Inside: Stephanie Rose on Grasses

WaterShapes

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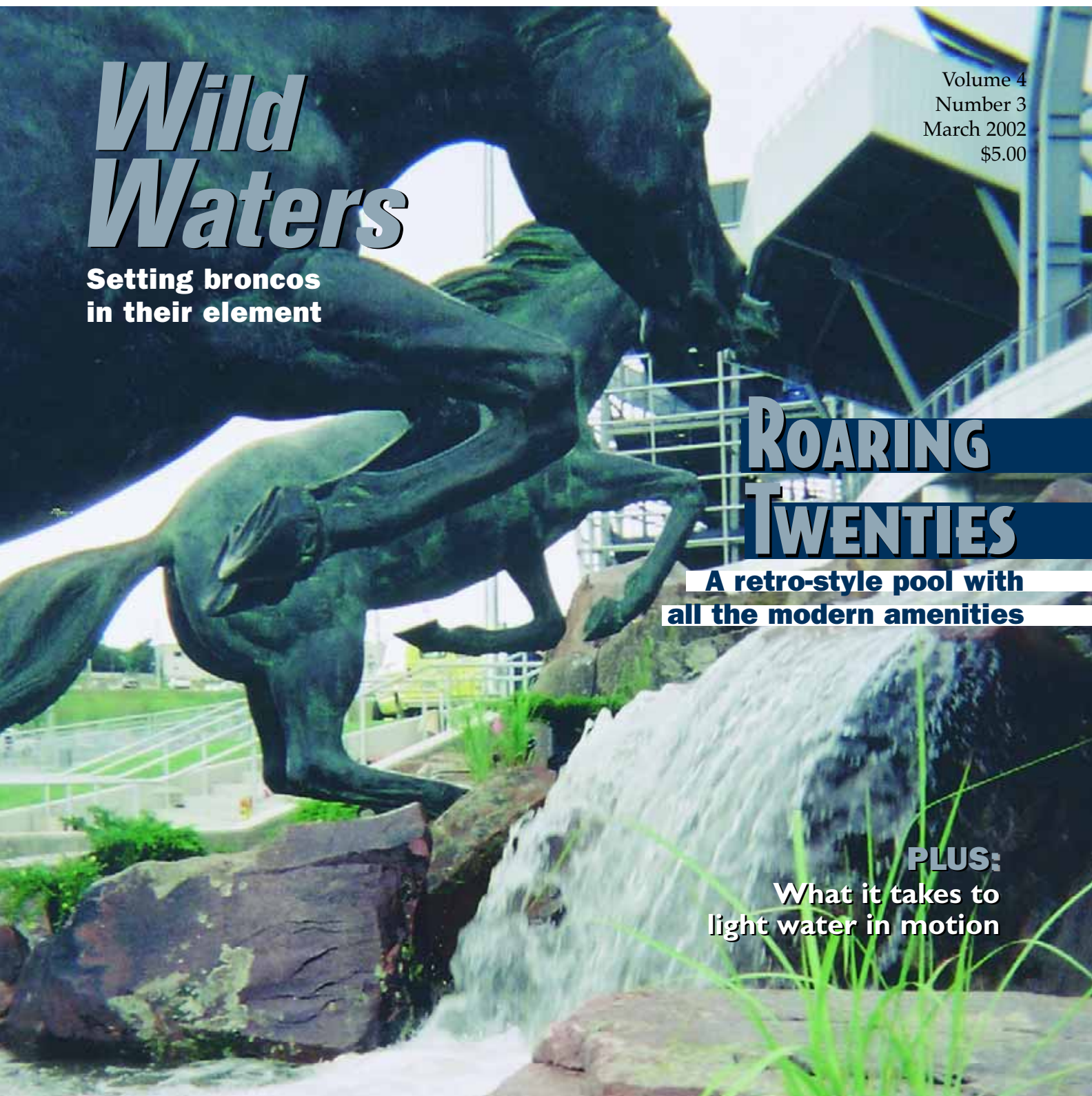

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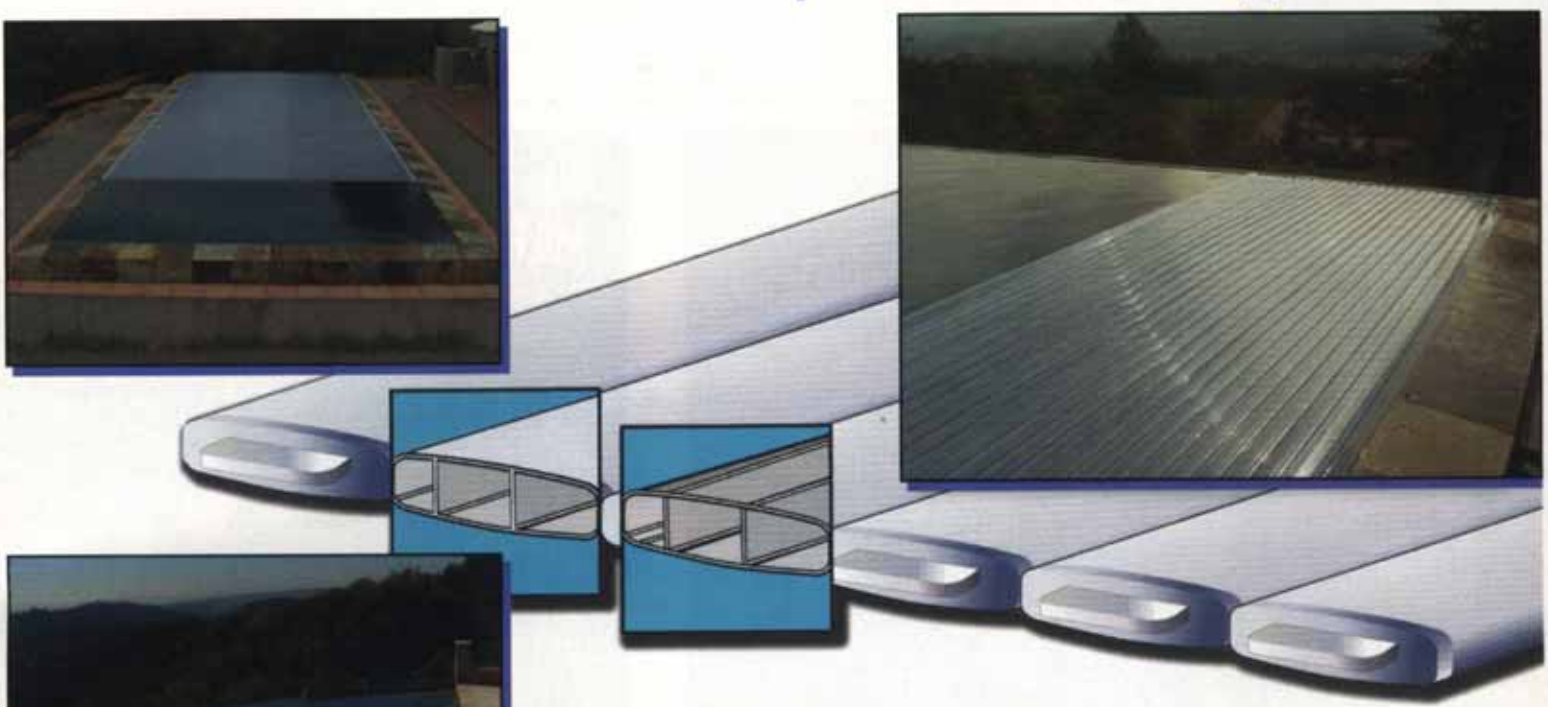

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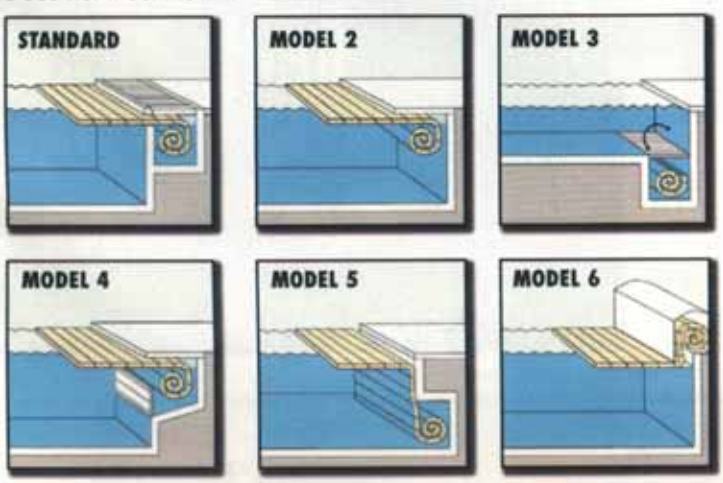

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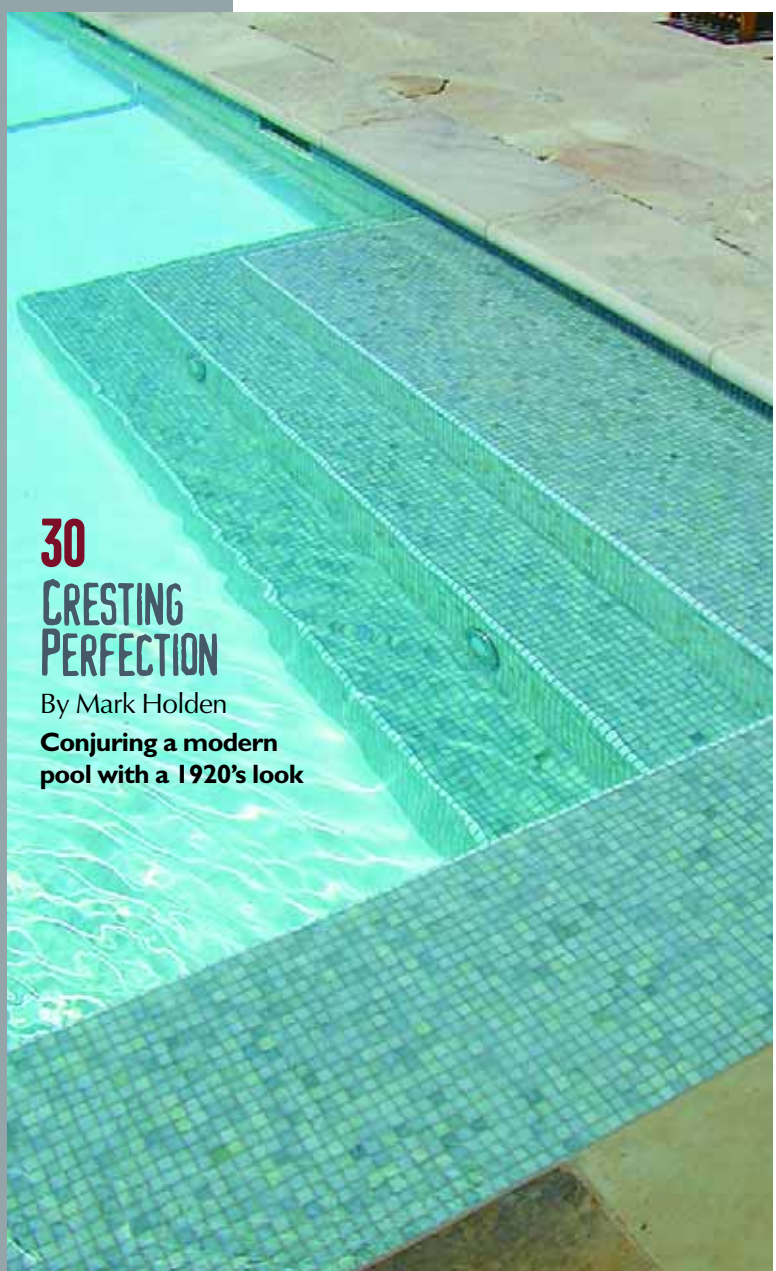

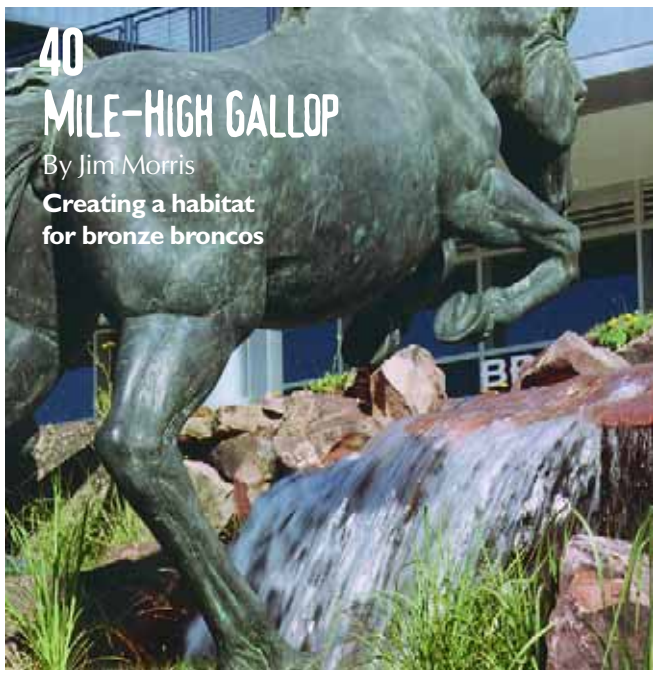

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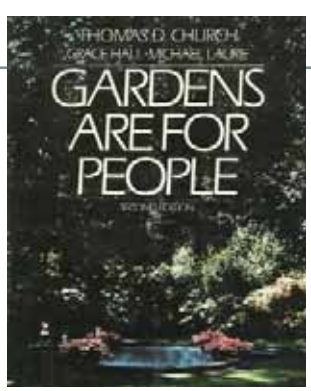

DEPARTMENTS

On the cover:
Photo courtesy Jim Morris,
Natural Pools & Waterfalls, Denver

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By Eric Herman

Passion Plays

I'm often asked what it takes to write an article for *WaterShapes* – and, almost as often, why it is that certain voices find their way into print while others don't. I love to field these questions, because they cut to the heart of what we're doing with this magazine.

Let me say right up front that we have an open-door policy for editorial submissions. *All* ideas are welcome, each greeted with warmth and consideration by yours truly, and that's why my phone number and e-mail address are printed in the magazine. If you have an idea for an article, just send me a message or pick up the phone and give me a call. I enjoy these exchanges, partly because I like hearing comments about the magazine, but mostly because I love the process of kicking around ideas.

On that level, taking the first step toward publication is very simple. Beyond that, however, stands a requirement for publication in this magazine that is challenging for some. To put it in a single word, that requirement is *passion*.

As I work with prospective contributors, it usually doesn't take long for us to get around to the question of what exactly an article should cover and what it should *say*. I know from experience that it's frustrating to some when I ask, "What do *you* want to talk about? What message is most important to *you*?"

This might seem a cop-out, as though I'm shifting ultimate responsibility from myself to our writers, but the simple asking of these questions is indicative of what makes *WaterShapes* so different from most other trade publications. We do not "plan" our content and decide in June that we need an article on heating systems or automatic cleaners or decking materials for January. Instead, we package the ideas that come our way – *as* they come our way – from professionals who care enough about advancing the art of watershaping to share what they know.

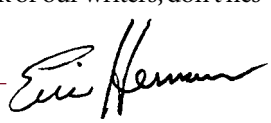
Very much by design, we publish only those articles and columns that excite our contributors the most, working with topics for which they feel genuine passion. Sure, I suggest ideas and angles of attack, but there's nothing I can do to generate passion that isn't already there.

This single criterion is at the heart of what you see in every issue of *WaterShapes*: We publish articles that are important to those who write them, and we do so because we've found that passion and depth of knowledge – two factors that generally go hand in hand – cannot be faked. Using these touchstones, we draw information from our contributors that is more deeply felt and more meaningful than it would be if we asked them to write about their favorite sanitizer or pond liner.

To be sure, contributing to *WaterShapes* is no walk in the park for those who are reluctant to pull back the curtains and share the things that drive them and their work and their designs. But there's no mystery to finding your way into print in *WaterShapes*. And yes, I want to hear from you if you have an idea for an article.

Just be prepared for a voice on the other end of the phone that will be asking you to reveal why communicating about your work is important to you, because if there's a passion there, we can presume together that others will "get it" when your words and images appear in print. That passion is why our magazine is must reading for the nearly 14,000 watershapers who receive it each month.

