level perspective drawings in all their detail are far and away the most dramatic and successful with respect to placing clients right into an environment.

I also believe it's important to include a selection of details on the main drawing or on separate drawings. Clients are not as familiar at looking at details as we are, and it's not always clear to them how some of these things will look—even something as basic as bullnose coping. You may do a good job of showing it as part of the whole picture, but it isn't until clients see it up close, perhaps in a cutaway view where they actually see the profile of the coping stones, that they will fully comprehend what bullnose coping is.

Visual Tools

Certainly, the better you are at drawing, the more detail you can include and the more effective the images will be in communicating.

For myself, I've found that learning to draw is more "scientific" than I had originally thought. It's not about some artistic muse who anoints one person and ignores the others, although talent certainly helps and I know I'll never be as good at drawing as other people I know. But when you learn the rules of drafting and how to create three-dimensional images, then the whole "drawing thing" becomes much less mysterious and much more practical and accessible.

Computer-assisted (CAD) drawings have a big role in all of this, too. I personally don't think they're as dazzling as hand drawings, but I know people who use CAD systems to create professional-looking images, and if the overall design and the details you include are presented in a way that your clients can understand, then the computer-generated image can be as alive and meaningful as something drawn by hand.

If you get creative, there are a variety of ways that you can capture an image with which to work your magic. You can, for example, take a photograph of the space from a primary focal point and then project that image onto a piece of paper. You can then trace the major contours of the space and create a landscape by hand. Tracing from projections is a technique that's been used by architects and artists for generations. I haven't tried it myself yet, but I'm open to giving it a try.

Another tool that's been used to great effect in architecture is computerized 3D imaging. These days, it's possible to render a planned environment as a virtual reality setting in which the "visitor" can move through the picture and see the space flow from angle to angle. Imagine the impact of enabling your clients to "walk" through some trees

and into a gazebo that's right next to a waterfall, then turn around and look back down the path to their home and all its architectural details.

Then there are models—another tool that our colleagues in the architecture business have been using for generations. In fact, they create elaborate scale models of everything from college

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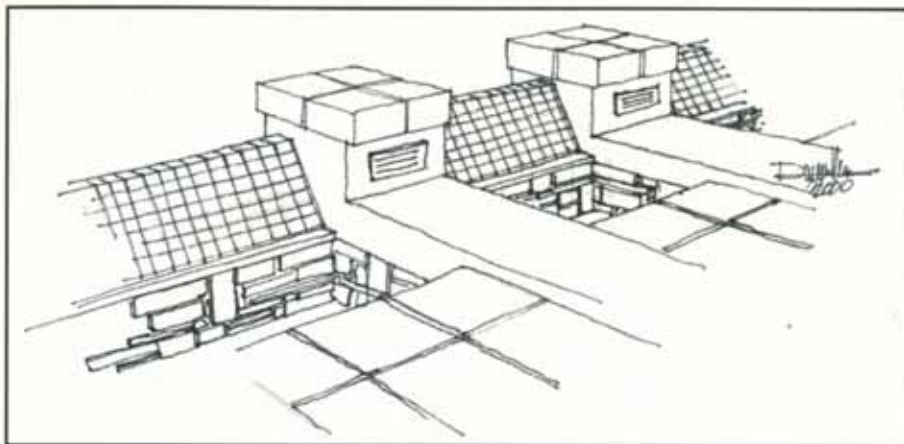
campuses to skyscrapers and amusement park rides in helping their clients "see" large projects.

I've seen models of luxury condominium complexes that have included pools, for example, and the effect is impressive. I'd love to see a scale model of a custom vanishing-edge pool with all sorts of landscape and architectural details. Again, I've never tried building a model, but given an appropriate situation and the right clients, I'd commission one in a heartbeat.

Telling a Story

The one thing that all of these forms of visual presentation have in common is that they tell stories. They convey what it will be like to be in the space you're designing.

The one thing that every good story needs is a good setup. That's why I always personally present drawings to my clients: I'll never just "send one over" without being there to support



the presentation with verbal communication. That's important: No matter what forms of visual aid you use, from a plot plan to a model, you need to be there to add verbal descriptions of what the setting will be like once the work is complete.

Those of you who know me at all are aware that I'm something of a talker – and proud of it. I've found that by enthusiastically describing the scene, I can draw

clients into the image much more quickly. I can also reveal that I've designed the watershape with their preferences and lifestyle in mind. I can describe what it will be like to walk barefooted down this path over stones with moss growing in the cracks and stepping into that shaded area where music will be playing over the gentle sound of water running in a nearby stream.

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you can fill in all the blanks and explain the sensory experiences your clients will have, right down to the smell of the flowers or the happy sound of the blender or the smooth feel of the tile beneath their feet at the water's edge.

You can describe the cooling, evaporative effects of the waterfall, or the spa massaging their shoulders (and explain that, unlike a spouse, the jets never get tired). Or if you know a client is sensitive to sunlight, you can point out that while the kids are playing on the diving rocks, he or she can lounge in the beach entrance beneath the cool shade of an umbrella.

You can conjure social scenes as well, while explaining that by using the advanced control system, the clients can set things up so that just as everyone's sitting down to dinner by the pool, the lights will come up and the waterfall will come on. You can wow your clients by getting them to imagine the amazement on the faces of their guests as all this happens, unbidden, while you're pouring the cabernet.

When you have effectively cast these images both verbally and visually, you create value for the product. All of sud-

den, they're not thinking about the extra money for the waterfall so much as they're enjoying the idea of sitting behind it, watching the world through the whimsical distortions of the falling water.

There's clearly a real power in visualization. If it's handled with skill and planning, it can generate a heap of real fortune as well.

Brian Van Bower runs Aquatic Consultants and is a partner in Van Bower & Wren, a pool-construction firm in Miami. He is also a co-founder of Genesis 3, A Design Group; dedicated to top-of-the-line performance in aquatic design and construction, this organization conducts schools for like-minded pool designers and builders.

Samples at Hand

Among the most compelling visual aids I bring with me to client meetings are samples of materials I'd like to use. It's so easy that I'm constantly surprised that more people in the watershaping trades don't do it.

In a recent column, I discussed the range of materials available to us. I've had great luck picking a key item or two and bringing them along for the client to see and feel.


Sometimes the samples I bring are fairly substantial: If I'm showing glass tile, for example, I won't just bring a piece or two. I'll buy a whole sheet, lay it out on the floor and let the clients really get a feel for it.


Many manufacturers have ready-made samples—of decking materials, interior surface options, edge treatments, pathways stones, even thatch from a chikki hut. It's just another way to illustrate detail and give the clients a sensory experience that helps them visualize exactly what it is they're buying.

—B.V.B.

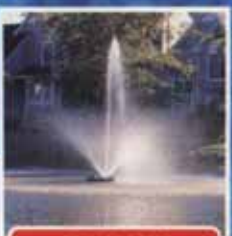
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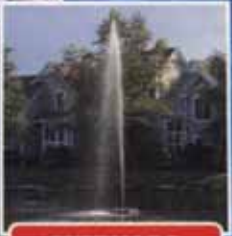
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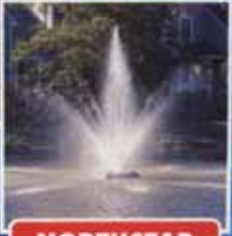
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When Fall's in the Air

By Stephanie Rose

As fall looms before us, it's timely to consider a question that should be a factor in every design we prepare: To drop or not to drop? This question is a good one to ask *before* you start planning and has to do with how much natural debris your clients will be willing to fish out of their watershapes once you're gone. In other words, while it's always important to decide what *style* of plants to put around your watershapes, it's also important to think about *types* – that is, evergreen vs. deciduous.

I'm sure most (if not all) of you are aware of the general distinction, but here's a short explanation: The *Sunset Western Garden Guide* defines an *evergreen* as a plant that "never loses all its leaves at one time." By contrast, it defines *deciduous* as "any plant that loses all of its leaves at one time each year, usually in fall." (Of course, just to confuse the issue, there are some plants that are considered *partly* deciduous, which means they lose *some* of their leaves one time each year. These plants are not quite as common.)

Does all this matter to a watershaper? Absolutely! When designing a watershape and the landscaping that will surround it, you need to consider whether the plant is going to shed its leaves (or any other form of debris) and if any of that stuff is going to fall into the water. Aside from the obvious concern about leaves clogging a filter, you need to consider whether tree droppings will affect your watershape in other ways: Will they, for example, stain the bottom – or poison the water, killing fish or other wildlife?

All About Nature

Whether we like it or not, every year nature completes a cycle. For the deciduous plant, it's all about leaves that begin their life in the spring, hang around during the summer and then die off in the fall, leaving (pardon the pun) a blanket on the ground as a reminder of their sudden lives.

And we're talking about more than leaves: These same



Remember, we're dealing with nature here. It won't alter its habits to conform to our needs. Instead, we need to adapt to its sublime sense of order.

plants may produce fruit, seeds and/or other objects that will end up dropping onto (or into) whatever is beneath them.

If the space below these plants is water, it's as though they're letting you know exactly what they think of your watershape. They'll drop on down, stain the walls and bottom, change the pH of the water or do any of a number of things that will cause you to ask, *Why did I ever plant that there?*

Remember, we're dealing with nature here. It won't alter its habits to conform to our needs. Instead, we need to adapt to *its*

sublime sense of order.

This doesn't mean you can't put a deciduous plant of any sort in a yard with a watershape. It simply means, when planning the watershape, that if you want a deciduous tree such as a Weeping Willow, you need either to make room to accommodate it away from the watershape—or your clients have to be willing to put up with the leaf, fruit or flower drop.

Some No-Nos

I couldn't possibly list all the dos and don'ts here, if only because of the fantastic regional variety of available plants. But here's a brief list of some plants that have such pronounced or damaging flower, leaf or fruit drop that I would *always* recommend locating them away from a watershape:

□ **Jacaranda Tree**—This is one of the most beautiful trees around, but the pale purple flowers of the Jacaranda are well known for staining patios, cars and anything left under their canopy—including

decks and watershape interiors. By all means use them—but place them away from watershapes where the flowers can fall onto a lawn or other surface that won't be stained.

□ **Eucalyptus Tree**—These are among my favorite large trees, but they can wreak havoc on the bottom of any pool. These are evergreens, but they do drop their leaves and seed pods—and can mar a white-plaster pool quite quickly with a stain that is difficult (if not impossible) to remove. In this case, my recommendation is extreme: I'd avoid planting one in *any* yard with a watershape.

□ **Carob Tree**—Most of us think of carob as a chocolate substitute (is there really any substitute for chocolate?), but these trees are quite commonly used and produce a seed pod (the source of the chocolate substitute) that is quite large and makes quite a mess when it drops. There's also an odor about these trees that many people consider unpleasant. Bottom line: Plant something else next to your watershapes.

□ **Liquidambar**—Have you ever stepped on a little, brown, spiky, ball-shaped object that looked like a mace out of a gladiator movie? It was probably the fruit from a Liquidambar Tree—something you'll never forget if you happen to be in bare feet at the time. These trees give an incredible color show in fall and are definitely worth having somewhere in a yard—so long as you keep them at a distance from your watershapes.

□ **Silk Tree**—Also known as *Albizia julibrissin*, this is one of the most beautiful and delicate-looking of all trees, but its "drop" factor makes it almost completely incompatible with a watershape. It is *totally* deciduous, dropping its finely-toothed leaves in the fall along with delicate, fluffy, pin-cushion-like flowers that drop off in the summer—not to mention large seed pods that also create extra litter. Steer clear!

□ **Chorisia speciosa**—Although it has beautiful flowers and ominous-looking spikes on its trunk that keep intruders away (you wouldn't want to slide down

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this one!), the Floss Silk Tree drops a cotton-like plume that will coat everything in sight. A yard with this tree will look as though someone decorated it early for Halloween – a combination of debris types that is bound to clog filters and displease swimmers as well.

