

Inside: Stephanie Rose on Landscape Styles

WATER SHAPES

Design • Engineering • Construction

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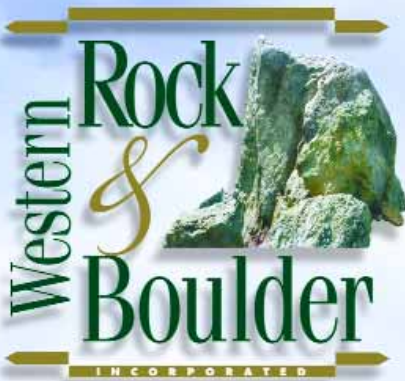
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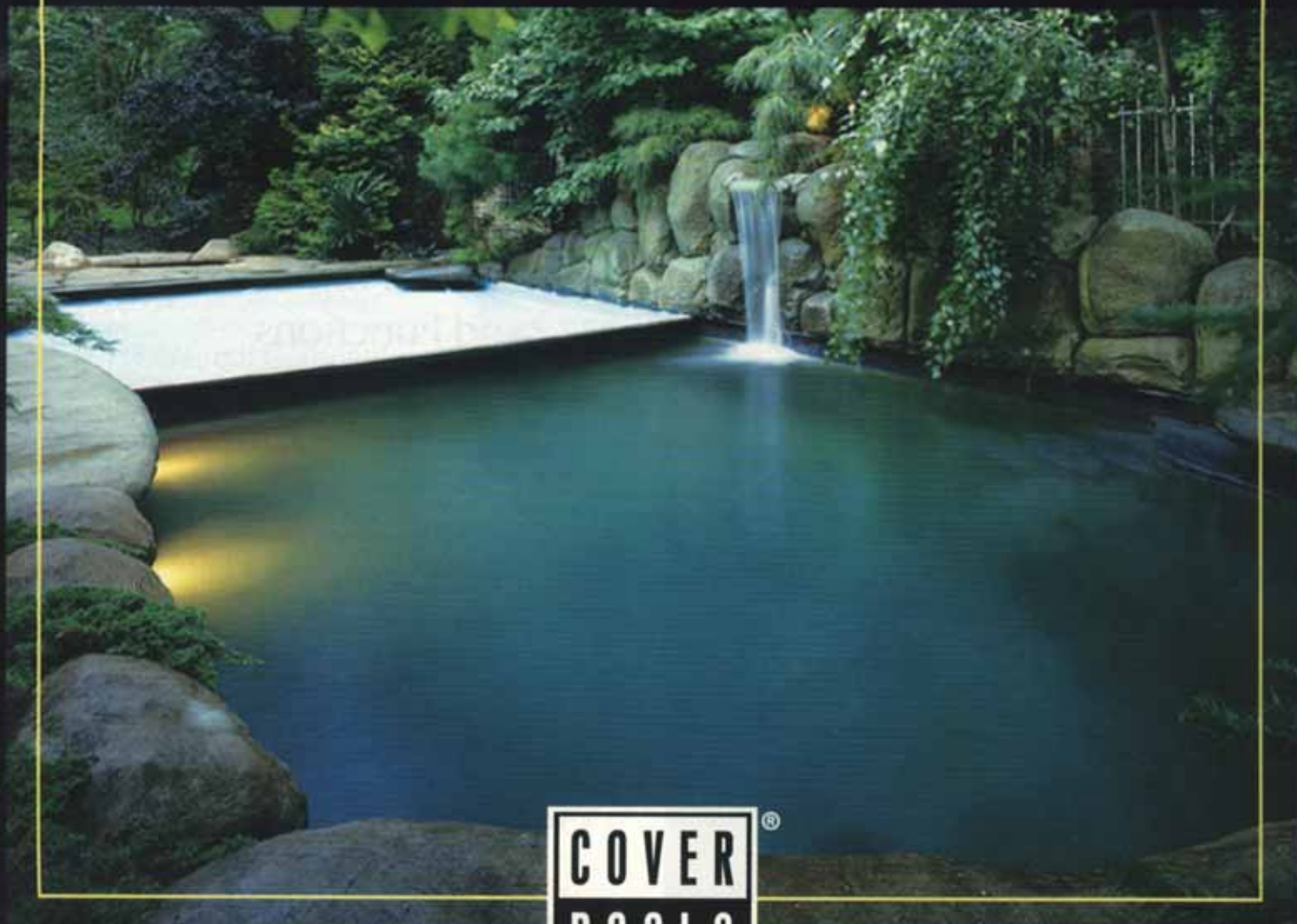


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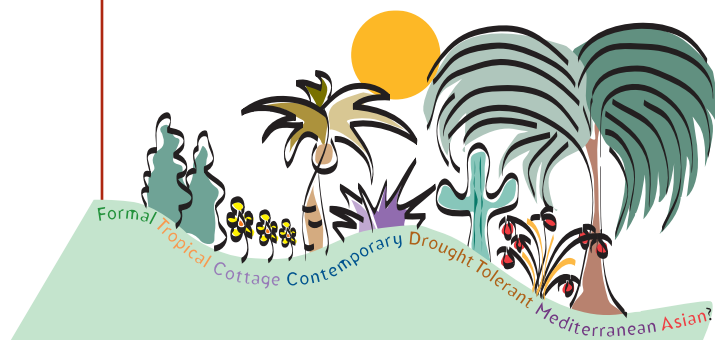
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On the cover:

Photo courtesy
Ston Wurks, Columbia, S.C.

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Arriving At Common Ground

There was a time not long ago when the thought processes of swimming pool and spa designers and contractors stopped at the edge of the deck – or even at the coping in some cases – while the area beyond was strictly the domain of landscape architects, designers and contractors. The result was often a pool or spa that looked like it was part of one yard and landscaping that seemed to be part of another.

As professionals in both trades have looked at ways to improve and expand what they do for a living, forward-thinking members of the pool and the landscape design communities have come to the very same conclusion: Reaching across the bond beam and integrating water-containing hardscape with traditional landscape-design elements enables every practitioner to better serve the needs and desires of an increasingly demanding clientele.

I'd go so far as to say that the traditional landscaping and traditional pool-building trades are now on convergent paths. Both work on the same backyards and commercial properties, both require a clear vision of customer desires, and both strive for the integration of multiplicities of visual and functional elements. That's why, from the beginning of our work here at *WaterShapes*, we've brought the work of these two trades together under one banner.

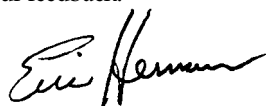
It just makes sense for landscape professionals to move beyond their perceived boundaries by encompassing vessel design, just as it makes sense for pool people to see their work as a part of an overall landscape design. True, experts from both trades may arrive at this common ground with different things in mind and skills at hand, but when it comes to making a client happy, the issues and challenges are virtually one and the same.

So here, and in every issue of *WaterShapes*, you'll find articles and columns that utterly and completely blur the lines between the trades. We consciously illuminate a broad range of possibilities and do all we can not to pigeonhole activities or principles on one side of the line or the other. In our promotional material, we call *WaterShapes* "a new magazine for a new era" – and we take that slogan seriously.

Certainly, we have no desire to turn landscape professionals into pool builders or vice versa. Rather, we want to break down some walls and draw inspiration from both sides as we seek to broaden perspectives on principles of design and application. As I've mentioned previously, we're creating a forum in which all can participate, share ideas, learn a new trick or two and, along the way, come to appreciate and understand that the two sides of the market are inseparably intertwined and really do operate on common ground.

We've added a new wrinkle to the postage-paid cards in the back of the magazine, placing a couple of blank lines on the lower right side that encourage you to give us your feedback on this and future issues of *WaterShapes*.

As we work to provide you with meaningful and innovative articles, you can help us immensely by letting us know what you think and what you'd like to see down the line. This is a forum, after all – and we thrive on your feedback!



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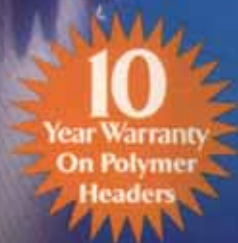
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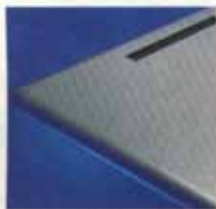
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IN THIS ISSUE

AUGUST'S WRITERS

Rick Anderson is owner of Ston Wurks, a landscape-design firm in Columbia, S.C. A designer and artist with 21 years of professional experience, Anderson's work focuses on the use of natural materials, particularly stone, in naturalistic settings. He is the founder of The Whispering Crane Institute, a landscape design "think tank" dedicated to exploring our physical, emotional and spiritual relationships with the land. The institute annually stages a Philosophy of Design Symposium in Hocking Hills, Ohio. Anderson is a past director of the Association of Professional Landscape Designers and has contributed numerous articles to a variety of trade and consumer magazines.

Holli Adams is an associate with Edwards and Daniels Architects, a Salt Lake City-based firm specializing in the design of public and commercial projects in the Intermountain West. Adams holds a masters degree in environmental design and architecture and focuses her work on recreation projects, community pools and aquatic facilities. The key to her designs is a focus on fun and fitness in service to community needs; this requires her to encompass disparate aquatic zones and functions – a balancing act that calls for a great deal of interdisciplinary engineering coordination. Most recently, Adams completed design work on the Deseret Peak Swimming Pool.

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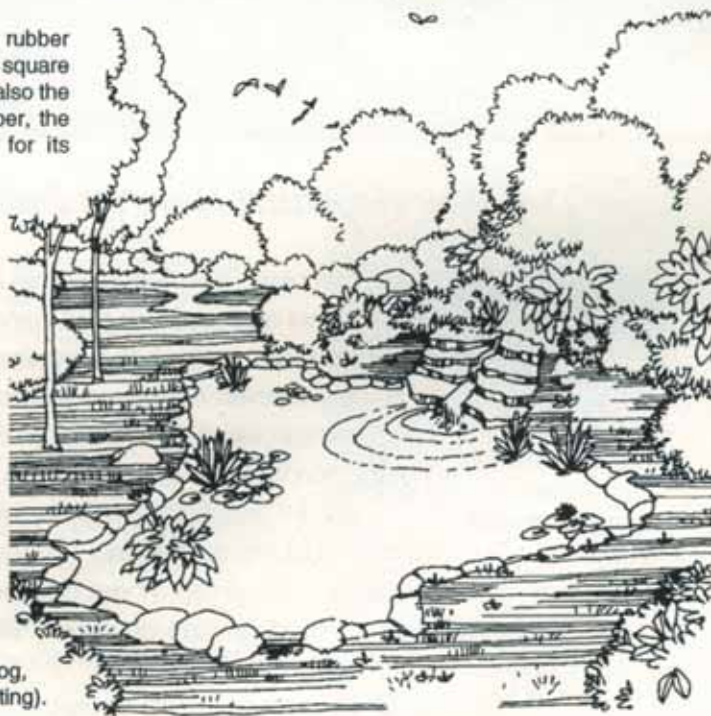
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Interested in writing for WaterShapes on design, engineering or construction topics? Contact Eric Herman at (714) 685-1854!

Steve Gutai is technical services manager for Waterway, a manufacturer of spa jets and components based in Oxnard, Calif. A 13-year veteran of the pool/spa industry, Gutai started his career as a service technician in the pool-rich San Fernando Valley of Los Angeles. After gravitating toward repairs and remodeling, he ultimately left the service industry to become a plumbing and electrical subcontractor for local builders. In 1997, he joined Waterway to work in its OEM sales department, where his technical skills proved valuable to the company in marketing its jets to spa manufacturers. Early in 1999, they moved Gutai into his current position as head of the technical services department. In that capacity, he conducts seminars on hydraulics at

trade shows throughout the country.

Greg Wittstock, also known as "The Pond Guy," built his first pond when he was 12 years old as a home for his pet turtles. He eventually ripped out and rebuilt that pond seven times, learning from his mistakes and always striving to perfect his skills. What began as a hobby ultimately turned into a lifelong passion. In 1990, Wittstock founded Aquascape Designs, a company specializing in waterfeature design and construction. The company, which now franchises its name and construction techniques to construction firms nationwide, lays claim to being the largest builder of water gardens in the United States.

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Client Collaborations

By Brian Van Bower

One of the most critical moments in the life of any watershaper occurs when he or she meets prospective clients face to face for the first time. This is when jobs are won or lost – and, more significant, the point at which watershaper and clients begin what can become a long and fruitful relationship.

I'll state right up front that I do not approach my initial customer meetings with the idea of walking out with a signed contract and a check. Instead, I go in trying to do what I can to help clients realize their dream of becoming owners of a quality watershape. Whether I end up doing only a design or designing and also installing it, my goal is to lay the groundwork for an effective long-term collaboration.

I know this runs counter to the practice of those who seek to answer objections and close on the spot, but I can't work that way. In fact, I use this first meeting to gather even more information than I already have in my notes, so I try to keep my mouth shut (as much as possible, anyway) and let my customers do much of the talking.

In other words, instead of parading each and every benefit of pool or spa ownership across the dining-room table and marching to a close, I ask open-ended questions and prompt my customers to share *their* views, confidently leading them to the conclusion that I'm the professional best suited to help them meet their goals.



BE PREPARED

As I'm walking to the front door, I have my file in hand with the customer name displayed neatly and prominently. Inside the file, I have all the notes I took during our initial phone conversation. I've reviewed those notes and have made a mental list of what I know about the clients and the job – and what I still need to learn. I also have my portfolio in professional-looking, wedding-album-type binders as well as a binder full of information from manufacturers (which I may or may not decide to use).

I look professional, which, of course, means many different things to different people. In my case, I think I'd look pretty silly in a coat and tie in South Florida's heat, so I dress casually but neatly. (On really hot days, that often means shorts.) The important thing here is to be comfortable with yourself: If you find that you sell effectively wearing a Hawaiian shirt and shorts, then go for it. Whatever you do, however, you should be well-groomed and clean.