If you're ready to make the kind of commitment we ask of our writers, don't hesitate to call: The door is always open.



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Mark Holden is a landscape architect, contractor, writer and educator specializing in watershapes and their environments. He has been designing and building for more than 15 years and currently owns several companies – including his latest venture, HoldenWater, a water-oriented design and construction firm based in Fullerton, Calif. His business combines landscape architecture and pool construction, and he believes firmly that it is important to reach beyond traditional barriers between the two trades and get back to the age of the "master builders" as a means of elevating standards in both. Holden works toward that goal as an instructor for Genesis 3 Design Schools and also teaches at California State Polytechnic University in Pomona as well as other educational institutions.

Jim Morris is president of Natural Pools & Waterfalls, a design/build firm specializing in custom pools and waterfeatures in Denver. Morris founded the company eight years ago after a long career as a swimming pool contractor in Boston. He first joined the industry in 1970, installing vinyl-liner pools for Heritage Pools in his hometown of Natick, Mass. He be-

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

gan working full-time as a contractor in 1975, following his graduation from St. Anselm's College in Manchester, N.H. Today, Morris and his company specialize in projects that feature natural rock and creative designs.

Paul L'Heureux is president of Crystal Fountains, a waterfeature design, engineering and construction firm based in Toronto. Working as a team of experienced architectural waterfeature specialists, the Canadian firm produces high-end commercial fountains and waterfeatures around the world. A "career world traveler," L'Heureux has more than 20 years' experience in business management, export marketing and process improvement.

In the feature "The Enchanted Hill" on pages 40-47 of our January 2002 issue, we omitted the credit line: Photos by Victoria Garagliano. © Hearst Castle/California State Parks.

BY BRIAN VAN BOWER

Education or Litigation?

I know deep down, regardless of who's right and who's wrong, that lawsuits are bad for business: They leave consumers feeling cheated, while they force too many contractors to spend valuable time and hard-earned money defending their work or suing for payment.

One of my least favorite activities is testifying as an expert witness in legal disputes over watershaping projects gone awry.

As a rule, I try to stay out of courtrooms for any reason, but from time to time, I reluctantly agree to offer my opinion as a witness if I think I can help generate a fair outcome. Despite my best intentions, however, I seldom see it as time well spent.

The process is often stressful, and I know deep down, regardless of who's right and who's wrong, that lawsuits are bad for business: They leave consumers feeling cheated, while they force too many contractors to spend valuable time and hard-earned money defending their work or suing for payment.

Through my experiences as an expert witness in various cases over the years, I've come to believe that most of the time, regardless of outcome, *everyone* loses – except, of course, the attorneys, who more often than not seem motivated by a desire to drive up their fees by intensifying a conflict.

Due Diligence

From our perspective as watershapers, the only way to avoid legal entanglements is to strive for quality in our work and professionalism in our demeanor.

Given the number of lawsuits you hear about, that's apparently much easier said than done.

I don't mean to say every legal battle is the fault of the watershaper, but more often than not, what I see is the consequence of a contractor's having taken on a project that was simply beyond his or her reach.

Today's watershapes are *much* more involved and complicated than those of the 1950s and '60s and '70s, when simplicity was usually the order of the day. In those days, it really *was* true that just about anyone with basic construction knowledge could build kidney-shaped swimming pools. In today's market, however, you need more specialized information to be successful.

And now I hear it all the time: "We've had a pool built," says the aggrieved homeowner, "and there are *lots* of problems." Sometimes I get these calls as the lawsuit is being filed, but more often they come at an early stage – a point at which homeowners are seeking information and are simply looking for the fastest ways out of bad situations.

It's in these early-stage cases that I am most willing to get involved, basically because these are the situations in which I feel my involvement will do the most good for watershapers in general.

It's an obvious point that the sooner a conflict is resolved, the less damaging it is to all parties concerned. And nurturing positive word of mouth about our pools, fountains, ponds, streams and spas is far too important to all of us, I feel, for me *not* to get involved when I see any potential for a positive outcome.

Case Studies

I'll concede, however, that maintaining a positive perspective isn't always easy.

Continued on page 12

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Far too often, I'm confronted with and appalled by the lack of professionalism and know-how displayed by some watershapers – projects so poorly engineered or executed that I can only wonder why the designer or installer didn't do his or her homework and learn how to do the job right in the first place.

I say this knowing for a fact that the investment made in education would be much less than the cost in dollars and stress of correcting a botched project. To illustrate, let's take a look at a job in which the contractor didn't even follow the details shown on the plans.

It was a vanishing-edge project, and the engineer had done everything right. (In fact, the engineer was someone I knew who was using details that I had developed for some of my own projects, so I was familiar with the particulars.) It was obvious that the contractor had chosen to ignore the plans – or simply didn't know how to read them. The result was, in a word, *disastrous.*

We're talking really bad: The collection trough below the edge, for example, wasn't wide enough, so some of the water flowing over the vanishing edge overshot the trough completely, killing the landscaping, threatening to undermine the pool over time and causing dramatic water losses. This water-consumption concern was exaggerated by the fact that an auto-fill device, specified in the plans, had been omitted.

What's more, the skimmer had been installed in the trough – not in the pool itself, as had been indicated in the design. There was also no filtration on the edge system; more than anything else, the fact that the circulation system was blowing dirty water into the pool aggravated the clients.

The plans had also called for installation of a sensor and relay that would activate the vanishing-edge pump if anyone entered the water when the system was off – a step meant to keep the trough from overflowing with displaced water. The builder had also neglected to install a Hartford loop in the return on the vanishing edge, another safety factor intended to keep the trough from flooding as a result of water-level equalization.

At every step, just about everything possible had been done to ensure the project's failure. I'm happy to report, however, that the contractor was willing to correct this long list of errors and omissions – and in so doing spent far more in rectifying the situation than would have been required to learn how to do the job right.

These things don't always resolve themselves so happily.

The Hard Way

Quite recently, I heard from two different homeowners who live within two blocks of each other in an exclusive island community in South Florida. They had different contractors, and

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both were unhappy with their vanishing-edge pools.

I won't go through the laundry list of maladies these projects presented. Suffice it to say that the work in both cases failed to come anywhere close to meeting anyone's concept of "minimum standards." Pre-attorney negotiations on these jobs are still ongoing and nobody involved wants to go to court. I can only hope the contractors in these cases step up to their responsibilities.

The point I want to make with these three stories is this: Things never should have gotten this far, and it's clear that the problems occurred because the contractors had little idea of what was involved in installing a basic vanishing-edge system – even with a clear set of plans as a guide.

When you can't even rely on something designed by an engineer, you're left to your own resources and must take care of yourself and your own interests as well as those of clients who've hired you because they trust you.

This is particularly disturbing because the resources for a basic education on vanishing-edge pools exist from a variety of sources. I'm left to wonder: Why would anyone agree to install such a job without knowing how to execute the design or taking the steps required to learn how? Frankly, it saddens me to be part of an industry that includes people who would operate that way.

In all fairness, I'm also perfectly aware that it's not always the contractor's fault. I've been brought into cases where jobs have been improperly engineered by consultants who should have known better. I once saw a plan specified by a hydraulic engineer that called for a three-horsepower pump on a single two-inch suction line – pretty scary when even a basic knowledge of hydraulics tells you the pump is way too big for piping of that size.

This is why it's important for designers and contractors to get educated: When you can't even rely on something designed by an engineer, you're left to your own resources and must take care of yourself and your own interests as well as those of clients who've hired you because they trust you. Especially if you're going to reach beyond the ordinary and take on projects with vanishing edges, fountains, waterwalls, elaborate spillways and other details much in demand these days, you owe it to yourself and your clients to find out how to do the work!

Word Spreads

This isn't the first time I've written about the value of education, and you can be certain it won't be the last time.

Just as I'm sometimes amazed when I

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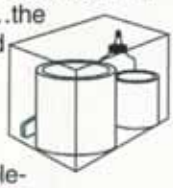

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see how wrong things can go in local backyards, I'm also amazed when I see watershapers spending so much of their money on advertising and promotions while investing *not at all* in educating themselves and their staffs in how things should be done.

As mentioned up front, we're not designing and building the simple vessels of the '50s, '60s or '70s. It's no longer true that just about anyone with basic construction knowledge can build a modern, full-featured swimming pool.

What these under-informed contractors are really promoting is a false image of professionalism – a sham that makes consumers think they're about to experience true excellence when in fact what they're getting is someone who inevitably degrades the product with substandard performance. To these contractors I say: Pull the ads and spend the money on making your clients happy – and see if this new strategy doesn't multiply your success.

If you're wondering if this discussion applies to you, I offer this challenge: Conduct a survey among all the clients you've worked for and ask them how they would rate their overall experience with you and how they feel about the watershape you installed. That's a tough test, and if you come up short, I'd strongly suggest investing in your success through education before it's too late.

However you get it, wherever you get it, an education is inexpensive compared to the hassles you're lining up for the future without one.

There is, of course, no guarantee that education will keep you out of court altogether, because the unfortunate fact is that being in business almost always means you'll end up ensnared in the legal system at some point. That's just the way our society works. But if you are informed and know what you're doing and it shows in your work, it'll be much easier to find expert witnesses who will help you defend yourself.

The alternative – taking on projects without enough knowledge to make them happen the right way – means you'll probably be sued so many times you'll wind up out of business, having degraded the watershaping industry in the process. Worse, from my perspective, is this simple fact: You won't have any fun along the way.

So choose to invest in education, or burn your resources and your career in needless conflict and litigation. It's a decision only you can make. WS

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

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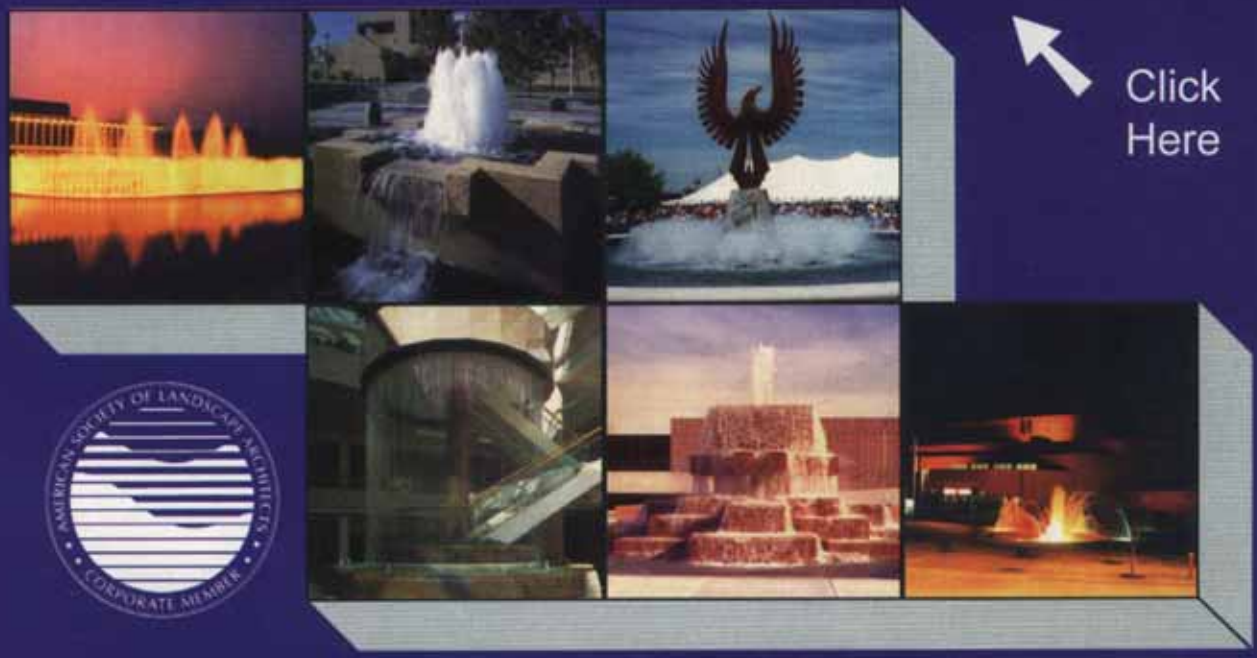

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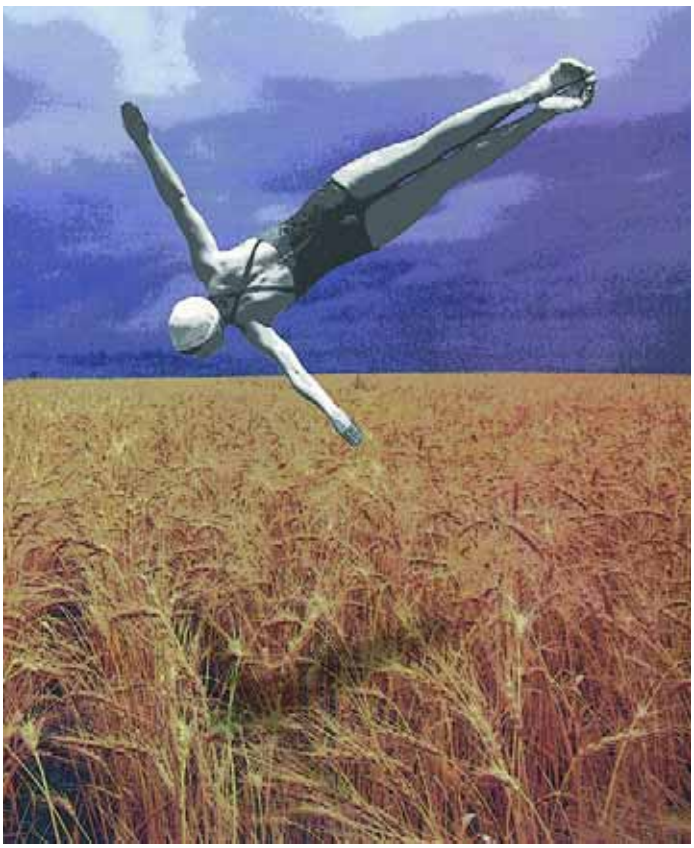

The Most Natural Companion

Images of waterways almost anywhere in the world are filled with gentle sweeps of free-flowing grasses swaying in the breeze or simply lazing by the water's edge.

From a watershaper's perspective, these grasses are arguably the most versatile of all plant materials. In one form or another, they exist and thrive in almost every environment in the world. They can be used by themselves to lend a natural feeling to a stream or pond, next to a contemporary watershape to make a bold statement or nestled among almost any other plants in any landscape style to soften and add texture.

One of the best things about grasses (particularly the taller ones) is how gracefully they wave in the wind, adding an element of movement to any design that no other plant can emulate.

Grasses come in many forms, from dwarf ornamentals and turf to tall clumps of statuesque reeds that can reach more than 50 feet high in the case of bamboo. They also encompass some of our most important cash crops: Corn, wheat and rice are all grasses, for example, and bamboo is used in many parts of the world for shelter and various household items. Furniture, fences and even cosmetics are produced from grasses.

One of the best things about grasses (particularly the taller ones) is how gracefully they wave in the wind, adding an element of movement to any design that no other plant can emulate.

Grasses at Work

For our purposes as watershapers, it makes sense to focus on the ornamental types and get to know how to use these plants to enhance our work.

Grasses thrive in all climate zones. In colder areas, their autumn colors brighten and enliven otherwise dreary environments. Some defy nature's cycle by producing vibrant fall colors and standing strong against cold winterscapes. In fact, they're often the only vestiges of spring and summer peering through blankets of white in barren winter settings.

Few would argue that grasses don't belong next to a naturalistic pond or stream. In almost every natural environment, you'll find some type of grass growing next to or out of a waterway. In fact, many varieties thrive in water or swampy environments.

The most natural-looking watershapes I have created all place grasses at the water's edge as a means of blurring and blending the transition between land and water. Creating that smooth transition is *the* essential element for "manufacturing" a watershape that looks natural.

What if you don't want your design to look natural? Take, for example, an ultra-contemporary rectangular pool surrounded by concrete, tall vertical walls, large flat planes, and little landscaping.

In this setting, sod or dwarf ornamental grasses can be used to maintain the planar appearance, while taller grasses can be used as specimens. In essence, grasses can be used here as artwork and sculptural forms. Choosing a tall grass with interesting foliage or blooms against an otherwise stark setting definitely makes a statement.