The Right Stuff

If the trees you and your clients select present any sort of litter problem – and that's true of just about any deciduous tree and also about many evergreens – here are some good guidelines. If you follow them, I'm fairly certain your customers won't be going out to buy a chainsaw anytime soon.

❑ **Think big.** When it comes to leaves, the bigger they are, the easier they will be to clean up. By contrast, a plant whose leaves are numerous and small will usually scatter more and make a greater mess. Magnolia trees (which come in both evergreen and deciduous varieties, by the way) usually have large leaves. The evergreen

varieties are quite manageable with respect to debris, while the deciduous ones tend to be smallish (such as a *Magnolia soulangiana* – the saucer or Chinese magnolia) and present few clean-up problems.

❑ **Consider the future.** As you select plants, think about how big your trees will be when mature. Just because you plant a 15-gallon Birch (typically 8 to 10 feet high with a 3 or 4 foot diameter) 20 feet away from the watershape, in 5 years that same tree could easily be 20 feet or higher with a 10- to 12-foot canopy. This means it will be creeping closer to the watershape just by its nature.

❑ **Weigh the possibilities.** As you think through your options, try to gauge just how far leaves and other droppings will reasonably be able to travel. Wind and the site's degree of exposure are big factors here: The lighter the leaf, flower or seed pod, the farther it will travel. Your goal should be to place the plants far enough away from the watershape that you minimize the opportunity for falling

debris to reach it – especially in a breeze.

❑ **Remember your clients.** This is a huge factor: Only plant what your clients say they are willing to clean up! At a minimum, do your duty by making them fully aware before planting of everything you know about a plant's "drop factor."

A great many of you have learned these lessons through trial and error or by dint of experience and lessons learned the hard way. If you've found plants that are suited to use around watershapes – or found ones you avoid like the plague – please let me know. I'll spread the word!

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



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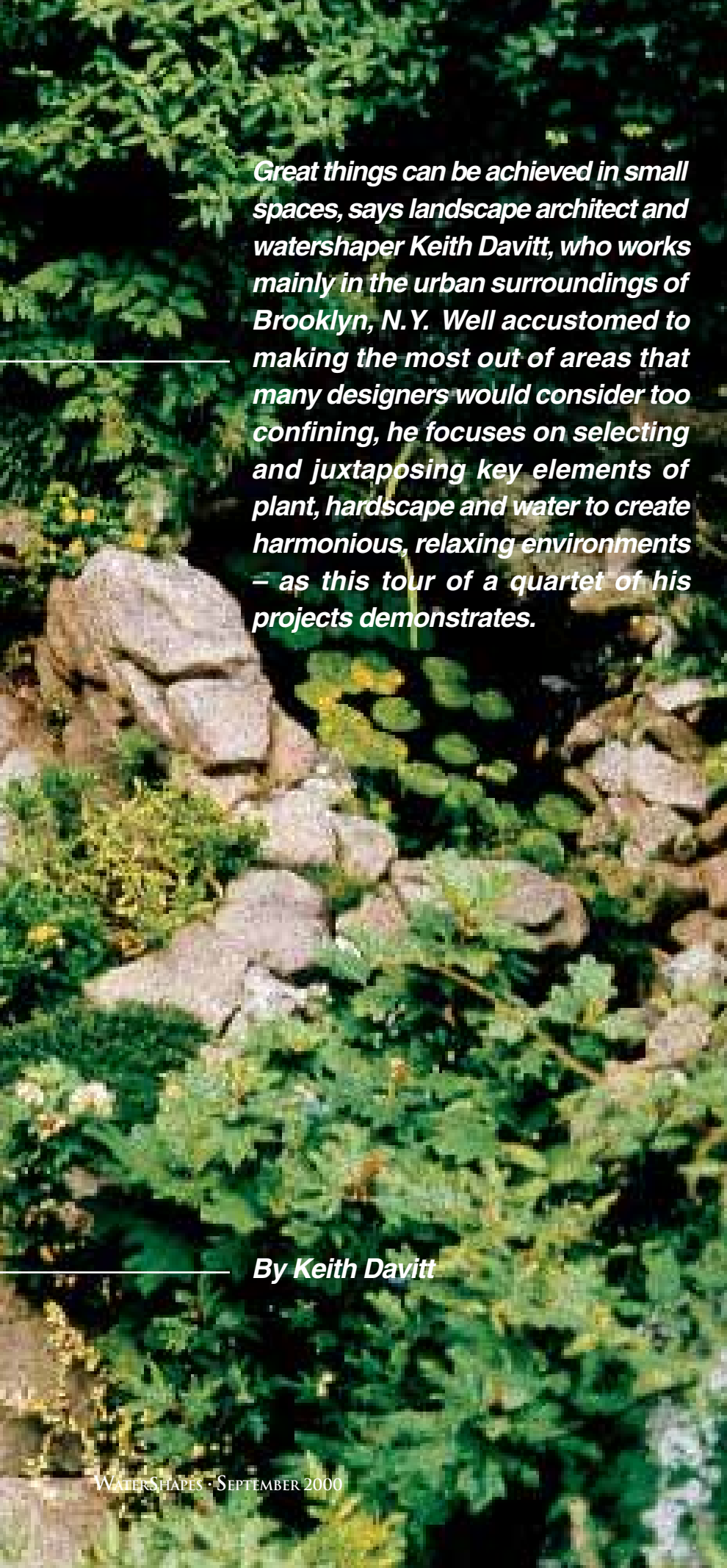
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Small Wonders

A photograph of a garden featuring a low, rustic stone wall. The wall is constructed from irregular, light-colored stones and is partially covered by climbing green plants with small yellow flowers. Behind the wall, there is a dense thicket of green foliage, including various leafy plants and shrubs. The overall scene is vibrant and naturalistic.

Great things can be achieved in small spaces, says landscape architect and watershaper Keith Davitt, who works mainly in the urban surroundings of Brooklyn, N.Y. Well accustomed to making the most out of areas that many designers would consider too confining, he focuses on selecting and juxtaposing key elements of plant, hardscape and water to create harmonious, relaxing environments – as this tour of a quartet of his projects demonstrates.

By Keith Davitt

Just as every garden should reflect the aesthetic values of its owners and accommodate their lifestyle preferences, so too every watershape should reflect the nature, purpose and “meaning” of the garden it inhabits.

If it’s a Victorian garden, then the watershape should be of similar style – perhaps a blend of formal and natural elements with stone or brick accents. If the theme is “wild, romantic tangle,” then cascades, blossom-laden pools and rambling roses may be in order. For its part, a simple, paved court may call for a raised fountain.

As a designer and builder of landscapes with a particular appreciation for water – and as one who has worked for the last ten years in the New York City area – I have been critically concerned with comprehending the principles of landscape and watershape design for small spaces.

When built from scratch, the watershape in a small garden should be seen as an integral component of the landscape – either as an accent or as a focus around which the garden is arranged. If the landscape is already there, then I let it guide the design of the watershape. Then, beyond basic design, there’s also the “how” of it all and the selection of materials most suited to creating the desired effects and impressions.

To illustrate these approaches, let me start with two landscapes – completely different arrangements in distinct styles that create entirely different effects, but both of which support the use of a raised fountain – and then follow up with discussions of two others that bring the issues I’m defining into sharp focus.

A NATURAL SANCTUARY

This first landscape, seen before work began (A), is now lushly organic and meant to be reminiscent of the owners' homeland of Nicaragua (B). Active businesspeople, they wanted a natural sanctuary in their little rear plot – a place in which they could escape the modular rooms and hard surfaces of their daily lives.

The key to success in designing for any space – and for small ones in particular – is achieving a balance of the elements that make up the garden. If you get it right, the space is comfortable, evocative and attractive. If you don't, you end up with disunity and confusion.

Though small in size, this private retreat gives them a variety of soothing sensory experiences. And even though the garden is only 18 feet by 30 feet, it doesn't feel confining.

The curving, dry-laid stone wall is one important factor. Straight lines are instantly taken in by the eye, forcing us to acknowledge the limits of the space they define. They also can be rigid and unin-

spiring, and the hard corners created by straight lines are generally uninviting. By contrast, curves create a sense of motion. They are soft and add interest, while the scooped-out bends are inviting and enhance the sense of usable space.

The wall sets up fundamental divisions of the space – a key issue of balance in small gardens. Had the planting areas been made larger, the living areas would have felt too confined. Had the planting areas been smaller, the hardscape elements would have become too dominant, rendering the scene both uncomfortable and even sterile. As it is, there is an ample living area with a richness of plantings that carries numerous and repeating harmonies as well as contrasts in form, foliage and flower.

Detail is another important tool for enlarging small spaces. Gardens are visual scenes, but they also are scenes that are *experienced*. Detail, however introduced, adds dimension and interest, expanding the impressions the garden makes. In this garden, I've used distinctive plant com-

binations to perform this function.

With its rounded leaves, the variegated *Hydrangea* both harmonizes and contrasts with the blade-leaved, variegated *Iris*. For its part, the variegated *Cornus* harmonizes in leaf color with both of those plants while contrasting with the dark, glossy-leaved *Ilex cornuta*. Below, the low spreading *Gaultheria procumbens* and the variegated *Liriope* repeat these foliage effects on a smaller scale.

This whole luxuriance of flora grows behind, within and spills over the top of the stone wall. It creates pleasing textural contrasts – again, adding dimension through detail.

The watergarden is a natural adjunct to the overall design motif and an extension of the dry-laid stone wall. It wasn't "fit into" the garden design; instead, it grew out of it and, with its rock, water and plants, reflects the garden back upon itself. It is not specifically a focal point, but instead is an integral and harmonious component of the landscape. The motion and sound of water trickling

Continued on page 26



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Continued from page 24

down rocks and the vision of colorful Koi gliding among the water lilies also add depth to the garden, contributing further to the sensory experience the owners craved.

CURVACEOUS CHARM

The second landscape also was built in a small yard, has a raised fountain and is a natural result of the overall design – but

here the watershape is clearly the garden's focal point.

The drive behind this landscape was our desire to capture a convivial, enduring whimsy that was inherent in the site but had not been exploited, as the “before” photograph shows (C). Those qualities are now supported by the curvy, rolling brick walls, the scooped-out/built-in seating areas and the hand-carved an-

imal tiles and family members' names built into the walls (D).

The space was designed for use by two little girls who love to play outdoors and throw tea parties – and by their parents, who thrive on outdoor living. This landscape, I think, gives all of them what they wanted from their garden (E).

The brick fountain, with its frog spout





and water-themed tiles (F), is truly the heart of the garden. It's the first place people go when they enter the space and a focal point from almost everywhere within it. But it's not visually inescapable: If you simply want to sit quietly and listen to the sound of falling water, the built-in brick-and-bluestone bench behind the fountain offers that experience, shielded by a rose arbor and

the cascading branches of a weeping cherry (G).

The space is not more than 30 feet by 17 feet, but because of the design elements – the division of space, the curves and undulations, the small spaces within spaces, the details of tiles, stone and unusual plant combinations – the garden feels ample. And the fountain lends the garden a vibrancy and charm that

echoes throughout the space.

CLASSIC VICTORIAN

Now let's move on to a discussion of a small garden done in a specific style – in this case, Victorian. Characterized by natural materials romantically composed, Victorian gardens can be among the most beautiful of all spaces to see and most pleasurable in which to be.



They also can be lots of fun to build. I really enjoy working with elements such as redwood decks, bluestone patios, dry-laid stone walls, stone planters, lattice fences and rose arbors – as I did in the project seen in the next sequence of photographs.

As seen in a snapshot taken before work began (H), the space was long and narrow, so I divided it into three “rooms,” thus building a sense of spaciousness and intrigue. A long, narrow garden is static, apprehended all at once and consequently uninteresting. Divided into rooms in this way, the viewer takes in other portions of the garden – but from no single spot can the *entire* garden be seen at once: There’s always some promising place to go and thing to see “just over there.”

The upper room, accessed directly from the house, features the redwood deck flowing down to a private patio area overhung with Birch and Japanese Maple (I). The customer wanted this to be a relaxed, easily accessible area, intended primarily for family members to drink their coffee, have a quiet lunch or enjoy an intimate dinner.