As I enter the door, I focus on my clients and the moment at hand – relaxed, confident, prepared to ask questions and gather as much information

as I can. I've already sized up the neighborhood, its age, relative income and level of care. I've looked at my customers' current landscaping and make notes on what I can see of the roof, gardens and walkways.

As I enter the house, I observe and note its design, materials of construction and the sorts of choices that have been made when it comes to furnishings and decor. I look for evidence of children, for clues about how much pride my clients take in their surroundings and any and all things that will give me insight into their tastes. I'll look at their photos to see if I'm dealing with an active family – Little League photos, perhaps, or soccer shots. I also look for vacation photos to get a sense of their leisure-time preferences.

As I go through the early, "getting settled" phase of the meeting, I think about preconceptions these folks may have about pool contractors. I consciously remind myself that they may be a little afraid of me because they've heard bad things about "us" or might have been conditioned to be inquisitive about pricing early on in the process. This in mind, I work very hard to make them feel as comfortable as possible.

My attention is entirely on them: I am in the moment, a true samurai salesperson.

TOOLS IN HAND

All customers are different, of course, so it's always important to bring whatever tools you need to bear in bringing them around to your side. This includes using your instincts and paying very close attention to the signals they send you.

Indeed, your ability to read body language is a crucial tool that will tell you a great deal about their states of mind – often far more than the things they say. Quite often, the first few minutes of the meeting will be awkward. Again, I do everything I can to make them feel comfortable by listening to what they have to say. It's critical at this stage to be patient and resist the urge to jump right into a presentation before they're ready to hear it.

I sometimes use my portfolio to get

past any initial hurdle. These materials speak volumes about the pride I take in the work I do, and I find that opening them engages my customers without my having to say a word.

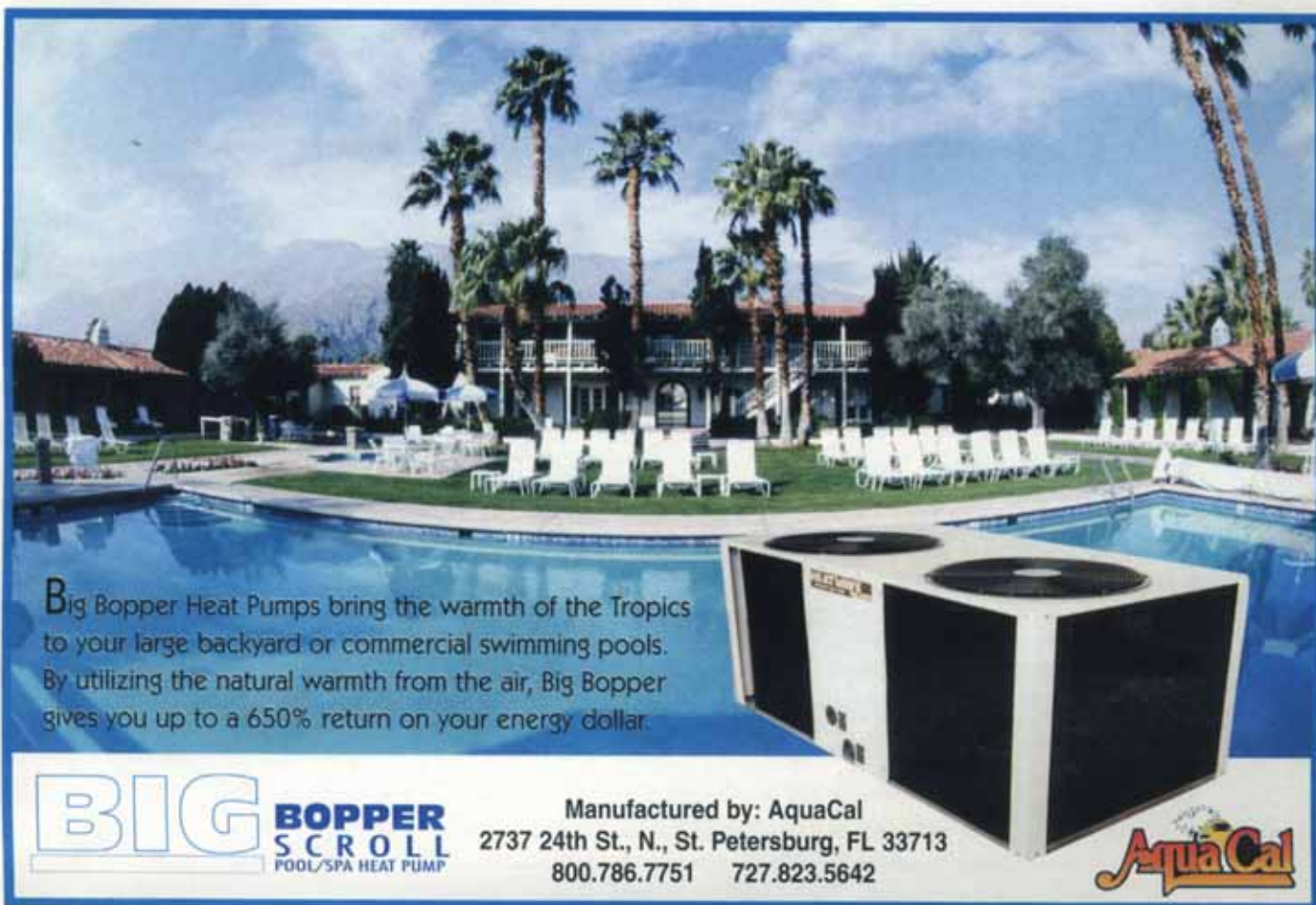
I bring three photo albums with me, all filled with carefully mounted color shots of my work housed in neat cases. (I want these cases to look sharp; in fact, I get new ones the instant they begin to look the least bit worn.) Because these portfolios look a lot like wedding albums, I often make a joke that I wanted to show them my wedding pictures but couldn't decide which of my three marriages to carry with me. (That may not be the funniest ice-breaker I've ever used, but it gets the job done.)

All I do is lay the first album down in front of the clients and let them flip through it at their leisure. Some people will look through only a few pictures and quickly satisfy themselves that I do beautiful work. Others pore over each and every shot, asking question after

question. I go with the flow and let them tell me what they want to know about the work I do. Later, if the discussion rolls around to a specific feature (a perimeter-flow system, for example, or a cabana), I may refer to a photo or two – but I consciously avoid giving them a "guided tour."

As I mentioned above, I also carry a binder filled with information on equipment and other products I incorporate into my projects. This is pretty much a back-up in case a customer wants to discuss a feature or component in detail. I *never* use this to go through and sell every item I'll put in with a project.

This brings me to a key point: My philosophy is to avoid making multiple sales on individual features and products. Rather, I make *one* sale – I sell myself – and then move on to sell the design only or the whole thing designed and installed. My firm belief is that customers do not need to become experts on pool and spa products: That's



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what I'm there for, and I tell them, "You don't have to be the expert; allow me."

DIGGING DEEPER

As the meeting progresses, I always keep it in the back of my mind that my job is to make the process simple for my customers. I listen and give them honest evaluations of the pros and cons associated with various products and features; I answer all of their questions – and sometimes they have long lists prepared for me.

When I meet a customer who has gone to the trouble of writing down a list of questions and wears a pocket protector jammed with pens and markers, I know this will take a while. Other customers, however, are satisfied with the notion that they're paying good money to have a professional worry about the particulars. Either way, I let *them* take the lead as a means of increasing their comfort level.

At every step along the way, I contin-

ue to gather information. Whenever possible, I try to ask questions that prompt my customers to do the talking. I may repeat some of the questions I asked on the phone, either to clarify or reinforce what I know. (In talking with couples, for instance, I often find that one or the other will amend or add to information I already have, such as, "We *do* want the pool for exercise, but we would also like some sound of water to drown out traffic noise.")

One of the most important pieces of puzzle I'm after here is finding out who has the strongest interest in the project and why. I often find out by asking, "How do you see yourself using the pool?" Basically, I want to help them *visualize*.

Some will want a pool that visually impresses others (what I call a "whoa damn" pool that will cause guests to look out the window and make some sort of amazed exclamation). Or perhaps it's a simpler desire for a place to get wet, exercise, wear out the kids, relax

or entertain. Whatever the case, the more they talk about why they want a pool, the more excited one or the other will get about it – and the more guidance I gather from the meeting.

What I want to hear most from clients is something like "We've been thinking about this a long time, and here's what we want." That gets me excited because it tells me they will want to continue with the process. This often happens with referrals. In these cases, we may even have already agreed over the phone that I'm going to design the pool – and that's great, because I don't have to sell the concept of pool ownership. Instead, I'm taking important steps towards helping them realize their desires.

If you get the impression that feeling your way through this sort of process takes a large degree of patience, you're on the right track. I don't rush *anything* during the initial meeting, and I don't rush *anything* afterward, because I know that

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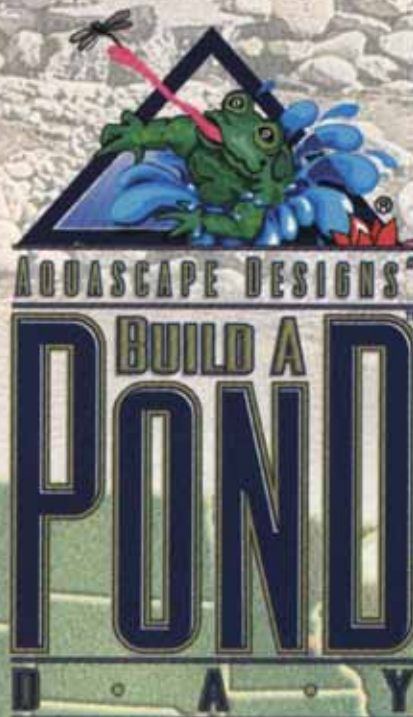
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many of my clients will play with their designs over a period of months. I strongly believe that my patience comes across as confidence and it puts me in a different category from most other contractors.

That might sound arrogant or elitist, but it's true. To me, a willingness to let my relationship with the clients unfold

over time transforms the entire process of selling into something altogether different from what we in the pool and spa industry are usually taught – and what our customers usually expect.

A GOOD LOOK

A big part of the initial meeting, of

course, is the inspection of the area in which the pool is to go (assuming we're meeting at that location, which is usually the case). As you might have guessed, I'm no fan of after-dark but "convenient" evening meetings, basically because I consider the site inspection to be too important to the very first stages of the design process. (Plus, I prefer my nights and weekends to be mine!)

As I walk around the backyard, I'm looking for things such as access, dimensions, landscaping and existing structures. I ask them how they see the installation fitting into the space and make quick notes and sketches to use later, when I get down to the business of designing the pool.

I do not try to design the project in front of them, "right before their very eyes" like a magician. I realize that this is an approach many builders use to impress clients, but I believe in doing the best job I can in the design process (which, by the way, I'm selling for a separate price) – and know that it takes time and concentration.

As we move through the space, I look for things such as children's play equipment. If there's a swing set, I'll ask the client if it needs to stay or should go. I ask them how they think the pool should connect with the house. We'll talk about ground conditions, fencing requirements and which rooms of the house will provide access to the area and/or look out over the area. I check to see if neighbors have easy sight lines into the backyard and then discuss privacy. I look at the topography and anticipate any changes in grade or elevation that we may have to create and how those contours tie into water features and landscaping elements.

We talk about decks and areas where parents can supervise children at play, relax or entertain. If there are older kids, I may suggest including some type of "adult retreat" area.

At this point, I'll discuss pool size and shape and begin to dig a bit deeper into any specific features they may have mentioned. If exercise is of primary importance, for example, we'll talk about the placement of the swim lanes.

Continued on page 16

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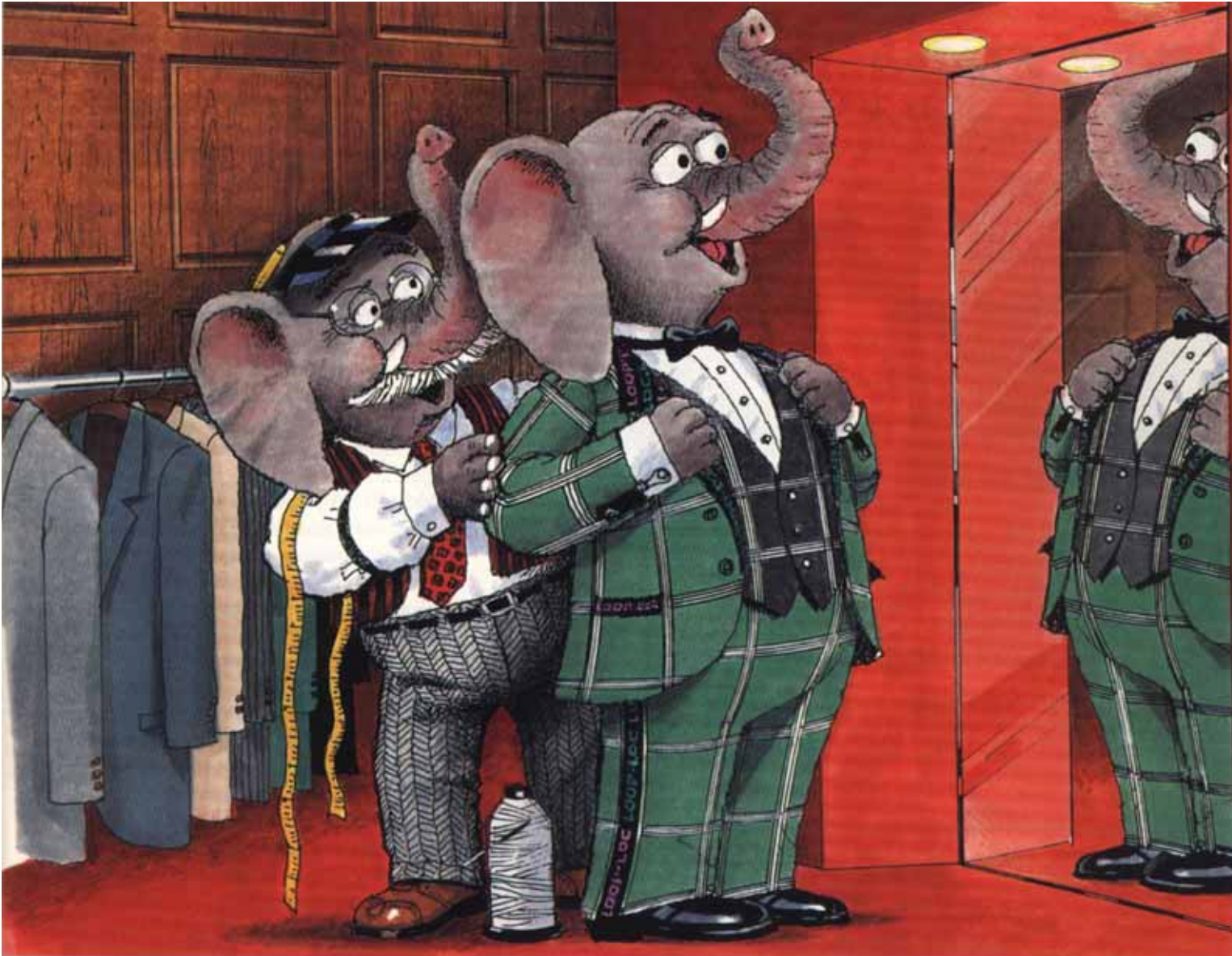
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Continued from page 14

Or if relaxation is a priority, we'll look at where the spa might go.