But most people tend toward something in between. Ultra-contemporary designs are often too sterile for these clients, while natural waterways are too difficult to maintain or don't fit the overall design. Adding grasses into any style – contemporary, formal, Asian, drought-toler-


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ant or cottage, just to name a few – is quite simple.

Green Basics

Unless you have selected a particular grass as a specimen plant, it's important to blend the grasses with the other design elements and plant palette you are using. This brings us to basic issues of color, height, form and texture as well as some seasonal issues:

• **Color:** Particularly with grasses, you need to weigh changing seasonal colors and whether they will clash with or enhance the rest of the landscape throughout the year.

• **Height:** While some grasses survive the winter, others need to be cut to the ground, thus leaving barren expanses if you've planted them en masse. This may or may not be desirable.

• **Form:** Though typically upright, grasses vary in form, with some arching or slightly spreading in appearance. From a design standpoint, this means that taller grasses can be used to draw the focus up, while turf and massed dwarf varieties will bring the eye forward and expand the visual space.

• **Texture:** A coarse-textured landscape, such as a tropical environment, may need grasses to break up and soften the design. They can be used, for example, to hide trunks or taller plants that have unattractive bases – or placed in the foreground to create transitions from plants to hardscape.

Grasses' straighter lines have the ability to guide attention, so they're a great tool for imposing order on your design and pointing visitors where you want them to go.

In a design where medium-textured plants are the primary mainstay, grasses can be used to break up an otherwise smooth plane. Their upright forms draw the eye away from the horizontal lines defined by the other plants and can be placed to direct the eye to other features of the design.

When using mostly fine-textured plants, such as ferns and smaller-leafed ground covers, a wider-stalked or contrasting form of grass can break up the overall flatness of the setting. In this case, the grass might even become a focal point.

Whatever grasses you choose, it's important to think of them as a way to direct viewers through a landscape. Their straighter lines have the ability to guide attention, so they're a great tool for imposing order on your design and pointing visitors where you want them to go.

Grass Choices

Deciding which grasses to use should follow the same basic principals we've used before, with a few specific caveats:

❑ **Climate:** Choose grasses that are right for your climate. Check with a local nursery to see which types grow well in your particular zone, and be aware that even if one type of grass might grow well anywhere in the country, it will most likely behave differently in different climates. It might, for example, maintain its color, size, and form in California, while it might change color, dry up and go dormant in Maine. Be sure to consult a local plant guide for accurate information specific to the zone in which you're planting.

❑ **Growth habits:** You need to know whether the grass you're considering is clumping or trailing. *Trailing* varieties need root barriers to stay within defined limits but are great at covering large expanses. *Clumping* grasses will typically stay in check unless they also drop seeds.

❑ **Reproduction:** You need to determine whether the grass is self-seeding or not. Many varieties drop seeds freely. You may not recognize this happening until it's too late and you have hundreds of the single plant you selected. With a meadow or larger area, this might not be a problem; within a defined design area, however, it's best to choose varieties that do not self-seed and can be controlled more easily. Ask your nursery: Some grasses are available in both self-seeding and sterile varieties.

❑ **Maintenance:** Choose grasses that fit your clients' maintenance requirements. Some require cutting back in winter, for example, while others display much of their beauty in their dormant-season form. Cutting grasses back may also simply be a matter of taste, as some people like the look of a dry landscape during the winter. As always, consult plant directories carefully before making specific selections.

Next time, I'll pass along some suggestions about grasses to consider for your watershape designs. If you're planning on suggesting grasses to your clients for planting in 2002, this information will reach you just in time. In most parts of the country the best plants come out from early April until the end of May. Be prepared!

And by the way, don't be fooled. Some of the biggest varieties of grasses are sold in one-gallon containers but grow to very large proportions. Be sure you know the mature size of the plant before you put it in the ground. WS

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

BY DAVID TISHERMAN

The Currency of Beauty

For many people in the watershaping trades, client relationships begin with selling and never really advance beyond that stage.

For me, however, it's not about selling per se; instead, it's about creating a sense of collaboration and building a foundation of mutual trust and understanding. In fact, the work I do in establishing these creative relationships with my clients may well be the most important "detail" of all.

In a sense, watershaping isn't a job to me. It's my *passion*, which explains why I'm so obsessed with steel and concrete and water and what I can accomplish with them. It's never about selling, and it's not even about making money, although that's certainly a byproduct of what I do. Instead, I'm in it for the craftsmanship (in the European sense of the word) and driven by the desire to create objects of enduring beauty.

With this mindset, making great art is *not* about extracting every dollar you can from the client. In fact, I'd go so far as to say that when I meet with clients, I'm not trying to sell them anything. Rather, I'm trying to inspire them with a vision of beauty and help them visualize what we can do with their property. If we decide to work together, it's because I'm a good fit for them and they're a good fit for me.

I don't care if a project includes expensive tile or not, or includes every conceivable bell and whistle. Instead, what I'm after is a selection of materials and an overall design that best fits the property and my clients' tastes.

What this means is that there is no distinct point where a deal is closed: We simply arrive at the mutual conclusion that working together makes sense.

Qualifying Potential

This foundation of collaboration and mutual agreement runs counter to an approach to swimming pool sales where you always hear phrases such as, "leaving money on the table." In fact, in my approach, I leave piles of it there more often than not.

Please don't make the assumption that because I work with an affluent clientele that I'm always trying to sell them the most expensive this or that, whatever it may be. The truth is, I don't care if a project includes expensive tile or not, or includes every conceivable bell and whistle. Instead, what I'm after is a selection of materials and an overall design that best fits the property and my clients' tastes.

I'll even say that I don't really like being pigeonholed as a "high-end" builder: I have no problem designing and building projects with inexpensive materials so long as those materials are appropriate to the soil conditions and the structure of the watershape and are a good fit aesthetically.

None of this is to say that money doesn't matter, because obviously it does. The distinction I'm trying to make is that the

basis upon which discussions with clients proceed should be about inspiring passion in their hearts and minds rather than about extracting dollars from their pockets.

Yes, you need to ask questions about budgets and get that squared away, and everything I cover in client presentations is based on what I believe to be reliable information about their wherewithal: I'm no more interested than the next person in spending a lot of time developing design ideas without knowing how much my clients have to spend.

What I want to emphasize is that coming to know about clients' budgets and whether or not I'm a good fit with them does not come down to a set of purely economic calculations.

As is the case with many top watershapers, all of my work comes through referrals. I don't go out of my way to solicit work, nor do I follow up on random leads. When prospective clients call, I always find out how they got my name – which can have a great deal to do with whether or not I'll get involved.

If they came to me through a soils or structural engineer, for example, I see that as a good referral because it indicates the clients are concerned right up front with proper engineering, which I consider my stock in trade. By contrast, if the contact has come from another builder, I might not get involved at all because there's a good chance the customer is collecting bids. I do *not* make bids.

If clients call me because they like what they've seen of my work by visiting friends or social contacts I've worked for in the past and have decided they want my expertise, I consider these to be my strongest referrals. Past clients tell these prospects what I'm about, how I work and what they can expect. They're prepared for my passion as well as some of my idiosyncrasies.

A New Prospect

Once these prospects and I clear the first hurdle, I'll try to determine in general terms what they're after. I start talking right away about *their* ideas, which tells me a great deal about their in-

Convincing clients that they can trust you to turn a disaster area such as this one into a paradise that befits a great home can be easy if you know what you're doing and can help the clients visualize their backyard's future.

terests, their level of awareness of design issues and their degree of engagement with their surroundings.

If, for example, they jump right into discussions of a specific architect or a specific style – or if they mention one of the materials in the house that they particularly love – they've equipped me with important clues.

Just recently, I was referred to a couple living in Pacific Palisades, an upscale community in Southern California, by way of a landscape designer with whom they were working. They'd been encouraged to call me about installing a pool to replace the abomination of a swimming hole they had on the property.

The designer's idea had been to build a naturalistic lake on the site, but that made no sense to me once I'd had a look.

As I pulled up to the house, I began noticing an array of stylistic influences on what could best be described as an ultra-custom home. The front yard was an unfinished wasteland, but the front door looming up over the clutter was made of padouk, an African hardwood with some of the most pronounced grain and coloring you'll find in any species, and all of the window casings were made with the same wood. This was *not* standard millwork!

Another unusual touch was that the house had been finished with plaster (rather than the common stucco or siding) in a beautiful yellow/ochre hue – a real statement. The floors inside were concrete inlaid with slate trim and details. The kitchen was loaded with stainless steel, and there were high ceilings everywhere with wonderful transom windows.

A love for sailing ships had obviously inspired the basic home design: The second level was surrounded by catwalks, and standing on the second-floor balcony – with the breezes rising from the Pacific Ocean a couple hundred yards away – was remarkably similar to standing on the deck of a tall ship. In just a few minutes, I could see that the house was passionate and romantic – and definitely the product of owners deeply involved in its creation.

As I spoke with these intelligent and interesting people, I became more and more agitated about the landscape designer's "lake." It was all wrong in terms of scale and style and all wrong for the tastes of the clients. So when we finished our tour and sat down, my first comment was this: "I need to ask you, do you want me to talk about the landscape designer's ideas, lie and say it'll be beautiful, or do I tell you what's wrong and go in an entirely different direction?"

The clients told me that I was there for a reason and asked me to speak my mind. Immediately, I knew that these were people with whom I could conspire to create something beautiful – and we were off and running.

Zeroing In

It's at this point in the process that I get more specific.

I start by breaking out my portfolio,

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which consists of three leather-bound albums filled with dozens of 8.5-by-11-inch, full-framed glossy photos. Two of the albums cover finished projects; the third is on details. There are no templates or cut-and-paste concepts, nor is this a catalog of every job I've done in the past 20-odd years: Instead, it's a selection of projects that best exemplify what I do, in multiple views.

Every job on display in these books has been designed and built by me, and I understand every one of them from the inside out.

What I'm looking for as they flip through the books is information about clients' likes and dislikes. I sort of view my role in this early stage as that of an investigative psychologist: I'm looking for the truth about my clients' needs and what's right for what is, after all, *their* environment and lifestyle.

I ask them if they entertain, for example, and how they see themselves using a pool. I find out if they've ever used

The pool is too wide and deep, the retaining wall is unsound and the homeowners are being advised by another designer to install a lake-style pool. This is just the sort of starting place I enjoy most, because I know the clients and I can straighten things out and conspire to create something beautiful.

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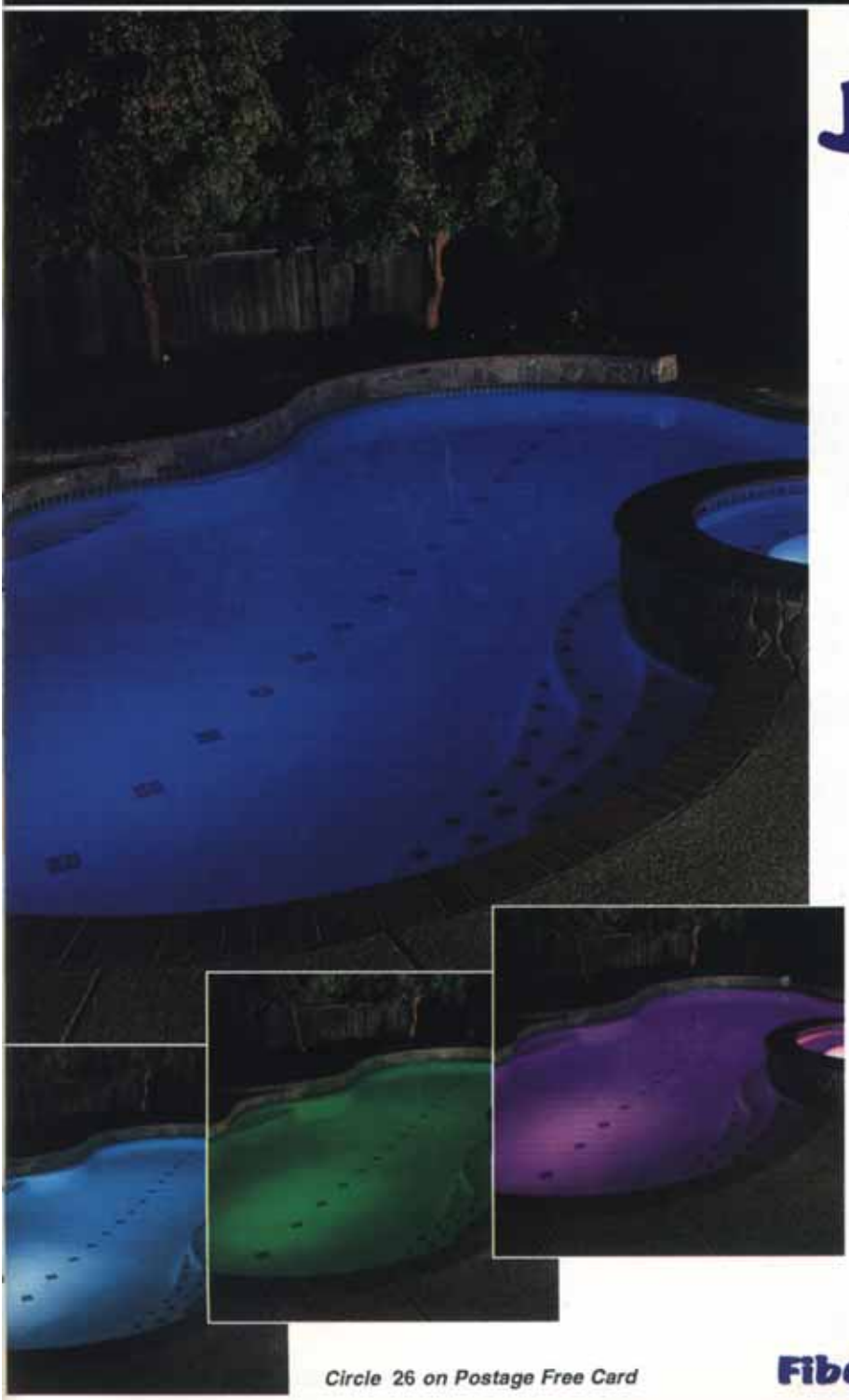

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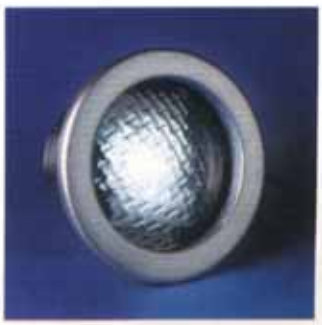

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a spa or if they've ever owned one (two very different things, lest we forget). I find out what artists they like and dig into their sense of style. My purposes here are twofold: I need to know what they're after and what they like, and I also need to develop a sense of how hard I'll have to work to help them visualize the potential I see in the outdoor spaces we're contemplating.

As we go, I also break out a pad of paper and a set of pencils and pens. Then and there, I begin sketching out ideas and helping my clients grasp what words can only attempt to describe. It is this artistic visualization and our ability to begin seeing things together that is the basis of our working relationship, right from the start. If we can't get to the point where they start to visualize, it just won't work.

In the case of the Pacific Palisades project I've been discussing, we walked outside and began talking about how we might transform their environment. We talked about how we might use part of the existing pool's structure while changing its shape and orientation to the house. We talked about how we might add a spa and how we could set up a secret garden that would be part of the home – yet slightly removed from it. We talked about color and how it would work with the overall design of the home.

In good order, we settled on a contemporary, bright, romantic color scheme. I'll get into this subject a bit more in upcoming "Details," but we determined that the pool would be finished in a red plaster – unusual, but in keeping with the setting – and that the walls and other hardscape materials would be salmon, blue, purple and lavender.

We also talked about setting up some spillways through a nearby wall to create additional visual interest. We discussed moving water and how we could use artificial lighting to create soft yet vibrant shapes on the walls through shadows, reflection and refraction. We touched upon entertainment areas and reserving a private meditation area. They were right there with me, beginning to see what could be done.

We also started talking about specific architects whose work I saw as compati-

ble with the design principles they'd used in their home. We discussed Barragan and Le Corbusier and some lesser-known Southern California architects who'd done wonderful things with moving water. We also discussed Ricardo Legoretta, and I even suggested that they get their hands on a book about him because of the way he uses vivid, contrasting colors to create special spaces. Again, they were right there with me.