I also wanted this room to have its own watershape. Keeping with the informal motifs of this area, I built a small fish-and-lily pool in a natural, free-form design with a small flow of water over river rocks.

From this room, one sees through a rose arbor and into a larger, more formal room and a semi-formal watergarden embedded like a dais in a field of lawn and plantings. This central room serves as an outdoor, scaled-down grand hall or pavilion, offering a classical Victorian experience — that of stepping from a modest, low-ceilinged room into a spacious, sumptuously ornate environment.

There are blossom-bedecked, stone-faced planters on the left, a dry-laid stone wall on the right (also richly planted) and a low, arching wall straight ahead. Here is the dining area for larger parties, a gathering area for groups or simply a room for quiet enjoyment and wandering. And once you’re in the room, the watershape draws you in further, becoming the focal point of the landscape (J).

The fountain itself is classic Victorian: an oval-shaped, inground pool lined in stone with an arch-shaped stone wall behind it – one that harmonizes with the





low retaining wall and from which water pours, catching both the eye and ear from the first room onward. Dead center and the most readily identified component of the garden, this fountain captivates the viewer at the same time it makes him or her curious about what awaits in other rooms and spaces.

A ROMANTIC INTERLUDE

The “wild, romantic tangle” I mentioned earlier was how the client described what they wanted in the fourth and last landscape I’ll discuss here.

How I was to achieve that tangle was, happily, left entirely to me. By the time I was finished, the project seen in the “before” shot (K), involved bringing in about 300 cubic feet of soil, three tons of stone, a lifting and moving machine, about a hundred species of plants, countless odds and ends and a whole lot of hard work.

This is a case in which the garden was built around the watershape. I conceived of the site as a sort of “ruins” through which a natural stream runs, issuing from an Artesian fountain and





flowing into a natural pool. (For details on how the stream came together, see the sidebar on page 31.)

Shown here just after planting and before placing a few more artifacts of ancient destruction – a piece of column, a broken capital and such – you can see how, as the plants grow in, the space will align with the owners' desires (L).

Important to this landscape is the "how": After bringing in 600 bags of soil (remember, these are city dwellings, and

there was no access to the rear except through the home) and then sculpting the terrain, we brought in the boulders, one by one. Through main force, we wrestled them onto the site – but it became quickly apparent that good placement would require something other than brute strength.

I thought about it, contacted an ironsmith and asked for help in building a machine that could lift the 1,200-pound stones. The first version crumpled instantly. After

consulting a few more ironsmiths, one directed me to a shipbuilder who repaired ocean-going vessels. From my design, he fabricated a machine that would allow me to lift, swing, pivot and precisely place even the largest of the stones (M).

In addition to good placement, this device also allowed me to set the liner under the rock, obviating the chore of laying the liner over the large stones, then covering it over with additional stone. This was certainly important: The garden was just 17 feet by 30 feet, so every square inch was precious. You may not have thought it possible for this type of construction to look natural in so tiny a site, but as you can see in the photos, it does work.

When planting time finally arrived, I set off for the nursery with a big truck and a small list with a few plants the clients particularly wanted. For the most part, however, I prefer to ad lib, looking for effects rather than specific species.

In this case, I wanted nothing too tame. I set up a backdrop of deep evergreen (*Arborvitae* and *Cryptomeria*), plants to arch over the water (dwarf spreading Hemlock, *Berberis*, oakleaf *Hydrangea*) and background shrubs to grow all into one another (*Viburnum*, *Camelia*, and *Cornus*) – along with a few flowering trees





(weeping Cherry), a bunch of vines and countless perennials.

It took us seven months to build this garden, including time spent in resolving some of the how-to issues and accommodating some specific client wishes. We had the stream completely built and looking great, for example, when the client requested more activity in the upper stream (N). We took it apart and started over.

To sum up, we began from a theme, translated that into a concept, built the primary element and let the rest of the garden grow up around it. By this time next year, as the climbing Roses, the Wisteria, the Lilac, the Honeysuckle, the Viburnum, the ferns and ninety-odd other species of woodsy, rambling plants grow in, we should indeed have a “wild, romantic tangle” with a magical stretch of water flowing through it.

As we moved along, even I wondered if we would be able to produce the results we were after in these cramped quarters, but on balance I think it works. More important, the clients wholeheartedly agree.

Making Magic

A big part of the “how” of creating the “wild, romantic tangle” my clients wanted in their small yard revolved around the task of setting up the stream and the river rocks.

I spent the better moments of my childhood sailing sticks down streams, and I suppose I picked up something of how streams look and water flows in the process. Although this is a skill you can learn, it isn’t something I can teach here – although I’ll share some principles I always apply in building streams.

First, if a stone is to be in water, it should show signs of water wear – smooth or rounded and placed in such a way that its curves parallel the flow of the water. Notice my waterfall stone, for example: I searched long and hard for that rock, and it works wonderfully. Too many waterfalls I’ve seen have

water flowing over rock recently hacked from the bones of a mountain and never before visited by so much as a raindrop. That just won’t do it for me.

Second, no matter how small, elevation changes (my client calls them “cascades”) are crucial to conveying the feeling of a natural stream. But they’re a real challenge to build when, as in this case, you do your shaping without the aid of concrete or foam. Fortunately, my foreman has a knack for folding liners up the backs of stones and covering with other stones – completely hiding the liner while forcing the water over the top of the lead stone.

Third, pay attention to aural effects. The sound a whole series of cascades makes is a real delight – and another key to creating the impression of a natural stream.

– K.D.

Good

Aer



The health and welfare of a typical pond or lake depends on a long list of factors

ations

and many man-made ponds or lakes will fall into an unwelcome balance. Here,

By Erich Altvater

– not the least of which, says engineer Erich Altvater, is proper aeration. If you get it right, he says, you can improve water quality; miss the mark, however, he explains what it takes to understand the water's needs and guide clients to the proper aerating system.

As the watershaping industry gets more involved with naturalistic bodies of water – particularly large ponds, lakes and streams intended to harbor life in the forms of aquatic plants and fish – it becomes increasingly worthwhile to understand the important role of proper aeration.

Aeration is a simple process involving the injection of dissolved oxygen (DO) into water. Nature aerates by way of things such as waterfalls and rain – activities we must imitate by mechanical means in our man-made settings if fish are to be healthy and a host of water-quality problems are to be avoided. This is why many man-made lakes and ponds have some form of mechanical aerator.

The issue becomes somewhat more complex, however, when you're faced with selecting an aeration system for any given watershape: Every body of water is different, and developing a nearly individualized approach to each one's oxygen demand is important in making an informed decision about the best form of aeration to apply. And when you add in the fact that many types of aerators also look like fountains – a big plus for designers and clients concerned with appearance as well as function – there's an aesthetic component to consider as well.

Let's start with the fundamentals and aeration in general before we get around to aerating with visual appeal in mind.

IN WITH THE GOOD

Aeration is all about oxygen, an elemental gas that is essential to sustaining nearly all forms of life and myriad natural processes, including the decomposition of organic matter.

Fish and other waterborne animals need adequate levels

Photo courtesy Oase Pumps, Irvine, Calif.

Lighting the Spray

Surface aerators can be used to great aesthetic effect – especially at night. White light can be beautiful, shot up through the spray pattern – and a clear lens will pass 97% of light from a fixture into the stream.

(Color lenses pass as much as 50% and as little as 10%. This should be considered in selecting colors for use in areas of high ambient light, such as restaurants or miniature-golf courses, or in mixing colors so that certain shades are not washed out.)

Low-voltage lighting is subject to voltage drops on long runs, although it does offer freedom from nuisance tripping of GFCIs. (This is not a total blessing, however, as it also hides leaky fixtures and damaged cables.) As a rule, larger spray patterns require the higher wattages offered by line-voltage (120 volt) fixtures.

And keep in mind that better quality fixtures are easier to service reliably. Remember, you may find yourself hanging off the stern of a boat to do so!

—E.A.

of oxygen to survive. DO promotes the oxidation of organic nutrients and displaces the water's concentration of other gases, promoting the overall health of the aquatic environment.

This concept of dissolving a gas in a liquid is pretty simple in scientific terms, but it's easier to grasp when illustrated by an analogy like this one: A *hot* can of soda will "pop" more when opened than will a *cold* one. This is because warmer fluids lose their ability to retain dissolved gases. When you apply this concept to a pond, lake or stream, you can understand why the need for aeration increases significantly in summer, when water temperatures rise.

When you add living organisms to the picture, things get even more complicated. All ponds have algae, for example, that will add oxygen during the day and subtract it at night. In other words, you're working with a living system that changes hour to hour, so you have to avoid the trap of thinking of your lake or pond or stream in static terms. (The respiratory efforts of algae, by the way, explain why it's a bad idea to shut aerators off overnight – just

when the water needs oxygen most!)

As important as aeration is, it is *not* a magic bullet: Challenges arising from shallow depth, the presence of heavy plant and animal life or limited circulation can tax any system and make it very difficult for any type of aerator to maintain adequate DO levels.

In this sense, the role of oxygen in the overall health of the water's living biosystem has profound implications for the construction process with respect to issues such as depth. The simple fact is that many man-made lakes and ponds are too shallow – probably an attempt on someone's part to trim a few bucks off the excavation bill.

A too-shallow pond or lake is really a marsh in the making. Sunlight easily penetrates to the bottom, making plant growth a potentially explosive issue. This leads to stopgap measures such as the purchase of aquatic dyes that effectively make the pond "deeper" in terms of light penetration. It also starts water managers on circuits of chemical treatments that control growth – but produce dead organic material that must decompose and in so doing will fur-



ther rob the water of dissolved oxygen.

To be sure, chemical manufacturers recommend treating the water in stages to avoid fish kill, but real-world situations often spiral out of control. It's also true in the real world that aeration will reduce the need for these chemical applications and their associated risks and expense.

And if you happen to work in an area where the use of herbicides or dyes is restricted – particularly if your lake overflows into another body of water – achieving health through aeration may be your only option.

TO EACH ACCORDING TO NEED

The factors that have come up so far – size, depth, circulation, aquatic life – all place their demands on an aeration system. Depending on the application or the type of the body of water being considered, that demand can change dramatically in ways that dictate your choice of aerators.

On one end of the spectrum, the most demanding needs for aeration are found in the aquaculture industry, where fish

are maintained in unnaturally high concentrations with correspondingly high DO demands. At the other, decorative ponds and streams demand much less from their aeration systems.

Paddlewheels, compressed-air units and aspirating injectors all have their niches in the aeration business, but none of them rank high on the beauty scale for residential applications.

- *Paddlewheels* are bulky devices that create splashing/aerating effects similar to those generated by cascades and waterfalls. They are well regarded by the aquaculture industry for their efficiency at oxygen transfer, but they're not intended for public use.

- *Compressed-air units* feature a shore-mounted compressor that must be mounted in an enclosure to reduce noise. Air is then distributed by a weighted air hose to air stones distributed across the lake's bottom. If the water isn't deep enough, there might not be enough rise time to enable the bubbles to dissipate before reaching the surface, which can cause an appearance issue and reduce performance. By contrast, very deep waters tax compressed-air systems by requiring more horsepower to overcome head pressure.

- *Aspirating aerators* use a pump to

force water through a venturi that aspirates air into the flow. These devices are useful in applying aeration and circulation to problem spots, and do so without creating a visible spray pattern.

Many customers, however, want to see something dramatic in return for paying their utility bills, which is why floating-fountain aerators are becoming increasingly popular – a practical and aesthetic solution.

Floating units disperse water through the air, increasing droplet surface area and, consequently, dissolved oxygen content. Another benefit is increased circulation that distributes the DO where it will do some good. In fact, this circulation offers added value by breaking up layers of thermal stratification and reducing fish kills that can result from thermal inversions that hit ponds seasonally. Increased DO also will help aquatic microorganisms and the aerobic bacteria that decompose sludge.