At this point, clients often mention an interest in something they saw in my portfolio, such as a beach entrance or a cabana. For now, the sky is still the limit as we spin out the fabric of a new backyard. And I'm still mostly all ears, picking up possibilities outlined by my customers that are now being shaped by the physical characteristics of the job site and that lead us naturally to a discussion of the big issue at hand: *money*, of course!

MONEY MATTERS

How and when money comes up in a sales presentation will say a lot about the real potential of the project at hand. It's a tricky passage—a point of anxiety for the contractor and often a point of wild-eyed concern for clients.

At some point during our conversation (it varies from case to case), I will indeed broach the subject and ask them what they're thinking about with respect to a budget. Often they will resist answering, and I can't say that I blame them: They're afraid that whatever they say is what I'll make sure the project costs!

Given my gradual, even-keeled, inquisitive approach, however, the circumstances are somewhat different for my clients. I make it clear to them that we are all part of a collaboration and that we all are involved in designing something that will grace their backyard for years to come. In other words, I bring up budget in a context that lets them know I want to talk about cost as a way to corral and define the scope of the project and present possibilities that fall within limits they want to set. I find that by associating these issues of budget with specific features and the overall scope of the project, the focus remains on their desires and steers well clear of any notion that I'm interested solely in prying their hard-earned dollars out of their hands.

For example: I recently presented a design that, at the clients' request, included a fairly elaborate stream. When they saw what the stream did to the overall cost of the project, they opted for a smaller, bubbling waterfeature



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that offered the sound of splashing water but kept the cost within budget. In this way, the subject of cost was dealt with in the context of what was and wasn't realistic – and what was and wasn't a true priority for the client.

Budgets are important, but we need to put them in context. Many times, I find that initial budgets simply aren't valid, because my clients aren't aware of all the features I can offer and the options they have. I also find that where there is a tentative budget, they aren't usually set in concrete so early in the process.

Again, it's not as much about selling as it is about collaborating. Dealing realistically with how much the project costs is an inevitable, totally natural part of that collaboration.

Another blunt question I often ask is, "How would you like to proceed from here?" Sometimes, clients are ready to go forward with a full-blown design/build contract; other times, they want to move ahead with a design-only contract that may or may not translate into further work for my company. Either way, I leave the meeting with an expectation of further interaction and a job to do.

If the client decides to take my design and shop it, great! I've been paid for the service of rendering the plans, and I've played a key role in helping them achieve their goals. If they end up wanting my company to install the project, well, I'm fine with that, too.

Either way, by approaching the meeting with the client as the beginning of an ongoing collaborative effort rather than an end in itself or a do-or-die sales call, almost invariably I find that something good comes of the investment of time and energy I've made.

Above all, I enjoy myself. Could a true samurai salesperson strive for anything less?

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.

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Searching for Style

By Stephanie Rose



Among the most complicated tasks you'll encounter in designing a watershape is determining your clients' style and how it applies to the project.

How important is it to know what style they want? That's a complicated question, because style is highly subjective. It's also an important one and can, in fact, make or break your design and your relationship with your clients.

How do you determine what they want? You can always start by asking them, but very few clients will tell you, "I want this style watershape with this style landscape, and I want you to use these plants" – and conclude by handing you a plant list. So let's take a look at what style means, then explore how it can affect your work as both designer and contractor.

WHAT IS STYLE?

Webster's dictionary defines style as "a manner of expressing thought in writing, speaking, acting, painting, etc." What this means in the case of watershapes is that your creation should be an expression of your clients and their own manner.

Do you have to identify a *specific* style? No, but you *do* need to identify your clients' tastes and desires very clearly. No

two people have exactly the same tastes, so any two people living in the same house are likely to see things differently – and it's your job, not theirs, to find the right blend.

Determining tastes and desires can seem like psychoanalyzing your clients, but it's well worth the exercise: Your final product will be better, your clients will be happier, and you'll make more money because you planned well and get more referrals because they are so happy. All you need are some tools – and that's what this article's about.

Let's look at some general examples of the way people usually refer to landscape styles:

- **Formal:** If your clients say they want a formal garden, they may be leaning toward manicured hedges, large lawn areas and more structurally designed plantings. A good example of a formal style would be a boxwood hedge surrounding a rose garden.

- **Tropical:** Typically, when clients tell me they want a tropical look, they want palms and larger-leaf plants. Hibiscus and ferns are also popular tropical selections.

- **Cottage:** Also known as the "English Garden" look, this usually means lots of perennials, roses and flow-

ering plants. Within this category, however, you need to determine whether your clients are thinking about a "wild" look, a more manicured look or something in between. In other words, saying "I want an English garden" doesn't necessarily mean they want chaos.

- **Contemporary:** By contemporary, your clients might be telling you they want strong vertical lines using bamboo, horse's tail or other "strappy leaf" plants including agapanthus, but there are other possibilities here. You need to ask more questions and get a better picture of what they're thinking of when they say "contemporary" – and find out whether they're after a sparse look featuring only a few varieties or want a fuller look.

- **Drought Tolerant:** Here's another style where you should ask more questions to get a clear definition. To some, "drought-tolerant" means cacti and succulents; to others, it's lavender and rosemary. What's happening in the latter case is that these clients are using the terms *drought-tolerant* and *Mediterranean* interchangeably – and that's something you need to sort out.

- **Mediterranean:** A Mediterranean look generally has an arid cast to it – one that often includes gray foliage or

Continued on page 20

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plants that look a little rangy or leggy, such as verbenas. This style might also include use of lavender or rosemary.

• **Asian:** In landscape terms, Asian style can be many different things. Most of us think of maples, azaleas, camellias and deliberately placed plantings worked in with gravel paths or large areas of a single ground cover or planting. Often, this look has features designed to simulate mountains or other natural textures within a landscape. For instance, gravel is sometimes used to simulate water in a dry river or waterway.

While it's true that no two people like exactly the same things, it's important to recognize that they may like elements of two or three or more of these categories and that it's possible to mix styles if you know what you're doing. It may take some digging to find out that what they really want is agapanthus around the edges of their formal garden, but this may be just the touch they're after.

All seven of these styles are popular

where I work in California, and I suspect you might add a few regional styles that feature favorite local species to the list. It's also the case that your clients may refer to these style groups by some other name. As a result, it's a good idea to ask some questions to narrow the range of possibilities and put yourself in a position of sounding like the expert even if you have no idea what style they are talking about.

STYLE AND DESIGN

In my last column (*WaterShapes*, June 1999, page 20), we determined that the size of the plant dictates space needs and that size may be determined by the style of the plant.

Existing plantings or other features may be your guide here. If the yard has established palms and philodendrons that the client wants to keep, you can work with and around them to create a "tropical paradise." But keep in mind that you don't need to be limited by these existing plantings or anything else

as you design. Your clients, for instance, may want to mix roses or a perennial border in with the existing tropical look.

Can you do that? Absolutely – and if you're uncertain about how to do it, find someone who can help you. *There are no hard and fast rules about designing with different plants.* You can mix anything – so long as you know how to do it!

Let's say you have a mature tree in a very prominent location. The size and style of that tree may dictate a certain style for the rest of the landscape; it may even lead you to change the contours of the watershape. Say, for example, that your clients want a contemporary look and a rectangular pool – despite the fact there's a mature sycamore or oak right in the middle of the yard. What do you do?

Short of convincing the clients to remove the tree, you might suggest a different geometric shape for the pool that still keeps its linear, contemporary flavor. You might also shift gears and suggest a style change, because the sycamore or oak



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would fit nicely in a cottage-style, Asian or formal yard. You might also mix styles, creating a new one that incorporates a number of different themes and ideas.

As you think things through and work with the clients, remember that different styles may also dictate different irrigation requirements. Let's take drought-tolerant plants or succulents as an obvious example: They certainly need less water than would a perennial border.

This issue may be addressed simply by adjusting a sprinkler clock, but sometimes that's not the case. What happens, for instance, when you put a regular irrigation system into an area in which the clients want only roses? Roses should be watered at the roots either by a flat spray, a soaker hose, a drip system or some other method that keeps the leaves dry. Drip systems require different installation than do regular sprinklers.

This may seem inconsequential, but poor planning will cost you time and money later as you struggle to adapt

systems to plants. That can be particularly discouraging when it's something you could easily have determined before the sprinkler system was installed! We'll discuss the different irrigation needs of various plants in a future column; for now, it's enough to say that planning is preferable to going back and changing all the sprinkler heads.

DETERMINING CLIENTS' DESIRES

Assuming you have lots of resources at your disposal about plants, styles, irrigation and how they all go together, that still leaves you with the challenge of figuring out what your customers want. Here's a list of questions to help you:

- ☐ Do you have any pictures that show the styles of plantings you like?
- ☐ Do you have the addresses of any houses with planting styles you like?
- ☐ What types of plants appeal to you? Do you prefer tropical plants, roses, something else?
- ☐ Do you want to see things in your

yard that you don't see in anyone else's yard – or would you prefer to have more common plants?

☐ Do you know the names of any plants you like?

☐ What colors do you like? Which ones don't you like? (Many people hate orange; they don't know what they're missing!)

☐ Do you want a wild look, a natural look or a manicured look?

☐ Is there a dominant plant you would like to see everywhere in your landscape?

☐ Do you like symmetry, or is asymmetry your preference?

☐ What is the planting budget? (Uncommon plants typically cost more, so steer them in the right direction. This may in fact determine the style of planting they *choose* regardless of what they *want*.)

If none of these questions (or not enough of them) can be answered to give you an understanding of what style they are looking to achieve, you may

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need other resources.

HITTING THE BOOKS

My favorite resource? *The Sunset Western Garden Book* (Sunset Publishing Corp., latest edition 1995). For information on plants, this book is basically the Bible of landscape designers and architects in the West. It's probably the best

resource for details on plants commonly available at wholesale nurseries. It's also good for ideas, particularly if you use the sections on plants for specific situations (such as shade-tolerant, drought-tolerant or deer-resistant plantings). Better still, the folks at Sunset have recently released a national edition, so we're all covered wherever we go.

While *The Sunset Western Garden Book* is definitely tops, there are several other publications I recommend:

- *Taylor's Master Guide to Gardening* (Houghton-Mifflin Co., 1994): Organized by types of plants (including trees, annuals and perennials), this is a good overall guide with lots of pictures and plant descriptions.

- *Taylor's Guide to Garden Design* (Houghton-Mifflin Co., 1988): This is a great resource to hand to your clients and ask them to tell you what they like and don't like – and why. I use it frequently because of its great pictures and ideas.

- *Taylor's Master Guides* (Houghton Mifflin Co., 1988): This is a whole series of books, each one on a separate topic from trees and shade plants to water plants, perennials and more. As with all the other Taylor guides, these give good descriptions of plants and feature lots of great photography.

- *The American Garden Guides* (Pantheon Books/Knopf Publishing Group, 1996): This series is similar to *Taylor's Master Guides*, but it features different plants in many cases, so I recommend having both series on hand.

There are also several books I like that specialize in perennials and color gardens, including *Best Borders* by Tony Lord (Viking/Penguin, 1995), *The Cutting Garden* by Sarah Raven (Reader's Digest, 1996) and *Color Garden* by Malcolm Hillier (Dorling Kindersley, 1995).

Another great way to determine your clients' tastes (if books like these aren't sufficient) is to take them to a nursery that stocks good-quality plants – and a good selection of those plants. Have them wander through the nursery and show you what they like – and what they don't like. Remember: It's just as important (and sometimes more important) to know what they *don't* like.

If you go through all of this and are still truly stumped when it comes to deciphering your clients' style, it's time to consult a landscape professional – or e-mail me at sroseld@aol.com.

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.