Getting Set

All of this discussion took place during our first meeting. Although the design that followed would be more precisely realized and rendered, we set an extensive groundwork through this free-flowing session. By now we were kidding and laughing, everything was open and honest, and I could tell we were becoming comfortable with each other. The lake, happily, was nothing more than a painful memory.

At this point, I gave them my price for designing the backyard in keeping with our discussion. I let them know that I charge for design work and that what they would get for their money was a set of plans that would be as complete as those done by any architect they could find.

The customers were eager to get started, and I suppose some would say that I "sold" them at that moment. But the fact of the matter is that they had sold me, too: Because of their passion and level of engagement in the process, the creative collaboration had already begun and we were getting ready to do some great things together.

This is the way it works with almost all of my clients: I haven't sold the Palisades couple a product; instead, we've agreed to work together to visualize and create a work of watershaping art that harmonizes with the work of art they call home.

That's what it's all about: What my clients are buying from me is a creative visualization of what they can have. Through my experience and the sense I've developed about what they want, I show them something beautiful and allow the work to stand for itself. That doesn't mean we have to build an all-tile pool to make me or my banker happy: It's about designing something that's right for my clients and helping them see it.

If you can agree with me so far, then it all boils down to this: Aesthetics are the real currency in the process of creating quality watershapes, and they take precedent over everything. Good clients will see that fact immediately. WS

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

Cresting Perfection

By Mark Holden

Cima del Mundo

MONTECITO, CALIFORNIA

It's time for a return

visit to Cima del Mundo, the 50-acre estate in the hills above Montecito, Calif., that we first visited a year ago. Last time, we took a look at the design and construction of the courtyard's central fountain, now complete. This time, we join landscape architect/contractor/watershaper Mark Holden to catch up on progress with another key feature: a new pool and spa that look as though they might have been built with the home in 1925.

A grand California estate deserves a grand pool, and *Cima del Mundo* is certainly no exception.

The new pool is part of a project that involves the complete renovation of a classic estate in the hills of Montecito, a prosperous enclave just south of Santa Barbara, Calif. In keeping with the overall theme of the project, which was described in detail in "The Crest of the World" (*WaterShapes*, January/February 2001, page 32), the pool has been outfitted with thoroughly modern technology and amenities but is meant to appear old, as though it had been installed when the house was built in the 1920s.

Keeping this period look and feel has been a considerable part of every aspect of this project from the outset, but in the case of the pool, that driving need also came with a truckload of engineering issues, planning difficulties and substantial construction challenges. Indeed, the pool is the culmination of almost three years of effort.

As you'll see here, a lot happened to complicate the pool project, but the resulting watershape is one truly and uniquely suited to its remarkable setting.

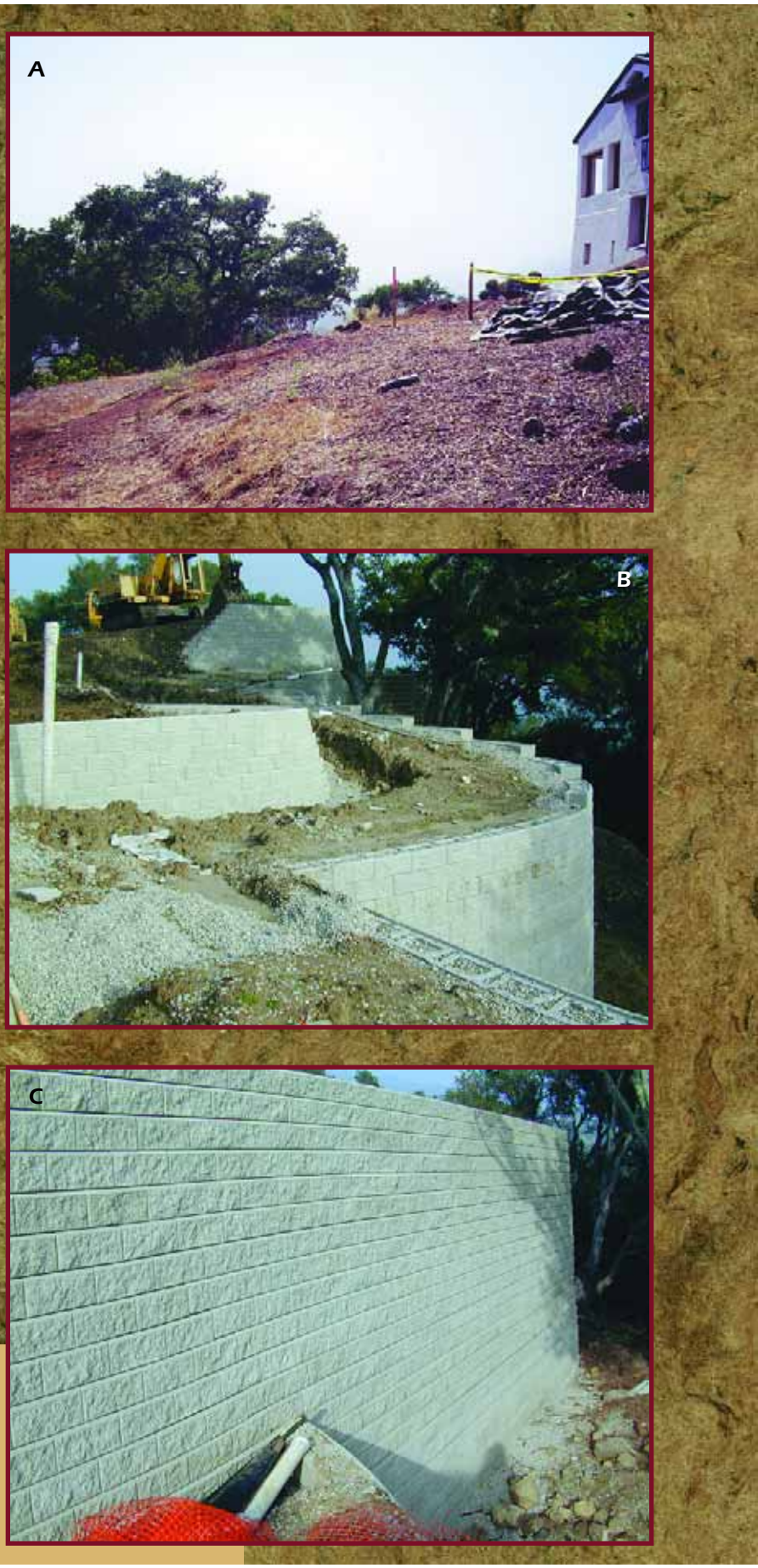
PERFECT ALIGNMENT

Everything we've done on this jobsite has been aimed at maximizing both the spectacular physical setting and the historic nature of the property.

To that end, the pool is aligned on a westerly axis to emphasize the setting sun and provide a prime view of downtown Santa Barbara in the distance. The spa was also set to maximize this view, using the length of the pool as a reflective surface. In every detail, we worked toward a simple elegance that is perfect for the time period, the space and the client's own sense of history.

Positioning the pool on the south side of the manor house was originally the client's idea – and it was an ambitious choice, because the property sloped off dramatically on that side. We knew immediately that we'd need to call in the experts to see what had to be done.

As with most hillside projects in California, our course was dictated by the results of geological surveying, soils reports and structural engineering. In



STEEP STUFF: The home sits on a hilltop, and the client wanted a pool set on one of its steepest slopes (A). This meant setting up massive retaining walls (B) to create a new backyard by which the pool and spa would be surrounded. Working with the advice of a team of soils and structural engineers, we came up with a system that's both functional and visually interesting (C).

HEAVY DUTY: The pool has been set up independent of the surrounding soil and retaining walls on a set of friction piles and grade beams. The cages, some of them more than 60 feet tall (D), feature vertical steel members of more than one-inch diameter. (Note the gray-plastic spacer wheels on the steel: These will keep the cages from coming into contact with the soil for the full length of the pile.)

Once the piles were in, we carefully excavated around them using every sort of earthmoving equipment we could get on site (E). Next, and after flashing the walls with gunite for stability, we dug out spaces in which to set the network of grade beams that serve as the pool's platform (F).

this case, the survey was performed with the aid of a satellite-based GPS system because of the immense size (almost 50 acres) of the overall site and the physical improbability of closing a surveying loop on such a parcel. The geologists and soils engineers were on site for weeks, and our structural engineers processed all that information and worked on the plans for months.

One of the greatest factors in the success of the project, I believe, was this synthesis of all available site information and the high level of value engineering that characterized this part of the project. Every alternative was investigated for cost, time involved in implementation and ease of construction – and considered alongside some obvious access issues.

During the soils investigation, it was revealed that the significant bedding material was sometimes 15 or 20 feet below the native grade and another 10 to 15 feet to the proposed finished grade, meaning we would have to build some *very* long friction piles to varying depths to set the pool and spa up on the same level as the house.

By design, the pool is set up not to rely on the support of any retaining walls we would be setting up to raise the grade. As a result, the 30-by-60-by-12-foot vessel sits on ten friction piles and a network of grade beams that create a stable platform that isn't dependent on the stability of the slope upon which it sits.

As mentioned above, the exact pile depths varied because of the inconsistent subsurface bedding plane, which meant that the grade beams also had unique dimensions to align with the changing profile. These two factors left us with almost every pile and beam having different specifications and dimensions – a steel fabricator's nightmare, but something that had to be done to ensure even dispersal of loads across the entire matrix of steel and concrete.

MAKING SPACES

It was at about this point that we hit a snag with the County of Santa Barbara, which had a long list of projects on the books to be approved for construction permits.

Given the complicated nature of the project, the sensitivity of the site and, quite frankly, the way things get done in coastal areas of California, the plan-review process was a long one that meant many trips to the county seat. From the time we completed conceptual design and preliminary structural engineering, we waited nearly nine months while the county considered the retaining walls – and more than a year as they pored over the swimming pool and spa.

Continued on page 35

Hydraulic Design

The pool at *Cima del Mundo* went through many changes after its conception, and each new change called for a revised hydraulic design. In all, we left six full sets of plans behind.

Fortunately, we always over-plumbed everything, which left us with plenty of flexibility for these ongoing changes. At this point, we still have one extra 4-inch and three extra 3-inch lines running to the main drains, if needed, and a complete second return loop around the pool if ever our client wants a perimeter fountain.

That might seem like radical overkill, but we have learned our lessons at the hands of a clientele with the impulses and wherewithal to make changes at the drop of a hat.

Our goal in selecting components was much the same here as it would be for any other watershaping project: We wanted to control a clean and safe swimming environment while minimizing service issues and maintenance challenges. To accomplish these basic goals, we designed dual filtration loops, each complete with its own pump, filter and heater for the 75,000 gallons of pool water. This way, if one system needs to be cleaned or repaired, the pool will continue to function.

We selected a pair of high-efficiency 350,000 Btu heaters to accommodate our client's desire for water at a constant, year-round 80 degrees. All of this filtered and heated water is returned via a single 4-inch return loop and injected back into the pool shell through 16 return fittings set up with simple schedule 80 slip couplers. (These hid the white of the PVC against the darker tile color.)

A third isolated sanitizer loop was set up to return ozonated water to the pool. This treated water receives its required contact time in the 150 feet of return lines and empties into the stone/tile spa runnel – a convenient means for off-gassing the oxygen without bubbles visibly coming out of the return lines.

As a back-up sanitizer, we installed a salt system running at very low levels. A pH/ORP sensing unit controls this unit and an acid-injection system. The result is a network of products that run at very low levels during their daily cycle and that, when the occasion arises, are capable of all kicking into high gear automatically.

The spa is a separate body of water and has its own redundant equipment set. We used a remote control unit that governs both equipment arrays. The mess of wires is tucked away in separate high- and low-voltage gutters.

All of the equipment is housed in a subgrade vault, covered with a roof that matches the home's and provides a ventilation system for the immense heat output generated by the motors and heaters.

Here's an equipment list:

- ❑ Two 350,000 Btu Laars/Jandy HiE-2 heaters for the pool
- ❑ One Sta-Rite Max-E-Therm heater for the spa
- ❑ Eight Sta-Rite pumps, ranging from 1/2- to 3 hp
- ❑ Three Sta-Rite Modular Media filters
- ❑ One Clear Water Tech CD15/AD corona discharge ozone generator
- ❑ Two Eco-Matic chlorine generators
- ❑ One CAT-2000 Ph/ORP sensor and control
- ❑ One Stenner chemical feeder and 15-gallon acid tank
- ❑ One Jandy RS 2/30 dual-equipment setup with 30 auxiliaries, a Telelink board, spa interface card, three one-touch in-house control pads, one Spalink and one Jandy multiplexer board for all of the connections
- ❑ One sub-panel at 100 amps with high- and low-voltage gutters for all control and load feeds
- ❑ Four Levelor auto-fill units by System Dynamics Inc.
- ❑ Seven rheostatic switches for the pool and spa lights
- ❑ Three large pool lights
- ❑ 12 small spa lights
- ❑ Custom 24-square-inch stainless steel main drain grates

– M.H.

Continued from page 33

During this stretch, we attended countless Architectural Review Board meetings and planner consults and spent hours in line at the Building & Safety Department. Finally, inspection card in hand, we broke ground in the backyard.

More accurately, we started building up the backyard, setting up a series of modular-unit retaining walls to secure 7,000 cubic yards of imported soil to flatten the existing 1.5:1 slope and create a backyard that would surround the new pool. This new grading included geo-textile matting at particular intervals to lend stability to the newly compacted soil. These mats connected to the modular concrete units of the wall itself.

In no way is this type of engineered retention intended to hold a swimming pool in place – and these walls should never be used that way, no matter what a salesperson might tell you. In fact, the wall's design allows minor movement to occur – movement that would have disabled the static matrix of a poured-in-place or concrete-masonry-unit (CMU) wall and been disastrous for a vessel holding any significant amount of water. We also set up an elaborate system of subterranean drains to relieve any hydrostatic pressure that might infiltrate the new soil.

After more than nine months of excavating, bulldozing, offloading dump trucks and testing for compaction, the backyard was finally ready for construction of the pool.

The first step didn't involve digging up soil we'd just placed and compacted. Before we could get there, we needed to augur the 30-inch-diameter piles because we wouldn't be able to drive a drill rig into the area once the pool had been dug. As a consequence, we had to calculate the exact pile levels and create the steel and concrete structures to exact specifications without actually being able to see their tops.

With the deepest augured hole finished at 75 feet below the surface, that left each top at between ten and 15 feet below finished grade, with the vertical steel sticking out of the pile holes by only a foot or so. (This vertical steel would later be bent into the network of grade beams.)

TALL ORDERS

Each steel cage had a dozen vertical bars that were well over an inch in diameter – not the standard #3s and #4s you see in pool projects. We used a crane to lower the cages – some of them more than 60 feet long – down into the holes, then pumped in a high psi concrete mix to the calculated depths. Because the tops of the piles were not visible from the surface, we had to rely on tape measures and moisture-sensor tape reels to help us decide when to stop the pumps.

Once the piles were set and cured, we started excavating.

Needless to say, great care was taken not to damage the friction piles, so even with a full-sized excavator, a loader, two Bobcats and numerous ten-yard trucks, it took more than two days to dig the shell in rough – and another week to excavate for the grade beams.

In all, we dug out 650 yards of soil, using the dirt to raise the entire backyard area to its finished grade. Digging the beams was tricky in such tight confines, but with the use of inch-thick steel road plates we were able to lower a backhoe into the shell. Once the backhoe was in place, we performed something of a ballet on the plates (and over the open beams) and eventually hand-cleaned each one.

Next, we brought in a gunite rig to flash the walls, and our reasoning was simple: If any settlement occurred or we had a run of bad weather, the cost of this flashing was far less than any damage that might occur with the plumbing and steel networks. Given the complexity of the project, we knew the hole might be open for months – and we weren't taking any chances.

With the pool excavated and flashed, we moved on to the grade beams – the crux of the support structure for the swimming pool. These units tie the piles together and provide the stable platform on which the pool rests independent of the surrounding soil.