ANCHORED PERFORMERS

Floating aerators are held in place either by shoreline ropes or by ropes tied to anchors or concrete blocks. Shoreline ropes can be used to pull the unit to shore for servicing, but most residential and almost all public installations use the anchor approach,



Electrical Issues

It's beyond the scope of this article to get into the subtleties of the National Electric Code, UL listings and the occasional gray areas that now exist between them. The next NEC will address floating fountains, as UL has recently done with a new listing category.

In brief, however, NEC Article 680 requires *fountains with submersible motors* – which is how most floating units are considered by electrical inspectors – to be GFCI protected and to operate with pumps at 230 or 115 volts, lights at 115 or 12 volts. Be advised that some manufacturers sell products that operate at 460 volts and get around the NEC by labeling them as *aerators*, which are not clearly defined in the rules. Others leave out GFCI protection and timers to cut the price of the floating device and shift the cost into what the owner must provide on shore.

Let the buyer beware: The major manufacturers in the industry will not sell floating fountains without GFCI panels; if the big guys don't want the liability, why should you?

GFCI protection should be located near the shore. This has a couple of benefits: It reduces the length of underwater cable running to the fountain (a substantial savings, especially given the lower cost of running a feeder line from the panel to the GFCI) and also minimizes the possibility of nuisance tripping. And if turtles or muskrats attack the cable, replacement costs will be reduced by having the shortest-possible cable run out to the aerator.

It's also a good idea to run a conduit sleeve from the shore to the GFCI panel to allow the cables to be pulled into place and attached. This protects the cables from mowing and vandalism. And be generous with the diameter: It'll come in handy a few years down the road when the conduit is filled with mud and crawdads and you need to pull the cable back out!

—E.A.

Photo courtesy Oase Pumps, Irvine, Calif.

which requires use of a boat for re-lamping of light fixtures or cleaning. (Safety is a must: Maintenance personnel should wear life vests, and electric-panel lock-outs should always be used when service is in progress.)

These fountains come in one of two forms: units with motors and surface propellers (usually called aerators) and units with centrifugal and mixed-flow pumps (usually called floating fountains).

Motorized propeller units move more water per horsepower than do centrifugal pumps, producing a heavier pattern of droplets – but this occurs across a smaller area.

Depending on the unit, the manufacturer and the application, these devices also may raise noise issues, and older designs can be bothered by ice or debris. The push for UL certification has made finger-safe intake screens the norm, making cleaning requirements increasingly similar to those applied with fountains.

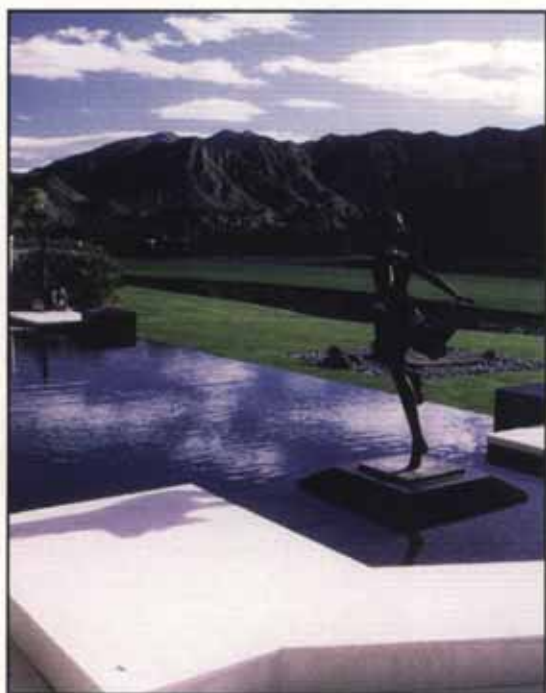
Continued on page 38



Photos courtesy Otterbine-Barebo, Emmaus, Pa.



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Fountains with centrifugal and mixed-flow pumps offer an extensive variety of water effects that cover wider areas—everything from the middle ground of flow and pressure up to high-pressure, multiple-stage turbine designs used to generate decorative patterns that reach heights of more than 30 feet. Here, it's a matter of selecting the unit that gives your clients desired features and long-term flexibility.

With both these systems, appearance and circulation are tied together. A vertical plume is simple, classic and dramatic, for example, and achieves the greatest height the pump can deliver—but the water falls directly back to the pump intake, so the system has a lesser effect on overall circulation than would a system with a wider fan pattern.

But while a wide fan pattern may be better for circulation, the practical approach may not be the best one aesthetically if the lake or pond level is a few feet below the

but that doesn't factor in either depth or shape. Often, for example, the best decision is to go with two smaller units at the end of an elongated lake rather than a big gun in the middle. (This two-fountain approach is also useful in providing redundancy when one unit is down for service.)

Many of these systems also come with accessories that may prove useful. If your clients opt for great height, for example, you should think about installing wind sensors and controls. Also, most products have separate cabling for pumps and lights. This feature makes for easier upgrades and repairs through the years.

THE AERATION MINDSET

The ultimate sin with respect to aeration is to ignore it altogether, but that's rarely a problem because any level of experience with living watershapes usually cures professionals of the tendency to walk away from this fundamental need.

Many customers want to see something dramatic in return for paying their utility bills, which is why floating-fountain aerators are becoming increasingly popular.

bank and the fan cannot easily be seen. For this reason, many designers turn to combination units that deliver center and horizontal sprays or arch patterns as a compromise. It's also possible to get models with interchangeable nozzles to produce a variety of effects—allowing selection of seasonal configurations for maximum decorative or aerating effects.

As might be expected, these units range in size from quite small to quite massive. Ease of installation and maintenance is obviously influenced by product design, so you need to make sure at the outset that the body of water is deep enough and has sufficient shoreline slope to make the selected unit workable.

As for the working part of the system, the pumps are rated in horsepower—which doesn't necessarily tell you what you need to know. Some in the trade use "one to two horsepower per acre" as a rule of thumb,

Despite general acceptance of the need for adequate aeration, however, the subject is not without debates of both the theoretical and scientific kind. Anyone who works with living bodies of water as a steady diet should spend some time at that higher level of discussion, but the important thing for most professionals is becoming familiar with the fundamentals of aquatic environments and appreciating the role of oxygen and all the processes it influences.

It can take time to sort through marketing claims and the bits of misinformation that can creep into competitive discussions, but for the most part, companies that have been successful at selling aerators have done so with products that work. In that context, the best way to ensure success in building and maintaining lakes, ponds and streams is to learn the critical questions and actively seek the best answers.

Aerator ←

By Lisa A. Berosh

Fountains have been a focal point in the center of almost every European city for more than a thousand years. From the fountains of Rome to the fountains of Versailles and beyond, every man, woman and child is familiar with the grace of these watershapes.

Comparatively speaking, aerators are relative newcomers: Invented during the Industrial Revolution, aerators are environmental tools that have many applications.

The difference between an aerator and a fountain is clear in concept, but not necessarily in appearance. Where the primary purpose of an aerator is to improve the environment by oxygenating water, fountains are there purely for aesthetic reasons. You might say that it's like the difference between a tool and a statue.

So why does there seem to be confusion between aerators and fountains? Well, it all boils down to appearances: Both may throw water into the air, but the similarities mostly stop right there.

DELICATE BALANCES

To understand the real distinction between fountains and aerators, you need to dig into a science called *limnology*, the study of water-quality maintenance in a lake or a pond. What that science tells us is that we aerate these bodies of water to slow the aging process.

It tells us that all lakes and ponds age based on the levels of oxygen in their water balanced against the amount of nutrient loading. The greater the ratio of oxygen to nutrients (or organic matter), the slower the aging process.

As nutrients for plant and animal life find their ways into the water, bacteria will metabolize or oxidize them. This is known as *aerobic digestion*. It's pretty easy to tell when it's working: In fact, most odors associated with lakes and ponds are usually due to the presence of *anaerobic* conditions in the lake—meaning there's not enough oxygen in the water to go around.

or Fountain?

Photo courtesy Oase Pumps, Irvine, Calif.

As nutrient levels increase, so do oxygen demands. When all of the lake's available oxygen has been consumed, bad things are at hand: Algae and aquatic weeds grow, creating an unsightly mess. And most algae have two-week life spans, so they'll soon die and fall to the bottom – thereby adding to the nutrient level and robbing the water of even more oxygen.

Studies have shown that this sediment accumulates at anywhere from 1 to 25 inches per year. The effects of the resulting lowered oxygen levels are the premature aging of the lake, algae and weed growth, unpleasant odors and significantly reduced aesthetic value of the watershape and landscape.

In a nutshell, the highest goal of any manager who oversees a lake or pond is to ensure sufficient oxygen levels in the water.

MORE THAN PRETTY

Into this challenging scene, inject the aerator.

Initially used in wastewater treatment, aerators became a tool in the landscape industry during the early 1970s, when it was recognized that proper aeration practices could replace or limit the use of chemicals. By promoting good water quality and helping to prevent algae growth, aeration served to eliminate odors, prevent sediment build-up and enhance the beauty of the watershape.

As was mentioned in the adjoining feature, this meant application of three basic types of aerators. We at Otterbine-Barebo classify them as bottom diffusers, horizontal aspirators and surface-spray aerators.

The first two types of aerators create no surface disturbances and operate invisibly –

a plus if your client is after a purely naturalistic setting. The third type – the popular surface aerator – is the one often confused with a fountain.

They may look the same, but the purpose of an aerator is much more sophisticated in technical terms. As the many droplets travel through the air, they trap atmospheric oxygen, releasing it into the watershape as they strike the surface. The more water you pump into the air, the more oxygen you transfer to the water. This is known as the *oxygen transfer rate*, which is expressed in pounds of oxygen per horsepower per hour.

Certainly, fountains send water through the air and increase aeration, but because these systems are not designed with oxygen transfer rates in mind, you'll never really have a way of predetermining how much good a fountain will do.

MAKING A CHOICE

Knowing this, you can ask some key questions when you're in the market for an aeration system destined for use on a lake or pond.

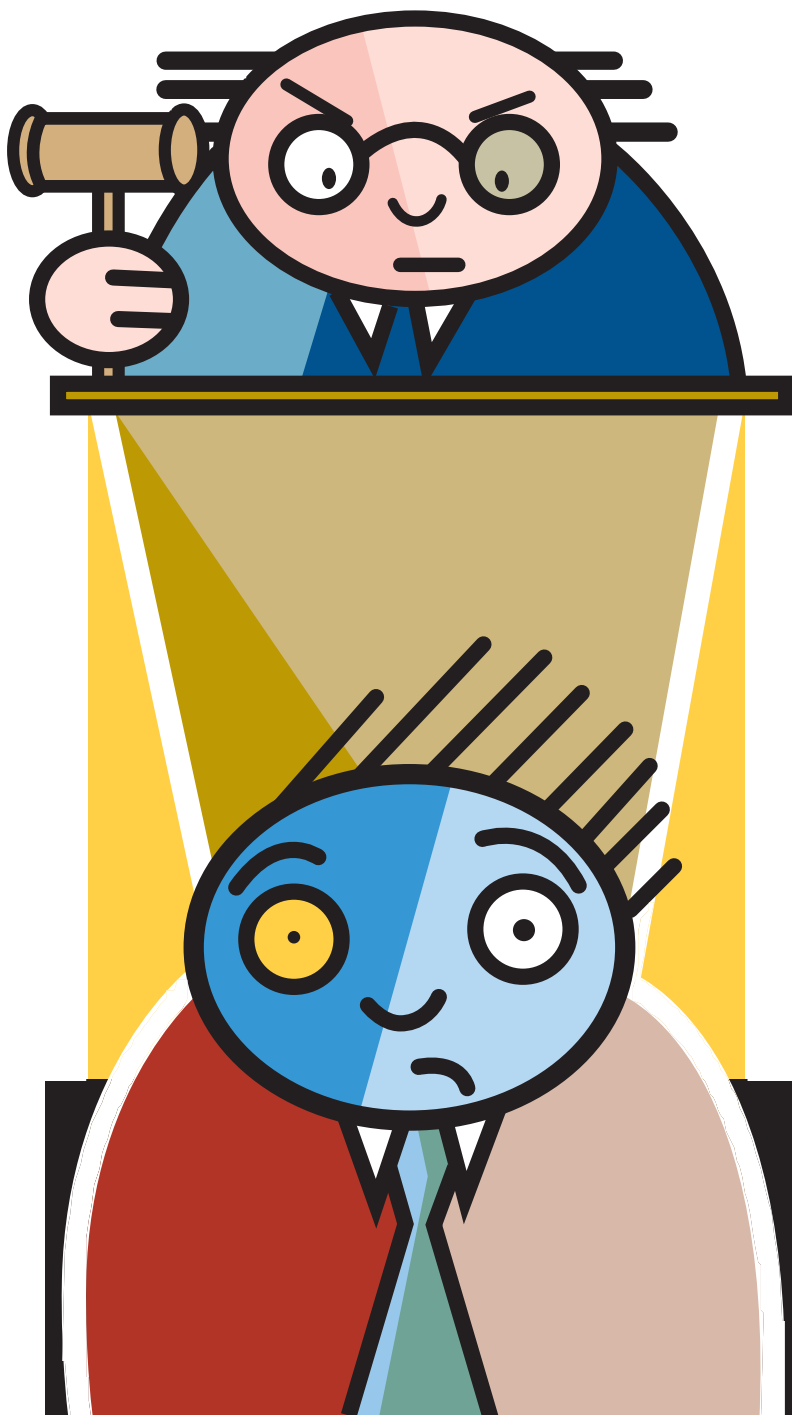
For starters, ask the manufacturer if a university or an accredited lab has verified its published oxygen transfer rate. We believe that a good aerator will transfer approximately 2.2 pounds of oxygen per unit of horsepower per hour.