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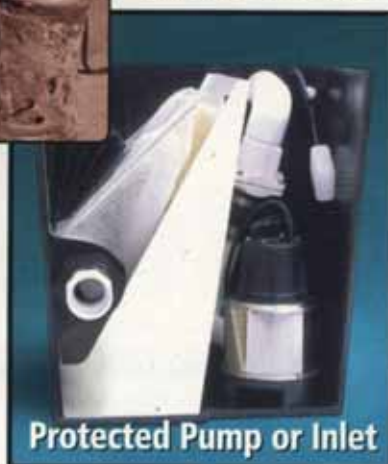
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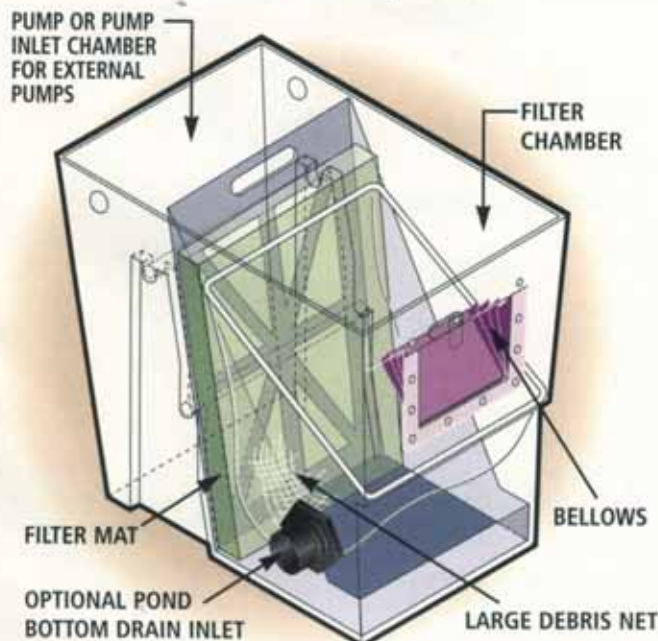


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Where Streams Live

By Rick Anderson

Designing and building a stream is no small task. The usual scale of these projects, along with typically high customer expectations for a convincingly 'natural' look, combine to ratchet the difficulty level up several notches. Here, a landscape designer specializing in streams shares his expertise in approaching these challenges as a guide to watershapers who aim to please with wandering waters of their own.

As I see it, there are six main types of watershapes: pools, spas, fountains, ponds, waterfalls and streams. Although there is tremendous variety within each category, I think most of us in the business would put pools, spas and fountains in one sub-group and ponds, waterfalls, and streams in another.

Obviously, there's room for overlapping here – waterfalls installed with pools, for example, or fountains in the middle of ponds. The key distinction for me, however, is the closeness with which a pond, waterfall or stream must imitate nature when compared to many pools, spas and fountains that need only *suggest* a natural design – if they need to do so at all.

Hands down, it's hardest to get "natural" right when it comes to streams. The difficulty isn't so much with the construction techniques they require or even with their hydraulic design (both of which *can* get complicated). Instead, it's the level to which the designer and contractor must first un-



derstand the way water interacts with rock and landscape in the natural world and then carefully mimic those effects in a fabricated watershape.

To see what I mean, let's take a photographic tour of streams where they live, look at some specific areas, and then isolate some ideas we can apply to the watershapes we build.

GOING WITH THE FLOW

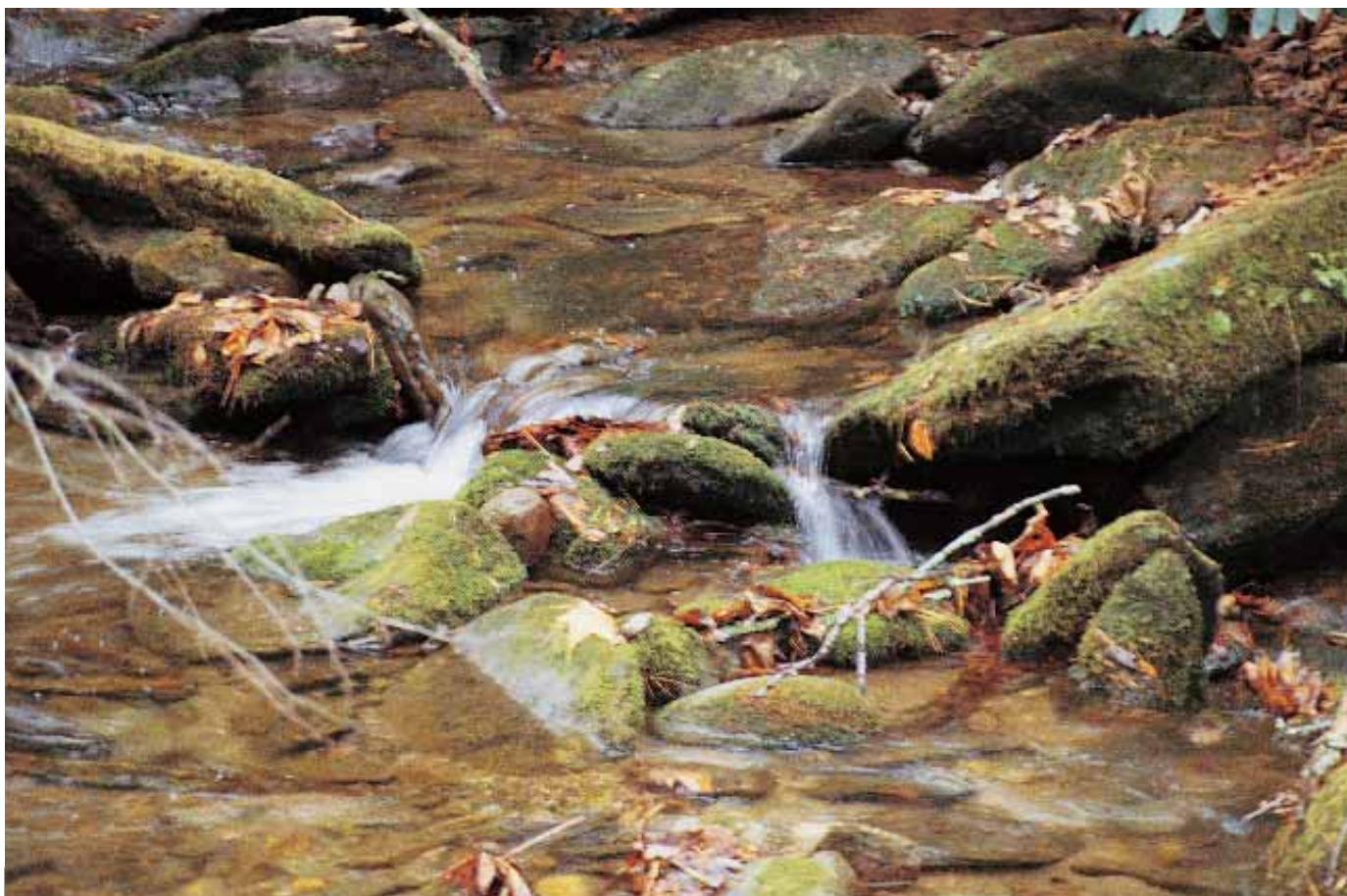
As with many watershape designs, success or failure with a stream largely boils down to how you treat the edges. Stream banks are especially difficult, because you need to create a natural-looking edge while making certain the structure holds water, that the water stays somewhat clear and that it all looks natural. Think about it: How do you create a bank that seamlessly rolls down into the water along with a stream that naturally meanders through and pushes at the edges of the space it occupies?

The answer is simple: *You need to study streams as they ex-*

ist in nature. Understanding how nature works will inform and shape every aspect of the work you do. In fact, I'd say that studying streams in nature is *the* key factor in your ability to imitate or re-create a natural look in your projects.

Consider the underlying structure of your watershape: Whether vinyl, EPDM or concrete, you set the channel or path that determines how a stream moves, flows and creates its own space. In nature, geology and topography determine the way a stream shapes itself, dictating where the turns are, how much and how far the water drops and the rapidity with which the water flows.

A designer/builder can define this underlying structure through his or her design or, in some cases, work with the underlying structure at the job site – perhaps a rock outcropping or a stone mass you can use to your advantage. If you've forgotten your geology (or never had it in the first place), pick up a book and take a look: Fault lines, protrusions, upheavals, glacial till and other features all can be



One of my favorite effects occurs where water is diverted in two directions and thereby creates different points of interest in the same scene. In this shot, I also marvel at the way the bank stones lean down into the stream and serve to frame and anchor the composition of bank and stream both physically and visually. When I apply these concepts to my own work, I'll think about setting this sort of stream up with both sunny and shady areas. The shade will give me the opportunity right away to set up some moss, which will soften the edges, enhance the natural impression and add to the visual interest created by large stones emerging from the stream.

used to define an underlying structure that will "sell" the natural qualities of your watershape.

The structure may be man-made, but the form created should be natural.

When a stream builder pays little or no attention to the way geology works, the project is almost always going to look unnatural. By contrast, when the builder looks at what makes a real stream turn, twist, spill or cascade and sees what happens with sand bars and dry areas, a great watershape may be in the making. The result will be a stream that reflects the way the natural world works.

This boils down to a couple of key questions I'm always asking myself: What are the major natural features that make up a stream? Why does it turn this way or that? What makes it shallow here, or deep? When a stream turns, what features are mainly responsible for the change in direction? After the stream *does* turn, what happens downstream? Again, the idea here is to force yourself to consider underlying structures.

These are the thought processes any good stream builder will pursue in starting to design and fabricate a stream. They keep you focused on cause and effect, and they enable you to begin working on streams that really have something to say – streams that look as though they belong instead of being little more than a trench bordered with rock that has no business being there.

WATER AT WORK

Once you have a channel and course in mind, you have to factor in the water itself.

Consider a stream project that involves lots of stone. In nature, this suggests a younger stream, a high degree of violence and tumbling rock – all associated with a steeper and stronger push of the water. Further downstream, you'll find a collection of tumbled boulders and rock carried by the runoff from the spring thaw.

Now think about a setting in which a stream has cut its way along the same course, year after year, and has, through

those years, eroded its own pathway. There may be lots of water involved here over time, but the scene suggests a gradual process rather than one of violence.

This issue of appropriate water flow is crucial to good design. You can work with volume in any number of ways to achieve effective results. The important thing to bear in mind is that water flow should tie in directly to the underlying structure you have created; that is, the flow must be appropriate to the channel. In this context, you must pay close attention to stone you place outside the stream itself: They are a major part of the design because it is *these* stones that tell the story of the stream.

Usually, stream builders work somewhere between deep, curving rivers and rushing mountain streams in our residential settings. This gives us the opportunity to take the best of this (and little pieces of that) to create the finest possible watershape.

So what must we do to create great streams, to create streams with seamless

banks and a water flow that fits the context of the site? How do we gain the understanding of the underlying structures that lets us accomplish the right look in the right places? It's easy: Go to the real thing and look at streams as they are in the natural environment. In other words, go where streams live!

NATURE'S OWN

The notion that we should look to nature and the sorts of locations shown in the accompanying photographs to guide our designs should come as no great revelation. What does come as a surprise to me, however, is the fact that so few watershapers use this strategy to best advantage. How much time do you really spend looking at natural waterfeatures? Even more important, how do you look at them?

I've always spent a lot of time outdoors. In fact, I even had a creek in my backyard and spent a lot of time in it as a kid, much to my mom's chagrin. But that's not what turned the corner for me as a designer

When I came upon this stream, what impressed me most was the way the bank just seemed to flow right down into the stream as a magical, seamless intersection. In my opinion, this melding of stream and banks is the hardest effect to achieve in a man-made stream, and I must say I've seen some otherwise good, natural-looking streams seriously compromised by poor edges. In this sense, edges separate the good pro from the great pro: The key, I think, is to keep your liner or structure angling up ever so slightly instead of making a quick fold at a 90-degree angle.





The most impressive part of this scene is the way the larger stones change the course of the stream. This embodies my point about the specific geology that underlies a living stream; it also emphasizes the point that mixtures of small and large stones can be used to create a rhythmic interest in the stream. Note also the water-worn stones in the midst of the stream while stones with sharper edges lie just beyond the main flow of water.

and builder of watershapes and other designed outdoor spaces. Yes, I had an appreciation for the joys of nature and moving water, but I had no clue that there was order amid the chaos, that there were patterns, repeated elements and structures hidden in a seemingly fractured world.

How did I find those almost magical and mystical elements? This is where two additional factors enter the scene – factors that completely transformed my professional life: a camera and a sketchbook. If you learn to use them, these two tools will change the way you look, study, sense and, most important, interact with the natural world.

A camera forces you to slow down, really study the site and look at the composition of a scene. It pushes you to find the best angles, the best light, the best moods – and probably a hundred other things I still don't appreciate on a conscious level but that come through on one level or another in the photographs I take.

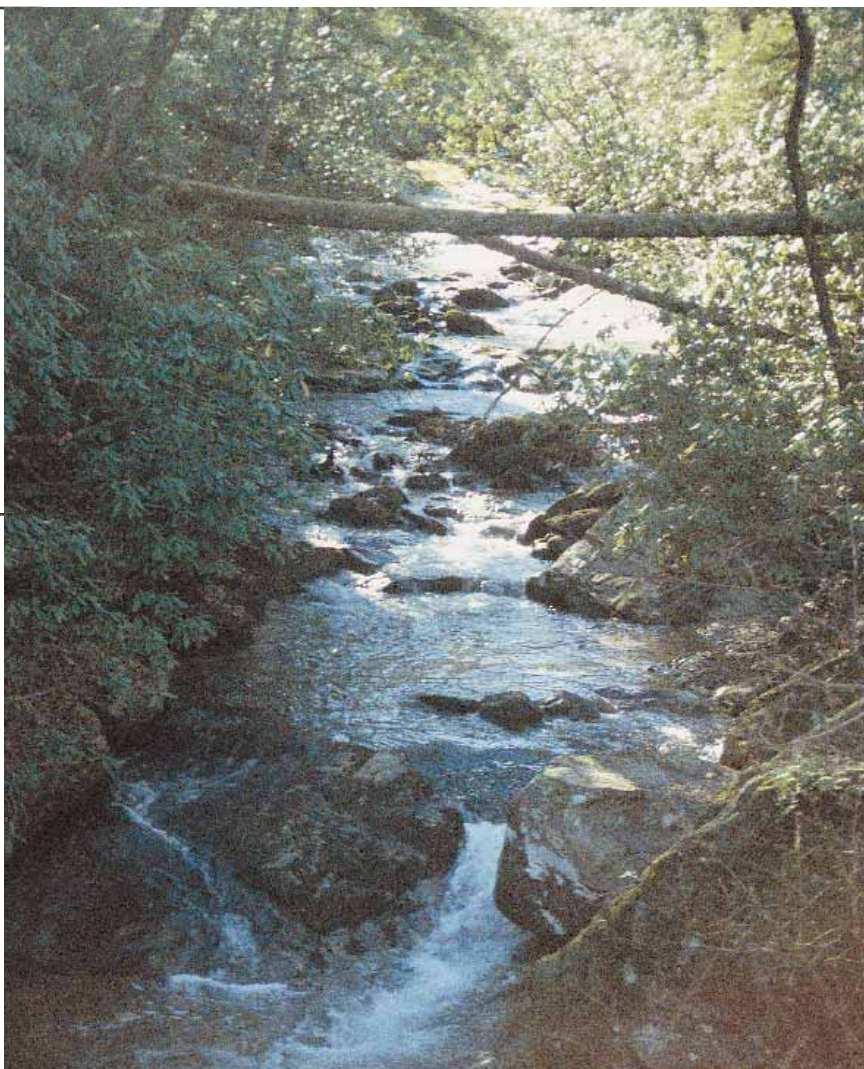
A sketchbook does something entirely different: It makes you a participant in the scene, not just an observer. With a sketchbook, you can record what is around you in words and graphics, capturing the essence of a place. When you use a sketchbook – and I mean really *use* a sketchbook like a field journal – I promise it will have a profound effect on the way you look at, live in and interact with the natural world.