We started by bending all of the one-inch diameter steel bars rising out of the piles at the correct angles and elevations to intersect with the steel of the beams and support them. Most of the beams were 24 to 30 inches wide and 36 to 60 inches deep, depending on the loads exerted upon them by the weight of the pool. (This huge weight had to be considered in computing the surface area of the friction piles.)

Following installation of the grade beams, we began plumbing the shell. The hydraulic design had been a full year in the making and featured a plumbing trench more than 12 feet wide, which gives you an idea of the scale of what we were doing. It took five plumbers working consistently for more than three weeks to install the 3- and 4-inch suction lines, four skimmers, 24-square-inch main drains, 4-inch return manifolds and future stubs for the spa and runnel. (For more information on hydraulic design, see the sidebar on page 34.)

The gunite flashing was ideal for pinning the plumbing lines to the straight walls of the pool using small steel dowels, leaving the final steel cage more than 24 inches away. This made working *behind* the cage easy up until the day of shotcrete installation.

The floor and walls themselves consisted of double curtains of rebar spliced into the transition bars from the grade beams. Along the way, we used lots of *big* bars for the shell – and the only thing that stopped us from going bigger is the governing factor for structural

WORKING SPACES: With the over-excavation and flashed walls, setting up the plumbing and steel cage for the pool was simplified – somewhat. The plumbing is large, with 3- and 4-inch circulation lines throughout (G) – and there's an awesome amount of steel here (H). With all the details in the structure, it took a full shotcrete crew more than 20 hours to complete its work (I).

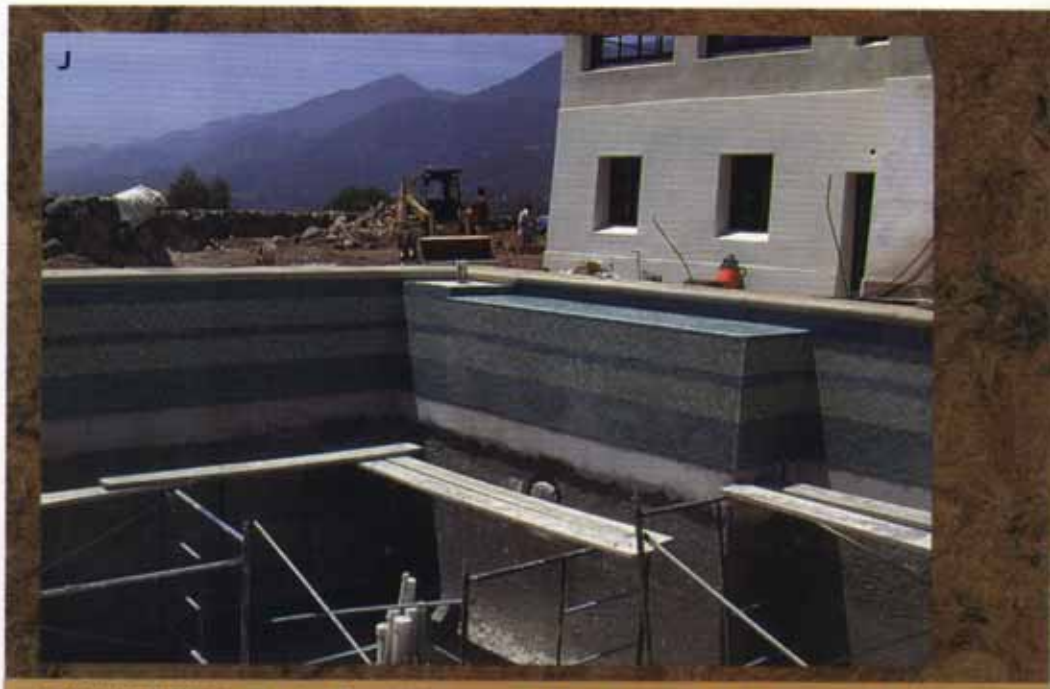
steel; that is, at a certain point, the weight of the steel outweighs its strength. We were also constrained by the fact that shotcrete applicators need room to work, and bars spaced too closely just won't do.

COMING TOGETHER

All in all, the shell consisted of 230 cubic yards of shotcrete, with a finished bond beam 20 inches thick and the bases of the straight walls at just above 30 inches in depth.

Added to this tonnage of concrete was the 18-inch thick floor topped off by a couple of deep-end benches at 12 cubic yards apiece and 20 yards in the shallow steps and thermal ledge. After more than 20 hours of shooting, the client finally had some idea of how significant this structure was to become.

This had been something of a concern up to this point: After the over-excavation and the steel/plumbing phase, the client still wondered if the 30-by-60-



FINISHING TOUCHES: The glass Tessera tile – more than 1,000 square feet of it – was used to accent the steps and the waterline (J). We played with the idea of finishing the interior completely in this tile, but backed away in favor of white plaster and a more authentic 1920s look.

foot rectangle was the right size for such a large space. Now, with the shell there in all its massive glory, one and all could see that the proportions and scale would be just right.

We moved quickly to the finishes. Glass Tessera tile had been selected for the walls and benches of the pool – more than 1,000 square feet of tile in all. First, of course, we had to waterproof the walls, then tile and lap the final plaster over the waterproofing to ensure a tight membrane.

The selected finish colors were subtle, picked up from other parts of the project and the surrounding environment, including the hues of California Live Oaks, the home's antiqued plaster and Montecito's low-slung skyline. Washed greens, various shades of tan and gold and the reflected blue of the water brought the project's color scheme full circle in the pool/spa area.

Where the fully enclosed central courtyard had a more dramatic design and color makeup, this area has an incredible view of Santa Barbara and the Pacific Ocean as its true focal point – not the pool. And we achieved our visual goal: This pool fits into the setting and is in no way dominant or overbearing or competitive with the grander vistas.

In keeping with the vintage 1920s theme, white plaster was chosen for the pool's interior. We'd thought for a while about using the hand-drawn glass tile throughout the entire pool, but ultimately we went with the more traditional look. So instead of a tile monolith, we used the tile as a means of visually connecting the deep- and shallow-end benches and ran the tile all the way to the bottom of the shallow end's wall.

At this writing, the pool is nearly complete, but finishing work with the landscape surrounding the pool and with many other areas of the estate will continue for some time. In the third and final article on this project – and you won't have to wait a year this time, believe me – we'll focus on some of the finer points of the finished project, with an eye toward demonstrating how it all comes together to create a complete tapestry of water, plantings and hardscape.

Making a Spa 'Disappear'

Despite the fact that it's an anachronism, the spa became a primary design element in this project.

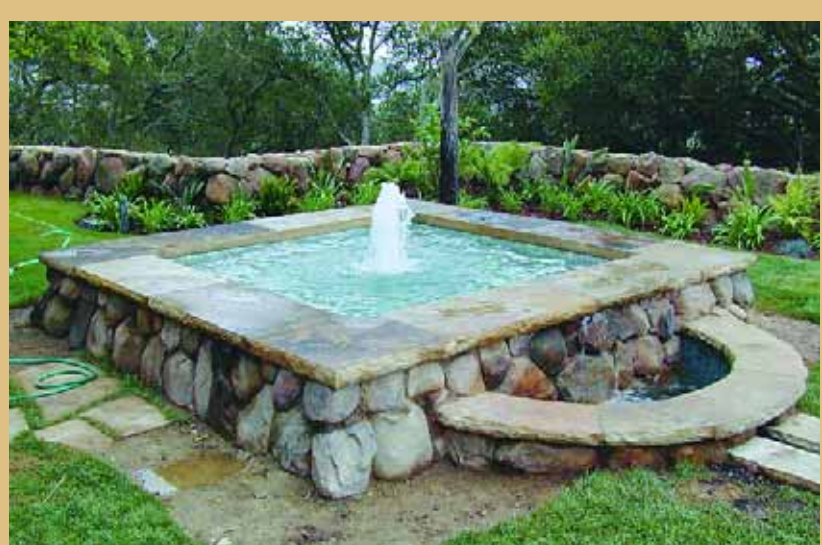
We all were conscious enough of the fact that it didn't really belong in the 1920s design in which we were placing it – and took it out at the client's insistence before reinserting it a couple more times with different shapes. Finally, we settled on a square shape with beveled back for comfort (a standard design for all of our spas) and the same finish materials we used in the pool.

The key to fitting this smaller vessel into the grand scheme was setting it up with a central fountain that retracts into the floor when the spa is in use. When the fountain is on and the turbulence it creates hides the jet fittings, the spa's true nature is masked enough so that nothing seems out of place or anachronistic.

The spa's sandstone coping was hand hewn to a perfect radius for resting one's neck, and the entire interior is lined with the same glass Tessera tile as was used in pool details. We installed nine therapy/massage jets (made by Waterway Plastics) and five flush-cut calf jets, all of them supplied by the spa's 1-horsepower circulation pump and 2-horsepower booster pump. A third 1/2-horsepower pump supplies the central fountain.

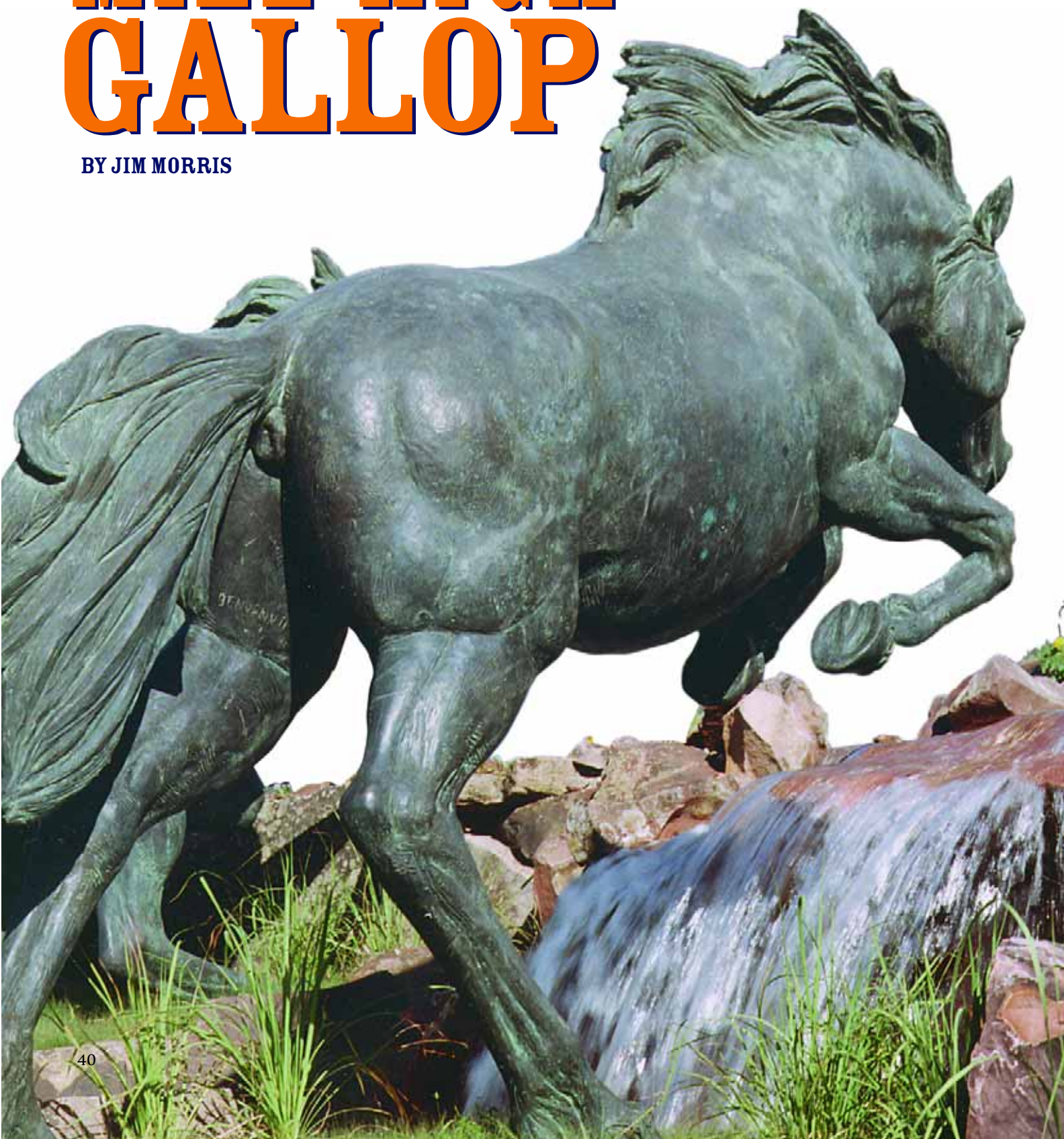
In point of fact, all of the water in the Islamic-styled runnel that flows for 30 feet from spa to pool is run by the pool's circulation system. We created the illusion that the water originates in the spa by taking a standard Waterway skimmer and cutting off the top half (including the throat) to create two weirs of identical size that make it appear that spa water flows under the coping and into the runnel.

– M.H.

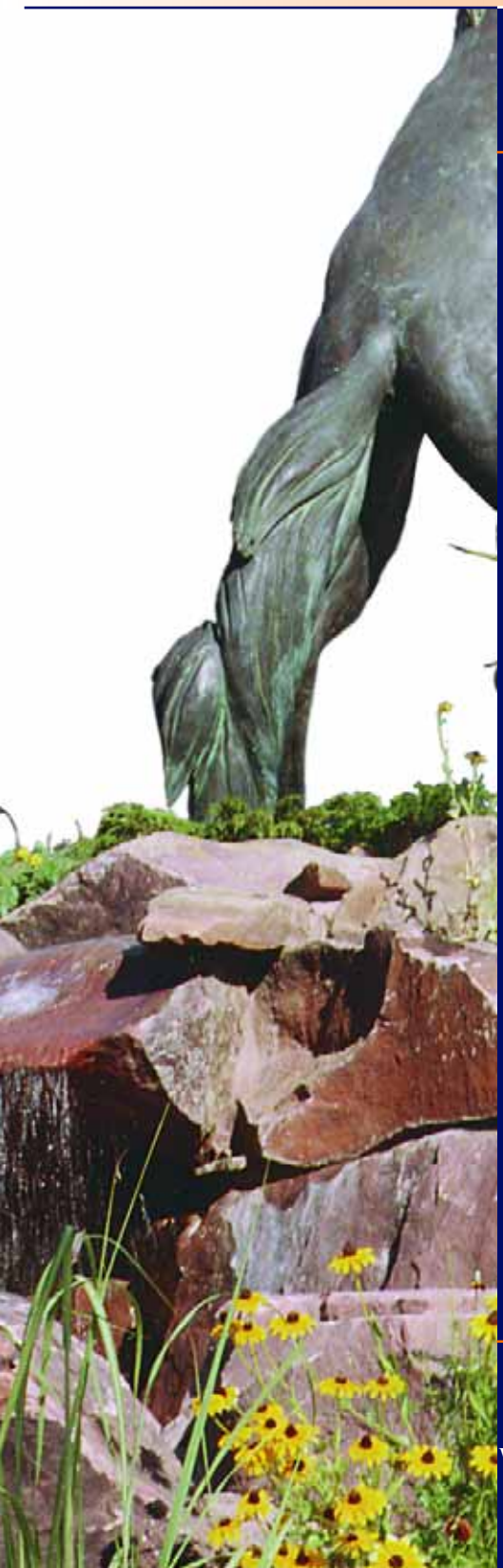


MILE-HIGH GALLOP

BY JIM MORRIS



Located at the entrance to the new home for the National Football League's Denver Broncos, this unique vertical watershape is the combination of ambitious visual design, massive bronze sculptures, complex cascades, rugged rockwork and delicate alpine landscaping – and all Jim Morris and his staff at Natural Pools & Waterfalls of Denver had to do was figure out how to make a grand concept work.



IT'S NOT EVERY DAY you get the chance to work on a project that's going to be seen around the world by millions of people for decades to come.

That was exactly the opportunity that came our way in October 1999, when we were asked by the Denver Broncos to construct an elaborate waterfeature at Invesco Field at Mile High, a brand-new stadium that opened at the beginning of the 2001 football season.

The project architect – HNTB Sports of Kansas City, Mo. – had developed the initial sketch and concept for the unique watershape. As is the case with many of the plans received from project architects, however, this one was long on ideas and woefully short on details. All we knew to start with was that they wanted a sloped watershape that would serve as the platform for seven larger-than-life sculptures of bronze broncos that would appear to be bounding up mountainous terrain leading to the stadium's south entrance.