This results in 475 gallons of water being pumped into the air per minute and points to another key distinction between aerators and fountains: Where an aerator will pump large volumes of water at low pressures, fountains mostly pump low volumes of water at high pressures.

To ensure that you are selecting a product truly designed for water-quality management, always ask the manufacturer for their oxygen transfer rates: If they offer them, they're selling aerators and you'll have the information you need to make comparisons and intelligent buying decisions.

By selecting the right system, you reap the aesthetic advantages of a fountain and the practical benefits of an aerator – the best of both worlds.

WHO NEEDS



None of us like it, but the simple fact is that contractors of all sorts – watershapers included – are all too often hauled into court to defend their actions. To aquatic consultant Curt Straub, this process of resolving conflicts in front of a judge is costly, painful – and almost completely avoidable. Here, he offers a powerful alternative that can help designers, engineers and builders avoid the courtroom doors.

BY CURT STRAUB

Most watershapers and their businesses have been (or at some point *will* be) exposed to some form of litigation. We do indeed live in a litigious society, and if you have yet to experience this sad reality at close hand, just wait a while: It's the nature of the contracting business, and your turn almost certainly will come.

Doing battle in a courtroom has often been described as the world's most expensive indoor sport, one about a half step away from hand-to-hand combat. It's stressful, costly in time and money, incredibly distracting and generally no fun at all. In my own experience, litigation is the ultimate in misery and frustration: Even when you win, you walk away feeling like you've been through some kind of meat grinder.

LITIGATION?

In an effort to stave off the costly, time-consuming, unpredictable and generally unsatisfying outcomes that all-too-often arise through the conventional judicial system, many companies have been turning in recent years to Alternative Dispute Resolution. In fact, this trend has so much momentum and respect that Congress passed the Alternative Dispute Resolution Act and the President signed it into law in October 1998. This legislation mandates that all federal courts must develop and implement ADR programs.

I'm not always in support of things our government does, but in this case, I believe strongly that ADR programs and other mediation strategies can help all of us lift the burdens of litigation from our lives.

A BETTER WAY

You don't have to have been a water-shaper for very long, or, for that matter, have participated in any other construction trade, to know that lawsuits lurk around too many corners. The web of contractors suing subcontractors, homeowners suing designers and contractors and suppliers – and, generally, everyone suing everybody else – has become an unfortunate part of the industry's fabric and psyche.

At times, it seems the lawsuit mentality is habitual, something we do reflexively and without hesitation – and I think that should stop. But how? Well, I believe it is in our individual and collective interest to do everything we can to eliminate as many legal actions as possible – and that means finding other ways to resolve our differences.

In a previous article (October 1999, page 46), I discussed the practice of part-

nering as a method for forming alliances among designers, engineers and contractors that can be used to streamline the work on a given project and provide a positive environment for the solving of problems as they arise. Although I firmly believe that partnering is a wonderful way to stack the decks in your favor, there is no doubt that, for all of the best intentions, there are still going to be conflicts that require outside resolution.

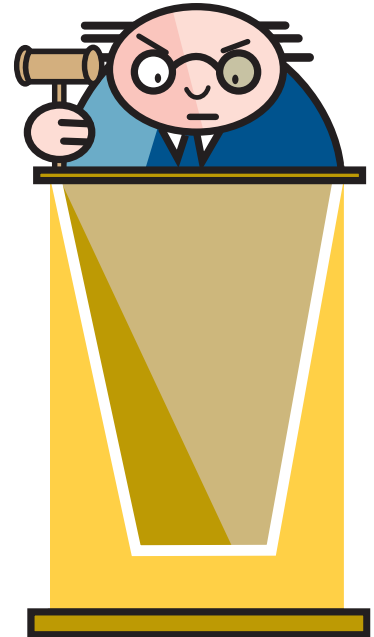
ADR offers a number of options in that respect, the three most common of which are negotiation, mediation and arbitration – and all of which can be used effectively before you reach the courthouse steps.

□ **Negotiation** is the most common option, one that is used daily by just about everyone in one way or another. In this (typically) informal process, parties engage in a personal, face-to-face “give and take” to resolve disputes.

The only problem with negotiation, and one that sometimes results in unsatisfactory outcomes, is that it's not as easy as it seems and the parties involved often do not take the time to prepare properly. (How to prepare for negotiation is a long topic unto itself – and the subject of a future article.)

Suffice it to say for the moment that proper preparation means close examination of the issues at hand, with an open mind as to how and where you can bend a little for the sake of a positive outcome. In other words, it means looking in specific terms what is and isn't important to you as well as setting aside your anger or at least holding it in check for the duration of the process.

□ **Mediation** is the process of allow-



I believe it is in our individual and collective interest to do everything we can to eliminate as many legal actions as possible – and that means finding other ways to resolve our differences.

ing a third, neutral party to assist the disputing parties in negotiating more effectively. A *neutral party* is one who has no connection with the dispute or interest in its outcome. From this standpoint, the mediator helps the parties clarify relevant

litigation reflex all too often kicks into gear. If you can resist the impulse at this stage and seek out a third party, you're following the ADR path through its logical steps.

□ **Arbitration** is similar to courtroom proceedings in that the third party actu-

forms of litigation. The key is finding an arbitrator who is familiar enough with the area of conflict – and, more important, to be in agreement with the other party in the dispute that the arbitrator's decision will indeed be *binding* in almost all cases.



The web of contractors suing subcontractors, homeowners suing designers and contractors and suppliers – and, generally, everyone suing everybody else – has become an unfortunate part of the industry's fabric and psyche.

issues, communicate more effectively and evaluate their risks and options.

Mediation is helpful anytime negotiations get stuck. If you find yourself at loggerheads with another company or individual, the next course of action should be to suggest mediation and to seek a qualified go-between to step into the breach.

This, however, is the point at which the

ally makes a decision after the parties have presented their respective positions. (We've all heard about arbitrators solving trade disputes, for example, or deciding how much professional athletes should be paid.)

Unlike the courts, however, arbitration is a private process and can move more quickly and be less expensive than most

Obviously, the first two options above are preferable in that they can reach a resolution quickly. If neither negotiation nor mediation does the job, the parties may seek other options for determining the outcome – and that doesn't necessarily mean arbitration or litigation. Often, for example, they will step back and gather more data in order to renew negotia-

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tions or give a mediator a better shot at clearing up the issue. If an agreement is reached in this way, then it can be formalized into a written agreement and enforced under contract law.

In my view, these negotiated or mediated outcomes are preferable to arbitration, because arbitration is almost always binding (absent fraud or abuse of the process) and has no appellate procedure, as is the case in court proceedings – unless the parties have agreed up front to receive a non-binding or advisory opinion only. Even with these potential problems, however, I'd take arbitration over a date in court.

CAREFUL PACES

I want to make it clear that these processes line up in sequence. That is, if negotiations between two parties fail, mediation is the most reasonable next step for many people and firms. To me, in fact, mediation is a *great* alternative – and the one I'll be dealing with for the rest of this article – because it involves an objective

third party without the complication of judgment and imposition of a resolution.

Mediation allows the disputants to have a dialogue and to be highly involved with the mediator in finding a resolution. It is a process in which the parties have an opportunity to reach a shared benefit in which the solution is driven down nobody's throat. Better still, rather than spending thousands of dollars on experts, depositions, attorney's fees and the other "stuff" associated with preparing for trial, many mediations can be completed within hours or a few days for what is almost always a lesser cost.

For all of these potential positives, however, mediation is far from automatic. For it to work, the involved parties must be ready to push the process along.

Here are several important points to consider. As you review them, bear in mind that any of these can be a stumbling block to successful mediation and that if the answer to these questions is "no," the first step is to try and identify what-

Continued on page 45

APPROPRIATE ALTERNATIVES

You can tell from the accompanying text, I'm a big fan of Alternative Dispute Resolution (ADR) – although I'm not so crazy about the word *alternative*.

I recognize that because negotiation, mediation and arbitration are all less the norm than litigation, the word fits for now. My hope, however, is that these methods will soon become so popular that they will shed the "alternative" label.

When the time comes, I offer the suggestion that the initials ADR will refer to *Appropriate* Dispute Resolution.

—C.S.

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If a dispute arises out of or relates to this Contract/Agreement, out of breach thereof, and if the dispute cannot be settled through direct discussions and negotiations, the Parties agree to endeavor first to settle the dispute in an amicable manner by mediation administered by Curt Straub; or a member of and under terms of the Heartland Mediators Association; or Three Step procedures set forth by the Center for Public Resources, Mediation of Business Disputes; or Construction Industry Mediation Rules set forth by the American Arbitration Association; before having recourse to arbitration or a judicial forum.

This Agreement shall be construed in accordance with and governed by the laws of the State of Kansas and Missouri.

INTENDING TO BE LEGALLY BOUND, the Parties hereto have caused this Agreement to be executed as of the date written above the signatures.

DATE: _____ DATE: _____

April 1997
Curt Straub
Aquatic Consultants, Inc.
P.O. Box 9254
Shawnee Mission, KS 66021

SETTING A TONE

The key to making alternative dispute resolution work is having an upfront agreement that the parties involved in the project will seek out those alternatives rather than take the case to court.

Included here is a form I use that likely can be modified for use just about anywhere – although having an attorney review the document for compliance with state and local laws would be more than slightly advisable.

–C.S.

If one of the parties is **itching** for a fight, moving them toward **mediation** can be difficult – but even then it's **worth** a try.



Continued from page 43

ever is necessary to satisfy these preliminary considerations before mediation begins. (In this sense, the success or failure of mediation is often determined before the disputants ever sit down with a third party.)

❑ Are the parties ready for mediation? Is everyone involved motivated to mediate in good faith? Are the parties – and their attorneys, if they are involved – putting aside trench-warfare mentality in favor of open minds and a willingness to come to the table in search of a solution? (If one of the parties is itching for a fight, moving them toward mediation can be difficult – but even then it's worth a try.)

❑ Are the parties willing and able to participate directly with a mediator? Are they all willing to strive for what may necessarily be a creative solution, one that may not be immediately identifiable at the outset? Do they have enough information at hand to permit development of a sound and durable solution?