As you take pictures and make sketches, break the stream into sections and ask: “What can I take away from this section?”

This stream shows perfectly how much interest is created when a natural stream separates into two distinct falls. The sound arising from these structures is amazing: Instead of a single sheet of water breaking that flat little run of water, a split cascade allows for a unique and distinctive water music.

or “What can I take away from this scene?” Make yourself look at the overall setting through which the stream runs its course and consciously notice whether it is rough and tumbling or slow and shallow. Observe whether it’s full of large rocks and debris or deep and wide with long winding curves – and whether it’s loud and splashing or tranquil and calm. Now look to see what it is that makes or muffles those sounds.

What you’re doing here is putting the stream at hand into one of two broad, helpful categories: the mountain stream vs. the valley stream.



This view offers a great example of the way nature uses emergent stones to create interesting effects. In looking for ways to re-create this, I would focus on the relationships between the stones and their size ratios – and their spacing, a factor that must not be (but too often is) overlooked. As I look at this photo, I can’t help noticing the directional forces these stones reveal, almost as if the rock had an energy of its own that moved my eyes over the scene. Those of us who set a lot of stone understand this energy and use it as we place stones in the overall context of a watershape. To me, what these stones might say to a geologist is much less important than what they say to me as an artist.





Here, I worked to create a valley stream – under some difficult topographic conditions: The stream was more than 45 feet long but dropped only 17 inches along that length! The key to achieving a natural effect in this case had to do with completely hiding the source of the water.

HAPPY MEDIUMS

This distinction between mountain and valley streams is useful in your field studies not so much because you'll end up re-creating one or the other but rather because it gives you a complete design vocabulary. These themes and ideas let you conjure streams that exist somewhere between the extremes that have the characteristics of both – a section with a little tumbling action, say, along with a calmer portion with a little vegetation growing right down into the stream.

As you'll see in the photographs, I'm constantly on the lookout for small mountain streams that run anywhere from six inches to six or seven feet wide and feature whole series of cascading waterfalls and pools of water. I carefully observe the small stone outcroppings I find along their banks, make note of the positions of trees close to the banks – and observe what happens where trees have fallen down into the water. I've also included two photos here to show the specific ways I apply some of what I've learned in the field to my own work.

As I go, I look for pockets of vegetation down along the stream bank and photograph and/or sketch the ones that would be the most challenging and rewarding to re-create. I spot trees that seem to grow right out of a rock, hanging by the narrowest threads to life – yet are thriving and doing well. I look where the moss is growing and file all of these scenes away for use in setting up my own mountain streams.

I can't say strongly enough how important it is for watershapers to get out in



the field, study the physical world we're being asked to re-create and really look at, listen to and feel what is out there. Go sit with a stream. The rewards are priceless – and this sort of immersion in the ways of natural phenomena is, I think, the key to becoming the best designers and builders we can be if that's what we're truly after.

And who's to complain if taking a little nature hike becomes part of a good day's work?

In this project. I worked to create my own mountain stream in miniature, starting with a hard, splashing cascade leading into a gorge and creating a flow of water fast enough that it seems to be cutting its way through the stone. The ferns and moss brought right up next to (and into) the stream add to the overall "mountain" impression.

An aerial photograph of a public aquatic facility. In the foreground, there is a large, irregularly shaped swimming pool with a light blue interior. To the left of the pool is a blue and white water slide structure. The pool area is surrounded by a concrete deck and a white fence. In the background, a baseball field with a green field and brown infield is visible. The sky is clear and blue.

Public Forms and Functions

By Holli Adams



This aerial shot offers a view of the facility no bather ever sees, but this perspective shows how the pool area is “zoned” to meet the needs of swimmers, divers, waders, daredevils, picnickers, sun worshippers and those who crave some shade. This sort of multi-purpose facility may be just the ticket for communities looking to respond to the booming popularity of commercial waterparks.

Driven in part by the popularity of waterslides and the resulting explosion of attendance at waterparks, aquatic designers are being pressed to rise to the challenge of creating interesting public pool facilities for recreation-oriented communities. So much so, says architect Holli Adams, that traditional public pools are being rethought and completely transformed with ideas of both flexibility and fun in mind.

These aren't our parents' public pools.

Whether run by a city or by a county, these recreational facilities are now subject to a new set of rules in response to evolving consumer demand and the growing popularity of elaborate waterparks. The inert, rectangular pools of years past – ten or 12 feet deep at one end, three or four feet deep at the other – are fast being replaced by multi-faceted, multi-purpose, quasi-organic forms that appeal to users of all ages and abilities.

The new designs incorporate large beach entrances, passive or interactive waterfeatures, lazy rivers, floating fountains, water sculptures and, of course, slides of the sort that drive the big attendance figures for waterparks. The use of these interactive amenities at public pools has profoundly changed the design principles for these facilities – forever, I think – and is leading to a resurgence in commissions for public pool projects.

So strong is this trend, I think it's accurate to say that not since the public baths of Rome have public swimming pool facilities received so much attention or undergone such dramatic changes in perception of form and function.

MULTIPLYING USES

It's easy to overanalyze trends like these, but at their root is the plain fact that people have changed the ways they have fun in the water – and that more people are getting in on the act.

Thus, for a swimming pool to be an effective asset to a community, its design must be flexible enough to attract a true cross-section of the public it serves. And this means that the designer must be aware that a swimming pool is many different things to diverse sets of people.

Public pools serve as places for fun with family and friends, for example, and as meeting places for teens and young adults. They are also venues in which senior citizens enjoy the benefits of water-exercise programs, and there has been a dramatic rise in programs developed for extremely small children and for people with physical disabilities. An all-important goal in pool design is therefore to create a facility that appeals to and adequately serves all ages and interests.

From the sweep of the beach entry to the placement of the waterslide and the space devoted to decks, this facility has been arranged with the multiple interests of its patrons firmly in mind. In contrast to the aquatic center depicted on the opening pages of this article, the pool shown here offers far greater room to its swimming customers than to its waders.



Fringe Benefits

One of the side benefits of a zero-depth entry with a gradual slope to deeper water is the advantage this contour has in facilitating the entry and egress of bathers who are physically challenged.

Common now at public pools are specialized “water wheelchairs” that can easily be maneuvered through the splash zone, eliminating the need for assistance from others or the use of mechanical lifts, transfer walls or dry wells. The same benefit applies to older swimmers with limited mobility or upper body strength: They can easily get into and exit the pool with little or no assistance and will not need to pull themselves onto the deck or up a ladder.

But note: If beach entries are to be used in this way, the slope from the lip should have a drop of just one foot for each 20 feet of length. This works for the wheelchair-bound, among others, and brings the design into full compliance with the slope requirements described in the Americans with Disabilities Act (ADA), the federal code that defines access to buildings and public facilities.

—H.A.

Meeting this cross-generational, multiple-use demand requires the careful inclusion of many specific features and areas. In other words, it goes far beyond water toys and slides: The key to a successful public pool design begins with the notion that the facility must be flexible enough to accommodate everything from the splashing play of small children and the lap swimming of adults to instructional courses in swimming and life-saving – and even, in some cases, competitive swimming events.

This diversity of use is achieved by “zoning” the facility, dividing it into areas meant to meet the concurrent needs of different customers and the programs they now demand of their public pools.

Zoning gets you involved in planning for various features and activities in different portions of the facility. The goal here is to attract various age groups and enable them to congregate at various points in and around the pool. That may sound simple enough, but it’s an idea that must inform and drive a design from the very start of the process.

PLANNING THE ZONES

The design factor that has the greatest influence on the behavior of those using a public pool is the depth of the water. This is the means by which the most effective zoning is accomplished – at least as a starting point.

In recent years, designers have moved toward large, multi-depth pools ranging from zero-depth beach entries to 12-foot diving areas. The shallow areas attract small children and their caretakers, and such amenities as small slides or gentle fountains have proved very appealing to this target group. Somewhat older children will seek somewhat deeper water; here, more vigorous water toys and features attract attention with a greater variety of interactive components.

Next, open transitional areas with depths of approximately three feet are suitable for many types of water games, from structured games like volleyball to impromptu bouts of water acrobatics or small-scale competitions among siblings

and friends. Going deeper – and as target users approach their teens – features such as waterslides and diving boards best draw their attention. These elements permit more aggressive play and foster more intense forms of competition.

By sequestering diving boards and slides in close proximity at the deepest portions of the pool, the designer creates a natural gathering place for teens and pre-teens, freeing up the shallower areas for smaller children (and adults) who might otherwise be intimidated by the rougher play of the older children.

Into this mix must be designed a zone intended for adult fitness swimmers. This typically takes the form of an area with defined lanes of a length suitable for lap swimming. Typically, pool operators on old-style public pools end up roping off areas adjacent to diving boards for lap swimming – generally not without complaints. Or these

older facilities will establish designated times for lap swimming – again drawing complaints because the times can't always be at everyone's convenience.

In most newer designs, however, the pools are zoned so that these activities can go on simultaneously, thereby increasing the full usefulness of the pool's operating hours.

Generally, these zoned designs call for an increase in the surface area of the water – typically to 10,000 square feet or more. This does not necessarily translate into significant increases in water volume, however, because much of this space is consumed by expanses of shallow water.

IN THE SHALLOWS

In the past, traditional public pools were designed with small shallow areas. In many cases, a perceived need for shallow water was met by installing

a small wading pool off to the side of the swimming pool, completely separate from the main body of water. These pools were kept small for many reasons, not the least of which was a common code requirement that water in a wading pool be filtered ten or more times an hour.

All that has changed with the proliferation in the last ten years of zero-depth or “beach” entries – perhaps the biggest development going in public-pool design. Often referred to as the “splash zone,” these areas are, according to pool operators, where the vast majority of bathers stay when in the pool.

Many zero-depth pool entries are designed in an arc, a shape that comes closest to emulating the natural configuration of water on a beach (which is rarely contoured in straight lines and right angles). With this approach, the gutter of the pool perimeter is concealed under slotted cop-



As important to a facility's performance as the pool itself is the area surrounding the pool, its provision of shaded and open areas, the lines of sight it offers – and the kinds of amenities it provides for families and children of all ages who use the aquatic center over the course of a long summer's day.

ing stones, an approach that lets the designer eliminate a lip or exposed gutter. Typically, the water falls gently through 1/4-inch slots in the joints of the coping stones.

Ideally, the edge slopes very gently from zero depth at the edge to a depth of three or four feet at the deepest. This natural slope permits children to become comfortable with changing water depths. As gradually as they need to, small children can test their skills, confidence and progress as they move more and more toward the deeper water—a process that may take place over a series of visits. Designers can aid the process by incorporating water toys and features, beginning with passive elements in the shallowest water and progressing to more interactive elements as the water deepens.

(These shallow areas also ease the use of public pools by those with disabilities. For more information, see the sidebar on page 36.)

In this context, straight traditional slides

and standard diving boards no longer merit the attention that spiral waterslides and other water toys or fountains receive. Features such as large “umbrella” fountains and interactive piping “sculptures” are in tremendous demand, as you’ll find in any quick visit to a facility that has them. Basically, say pool operators, they are in *constant* use.

ON THE PERIMETER

When you observe the recreation patterns of swimmers, one thing becomes quite clear: The edge of the pool is the most occupied area. At some point, all swimmers need to rest, and so they’ll head for the edge.

As a result, a pool that maximizes the amount of perimeter zone available to swimmers gives each one an ample opportunity to claim a portion of the edge as their own personal space. And make no

mistake, this familiar concept of “personal space” comes *heavily* into play when people congregate around water. Good examples of this space claiming can be seen at a natural beach, where groups or individuals space themselves out, comfortably removed from others—moving closer only when crowded conditions dictate.

By providing space to congregate (or rest alone) at the edge of the pool, a designer adds immeasurably to the overall usefulness and comfort of the facility. Small children just learning to swim can be easily supervised; sunbathers can dangle their legs in the water; a greater number of informal games can take place at once; and, in general, more people can “hang out” in the water and on a pool’s edges.

Pool designers have many ways to increase the amount of edge in relation to the surface area of the pool. The handiest approach now seems to be the inclusion of peninsulas or islands.

Peninsulas in particular are useful because they not only create more edge space, but they also provide the designer with an effective means of creating and marking depth transitions. In addition, they permit lifeguards to focus more attention on the center of the pool, and instructors appreciate the opportunity they offer to better observe their students. Islands, while somewhat less practical, create great interest and foster the development of swimming skills as children strive to “swim to the island.”