The project was to be a gift from the Broncos' CEO Pat Bowlen to the citizens of Denver, who had funded the construction of the stadium. The result is a work of art, now aptly known as "The Broncos," that has already been seen by fans of the National Football League throughout the country and, indeed, around the world.

A BREATHTAKING SETTING

That visibility is all well and good, but bringing the project to fruition was a challenge that called for a great deal of ingenuity, patience and cooperation.

To set the scene: Invesco Field at Mile High is a publicly funded facility operated by Denver's Metropolitan Football Stadium District. Unlike many stadiums constructed in recent years that have sought to recapture the asymmetrical charm of legendary sports venues of eras gone by, Invesco Field is a sleek modern marvel of stainless steel and glass.

There are four main entrances to the stadium. "The Broncos" were to be located in the center of the flight of stairs ascending to the south entrance.

Initial discussions among the project manager, architect and general contractor recognized that they would need someone in the loop who could design and build this sort of elaborate natural watershape. We had worked before with Turner Construction, the general contractor, and they recommended us.

From the start, it was clear that it would be up to us to figure out all the specifics of design and engineering that would be required to make the watershape happen on schedule for the stadium's opening in August 2001. Along the way, we worked closely with Turner Construction, with project manager R.M. "Dudi" Beretti of the Stadium Management Co. and with Fred Hare of Sta-Rite Industries, who crafted the hydraulic design.

The space in which we were to work measured 35 feet wide by 72 feet long, rising 14 feet on a gentle slope. In this span, we were to set up a reinforced shotcrete structure that would contain the rocks, landscaping, lighting, water systems and the seven broncos, which had been made in Florence, Italy, by renowned sculptor Sergio Benvenuti. The seven figures were chosen in homage to the Bronco's legendary quarterback John Elway, who wore jersey number 7.

By the time we became involved, the basic dimensions of the space as well as the poses, sizes and relative positions of the sculptures had already been established.

HEAVY LIFTING

Turner Construction was first on site. As part of the stadium's structure, they set up the massive concrete slab that would support the weight of the rocks as well as the seven concrete plinths upon which the broncos would be placed. A thick vinyl liner was placed over the foot-thick slab to waterproof the entire structure and ensure that the adjoining stairs would not be undermined by any water that might escape

es in diameter were plumbed in a variety of locations throughout the vessel. The shell was then shot and finished with a brownish red plaster that included large cobbled aggregate pieces to give the base an earthen appearance.

Even before we installed the boulders, the appearance was that the stadium had been built around this location, and not vice versa. Those boulders, more than 150 tons of Colorado Navajo Moss Rock quarried locally, were trucked in and set near the job-site in preparation for placement with a 50-ton crane. This particular rock was selected for its rustic appearance and for its ability to withstand

PRELIMINARIES: By the time we arrived on site, the general contractor had set up a platform for our work as well as the support structures for the seven bronco sculptures (A). We came in and put down

Our challenge was to create a lively, crashing stream that would befit the energy expressed by the broncos. By design, the rockwork and landscaping were to resemble as closely as possible the upper alpine terrain found in the nearby Rocky Mountains. The horses were to be positioned so as to appear to be bounding up this incline into the stadium, arriving along with the fans who would move right alongside them.

From the moment we set eyes on the plan, we knew this would be a watershape that, although beautiful and elegant in many respects, was by no means to be subtle or retiring: Rather, it would be a thunderous cascade, a set of waterfalls splashing wildly over huge boulders at a volume of about 850 gallons per minute.

the vessel.

With the slab, plinths and liners in place, our company began preparations for the vessel itself.

The entire composition is contained within a shotcrete shell made much like a swimming pool. Before we could build the shell, however, we had to build an earthen grade atop the liner using Class 6 compaction material. We set the soil in six-inch lifts, testing each for compression, and ended up with an overall depth ranging from five to six feet, respectively, from bottom to top.

On this base, we built the steel cage using half-inch steel. Suction and return lines ranging between four and eight inch-

freeze/thaw conditions in Denver's often-brutal winters.

It was at this point in the project that a great deal of the *specific* design work took place. Working closely on site with project manager Beretti – a gentleman I came to respect and admire greatly – we carefully positioned and repositioned the boulders in and around the plinths where we knew the broncos would later stand. We began by selecting large, structural boulders to create the basic contours and transitions for the various cascades. Some smaller accent boulders and landscape boulders were also added during this initial set of placements.

From the moment we set eyes on the plan, we knew this would be a watershape that, although beautiful and elegant in many respects, was by no means to be subtle or retiring: Rather, it would be a thunderous cascade, a set of waterfalls splashing wildly over huge boulders at a volume of about 850 gallons per minute.

POOLING RESOURCES

It's easy to define the general nature of this boulder-placement process in a sentence or two, but it would take volumes to describe the process in detail because of the continuous adjustments that occurred over a long period as the project progressed.

As is the case with so many naturalistic waterfeatures, the lion's share of the design work occurs intuitively on site. This project was no exception, and the process of placing rocks and creating the waterways all proceeded slowly and deliberately. Through this stretch, the support we received from a variety of sources was critically important – and none of it more significant than the hydraulic design and engineering work done by Fred Hare.

The water system starts with a large pond at the top of the system that overflows onto two large boulders. In this way, the headwaters have a natural look and avoid the look of water emerging from behind a weir, seemingly from nowhere. The pond is irregularly shaped, with large and small boulders obliterating its edges. A total of 24 two-inch returns in the floor essentially lift the water up and over the pond's downslope edge.

As the water cascades downward throughout the falls, the flow is augmented in key places by 20 returns of varying sizes. By combining these return locations with varying rock formations, we created a series of random pools, cascades and riffles throughout the system that enhance its natural appearance. All the water flows to an eight-inch drain at the bottom of the run and is re-circulated using a 15 horsepower pump.

The heated system is designed to run 24 hours a day, seven days a week, 365 days a year at a constant 70 degrees, which creates an interesting steam effect in the dead of winter.

As we worked on the waterfalls, there was constant discussion about the horses, where they would be placed, where the boulders would be set and how the water would flow around them. Before we set the main boulders, we measured the horses in all dimensions and did all we could to think through every detail before committing ourselves to any specific placements.

Over and over again, we'd temporarily place the boulders, reposition them until we were absolutely certain – and then remove them to prepare shelves of mortar and lay down the rock chips that we used to adjust the rocks as we lowered them into their final positions.

Once the boulders were placed, we attended to details, filling gaps with smaller rocks and colored mortar to create various channels and pools. Finally, we were ready – and the horses were craned into position before being bolted and welded into place. From that point on, we started applying finishing touches to watershaping and landscaping.

a liner to protect the adjacent stairways from any possible undermining (B), then added soil to create rough contours (C) before setting up the shotcrete shell (D) and moving in the boulders (E).

The broncos must be visible at night, so we set up a variety of fiberoptic lights and low-voltage halogen lamps throughout the area.

This incremental, on-site work was highly intuitive, but extremely purposeful at the same time as we created visually interesting water effects. In one spot, for example, a horse appears to be jumping into the water: At the point where the hoof meets the water's surface, we installed a small spray jet to make it seem as though the hoof is generating the splash.

Roman Fountains of Albuquerque, N.M., designed the spray jets for the horse-hoof splash. That company's technical support and ability to produce the specialty component needed for the effect in rapid order was much appreciated.

A PHOTO FINISH

The fine-tuning on the project lasted a number of weeks as we continued to adjust the placement of smaller boulders and began to add the landscaping.

The plantings on this project are fairly austere, in keeping with the rugged mountain terrain we were emulating. The plant life consists mostly of buffalo grass and some small wildflowers, all species that are indigenous to the area. This subtlety in the plantings contrasts with the boldness of the rockwork and sculptures in an interesting and beautiful way.

Of course, the broncos must be visible at night, so we also set up a variety of fiberoptic lights and low-voltage halogen lamps throughout the area. There's up- and down lighting and a variety of

THE BIG ROUNDUP: Moving the horses into position was a delicate operation that involved plenty of care and patience, but their relative positions had been

planned from the outset, so it was largely a matter of getting things right (F). Still, it was exciting watching the magnificent bronzes being lowered into place (G).

H

NECK AND NECK: The completed composition offers a dramatic invitation to come watch the Denver Broncos defeat their opponents (H). Many of those attending the game approach the stadium via the main-entrance staircases that flank the waterfeature and get the distinct impression that they're bounding toward the stadium alongside the broncos (I-J).


I

spots and fills designed to accentuate the rocky terrain and, especially, to highlight the galloping horses. Ultimately, the lighting effects are subtle and unobtrusive – and quite effective.

Work continued on the project right up to the stadium's dedication ceremonies on August 4, 2001 – a gala event attended by civic leaders, the media, several Denver Bronco players and fans. At the center of the festivities were the broncos, now formally dedicated and donated to the citizens of Denver.

In the time since, the Broncos (the football team) have taken up residence in their new stadium and I've had the pleasure numerous times of seeing the horses gallop up the cascade on television broadcasts of the team's home games. Team officials have also told us that the watershape has now become something of a gathering point for pedestrians who stroll by during the week.

In that light, I guess it's no surprise that the Denver Metro Convention & Visitors Bureau placed a photo of the "The Broncos" on the cover of its 2001/2002 Official Visitors Guide – signifying, I believe, that this singular watershape has become more than just a point of pride for a pool builder, but for an entire community as well.

J

Guiding the Lights

Numerous approaches to the illumination of decorative watershapes have been around for decades, but there's keener interest in specific techniques for the lighting of moving water as the 'fountain phenomenon' reaches past the commercial realm and makes its way into the residential market. In both settings, observes Crystal Fountains' Paul L'Heureux, it's always about maximizing the visual beauty of water.

By Paul L'Heureux

It's a simple notion: When designing illumination for fountains and for watershapes in general, we as designers have the opportunity to choreograph the interaction of light, sound and motion to create visually compelling experiences.

Just as painters mix colors to create desired shades, moods and movement within their compositions, watershapers can use the sounds created by moving water, the water's visual effects, various materials of construction, the ambient natural light, any surrounding architecture and the tools of modern illumination technology to take these masterpieces to whole new levels.

It would be misleading, however, if I didn't start by observing that *illumination* (as the technical people call it) is a complex topic. To succeed, you need to understand not only the technology of various lighting modalities, but also how they are best applied and why. Once you grasp these principles, you'll find that designing illumination for moving water is a creative and exciting exercise.

To demonstrate what I mean, the first of these two articles on fountain lighting will discuss ways in which lighting can become an integral part of the watershapers' art.

Considering Design

There are many ways in which to light moving water. As a result, when you design illumination for fountains (which will be the starting place for discussions that really include almost all watershapes), you need to consider and address a number of key issues:

❑ **What am I illuminating?** You need to consider the *entire* environment when you answer this question, because lighting water is not just about calling attention only to the moving parts of the water. In fact, the overall "illumination experience" includes the lighting of the structures in and around the water, including walls, ceilings or leaf canopies that may stand behind or beside the water.

Light reflected from the water can dance and undulate on the surfaces of these nearby structures to create interesting effects. In this sense, properly designed illumination for waterfeatures gives us the opportunity to add motion and drama to any public place or residential setting.

❑ **Designing by/for effect.** This is the most important criterion watershapers need to consider in designing with light, largely because of the diverse forms water can take. For example, illuminating a serene, interior water wall calls up a different set of design parameters than does lighting a dynamic sequencing waterfeature outdoors.

The process of determining the design approach can be simplified by first identifying water effects according to what the water does:

• *It shoots up in the air*: This type of water is either an aerated (foamy) water effect of the sort seen in Figure 1 – or a non-aerated (clear-stream) water effect. The most effective lighting solution here consists of submersible light sources surrounding the water source (nozzle). This method of illumination captures both rising and falling streams of water.

• *It arches from one point to another*: This is a similar effect to the one above but for the fact that the water's landing area is not the same as its source. Submersible lighting often is required for both areas, thus doubling the number of fixtures needed. There are also laminar water flows that use fiberoptic illumination carried in the water stream itself: Only one light source is required here (Figure 2).

• *It falls down from a water source:* Waterfalls of all sorts are in this category, as are rain curtains, ejector-nozzle troughs and clear sheet falls. Natural light, non-submersible lights and submersible light sources are all effective for lighting the falling water (Figure 3). Up-lighting (usually with submersible fixtures) is particularly effective here, because it projects the water's motion against surrounding structures, including plantscapes, walls or ceilings.

• *It flows on a surface:* Illuminating water that flows across or hugs a structural form is probably the most difficult of all lighting tasks. With these water walls, sloped streams or watercourses, sculptural forms or water steps, the challenge is to illuminate the surface (which is the primary reflecting material rather than the water itself) rather than just the water flowing over it (Figure 4).

(The second part of this article, which will appear in an upcoming issue of *WaterShapes*, will expand on these lighting-design considerations.)

❑ **Accounting for infrastructure.** It's important to consider the physical requirements for lighting fixtures early in the design process.

Submersible lighting fixtures, for example, have height requirements as well as specific footprints, and their needs for cabling that must be taken into account. They also require a flow of water around and over them for proper cooling, which means that these lights may be inappropriate for tight spots, cove lighting, or use

Figure 1: When water shoots up into the air, its visual qualities are best captured when the flow is surrounded by intense lights – in this case, to catch the opaque drama of the fully aerated water.

Photo by Frank Weber

Figure 2: Water flowing from one point to another will require multiple light sources to bring out its qualities – unless you set up a laminar flow, in which case the water can "carry" its own light.

Photo by Malek Karsh

Photo by Doug Duff

Figure 3: Falling water takes advantage of almost all available forms of illumination, including natural light and both submersible and non-submersible fixtures. As seen here, the results can be spectacular at night.

Photo by Charlotte Wood

Figure 4: Lighting water as it flows over surfaces is a challenge, because what you're really trying to do is illuminate the reflective surface *behind* the water to the greatest effect possible.

Photo by Paul l'Heureux

Figure 5: Interior waterfeatures require more intense lighting than their outdoor counterparts to compensate for the lower levels of natural light. As is seen here, meeting this indoor challenge can make for some singularly dramatic visuals.

in sloped and shallow watercourses.

By contrast, fiberoptic solutions may be ideal for these conditions – although this technology has limitations of its own to consider when it comes to light output and cable distances. In designing, you need to know that fiberoptic cables lose light at a rate of approximately two percent per lineal foot of cable, so with these systems, it's important to be sure your illuminator is no more than 40 feet from the point of output.

❑ **Designing illumination in accordance with local regulations.** Although the National Electric Code clearly lays out *national* regulations, local municipal codes take precedence. This is significant because a small but growing number of jurisdictions are now requiring 12-volt lighting systems instead of the more traditional 120-volt submersible lights for waterfeatures and fountains.

As a result and as in so many other elements of a construction project, it pays to check on ways in which local codes may limit your lighting-design options.

❑ **Distinguishing between indoors and outdoors.** Two main differences exist when designing for interior or indoor waterfeatures.

First, because natural light is limited in indoor locations, you need to illuminate indoor features for daylight as well as night hours. Also, interior features demand a greater intensity of illumination because there is a consistently low level of ambient light inside most buildings. As a result, you need to design interior features with more lighting sources and/or sources with brighter lamps (Figure 5).

Second, you must consider lamp life. Outdoor features will require illumination for daily maximums of about six hours (even in winter months), while lighting for indoor features will be on as much as 16 hours per day. This means that a lamp with a service rating of 2,000 hours will last just 125 days indoors and a more bearable 333 days outdoors. Possible indoor solutions may be "under voltage" lamps (such as 130-volt lamps) or lamps designed for service lives of 4,000 hours or more.

Approaches to Lighting

To design appropriate illumination for any watershape in any setting, it's important first of all to understand available approaches and available technologies – as well as what's soon to come. Here's a rundown, starting with basic approaches and then working through specific technologies.

❑ **Natural light:** Natural light can beautifully augment the lighting of a watershape, but

Photo by Doug Duff

Figure 6: Even indoors, natural light is a powerful tool in lighting watershapes. Here, the shadows cast by the window mullions serve to enhance the overall water effect.