❑ Have the parties developed their negotiation plan so that they can adequately explain their individual positions in a productive, future-oriented manner? (This is especially important and a point that is often overlooked: To mediate successfully, it's critical that the disputants take a hard look at their specif-

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ic points of conflict – the details of the situation – and identify what is most important to them in an outcome. Often this process alone leads those involved to identify possible solutions or see that the areas of conflict are more limited in scope than they may have thought initially. In other words, knowing your own desires is critical to entering the process

public eye can be helpful in opening frank discussions of the situation and its possible outcomes.)

❑ Are the parties willing to forgo a who's right/who's wrong approach in favor of working on mutual problem-solving and the isolation of common interests? (This is critical in that there are situations where some point of fact may never be resolved.

❑ If attorneys are involved, are they "on board" with the mediation process? Are they supportive and willing to give advice that will help settle the dispute rather than prolong it? (In my experience, good attorneys look for solutions, while bad ones seek ways to crank up their billable hours.)

❑ Have you found a trained media-

Mediation is very much a mindset, one that requires **acceptance** of the idea that by **giving** a little and looking for a creative **solution**, you will gain on all fronts.

with a pro-consensus mindset.)

❑ Is everyone willing for this process to be confidential, or is there a need for some type of public forum for resolution? (Often, privacy – or at least confidentiality – is critical in a negotiation, especially when one of the primary considerations is the reputation of either or both of the parties. Working away from the

A classic dispute in the pool industry arises, for example, over the question of whether a plaster problem has been caused by water chemistry, bad materials or improper application. No easy way out of that one!) Seeking a solution to the *im-mediate* situation can avoid the dispute becoming some kind of referendum on what may be a larger, unsolvable issue.

tor to do the job? (Mediators do not need to be attorneys. In fact, the most helpful mediators are often those who have been trained specifically in the skills of facilitation, evaluation, communication and problem-solving and may come from any profession. As long as both parties are confident in their selection of a mediator, the process has a very good chance of success.)

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□ When you've found a mediator, have you been specific about what you want this person to do? (Define what will happen during the mediation so that you are prepared and can go in with an understanding of the process and clear expectations about procedures. Indeed, it's a good idea to establish a schedule and a prospective time frame.)

If you've established a positive foundation for the process by addressing these concerns, mediation has a tremendous chance to work.

MOVING AHEAD

It seems clear that mediation is coming into its own as a means of addressing disputes. Indeed, mediation has increased exponentially in the past ten years, and it's even gaining credibility among those whose business is litigation.

Just a decade ago, less than 50% of lawyers felt that mediation could be used effectively – and then primarily in fami-

ly-based disputes. More recent surveys have discovered that fully 80% of lawyers now feel that mediation can be helpful in obtaining resolution at some point in almost any dispute.

Mediation is very much a mindset, one that requires acceptance of the idea that by giving a little and looking for a creative solution, you will gain on all fronts.

Think about the lingering impression litigation leaves with clients: How likely is it that clients who either directly participate in a lawsuit or are dragged into one are going to offer referrals for the companies involved?

Now consider the impression that can arise out of a negotiated or mediated settlement: There's a sense of cooperation, not resentment, and those involved can even take pride in having worked through a tough situation. You may even lay the basis for future work with the person or company on the other side of the issue: Through mediation, all parties show that their time,

reputations and the maintenance of civility are more important than the problem at hand. In effect, you have all risen above the problem in favor of moving forward.

Obviously, there are going to be situations that are intractable and must be solved in front of a judge. That's just reality. But negotiation and mediation (and even arbitration) not only keep you out of court: They also salvage relationships, save time, save money, let you retain your integrity, keep you on course and, most important, let you get on with your business sooner rather than later.

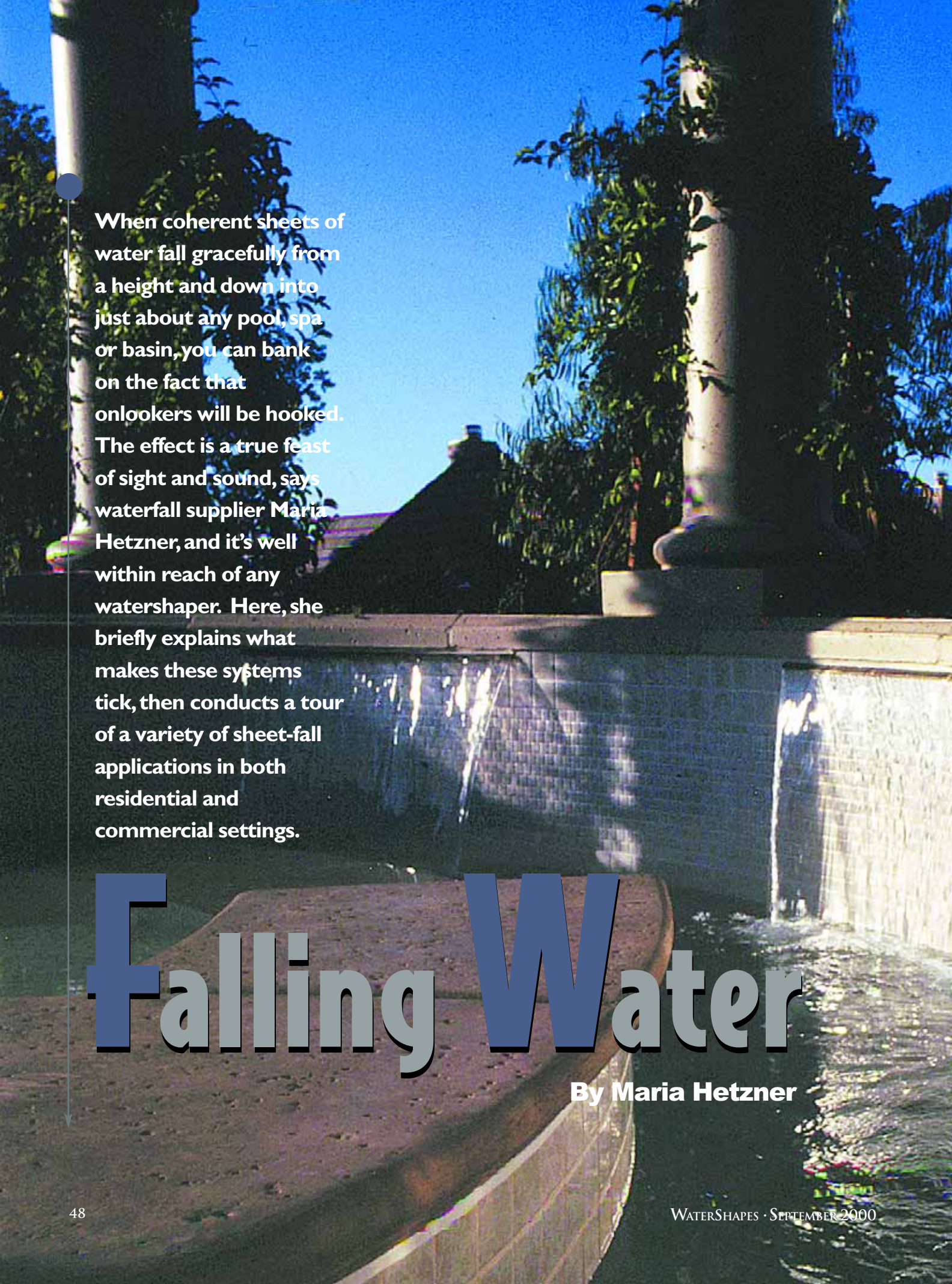
The best thing about alternative dispute resolution is that nobody is served legal papers – and everyone has a shot at coming out a winner. To my way of thinking, and based on my own experiences in the legal system and with ADR, *anything* is preferable to feeling that need to circle the wagons and start taking prisoners.



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When coherent sheets of water fall gracefully from a height and down into just about any pool, spa or basin, you can bank on the fact that onlookers will be hooked. The effect is a true feast of sight and sound, says waterfall supplier Maria Hetzner, and it's well within reach of any watershaper. Here, she briefly explains what makes these systems tick, then conducts a tour of a variety of sheet-fall applications in both residential and commercial settings.

Falling Water

By Maria Hetzner



As customer demands continue to push the creativity of watershapers to new limits, industry professionals need to stay atop the trends – and nudge those of us on the supplier side to new levels of creativity as well.

In some cases, this means learning how to construct new environments, such as the vanishing edges and beach entrances so many clients now want. In other cases, this expanded creativity comes from a need to know what products are available from manufacturers.

Although once they were the product of on-site construction skills, sheeting waterfalls now fall largely into the category of manufactured fixtures. This means that watershapers no longer need to worry about fabricating their own manifolds and nozzles, because these precision products are widely available over the counter and offer great versatility and crowd-pleasing visual effects – all at a reasonable cost.

LOOKING BACK

The manufacturing of sheeting waterfall components began in the early 1980s when our company, Custom Cascades, introduced stainless steel components that could be purchased off the shelf and installed in the field with ease. These early products initiated a rapid developmental process that's seen the introduction of several generations of products – an important line of technological advances that continues to this day.

Before these products came along, achieving good sheeting effects with water was no simple task. Builders had to design and create their own manifold and nozzle assemblies using formed concrete rigged with metal baffles and weirs. Getting things right required either luck (never reliable enough) or a truly advanced understanding of waterfall hydraulics. It also called for working with much tighter tolerances than most builders were accustomed to observing.

The specialized level of expertise required meant that the sheeting waterfall was beyond the technical ability of many watershapers and out of reach price-wise because of the specialized technical skills required. Of course, there were sheeting waterfalls before 1980, but they were much more difficult to build than they are now.

With the advent of prefabricated sheeting-water fixtures, more and more contractors were able to provide these effects in a broad range of designs in applications ranging from the most elaborate commercial watershapes to simple backyard projects.

Ease of installation freed watershapers to push the envelope, get more creative in their designs and develop all new approaches to using sheeting water. Twenty years later, we've seen literally thousands of innovative applications across a broad range of installation types and pricing levels.

The original units were much larger than they are now and came only in stainless steel. Now, they come not only in stainless, but also in PVC, ABS (in a variety of colors), copper and brass. A number of suppliers have gotten involved as well, calling their products out by a variety of names that all boil

down to the same basic purpose: the even disbursement of water across a linear nozzle to create the familiar sheeting waterfall effect.

LIQUID GLASS

In theory, sheeting effects are simple to attain: Water flows into a manifold system in which internal baffling forces water to the lip or nozzle area in an even flow pattern.

Making that happen effectively, however, is anything but simple. A big part of the technical challenge is that you need to know as you begin just how far the water can fall from a given fixture while remaining intact – that is, how high you can go without breaking the sheet.

Our standard plastic models are designed to provide three feet of an unbroken sheet of water flowing at 10 gallons per minute per linear foot. Stainless steel models can provide up to six feet of unbroken water at 30 gpm. Larger lip openings and manifolds can be used to create falls over an even greater drop.

When placed above the recommended height, the water tends to break up (especially in outdoor installations where prevailing winds are an issue), thus creating increased splashing and noise. This can be acceptable where the view is strictly from the fall side and where the increased noise and splash patterns are taken into account – but that's not always the case.

The advantage of pre-manufactured components is that guesswork is largely removed from the process: You know the tolerances and ranges right up front and can plan accordingly. You know the performance specifications, the required water flow and the size of the device itself.

Not having these factors left to chance means that contractors can install these systems with reliable results – and leave the engineering part of the design to the manufacturer.

Recent years have seen a real expansion in the number of available fall configurations. There are radius falls in convex or concave forms, compound radius falls, extended lengths, corner units, raindrop falls, lighted falls and more. Customized units also are available as manufacturers work with watershapers in figuring out ways to create specific effects.

Technical considerations aside, however, what's most exciting about sheeting water is the striking aesthetics you can achieve with these units. The play of light in sheeting water speaks for itself, and so does the crystalline transparency of the wall of water as it draws the eye and, as a result, highlights and emphasizes various architectural and design elements of both the water-shape and the surrounding structures.