The big concerns with edges, regardless of pool layout, are comfort and safety. Many designers address the comfort issue with deck-level, flow-over systems using slotted coping stones; these gain the benefits of perimeter flow while avoiding problems of entry and egress associated with gutter systems. As for safety, the main concerns are away from the shallows, where broad steps and narrow intervals between ladders are a must.

BEYOND THE WATER

No contemporary public pool design is complete without encompassing the spaces

Continued on page 40

The Almighty Slide

Perhaps the most recognizable symbol of waterparks’ influence on today’s public pool facilities is the presence in the latter of winding waterslides, whether tubular or open-trough. These towering structures are visible from great distances, instantly marking the presence of a recreational facility.

Waterslides have truly raised the bar in terms of fun and excitement and have rendered traditional slides obsolete. As a result, it is now common for planners and operators of public pools to want one in any new or revamped facility. Otherwise, they say, the municipal facility simply will not be able to compete.

They are correct—but only to a limited extent.

In fact, waterslides present public pool planners with a mixed bag of issues and in many ways do not tell the whole story of modern facility design. For starters, these slides are extremely expensive. A 150-foot slide of the sort included in most of my firm’s designs, for example, has an installed cost of \$100,000 at a minimum. And waterslides

also drive up operating costs, so their impact on budgets can be catastrophic.

And that’s just for one slide in an era when modern waterparks typically include multiple slides of varying designs. So even with the added investment of a slide in a public pool facility, planners and managers *still* won’t directly compete with any local waterpark worth the price of admission.

When you boil it all down to the basics, the decision to be weighed in considering a big waterslide is not whether having one will let you keep pace with the waterpark down the road. Rather, it’s an issue of understanding that the slide is *one* part of the formula for a successful public facility—not the *only* part or even the *primary* part.

A slide works if put in perspective and appreciated as an excellent focal point for teens and other vigorous bathers who enjoy spills and thrills. But *only* if you’ve given equal thought to the other zones will the overall facility succeed and become a full and successful community resource.

—H.A.

around the pool.

Broad decks, for example, are crucial. Indeed, if the facility has limited space, it's almost always better to shrink the pool a bit rather than condense the decking to the point where crowding and clutter may become a concern. In other words, however spacious, these peripheral areas should be given the same level of attention in the design phase as the pool itself.

Lawn areas around the pool, for instance, offer a great alternative to sun-heated concrete decking. A gradual slope up from the pool deck to a grassy berm in close proximity to the water is both visually interesting and desirable from a comfort and convenience standpoint. These areas become popular sunning and napping locations. They also allow visitors to view the pool without impeding traffic at the critical edge zone (five to eight feet back from the water). And parents can spread out their blankets well away from the splashing water while still maintaining watch over their children.

In recent years, the demand for shaded areas also has increased dramatically as concerns over exposure to the sun have become so much more serious. Because trees are a costly pool-maintenance problem, it's preferable to design shade structures. These features provide the designer with another chance to get creative and lend the facility some flashes of a signature architecture.

Stretches of dappled sunlight reaching across a deck area are often sought out by those looking to escape direct sunlight but still enjoy the warmth of a summer day. You'll find that these areas are among the first claimed by families and often serve as bases of operation for parents managing children of different ages. Outfitting these shaded areas with picnic tables and other seating will enable families to stay at the pool, comfortably and for longer periods.

It's useful to provide shade in various spots around the pool as a means of maximizing use of the whole space. Even so, concentrating several of these areas near the splash zone helps optimize a facility for family use.

J FLEXIBILITY RULES

ust as the buzzword for good public pool facilities is *flexibility*, so should it be for the designers of these facilities. Location, budget issues and, most important, the pool's expected uses all influence the project at hand and call for ample flexibility and creativity.

At the same time, there are basic design principles that should be observed and kept firmly in mind. To a large extent, the fundamentals are defined by local building codes, and following them is the responsibility of any good architect or contractor.

That said, the task at hand for the designer is integrating the needs of the pool's intended users with the demands of code writers and inspectors. This means know-

ing your business; it also means understanding and planning for the behavior of those who will spend their days in or near the water and casting ahead as much as you can to accommodate future needs of the pool's patrons.

Luckily for all of us, much of that understanding comes from simple common sense: All it takes is observation and appreciation of the fun and joy that goes along with spending a day at a local swimming pool or aquatic center. If you plan with flexibility in mind, the opportunity for fun naturally follows. In this way, simple planning can result in a facility that will become a true asset to a recreation-minded public and the pride of its community.

The Swimming Connection

For all the commotion about a new age of public-pool design, an old-fashioned swimming pool must stand at the heart of any successful project. In many respects, what this means is that the new-breed "swimming pool zone" must remain true to the traditional laned, rectangular forms and dimensions found in classic public pools built straight through the 1980s.

The key physical difference in new designs is that this traditional space will be connected to the splash area in some way and at some point, which means that a portion of one side of the swimming zone will open into the fan-shaped, gradual slope of the splash zone.

This transition can be designed so that it dominates an entire side of the swimming zone, or it can take place via a narrower channel that disrupts less of its perimeter. Either way, you need to set things up in such a way that the transition occurs in a logical, safe and readily observable way.

These decisions about depths and transitions can get complicated, especially in cases in which management's desire to control operating costs drives designers to offer shall-

lower pools that reduce water volume and operating cost.

In some cases, this goal can be met. In pools intended solely for water-exercise classes, swimming lessons and lap swimming, for example, the depth can be kept to an economical three to four feet throughout. But if the pool needs to double as a competition pool, then you enter a different world of specifications for length, depth, number of lanes and lane width dictated by federations of high schools, the NCAA, U.S. Swimming and various Olympic agencies. Likewise, if the pool includes diving boards, minimum depth standards must be observed along with local safety rules for commercial pools.

It'd be great to get a blank space and unlimited project funding, but that's just never the case. Thus, to provide adequate services as a public-pool designer, you need to size up all of these factors and define the ultimate uses of the pool in advance of any serious planning. It's the only way you can hope to meet your clients' needs and offer them a facility they can maintain within the desired budget.

— H.A.

Pool Mix



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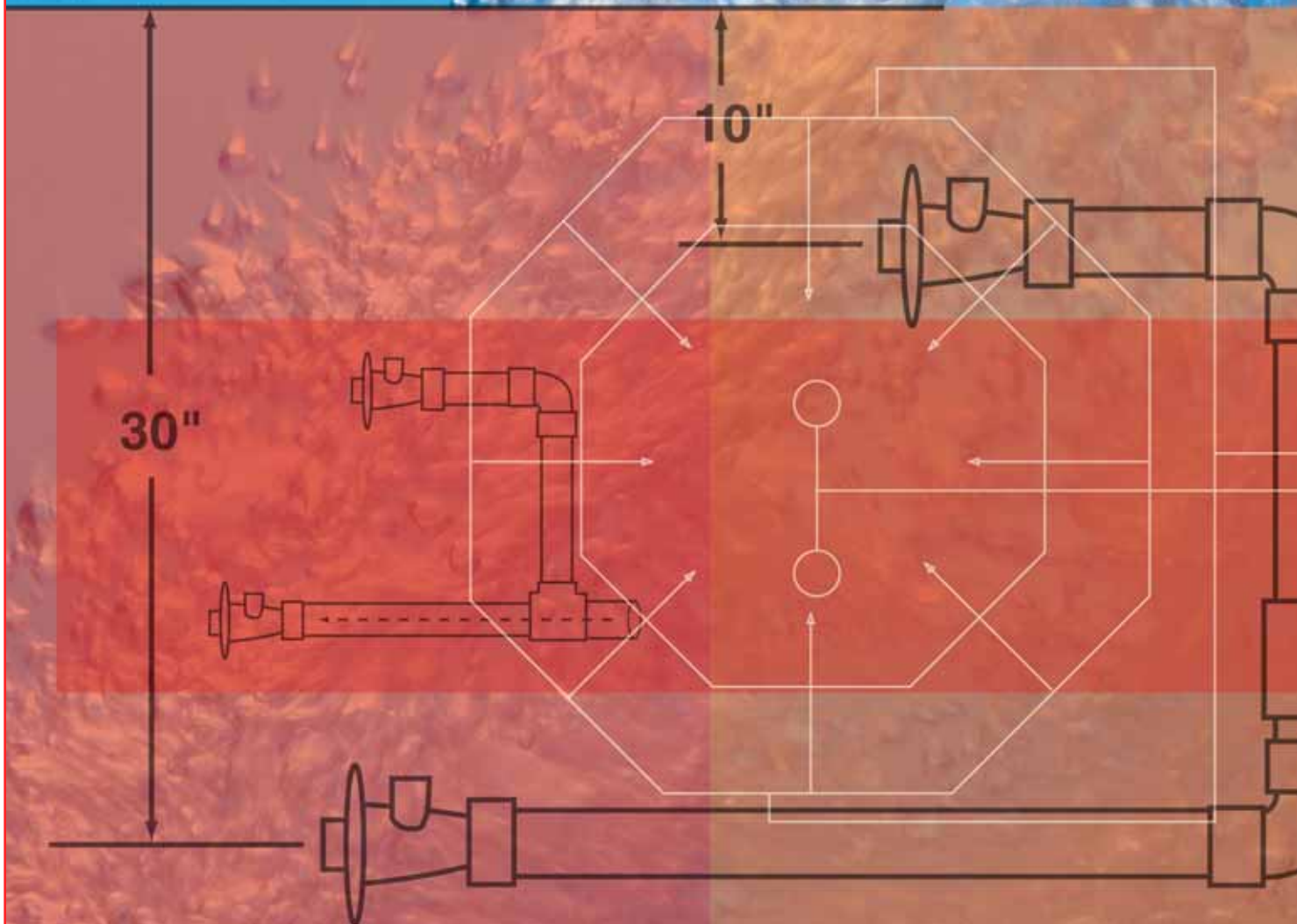
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Hydraulics in Hot Water

By Steve Gutai





Of all the features associated with inground swimming pools, attached spas almost certainly have the most complex designs. Achieving proper hydrotherapy-jet action requires the interweaving of air lines, water lines, fittings, jets and associated pumps, blowers and motors in a way that delivers results the customer wants and expects. And making mistakes is definitely costly: Once the plumbing is set in concrete, there's no easy way of turning back.

The bottom line: You have to get it right the first time!

Yes, you can adjust inground systems, but it usually involves ripping out expanses of decking and chunks of the spa shell at the very least – definitely not activities that breed customer satisfaction. It's a high-stakes game, but all too often I see pool builders take an ill-advised roll of the dice by not doing the work ahead of time to make sure the spa jets receive proper flow and that the overall spa system has a smart layout.

Fortunately, achieving proper system configurations before the shotcrete truck rolls up isn't that hard to do so long as you follow basic principles of hydraulic design and follow it up with sound installation practices.

ABOVE ALL, THE BASICS

As with any circulation system, your goal in engineering an inground spa is to balance the plumbing and pump size as a system. What this means is that there's no way around the fundamentals of hydraulic design: You must do the calculations for pool volume (in gallons), friction loss (feet of head), flow rate (gallons per minute), turnover rate (gallons per hour) and water velocity (feet per second) – because *all* are essential to proper sizing of pumps and pipes and selection of appropriate jets for your spas.

Because this information is widely available through seminars, trade publications and technical manuals distributed by manufacturers of swimming pool components, we won't get into a step-by-step hydraulics primer here. I will plainly state, however, that if you're designing spas as part of your projects, you absolutely need to understand basic hydraulics to be successful – or have ready access to designers, engineers and plumbers with the necessary expertise. There's simply no way around it!

Unfortunately, pool builders are the common subject of horror stories on this topic – to the point where the whole construction industry is suspect. There's no doubt that many contrac-

Designing for hydraulic balance and efficiency is critical for any water-shape, but nowhere is it more important or more challenging than with inground concrete spas. Indeed, laying out these projects offers plumbers an unmatched level of complexity – and an outcome that will be permanently enshrined in concrete. You can knock the challenge down to size, says hydraulics expert Steve Gutai, by paying close attention to the fundamentals.

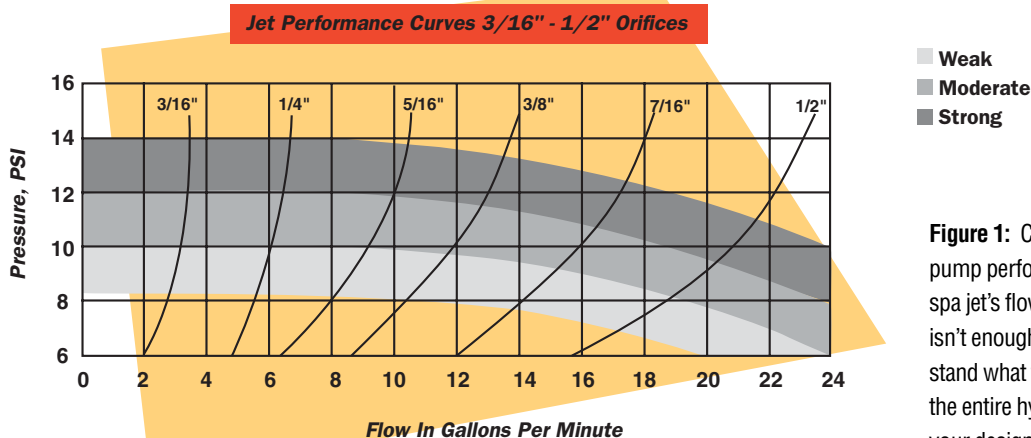


Figure 1: Casual acquaintance with pump performance curves and a spa jet's flow requirements simply isn't enough: You have to understand what they mean in terms of the entire hydrotherapy system for your design to succeed.

tors know what they're doing, but it's also true that some have gotten into trouble by taking shortcuts around the need to do the basic calculations.