Photo by Douglas Group

Figure 7: Waterwalls are a lighting challenge best met through use of non-submersible lights – as in this case, where lighting from above creates strong yet subtle impressions by calling attention to tiny ripples and variations in the flow down the wall.

you cannot rely on it alone.

Both interior and exterior fountains can and should make use of available natural light according to conditions that prevail, but you must be careful how you balance your sources, because natural light can overwhelm a watershape if it's not properly controlled.

The specific water effects in use also play a role here. If, for example, you're working with aerated (frothy or bubbly) water, this will tend to diffuse natural light rather than let it go straight through to reflective surfaces.

This can lead to interesting lighting effects: As it hits the moving surface of the water, natural light will create the phenomenon known as spectral reflections, a shimmering effect on the surrounding area. This can be particularly nice when the waterfeature is well positioned within an architectural environment and the reflected light animates surfaces such as walls and ceilings.

With relatively still water, by contrast, natural light will move right through the pool of water. Because the water has no color (and no diffusing bubbles), only limited effects will be created here by natural light. In this case, you must use submersible lighting to create any desired shimmering effect.

And of course, natural light works with an *interior* waterfeature only at certain times of the day – and depends as well on the architectural design and its use of skylights, reflective surfaces or sculptural elements to maximize this lighting-design potential.

Indoors, you also have to consider the degree to which natural lighting is controlled, because it can wash out the appearance of a waterfeature. In some settings, the use of reflective surfaces in the feature, such as the mullions in the glazed panels above the waterfeature seen in Figure 6, can help throw interesting shadows and develop animation with the light from the skylight.

Outdoors, you need to consider how the light changes in the course of the day, particularly with respect to the angle at which sunlight plays on the water. Early mornings are optimal for spectral reflections, but any time of day can be quite beautiful right up to dusk. You must also be aware that none of this works on dark days.

❑ **Non-submersible:** Its behavior is similar to that of natural light, so non-submersible lighting cannot be used on its own and is instead used widely to augment submersible lighting.

Light from beyond a fountain can't illuminate a clear jet, for example, because it would pass right through clear water. By contrast, with something like a high water wall, you could install these lights in the ceiling to shine down on the feature to great effect (Figure 7).

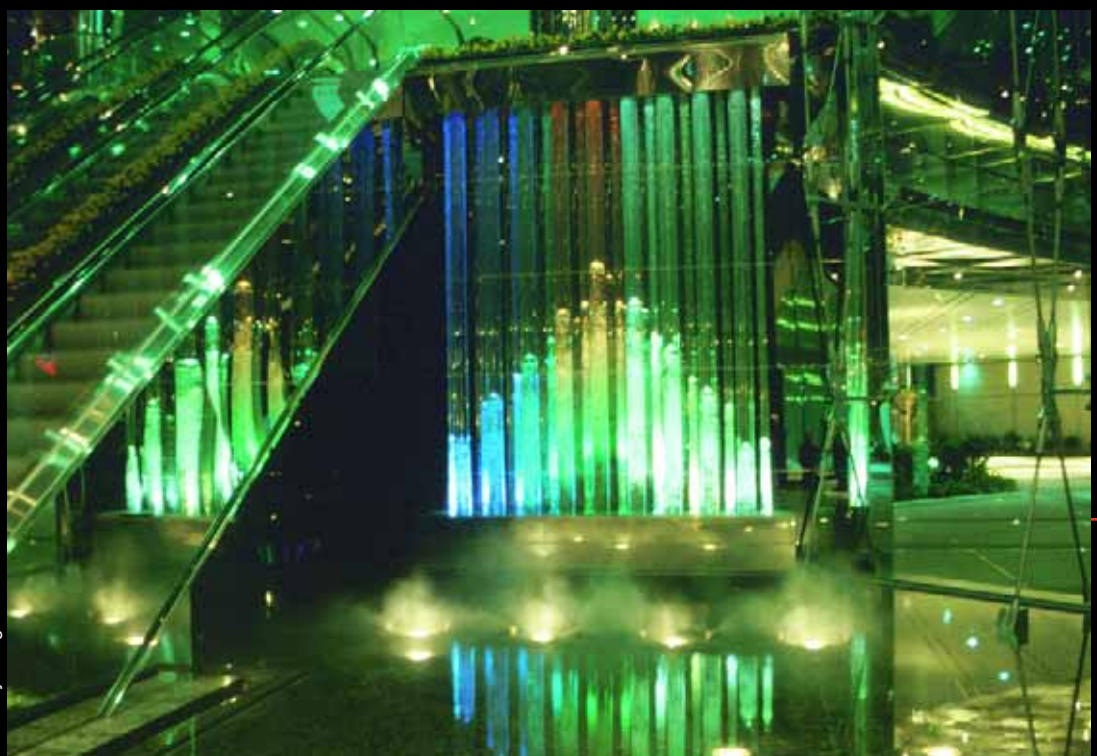


Photo by Doug Duff

Figure 8: Fiberoptics aren't just for suffusing laminar flows with light: In this case, they lend subtle colors and color changes to vertical water structures.

As with natural lighting, non-submersible lighting illuminates the material *behind* the water, thus producing a less animated effect than you'll get with light emerging *through* the water, as with submersible lighting.

❑ **Line-voltage lighting:** Long the workhorse of watershape illumination, line-voltage lighting at 110/120 volts out of the socket is slowly becoming obsolete.

Europe has already embraced low-voltage (12-volt) lighting, primarily as a result of higher safety standards as well as a more urgent quest for efficiency and cost savings than you find in North America, where electricity is cheaper and line-voltage lighting is still available and popular. Here, the shift toward low-voltage lighting is being driven more by safety concerns and a lowered risk of electrocution than it currently is by energy issues.

Because of its past prominence and familiar technology, line-voltage lighting is still the least expensive form of illumination and is still used in many fountains, especially those of the non-interactive variety.

During transmission, line-voltage lighting does not lose as much intensity with distance as does low-voltage lighting – a cost and design advantage. But 110-volt halogens look yellow in comparison to 12-volt options, and there's also the fact that as the rest of the world shifts over to 12-volt systems, line-voltage lamps for specialty applications will become scarcer and more expensive.

What it all boils down to is that a classic look is fading from the scene, driven by low-voltage technology and the desire on the parts of many designers to use the safer, brighter light available in 12-volt systems.

❑ **Low-voltage lighting:** The increasing popularity of interactive and the so-called "children's watershapes" is dictating the increasing use of low-voltage (12-volt) lighting for lots of other waterfeatures in North America. Recently, for example, regulations in Florida for interactive waterfeatures (in public water areas) have mandated a maximum of 15 volts for lighting systems.

This is a trend that will continue. Manufacturers have been making bulbs for 12-volt systems for a long time, and they've now been in use in the fountain industry for about ten years with good results. The key from the fountain manufacturer's perspective is keeping up with the flood of new lamp types and configurations that continue to emerge from the lamp manufacturers and making housings that will put the new lamps to work in creating new lighting effects.

For all of its growing popularity, however, there are design limitations with low-voltage lighting. When designing a low-voltage installation, for example, care must be taken in calculating line losses in the wiring – which become more critical as distances increase. Helpfully, suppliers have developed multi-tap transformers and larger cable to help overcome these line losses – but this potential for less-than-full performance is yet another element that must be considered in the design process.

Even something as familiar as conduit sizing can become an issue, because the rules of thumb we've long used for line-voltage applications no longer apply. Wire gauges are larger to handle the higher amperage of low-voltage lights, and there are other extra costs for infrastructure, including the need to put transformers closer to the output sources than is true with line-voltage systems.

As a rule, you'll find that low-voltage lighting is more expensive and requires greater care and attention during design and installation than line-voltage lighting.

That said, it's still true that 12-volt lamps usually have a longer service life than line-voltage lamps, and, as previously mentioned, they produce a brighter, whiter light.

❑ **Submersible lighting:** Submersible light fixtures for fountains are virtually identical to submersible swimming pool fixtures in that both use incandescent or halogen lamps sealed in watertight enclosures. In both cases, it's also important to make certain the light doesn't shine into people's eyes.

The main distinction between the two technologies is that fountain fixtures are constructed out of bronze and/or copper, while swimming pool fixtures typically use stainless steel or plastic. The difference exists because in fountain applications, lights are often freestanding and are installed in areas that may subject them to more abuse than you'd find in a typical swimming pool installation – hence the more robust housings. Also, fountain fixtures often use higher wattage lamps because more lumens (that is, greater light intensities) are required to illuminate vertical fountain effects.

Another distinction, of course, is that positioning is more critical in fountains. This is why freestanding fixtures that sit on the bottom of a fountain's pool are popular with designers because they can be moved and adjusted as the fountain is operating to optimize visual effects. (An alternative here is niched fountain lighting that allows plenty of leeway for swivel adjustment.)

Another possibility here is the wet-and-dry-fixture fountain lighting that has emerged in the last half-dozen years in construction of dry-deck fountains or waterfeatures that don't stand in bodies of water. While these fixtures can be used in both submersible and wet/dry locations, there are restrictions. U.S. regulations, for instance, limit the external heat of a light fixture to 194 degrees Fahrenheit (90 degrees Celsius). Because 70% to 80% of incandescent lighting is in the infrared spectrum and generates heat, lamps for these applications are restricted to 35 to 75 watts (compared to a submersible's 1,000-watt maximum).

Metal-halide fixtures are an excellent potential light source for wet and dry fixtures since more of their energy (wattage) is in the visible light spectrum and they don't create as much heat per watt of power. This technology is still emerging, but it will represent a welcome addition to the design repertoire.

❑ **Fiberoptic illumination:** Fiberoptic lighting has been around in fountains for more than a dozen years now, and it has improved dramatically in that time (Figure 8). This technology uses either colored glass or dichroic filters positioned between the lamp/optic lens assembly and the fiberoptic cable.

Fiberoptic illuminators are usually available with a color-changing feature that incorporates pie shaped pieces of different colors assembled together in a disk, rotated by a small motor. The most brilliant colors are green and violet, with red being the least intense color.

With moving water, fiberoptics are used primarily to add color to laminar jets and sometimes with other color-changing effects. With the other water effects, the results are similar to those obtained with light-emitting diodes (LEDs), but in neither case does the cost per impact beat traditional lighting.

Light intensity is the key issue: In brighter locations such as an indoor mall, fiberoptics lack the intensity required to make a compelling impression. For the moment, the best fiberoptic application with water in motion is with a laminar jet, where it creates a soft glow and a peaceful atmosphere.

Laminar water can carry light along its entire length even when it's a curved arc, and the effect can be quite stunning as people are enticed by the sense that the stream is not even water, especially when the glass-like rods of laminar water appear to be changing color!

Color Counts

It cannot be stressed enough: The color of materials you use in your fountains and waterfeatures is critically important to the impression they make.

Particularly with outdoor features, you need to be aware that natural light goes right through non-aerated water. With a light background, the water will virtually disappear because it has no color – and the impression to be made by the moving water, no matter how artfully conceived, will be severely limited. (The same holds true, by the way, for indoor features lit by natural or non-submersible light.)

As you select materials, remember that water relies on what's behind it to give depth to pools, waterfalls and water walls: Darker materials do this best.

– P.L.

Lights at Work

The choices in approach listed above are largely matters of experience and even personal preference on the part of the designer. When it comes to putting light to work in and around the water, however, we begin to step beyond technological savvy and into the realm of art.

We'll delve into that topic much more directly in the next article, but before we get there, here are a couple of additional technology-oriented considerations that come into play when you've chosen a style and it's time to get down to composing your masterpiece.

❑ **Spotlighting vs. floodlighting:** The difference between a spotlight and floodlight has to do with the angle of the lamp's lens. A *spotlight* emits a narrowly focused beam that illuminates a small spot on a wall, for instance, while a *floodlight* can illuminate the whole of that same wall from a distance.

As mentioned previously, deciding on your approach to illumination depends on the effects involved. With vertical jets, you need intense, high-traveling light, which means using a spotlight because it has high lumens in middle of the beam and less on the edges. By contrast, illuminating water walls, foaming jets, cascades and low-height jets will not present the same challenge, so you can spread out the lumens with the width of a floodlight.

❑ **Colored Light:** Colored lighting for waterfeatures has been around as long as fountain lighting itself. Submersible and dry lights have used colored pieces of glass or plastic installed in front of the lamp to add this effect for generations.

In the last 15 years, however, theatrical dichroic-coated lenses have been used in-

creasingly in high-end commercial waterfeatures (Figure 9). These lenses, which are comprised of two colors, produce a truer color light than conventional colored glass. They also allow more light to pass through the color filter than is possible with ordinary colored glass – and they are more expensive.

Typical colors available are amber, turquoise, red, blue and green. It's important to note that various colors require you to increase lighting intensities to achieve optimum levels: Amber and turquoise require 50% more intensity than do clear lights, for example, while red requires 100% more and blue and green each call for a 250% boost. You also need to be aware that high ambient light levels tend to wash out colored lights: In such conditions, you should use clear, amber or turquoise colors.

Figure 9: Whether achieved with glass or the newer dichroic lenses, colored light can play an important part in the impression a fountain makes.

So Much More

As you can see, even a quick survey of basic lighting options offers the potential for complexity in both technical issues and aesthetic considerations. Through experience, we've learned that although there are certain reliable rules that apply to specific lighting technologies, each project – from small and simple to large and complex – must be considered on its own terms.

Backed up with a solid understanding of your lighting options and based on discussions with clients to determine their expectations and desires, your capacity to think through the lighting options as you develop a watershape design will add considerable value and beauty to your work.

Next time: In Part II, we'll take a look at emerging lighting technologies and safety issues and focus on maximizing the aesthetic effects of fountains and other watershapes that use moving water.

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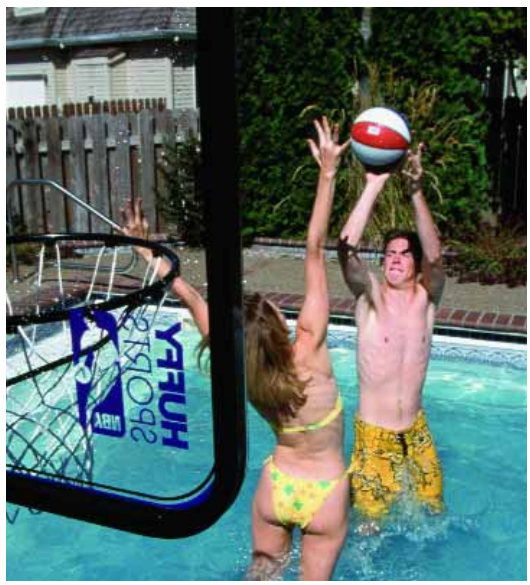

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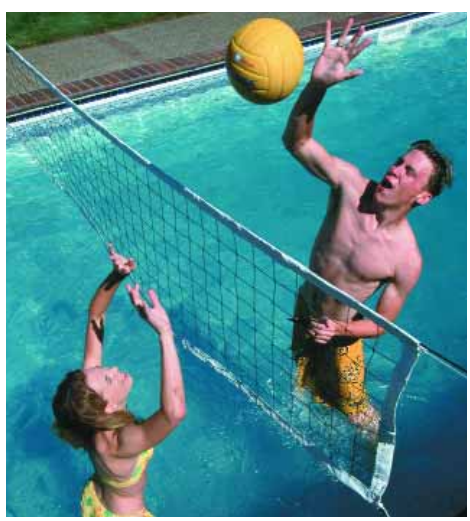

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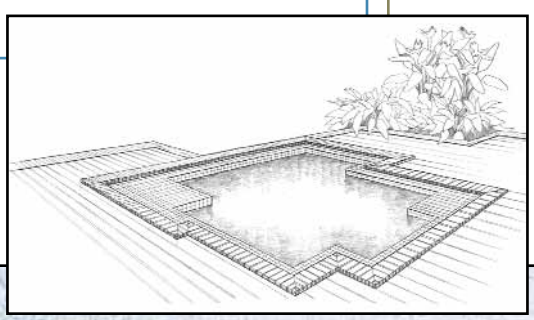