It's also true that sheeting water is great fun. In pools and spas, for example, sheets of water are extremely interactive, inviting kids and adults alike to swim beneath the curtain and look back through the distorting layer of falling water. And these features create a wonderful noise, uniform and soothing and highly effective at masking the noise from equipment pads or nearby traffic.

Descriptions alone don't do many watershapes justice, and that's certainly the case here. That in mind, let's take a brief pictorial tour of some projects, all by way of demonstrating the versatility of these waterfalls and setting up a spot for them on the palette of possibilities available to watershapers.

Right In Line

This spectacular swimming pool/waterfall combination – by Ron Gibbons Swimming Pools of Islip Terrace, N.Y. – provides a perfect example of how dramatic a simple, straight line of sheeting water can be. The fall in this job is created with a single 23-foot-long stainless steel lip and drops 4-1/2 feet into the pool below. When viewed from the fall side (as shown here), the linear quality of the fall echoes and accentuates the classic rectilinear architecture of the home. From the driveway above the feature, the effect is of the water flowing beneath the roadway and falling into the pool.



Helpful Tips

Pre-fabricated waterfall fixtures are easy to use, but there are a few points of information that will help steer you clear of trouble:

- ❑ Keep all plastic units out of extreme heat or direct sunlight for extended periods. If left exposed, they may bend or warp and won't work properly.
- ❑ If a unit has debris in the lip area, be careful not to remove the attached ribs as you clean: This can result in a collapsed lip.
- ❑ Keep all plaster and gunite away from the lip area: Any particles left on the surface of the fall will interrupt the sheet-like flow.
- ❑ If using a metal fixture, be sure to extend the lip beyond the face of the surface wall. This will allow the water to drop into the reservoir as opposed to dripping down the face of the wall.

– M.H.



A Modern Edge

This commercial waterfeature, built by Prestige Pools of Las Vegas, makes use of a similarly extended line of sheeting water – but with an entirely different aesthetic outcome. The clients, owners of a commercial horse ranch, wanted a distinctly modern-looking feature with clean lines and a near-monolithic appearance. In this case, not only does the sheeting waterfall echo the stark geometry of the installation and serve as the visual center of the waterfeature, it also provides a refreshing sound of running water in the midst of the often-scorching Nevada desert.



Gentle Curves

A set of three (slightly radiused) 2-foot falls follow the contours of an elegant canal that surrounds this island spa. But unlike the first two projects shown here in which the sheeting fall is a dominant visual feature, Crowder Construction of Walnut Creek, Calif., used the falls in this case as an accent – a device for adding visual and aural interest and texture to a spectacular residential installation. Lucky bathers can float around the spa and get wet by passing beneath these simple falls.



A Splashing Racket

Here's an unusual application of a sheeting waterfall: The owner/builder took two 8-inch units and directed the flow onto two steel scuppers about a foot below. The result is an indoor waterfeature that makes a tremendous amount of clatter – not my first choice for a way to use sheeting water, but illustrative of the range of effects you can create by thinking outside the box with these watershaping components.



Night Lines

This spectacular backyard project, completed by Wise Pools of Conroe, Texas, winds up this quick tour by revealing the beauty and drama that can be gained in what can easily be called a “typical” sheeting waterfall installation. The falls were set in raised bond beams and staggered to provide a meandering focal point. The radius falls harmonize with the fan-shaped geometry of the pool and further echo arcs expressed in the steps, planters and grass-filled spaces in the decking.

Continued on page 54

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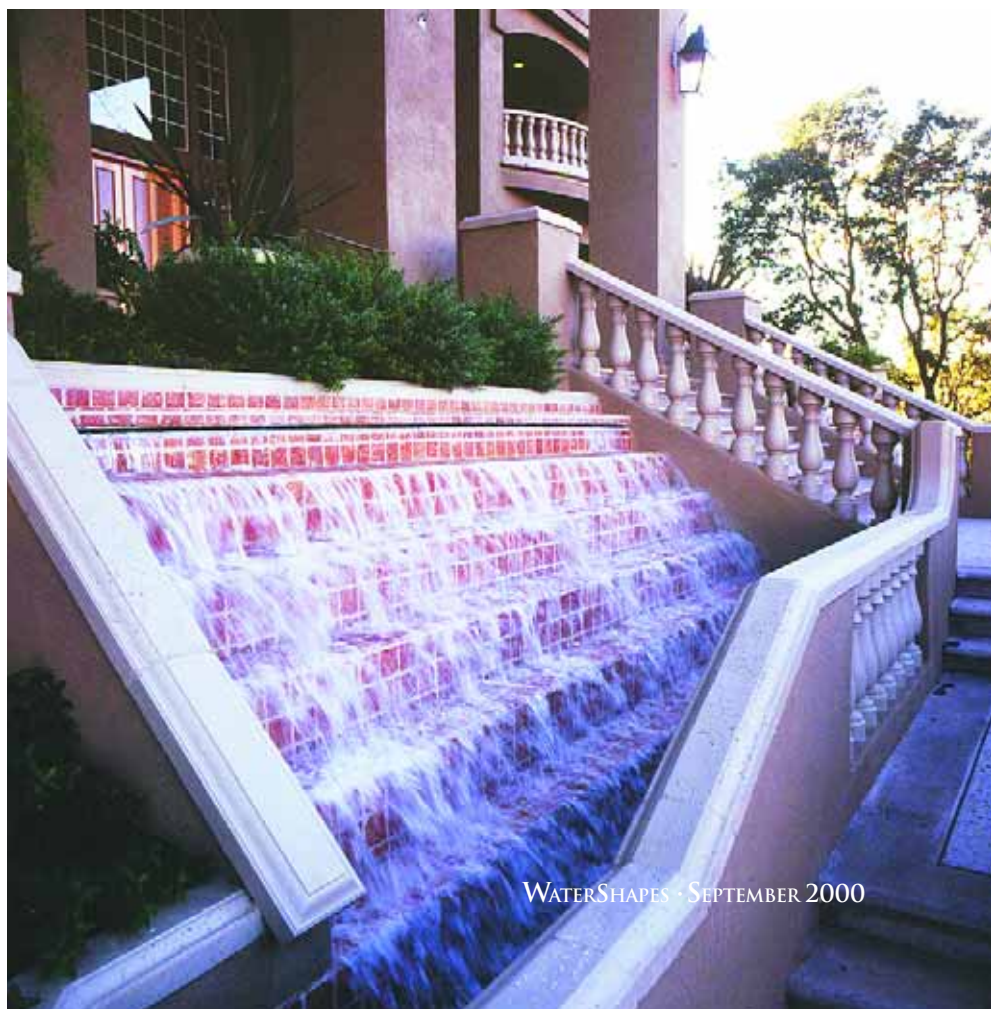


Sculpting an Arc

The “arc fall” is a souped-up alternative to the sheeting waterfall. In this truly spectacular backyard spa, Aquatic Technologies of San Juan Capistrano, Calif., incorporated the waterfall fixture in a sculpted structure that borders on modern art. To be sure, arc falls requires a fair amount of engineering based on the unit’s ability to work at zero elevation; the important point to note is that this effect of pushing the water further into the water environment is readily attainable using off-the-shelf products.

Cascade Steps

For this project, Crowder Construction devised a more elegant approach to using the sound qualities of sheeting water. The customer wanted a soothing rush of noise, combined with a visually striking architectural detail. The sheeting water in this case creates a perfect disbursement of water over the tile steps, guaranteeing a uniform, all-encompassing flow. (This uniformity of flow also offers big advantages in creating naturalistic flows that roll over cascades of faux rock or real stone.)



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Mark your calendars! The staff of *WaterShapes* will be on hand for the fall's two biggest and best watershaping events – the American Society of Landscape Architects' Expo 2000 (October 28-30 in St. Louis), and the National Spa & Pool Institute's International Expo (November 8-10 in Orlando).

For both events, we'll be setting up Literature Distribution Centers featuring brochures, flyers, catalogs and other sorts of information from many of our advertisers. We'll also be ready to answer any questions you might have about the magazine itself – and pick up any feedback you have to offer us about the magazine and its direction.

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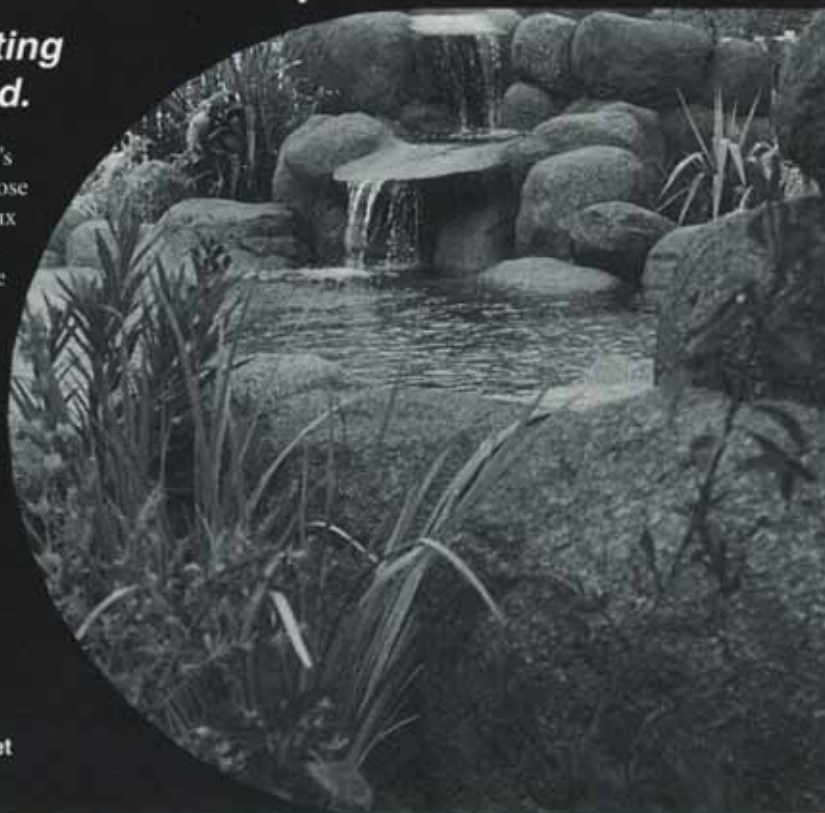
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SPECIFICATIONS ON PUMP LINE

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JACUZZI BROS. offers a specification sheet on its Magnum Force line of watershape pumps. In addition to a 12-year warranty, features include a one-piece case with two drain plugs, Ring-Lok access for tool-free entry, a patented air-cooled heat sink, a high-performance impeller/diffuser, self-priming hydraulic design, a 180-cu. in. strainer basket and energy-saving 1/2- to 3-hp motors. **Jacuzzi Bros.**, Little Rock, AR.



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MOSAICOS VENECIANOS de MEXICO has published a brochure on its Colorines line of Venetian glass tile. The six panels offer a color-selection guide, samples of random-blend panels and border patterns as well as basic information on the product's advantages with respect to durability and long-term economy. Also included are photos of the tiles installed in a variety of applications. **Mosaicos Venecianos de Mexico**, Cuernavaca, Morelos, Mexico.

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CONTRACT PACKAGING has produced a line of clothing and accessories to promote a theme of "No Ugly Concrete" – the motto for its KoverKrete line of decorative concrete finishes. The pocketed polo shirts and T-shirts are made of 100% cotton and come in black or white. Baseball-style caps are also available. **Contract Packaging**, Orlando, FL.

COMMERCIAL SAND FILTERS

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Continued on page 60

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June 1999 (Vol. 1, No. 3)

Featuring **Skip Phillips** on relationships between water and deck; **Larry Parmelee** and **Wayne Schick** on the influence of soils and geology; **Rick Anderson** on using the sounds of moving water.

August 1999 (Vol. 1, No. 4)

Featuring **Rick Anderson** on resources for stream design; **Holli Adams** on designing community waterparks; **Steve Gutai** on hydraulics for concrete spas; **Stephanie Rose** on landscape styles.