It is absolutely critical for *someone* involved with an inground spa project to understand the correlation between flow and velocity *and* between resistance and pressure at the jet orifice. Step One in designing and installing any hydraulic system – and especially one with the added complexities of a hydrotherapy system – is to align components in such a way that these hydraulic characteristics are in balance.

One particularly risky shortcut is the common practice of following the "quarter horsepower per jet" mentality when it comes to spas. This error tends to lead to radical oversizing of pumps used to power spas – and a host of other problems as well.

In place of this sort of uninformed folly, designers and contractors need to understand pump performance curves and a spa jet's flow requirements, which can range anywhere from 5 to 25 gpm for typical spa jets (Figure 1) and up to 150 gpm for swim jets. When you look at pump performance specs across a range of pipe sizes and friction loss figures, you'll find that sizing by horsepower isn't the way to go: System performance is the key, not muscle.

And if you have the candor to admit

you don't know what you're doing, by all means find someone who does. Ask your vendors for technical support and remember that even the cost of hiring a consultant will be less in the long run than having to pull out a deck, break a shell and make good on inadequate work.

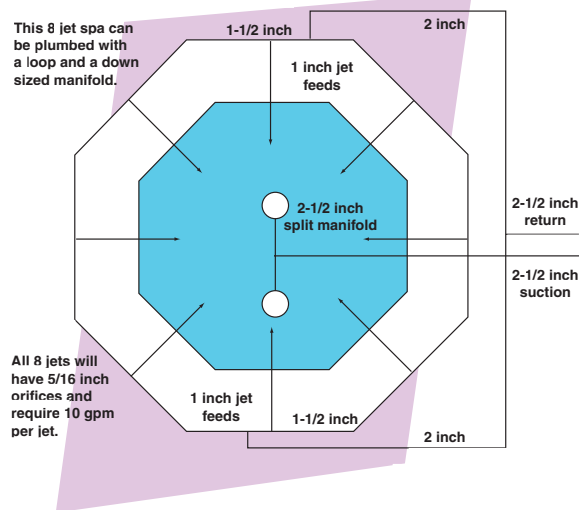
LINE BY LINE

There are many reasons why getting the hydraulics right is so important with spas in particular. Proper pipe sizing and pump selection, for example, result in proper flow

at the jets – all-important because the air system will not work properly if either too much or too little water is moving past its apertures. And in fact, most of the calls I get from panicked builders are either about not enough air or not enough water coming out of the jets.

Sizing pumps by horsepower, undersizing pipes as a cost-cutting measure, or failing to follow a few basic rules (such as using a combination loop and manifold for water lines or a Hartford loop for air lines – the need for both of which we'll

Figure 2: This eight-jet configuration around a ten-foot spa is fairly typical among spas attached to pools. This familiarity, however, shouldn't lull you into taking jet-system configurations for granted.



cover below) are among the most common mistakes made. In teaching builders and plumbers how to get it right, I break spas into three systems: suction, discharge and air.

There are many ways to approach each topic, but I know from experience that this approach works consistently and well. As an example, let's assume we're plumbing a spa with eight jets, all at the same depth and each with a 5/16-inch orifice requiring a flow of 10 gpm, giving you a total return flow of 80 gpm. The jets are spread symmetrically around a 10-foot octagonal spa (see Figure 2) – a fairly standard configuration for a concrete spa attached to a pool.

All too often, plans for this sort of installation will say no more than "run eight jets off 2-inch suction/2-inch discharge/2-hp pump," leaving it to the plumber to decide what to do in the absence of more detailed instructions. If he or she knows

what's what with spa hydraulics, the builder and customer are in luck. If not, the project's involved in the ol' crap shoot.

The place to start in a sensible design is with the suction and return lines and setting them up as parts of a balanced system:

❑ **Suction lines** are pretty straightforward, so long as you observe some simple guidelines. I'm not alone in recommending a split manifold line at a total maximum velocity of six feet per second. (For safety reasons, *no* single suction line should have a flow velocity of more than 1-1/2 fps.) In our sample spa, I would plumb a 2-1/2-inch suction line branching off a 2-1/2-inch manifold for the drain lines.

❑ **Return lines** are a bit more complex, given that we're plumbing for multiple jets. I recommend designing for a velocity of 6 fps: This velocity, in combination with recommended pipe sizes,

is efficient and puts you in the necessary range of water flow and pressure for a good many of the jets available to you and your customers.

The return system should begin with a 2-1/2-inch line feeding a 2-inch split manifold plumbed to opposite sides of the spa (again, see Figure 2). The manifold would in turn feed a plumbing loop of 1-1/2-inch pipes that feed all eight jets.

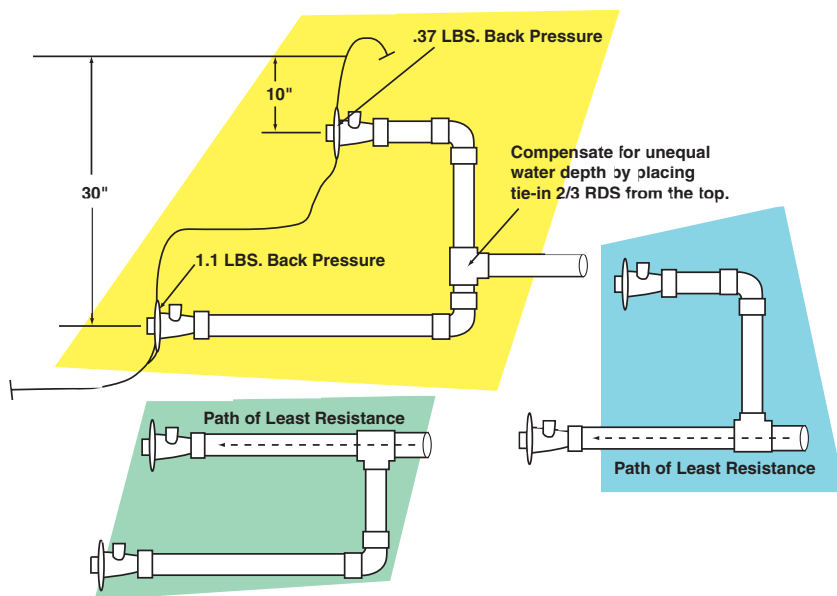
This split-manifold, one-level, plumbing-loop arrangement provides an extremely balanced flow at all jets – and ample opportunity to incrementally decrease the plumbing size while avoiding a *sudden* decrease that would apply unnecessary resistance and ultimately decrease water pressure at the jets.

Let me emphasize: This step-by-step reduction of pipe size is important. Note that this layout includes several plumbing tees at which we come out of the tee

Many builders get into hydraulic trouble when they install spa jets at different levels in their concrete spas. Once burned, they tend forevermore to position all of their jets at one level – certainly a workable solution, but hardly one that allows for much creativity in spa design.

Understanding why these problems develop with multi-level jets can help overcome this phobia and ensure proper jet performance. The trouble here extends from the pressure differential provided by the added weight of the water on the lower jet. This creates uneven flow at the orifices, and, depending on how the system is plumbed, you'll end up with terrible performance out of the lower jet, the higher jet or *both* jets.

High-Low Spa Jets



Working High and Low

The answer here is simple, but first you have to understand the mistake. What I usually find is that things have been arranged so that the return line feeds either the top or bottom jet and the other jet is branched off the first. Because water will naturally follow the path of least resistance, the jet nearer the feed will have greater flow than will the other jet – especially if the feed goes directly into the upper jet.

As shown in the illustration, the key is to compensate for the pressure differential by offsetting the feed line *between* the two jets, connecting the feed line about two-thirds of the way down from the upper jet. This gives the water flowing to the lower jet a bit less resistance, thus evening out the flow between the two orifices.

–S.G.

with a pipe size smaller than the feeding line, dropping from 2-1/2 inches to 2 inches using a 2-1/2-inch tee, with 2-inch plumbing coming out of the fitting. This approach minimizes friction loss and maintains efficiency, where running the 2-1/2-inch feed line into a 2-inch tee would throw the system out of balance.

Another common misconception is

that you want to use a high head pump on a spa-jet manifold. In fact, the exact opposite is true: A properly designed system such as the one outlined in the example should be run by a medium-head pump. When you design the system so that the jets have proper flow and pressure – and the plumbing is laid out in an efficient and balanced way – you

can use a medium-head pump. The result is a system that is energy efficient and almost certainly more effective in creating proper jet action.

If, however, the pump also provides circulation for the pool filter, you will want to use a high-head pump. Whenever possible, however, I recommend separating pool circulation from spa circulation through use of separate pumps.

UP FOR AIR

There is, of course, a third system in spas we have yet to cover in detail:

❑ **Air lines** are really very simple to install – but they *can* be a bit hard to understand. We've all heard the term *Venturi*, of course, and most of us know that this refers to the phenomenon of (and components designed for) drawing air into a fluid stream.

At its most basic level, the "Venturi effect" means that water flowing past an opening in a pipe will draw in a certain amount of air. This is, of course, a gross oversimplification, but it again speaks to the need to have proper water flow and velocity in the plumbing lines so that the Venturi will work properly.

The amount of air a jet will draft is measured by inches in a water column (WC) and indicates how much the Venturi will draft. All jets create a certain amount of vacuum in the Venturi chamber that can be expressed in WC units. This will correlate mathematically to a jet's pressure rating, orifice size and flow requirements.

Jet designers take care of the engineering that makes their products function properly; your role is to see that they are plumbed correctly and are provided with an adequate flow and pressure. Helpfully, if you're installing the jets on a properly balanced hydraulic system, getting the air lines right isn't too difficult.

Air lines of specified dimensions connect directly to the Venturi. One of the keys to air-line performance is a properly installed *Hartford loop*, which is really little more than a section of pipe that reaches above the water line, ideally close to the jets – that is, within the bond beam. This loop should be installed in the manifold right before it splits into the air lines.

Without such a loop, water will fill the air line when the system is off. The Hart-

Photos courtesy Barnes Watertech, Encinitas, Calif.



AS A SPA'S OVERALL DESIGN becomes more complicated, the need for a clear, accurate plumbing plan is obvious. Leaving it to the plumber to sort things out is risky business in cases like these, no matter how accustomed he or she might be to basic spa layout.



IT ALWAYS PAYS to mind the fundamentals when plumbing a spa's hydrotherapy system, even when you're working with a simple round spa. Remember: The outcome of your efforts will be compared to what bathers have experienced in finely engineered portable spas – and whatever you do will be encased in concrete!

ford loop places an air gap in the line – crucial for starting the Venturi effect when the system is turned on. The loop also provides some vertical pressure due to the weight of the water in lines; this pressure helps evacuate water from the lines.

The loop should be installed near the Venturi. Here, it will only need to break the water line by two or three inches to be effective.

If all of this is a bit confusing, don't worry. What's important to know is that when you install a Hartford loop, the entire system becomes far more forgiving: You can be a bit off in terms of flow and pressure, for example, and still have adequate jet action. In fact, I'll go as far to say that in a great many situations the difference between a system that works and one that doesn't boils down to whether or not it has a Hartford loop.

JETTING TOWARD SUCCESS

The last step in successful in-ground-spa design and installation is making cer-

tain the jets you've carefully selected are configured correctly.

When used as specified, spa jets will operate beautifully – but there are a couple of key considerations. Depending on their design, the jets themselves may be installed several inches behind the surface of spa wall. The jet then extends to an eyeball or perhaps a rotating assembly mounted at the wall's surface.

Mismatches between nozzles and eyeballs can spell trouble. In fact, I've seen many spas that didn't work properly simply because an eyeball of the wrong size (usually too small) has been installed. Too small a nozzle will restrict the flow of both air and water and add resistance to the system; too large a nozzle will dissipate the flow through the nozzle and probably hamper performance.

The fix here is simple: It only makes sense to pair the correct eyeball with the jet right from the start.

In some cases, the thickness of the shotcrete in a spa wall is a source of concern.

If it turns out to be thicker than expected, inadequate jet action may result from the increase in distance between the Venturi portion of the jet and the nozzle. Again, the remedy is simple: All you need to do is use a simple nozzle-extension kit.

Here and in many other stages of developing a good spa system, the steps to follow in getting things right are usually pretty simple. To get to this point where things can come together with relative ease, however, takes a good grounding in basic hydraulics, a good (and detailed!) plumbing plan and a plumber who has a sense of the importance of getting things right.

The proof of the pudding will be in the action at the jets: If yours are to meet the expectations created for your customers by the engineers at portable spa manufacturers, you need to focus on the basics, do the calculations, avoid casual solutions – and, if needed, call for help *before* you seal your work in concrete!

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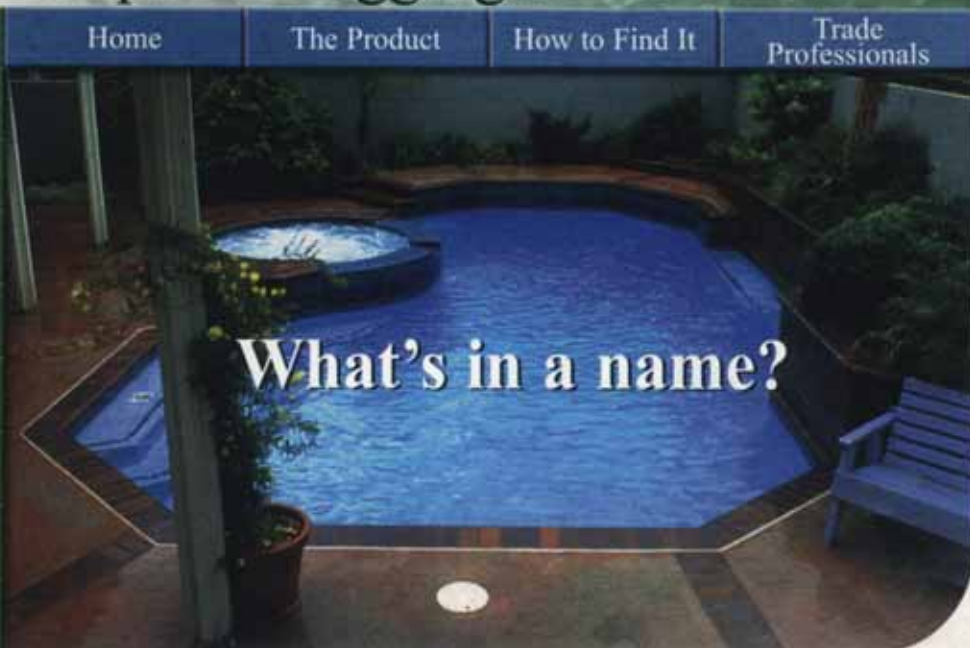
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3M Innovation

A Passion



'When you install a pond, you install a lifestyle,' says Greg Wittstock, proclaiming the universal appeal of ponds, the variety of settings in which they can be placed and the huge range of aesthetic options available to consumers. In this pictorial, he shares some of the many projects his company has completed, pointing out along the way the simple power found in these living watershapes.