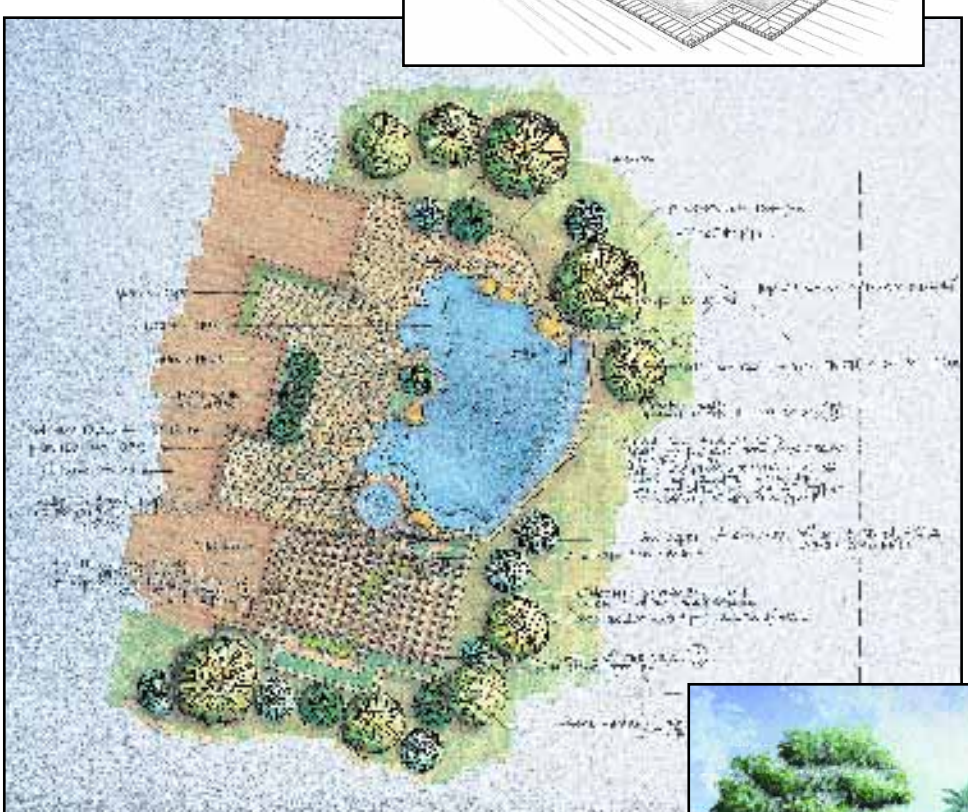

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WEATHERED-LOOK RETAINING WALLS

Circle 100 on Reader Service Card

VERSA-LOK manufactures the Weathered line of segmented retaining walls. Designed to complement historical surroundings, the wall units have a color and texture similar to old limestone while offering long-lasting durability. The pinned, solid-concrete units are environmentally friendly and virtually maintenance-free while providing a high level of structural integrity. **Versa-Lok**, Oakdale, MN.

PVC CHECK VALVES

Circle101 on Reader Service Card

VALTERRA PRODUCTS has released a new series of check valves designed to be used where backflow is not desired. The new models are available in spring or swing configurations for 1-1/4-, 1-1/2- and 2-inch plumbing lines. They also come in two colors: PVC white and/or PVC clear. **Valterra Products**, Mission Hills, CA.

ROCK WATERFEATURES

Circle 102 on Reader Service Card

CASTART offers WetRocks, cast-concrete rock features designed to provide natural waterfalls in any part of a landscape. Water delivery and return units come with quick connects for fast, leak-free installation, and each component part is set at a striking angle to match natural rock formations. The systems also feature water-flow controls for speed adjustment and air injection to enhance white-water effects. **Castart**, Tucson, AZ.

SLIP-RESISTANT SURFACE

Circle 103 on Reader Service Card

NATARE introduces NataTread, a slip-resistant surface treatment designed to replace sand-blasting of horizontal surfaces of stainless steel perimeter gutter systems. A new tooling system allows the company to produce a pattern of small, dimple-like projections on steel that are comfortable to the touch without the "cheese-grater effect" found on many slip-resistant surfaces. **Natare**, Indianapolis, IN.

Manual Safety Cover

Circle 104 on Reader Service Card

POOLSAVER manufactures Novaroll, a safety pool cover system that exceeds ASTM standards and offers quick and easy removal with a simple roll-up device. Secured to the deck using a simple system of anchor bolts and tension straps, the cover can be used in winter or year 'round and doesn't require modification to the pool, installation of a track system or any additional service. **Poolsaver**, Walnut, CA.

Mosaic Tile Designs

Circle 105 on Reader Service Card

ARTISTRY IN MOSAICS has published information on its handcrafted designs in ceramic mosaic tile. The six-page, full-color pamphlet depicts more than 50 standard patterns, including mermaids, angelfish, dolphins, sailfish, seahorses, turtles, crabs, reef scenes and other aquatic accents. It also describes the company's custom-design capabilities, including logos, banners, flags and more. **Artistry in Mosaics**, Fort Pierce, FL.

POOL/SPA CONTROLS

Circle 106 on Reader Service Card

INTERMATIC manufactures the Model P1353ME, a 24-hour, three-circuit, programmable pool/spa control system. Available with either wired or wireless remote controls, each switch can be programmed for up to three on/off cycles per day. The system has a freeze and fireman switch for safety, and countdown and override features allow cycle interruptions for pool service. **Intermatic**, Spring Grove, IL.

SELF-LEVELING LASER

Circle 107 on Reader Service Card

LASER ALIGNMENT offers the LB-100 Laser Beacon, a self-leveling laser system at an economical price. The stainless steel, ball-bearing leveler features rugged construction and a waterproof seal for long service life and offers consistent accuracy with a simple, two-screw base for quick, easy setups. The battery-operated unit also shuts off automatically if knocked out of level. **Laser Alignment**, Grand Rapids, MI.

DECKING/COPING SYSTEM

Circle 108 on Reader Service Card

SEASTONE GROUP has introduced its Glass Surf Mix, a unique, weathered-look composition of small fossils and colored beach-glass fragments embedded in a shell aggregate. Suitable for wall façades, flooring, coping or trim applications indoors or out, the material comes in white, buff or gray in 18-by-18-inch sections that are 3/4 or 1-1/2 inches thick with a natural or honed finish. **SeaStone Group**, Fort Lauderdale, FL.

COLOR LIGHTS FOR SMALL WATERSHAPES

Circle 109 on Reader Service Card

PENTAIR POOL PRODUCTS offers Spectrum Aqualight (SAL), an underwater light designed for spas and small pools. Through electronic cross-fading, primary colors are mixed to achieve a near-infinite array of color combinations, all controlled via an in-home switch. The system, which uses 4,000-hour halogen lamps, parades through the entire spectrum or freezes at a preferred color. **Pentair Pool Products**, Sanford, NC.

Building and Landscape Stone

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DELAWARE QUARRIES offers a full line of stone products for use on decks, in landscapes and around watershapes. Wallstones, Pennsylvania bluestones, flagstones, boulders, gravel and garden steppers are available. All stone products pass through a comprehensive quality-control system, and large inventories allow for quantity shipments, typically within 48 hours. **Delaware Quarries**, New Hope, PA.

Chlorine-Free Spa Treatment

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LED Pool Lighting

Circle 112 on Reader Service Card

SUPER VISION manufactures light-emitting diode (LED) systems for underwater pool lighting. Offering energy efficiency and long life (up to 11 years), the lamps feature five color modes and are suited to both new installations and retrofits. They fit most underwater light housings, and color modes can be controlled with the existing light switch. **Super Vision**, Orlando, FL.

New Ramp Rails

Circle 113 on Reader Service Card

S.R. SMITH has introduced a new line of ramp rails for commercial pools. Custom-made to any length and set up as two or more pieces complete with hidden splices for easy field installation, the stainless steel rails are suitable for use on stairs and slopes on poured concrete, shotcrete, fiberglass and vinyl commercial pools and spas. Specific anchoring hardware is available for different applications. **S.R. Smith**, Canby, OR.

POOL/SPA EQUIPMENT CATALOG

Circle 114 on Reader Service Card

JACUZZI BROS. has published a catalog covering its full line of pool and spa equipment. The 180-page book features pumps, filters, systems for above-ground pools, automatic pool cleaners, pool lights, automatic controls, skimmers, main drains and fittings, unions, jets and filter accessories. It also offers technical resources and complete parts lists for all products. **Jacuzzi Bros.**, Little Rock, AR.

DECKING HANDBOOK

Circle 115 on Reader Service Card

TREX has published a 48-page "Contractors Handbook" describing the characteristics, installation and maintenance of the company's Easy Care Decking. The booklet includes selling tips and comparison charts as well as details on pre-installation storage, safety, joist spacing, gapping and fasteners along with design ideas, instructions on care and full technical specifications. **Trex**, Winchester, VA.

RESIDENTIAL POOL CONTROLLER

Circle 116 on Reader Service Card

ACU-TROL now offers the model AK100 programmable controller for residential pools. The simple, easy-to-use system automatically and continuously monitors and controls pH and sanitizer levels and comes with alarms that notify the homeowner or service professional when the pool water chemistry is out of a set parameter – and all parameters can be customized for the individual pool. **Acu-Trol**, Auburn, CA.

POOL HEAT PUMPS

Circle 117 on Reader Service Card

FOCUS TEMP INTERNATIONAL manufactures ten heat pump models that transfer heat from ambient air to pool water. The Turbo-Pack, Turbo-Flow and Volcan-O models offer heating capacities from 45,000 to 145,000 Btu/hour. Environmentally friendly, quiet and reliable, all units feature either manual or digital controls and are easy to install, use and service. **Focus Temp International**, Saint-Hyacinthe, Quebec, Canada.

Watershape-Design Software

Circle 118 on Reader Service Card

NEMETSCHEK NORTH AMERICA has introduced VectorWorks Architect with Landmark – a comprehensive design solution that integrates two of the company's most popular CAD programs in one low-price package. The combination of systems is great for water-oriented projects and has all the tools and symbols needed for designing both the watershape and the landscape around it. **Nemetschek North America**, Columbia, MD.

Stone Pool/Spa Tiles

Circle 119 on Reader Service Card

STONEHENGE WATER LINE DIVISION offers waterline materials for watershapes. Made from natural stones including granite, slate and quartzite as well as high-end porcelains, all designs are cut using a precision water-jet machine and are assembled per the designer's pattern and color specifications. More than 20 available colors allow for a near-infinite array of combinations. **Stonehenge Water Line Division**, Simi Valley, CA.

Pool/Spa Equipment

Circle 120 on Reader Service Card

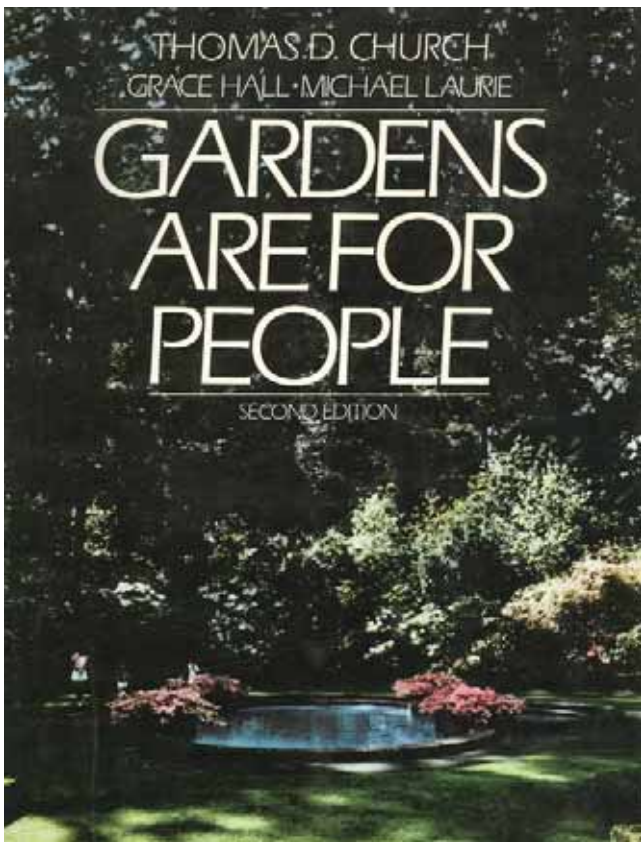
SPECK PUMPS offers a catalog on its line of equipment for pools and spas. The 20-page booklet includes specifications and dimensional drawings and features pumps for residential and commercial applications as well as sand and cartridge filters, pool skimmers, equipment packs for use with swim spas, inground spas and swim pools, and the BaduJet and BaduStream water-treadmill jet systems. **Speck Pumps**, Jacksonville, FL.

Underwater Digital Lighting Fixture

Circle 121 on Reader Service Card

COLOR KINETICS introduces C-Splash, a submersible fixture designed to bring boldly colored light to fountains, ponds and waterfeatures not intended for human use. The fixtures are powered by a proprietary LED-based digital lighting technology that has the ability to create more than 16.7 million colors and a variety of color-changing lighting effects including color washes, cross fades and more. **Color Kinetics**, Boston, MA.

BY MIKE FARLEY



Making People Places

One of the first books about landscape architecture I ever read was *Gardens Are for People* by Thomas Church, a designer justly famous for changing the way exterior spaces are treated today – especially in the residential environment.

This book was first published in 1953, but a second edition (published in 1983 by Reinhold Publishing Corp.) is still widely available in bookstores and on the Internet. The 250-plus-page book traces Church's long career, which started in California in the 1930s and lasted through the late '70s and almost to his death in 1978.

His great gift was taking the art of landscape architecture and applying it to the masses.

Before him, landscape architecture was a highly formal discipline, for the most part reserved for large private estates and commercial or public spaces. Observing the development of a huge middle-class population that liked to spend time outdoors in California's mild climates, Church was among the first to approach the small and previously undistinguished spaces that came with their residences and was instrumental in creating the concept of outdoor "rooms" and backyard retreats.

He didn't have one particular style, which also was particularly unusual for his time – and is even uncommon today. Instead, he was driven by three primary factors: the clients' desires, their home's architecture, and the site – as is evidenced in the extreme variety found in his work.

Many of his early projects were in the San Francisco area, where tiny yards became the norm as far back as 50 years ago. Inspired by his surroundings, Church used views, slopes and exposures to his clients' advantage, took particular care in arranging spaces to take advantage of sun and shade, and was a big advocate of working with existing site features. It seems strange today, but he was actually a pioneer when it came to working with a site's existing trees, particularly the majestic Live Oaks so common in California.

In everything he did, Church was guided by four design principles – unity, function, simplicity and scale – and his book eloquently describes how these principles are brought to bear in nearly all of his projects.

For watershapers, Church was truly a seminal figure, in his time perhaps the most influential designer working on backyard pools and the creator of some of the first truly "custom" backyard watershapes. At a time when rectangular pools were the rule, he was working with free-form designs, raised coping, water lounges, boulders – and then-outlandish materials such as green and black plaster.

He also worked to incorporate his pools into their landscapes, sometimes moving them away from the home to create secondary settings. He designed bathhouses, patio areas and outdoor kitchens as well – truly ahead of his time. One of his most famous pools featured a free-form piece of sculpture placed directly in the swimming pool to mirror the vessel's free-form shape. This project has been featured in magazines and on television for decades.

For me personally, Church's book and career have had a huge influence. More than anything else, his approach encouraged me as I moved into residential design, and he showed me how, even when working in a small space, we can design environments that are truly something special. WS

Mike Farley is a landscape architect with 20 years of experience and is currently a design/project manager for Leisure Living Pools of Frisco, Texas. He holds a degree in landscape architecture from Texas Tech University and has worked as a watershaper in both California and Texas.

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YOU'LL FIND THE MAX-E-THERM HEATER TO BE EARTH-FRIENDLY AND EASY ON ENERGY CONSUMPTION. THE MAX-E-THERM HAS BEEN CERTIFIED FOR LOW NOx EMISSIONS AND IS RATED #1 IN ITS CLASS FOR ENERGY EFFICIENCY.

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STA-RITE'S NEW POOLSHARK IN-GROUND CLEANER HAS A BIG APPETITE FOR DIRT AND DEBRIS. POWERFUL, TWO-WAY CLEANING ACTION EFFECTIVELY REMOVES EVEN THE MOST STUBBORN DIRT. DESIGNED FOR A WIDE VARIETY OF SURFACES AND BOTTOM CONFIGURATIONS.

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