October 1999 (Vol. 1, No. 5)

Featuring **Mark Holden** on the history of aquatic design; **Jon Mitovich** on dry-deck fountains; **David Tisherman** on site geometry and lines of sight; **Brian Van Bower** on the monetary value of design.

December 1999 (Vol. 1, No. 6)

Featuring **Elizabeth Navas Finley** on the principles of Japanese garden design; a roundtable on the relationship between pool building and landscape design; **Clint West** on color rendering.

January 2000 (Vol. 2, No. 1)

Featuring **Ken Hart** on designing for upscale model homes; **Bruce Zaretsky** on retaining walls; **Kirk Chapman** on hybrid pool finishes; **Brian Van Bower** on the benefits of putting water in motion.

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March 2000 (Vol. 2, No. 3)

Featuring **Paul L'Heureux** on international project management; **Larry Long** on setting up steel cages; **George Forni** on installing and maintaining lakes; **Eric Herman** on taking pictures.

✓ April/May 2000 (Vol. 2, No. 4)

Featuring **Bobbie Schwartz** on the drama of controlling access in gardens; **Rick Anderson** on setting up streambeds; **Michael Nantz** on integrating watershapes into existing architectural forms.

✓ June/July 2000 (Vol. 2, No. 5)

Featuring **Mark Holden** on the history of fountain design; **Rick Bibbero** on the colors and textures of large stones; **Rick Anderson** on making streams work; **Stephanie Rose** on planting for privacy.

August 2000 (Vol. 2, No. 6)

Featuring **Keith Davitt** on designing for small spaces; **Erich Altvater** on the importance of aeration; **Maria Hetzner** on sheet falls; **Brian Van Bower** on tools for helping clients visualize.

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INSTALLATION GUIDE FOR LOW-VOLTAGE LIGHTS

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HADCO has published its Low Voltage Installation Guide, a 36-page booklet designed to show installers how to work with its NightLife line of 12-volt lighting options. The text covers the fundamentals of landscape lighting, discussing what to light and how to get the job done. Lamp and fixture selection are covered, along with installation, maintenance and troubleshooting procedures. **Hadco**, Littlestown, PA.



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TREATMENT FOR ALKALI-SILICA REACTIVITY

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FMC CORP. has published a two-sided data sheet on Renew Concrete Treatment, a penetrating, lithium-based product that reduces the expansion that can result from alkali-silica reactivity (ASR). The sheet explains the chemistry of what takes place with ASR and how to treat it both in new and (with much greater difficulty) in existing concrete. **FMC Corp.**, Gastonia, NC.

NON-ABRASIVE POOL FINISH

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SEAMCO LABORATORIES offers Ceramco, a mold, mildew and algae-resistant pool interior that can be personalized with custom designs or logos. The material is also non-abrasive, eliminating scraped knees and damaged swimsuits, and can be designed to work in conjunction with decking designs for a strong, integrated effect. **Seamco Laboratories**, Tampa, FL.

SHEET-WATERFALL SYSTEMS

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POLARIS manufactures the PowerFall system of sheet waterfalls. Made with non-corrosive materials and available in a range of sizes, shapes and colors, the units' quality of construction ensures consistent water sheeting and shape. The waterfalls also can be integrated with the company's FiberFall fiberoptic lighting system to achieve an array of nighttime color effects. **Polaris**, Vista, CA.

RUGGED MORTAR/PLASTER MIXER

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MACALITE EQUIPMENT offers HydraFlow, a low-maintenance mortar/plaster mixer designed for heavy-duty use. Units feature reversible hydraulic drives for years of dependable, jam-free running and come with sealed, greasable bearings, steel mixing blades, heavy-gauge steel cowls and detachable towing bars. Available in 10-, 13- and 16-cu. ft. capacities. **Macalite Equipment**, Phoenix, AZ.

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CHEMICAL AUTOMATION TECHNOLOGIES offers Poolman, a digital water-quality controller that continuously monitors the water for pH and sanitizer content and automatically adjusts the chemistry to appropriate levels. Reasonably priced and easy to install and operate, the device is compatible with most chemical-feeding systems and comes with a one-year warranty.

Chemical Automation Technologies, Gaithersburg, MD.

QUARTZ AGGREGATE FOR FINISHES

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3M INDUSTRIAL MINERALS offers the Colorquartz line of aggregates. Designed for toughness, beauty and durability, the finish resists the wear and tear that come with cleaning, comes in a virtually unlimited range of colors and stand up to years of use. The colors, permanently bonded to each quartz granule, resist damage from UV radiation and strong chemicals. **3M Industrial Minerals**, St. Paul, MN.

2001 LIGHTING CATALOG

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RUUD LIGHTING has released its 2001 Catalog to promote both new and familiar products. Its 240 pages are designed to make factory-direct fixture specifying and purchasing a quick, no-hassle experience. The catalog's Technical Data section is easy to use, and the book comes with fax forms for easy, convenient ordering and submission of technical-assistance requests. **Ruud Lighting**, Racine, WI.



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INCRETE SYSTEMS offers Stain-Crete, a permanent stain that adds rich color tones to existing concrete. The product reacts directly with minerals in the concrete to create a finish that will not peel, crack, chip or fade. Available in eight colors (black, walnut, terra cotta, bronze, weathered copper, lime green, mission tan and rust brown), the finish is easy to maintain and is backed by the company's technical support system. **Increte Systems**, Tampa, FL.



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'Westinghoused'?

When it was determined that electricity could be used carry out death sentences, considerable discussion took place regarding the proper name to be applied to this grisly task.

Among available candidates, the new word *electrocize* had a lot of supporters. The list also included such tongue twisters as: *electroctasy*, *electrotony*, *thanelectrize* and *fulmenvoltacuss*.

The current word *electrocute* won out, being a simple combination of the words *electrical* and *execute*.

— J.M.

motors, generators, transformers, transmission lines and lighting. The ideas expressed in the patent applications were so original that the 40 claims were granted without challenge. In fact, it has been said that this group of patents was

more valuable than any other since the invention of the telephone.

The following year, George Westinghouse, the inventor of the railroad air-brake and several other railroad-related devices, purchased Tesla's patents for \$60,000 and hired Tesla to assist him in mating these new ideas with some AC generating techniques Westinghouse had been dabbling with for some time. When their AC system was ready for market, the battle was on — and the fun began.

Edison and the AC crowd, with such heavy hitters as Cornelius Vanderbilt and J.P. Morgan providing financial backing, started a campaign to discredit DC. Their tactics were mind-boggling: For example, they hired a Professor Harold Brown to hold symposiums wherein he electrocuted stray dogs and old horses to show the dangers of AC electricity.

Even more startling, when the state of New York decided to use electricity to execute an ax murderer at Auburn State

Prison, the DC group contrived to have a Westinghouse AC generator used for the purpose and made sure that the distressing details of the drawn-out death were published in all of the major newspapers. Next, they campaigned to bring a new word into the language: They wanted people to say "Westinghoused" instead of "electrocuted," as in, "When are they going to Westinghouse another criminal?" A sick, greedy game.

The end wasn't long in coming. The prestigious Chicago World's Fair of 1893, also known as the Columbian Exposition, wanted to be the first major event in the world totally illuminated with electric lighting.

By this time, Edison had lost control of his company. J.P. Morgan had taken it over and combined it with several other small firms to create the General Electric Company. GE bid to electrify the Fair with DC power for a million dollars. Westinghouse proposed to do

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it with AC for about half that amount – and won the bid.

The Turning Point

As it turns out, the difference in cost was primarily a result of the additional amount of copper wire required by the DC system. The DC system had one set of wires for lighting and a separate set for motors because they operated at different voltages. By contrast, the AC system operated everything at a common voltage from just one set of wires.

On opening night, President Grover Cleveland flicked a switch and 100,000 incandescent bulbs glowed brightly while dozens of electrically operated fountain pumps shot water into the air. Twelve Westinghouse AC generators feeding a 40-circuit distribution panel accomplished all of this. Amazingly, only one operator was required.

The final blow to DC came in 1896, when Westinghouse was awarded the contract for the development of the hy-

droelectric system at Niagara Falls, N.Y. This project called for installation of several 5,000-horsepower, Tesla-designed, Westinghouse-built AC generators. By 1900, more than 80% of the orders for electrical devices in the country were for AC products.

DC had lost the war, but not without some lingering successes. In fact, several cities in the world were initially powered by DC. My hometown of Detroit, for one, had a large block of DC-powered buildings in its downtown area as late as 1957, when I worked there for a recording-equipment company.

I dreaded service calls to any of the DC-powered buildings. The DC-to-AC converters available at the time were clunk-and-bang devices that used a loudly-humming vibrator to chop the DC current into bits and pieces that provided a poor imitation of 60-hertz AC current. (Equipment designed to operate from a high-quality sinusoidal waveform from an incoming AC power source just didn't

do as well on converted DC.)

By the early 1960s, it was all over for DC. A major blow came from the rapid growth of television: Early television sets were *not* AC/DC devices – they needed a clean, stable AC power source from which to operate, and the war Edison and Tesla had started more than 70 years earlier was now truly over.

Everyone knows about Edison's contributions and tend to overlook his blindness in advocating an impractical system of power supply, but Tesla has never been given due credit for his far-reaching accomplishments. He continued to pursue electrical phenomena until his death in New York in 1943.

He was no slouch in the patent department, either, with over 600 to his personal credit. We are all in his debt.

Jim McNicol is a technical consultant to the swimming pool, jetted bath and spa industries. He works from a base in Orange, Calif.

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A Productive Rivalry

By Jim McNicol



There is no doubt about it – during the later years of the 19th Century, Thomas Edison was “Mr. Electric” in this country, and the electricity he promoted was direct current (DC). Last month, we took a look at the shortcomings of his DC system versus the alternating current (AC) distribution system that now serves us all so well. Now let’s take a look at the personalities involved.

In 1876, using monies gained from his invention of the stock ticker, Edison established the world’s first industrial-research laboratory in Menlo Park, N.J. Edison referred to this establishment as his “invention factory” and announced that he would produce a minor invention every ten days – and a “big trick” every six months.

He soon had as many as 40 projects going simultaneously, mostly relating to things electric, and was submitting patent applications for as many as 400 items per year. (His final total is impressive: 1,093 patents issued in his name, a record that still stands.)

The Biggest Trick

After witnessing several demonstrations of arc lights in late 1878, Edison announced that he would invent a safer, less-troublesome source of light that would replace the gas and coal-oil lamps then providing light to the world’s homes, shops and factories.

After a 14-month period during which he experimented with more than 600 different configurations, Edison introduced the carbon-filament light bulb – powered by a high-voltage DC dynamo of his own design.

It was just what the world wanted, and within three years Edison’s company was building a power station in downtown New York and running wires to several hundred customers. All of this was with DC electricity.

A new name enters the story in 1884: Nikola Tesla arrived in New York from his native Croatia with four cents in his pocket and a letter of introduction to Edison. Edison gave Tesla a job, but it wasn’t to last long.

It is difficult to imagine people with as little in common as these two. Tesla, for instance, was schooled as an engineer at several of Europe’s finer universities and was fluent in five languages, while Edison had only three months of formal schooling and three years of home teaching from his mother.

Given his training, Tesla approached technical problems by applying theory and mathematical concepts, while Edison used the brute-force approach of experimentation in hopes of finding an answer. Tesla was a fastidious dresser and meticulous in his personal habits, whereas Edison was a tobacco chewing, spit-on-the-floor slob, seldom bathing and often sleeping in his clothes because he believed that changing them caused insomnia.

Their greatest difference, however, was simply that Edison was a dedicated DC man, whereas Tesla believed that AC was the way of the future.

Both men had very strong views in this respect. Tesla had worked out most of the details for AC generation and distribution and the design of AC motors. Edison knew little of AC and, not understanding the more complex theories involved, dismissed it as “work of the devil.”

On His Own

Tesla soon realized that he wasn’t going to get a lot of encouragement from Edison on the development of his AC concepts, so he began the preparation of patent submittals for a complete AC system on his own.

In 1887, Tesla filed for seven patents covering AC

Continued on page 64



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