By Greg Wittstock

Waterfeatures may well be the hottest thing in landscaping today, and the reason is simple: No other landscape detail captures all the senses the way moving water does. I don't get the impression that people sit around for hours watching their tulips grow, for example, but I know for a fact that people who have ponds in their yards will sit for hours, with others or in solitude, drinking in the scene and communing with the koi and the water lilies.

In that sense, ponds have more to offer than the average waterfeature: A pond's live component adds interest and touches of tranquility that work in countless settings, from backyards and corporate offices to dining terraces and the common areas in apartment complexes. The possibilities are virtually limitless.

To show you what I mean and demonstrate some of the ways ponds can be used to add life and drama to landscapes, let me take you on a guided tour of some of our company's installations and discuss ways ponds fit into a grander scheme of things.

THE VALUE OF A SYSTEM

Before we get to the photographs, let me clarify something. My company makes pond kits that we used to achieve what you'll see on these pages. In this context, however, what or whose products we used are not the issue. On the contrary: What's important is demonstrating how ponds fit into today's lifestyles, how much they add to landscape settings and what they might mean to designers and builders whose customers want them to move in this direction.

There are indeed many ways to build ponds, and each project is different. True enough – although we've found through experience that working with a system is the easy way to go, freeing both contractor and customer to focus on creative and aesthetic issues rather than construction details.

I also recognize that presenting information on vinyl-lined ponds in a publication dedicated to custom concrete construction is something of an intrusion. I do so secure in our experience and in the knowledge that the system with which our ponds are installed is up to the challenge in terms of quality and reliability.

That said, let's look at some gorgeous installations!

Basic Elements

Although ponds vary tremendously in size and scope, the materials used are generally the same, simply increasing in quantity according to the project. Materials on this “classic” project include:

- ❑ one of our 11-by-16-foot pond kits
- ❑ 1 ton of 12-to-18-inch granite boulders
- ❑ 1-1/2 tons of 1/4-to-3-inch decorative gravel
- ❑ 2 tons of 6-to-12-inch granite cobblestones
- ❑ 1/2 ton of 18-to-24-inch granite boulders
- ❑ lava filter rock

Start with a Classic



This classic 11-by-16 foot pond, built in a single day, includes a 6-foot stream and two waterfalls. A pond of this sort is ideal for people just getting into water gardening – small enough to be managed by a novice, but large enough that it will keep them from feeling they need to rip it out and replace it as they get more deeply involved and want to do more and more.

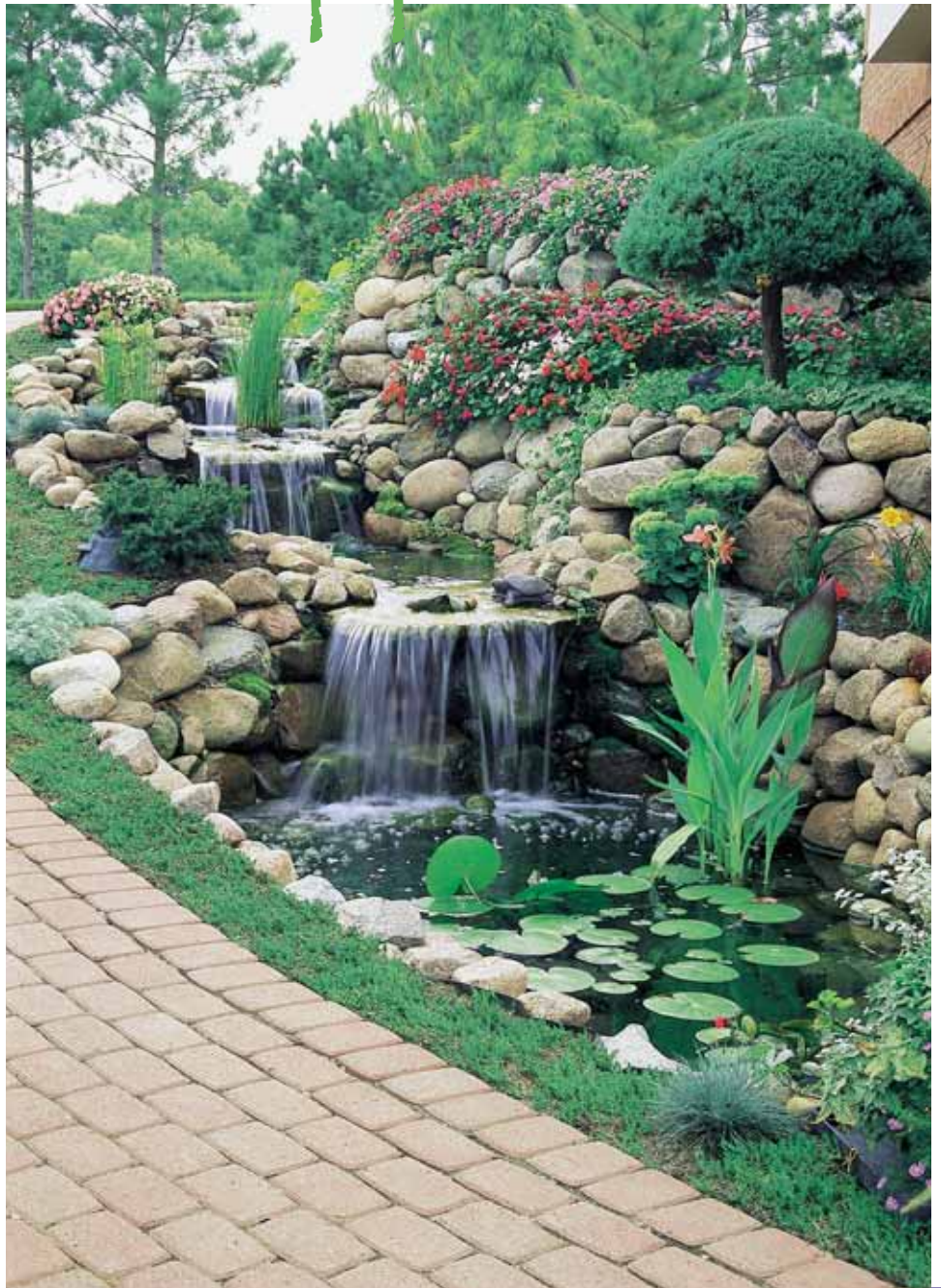
Ponds Up Front



Although most residential ponds are found in backyards, there's no doubt that a frontyard pond lends "curb appeal" to this home. It makes a statement to all who pass by, creating a peaceful yet dramatic transition from street to home. Again, this pond is based on our standard 11-by-16 design, but it also includes a 20-foot cascading stream that called for an additional liner and an extra ton of stone.

Elevated Approaches

This project was a lot of fun! Whenever a slope exists on a property, you can generally use it to create waterfalls. The slope here ran parallel to the house. We fit in a 50-foot stream that falls 6 feet into a 10-by-8-foot pond we positioned between a front walkway and the home. In all, the project used 12 tons of stone along with a special liner, a biological filter, a mechanical skimmer, a pump and 2-inch flexible plumbing.



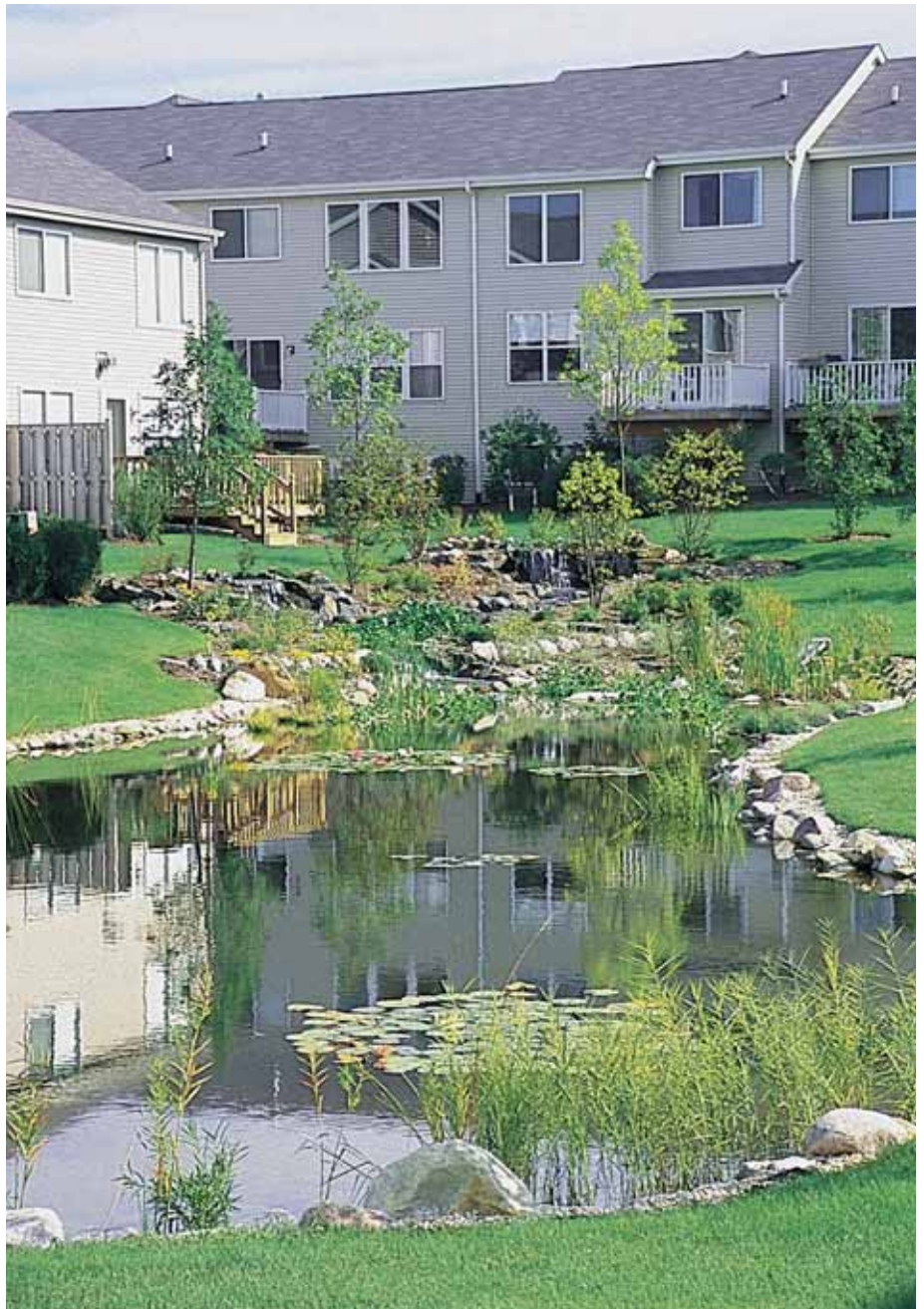
Bigger Is Better



The Number One complaint our customers have after we've installed a pond is that they wish they'd made it bigger. It's an issue we try to address up front (with varying results), but as a rule we recommend that our clients go with the largest pond that fits the available space. In this particular case, the lot was large and a 20-by-40-foot pond was just the ticket, with plenty of room for growing fish and plants. (This project, by the way, took a crew of seven two-and-a-half days to install.)

Great Lakes

This 110-by-65-foot pond started out as a retention basin built to hold storm water for this complex. The problem was that the homes had been sold to customers who were expecting a full-time lake rather than a basin that filled only when it rained. We were brought in to make the space hold water, look beautiful and appease a bunch of upset residents. We shaped this entire area in six days following our company's basic 20 steps (see the details on page 54).



Winter Wonders

A pond takes on a whole different look in winter. As beautiful as this scene can be, however, it does raise concerns. For instance, ponds should not be allowed to freeze over completely, especially if they contain fish: There must be a hole in the ice to allow for oxygen exchange and the release of gases generated by decomposing organic material. For these reasons, we recommend using a floating heater, a submerged pump – or simply keeping the waterfall running.



Twenty Steps to Success

As mentioned in the accompanying text, all of the projects pictured on these pages were completed using our company's own 20-step method. Here's how we do it:

- 1) Mark the pond area
- 2) Place the skimmer and the biological filter
- 3) Lay the plumbing
- 4) Hook-up the filter
- 5) Excavate the pond
- 6) Install the liner and underlayment
- 7) Hook up the skimmer
- 8) Put the rock in the pond
- 9) Position underwater lights
- 10) Wash the stones
- 11) Fill the pond
- 12) Build the waterfalls and stream
- 13) Bring in topsoil
- 14) Build necessary retaining walls
- 15) Tweak the waterfall
- 16) Trim the liner
- 17) Mulch the berm
- 18) Clean up
- 19) Give the homeowner a manual and bacteria kit
- 20) Get paid!

—G.W.



Special Beauty

Conveying the extent of the artistry that can go into ponds is sometimes difficult to convey in words. Suffice it to let this waterfall-backed pond speak for itself.



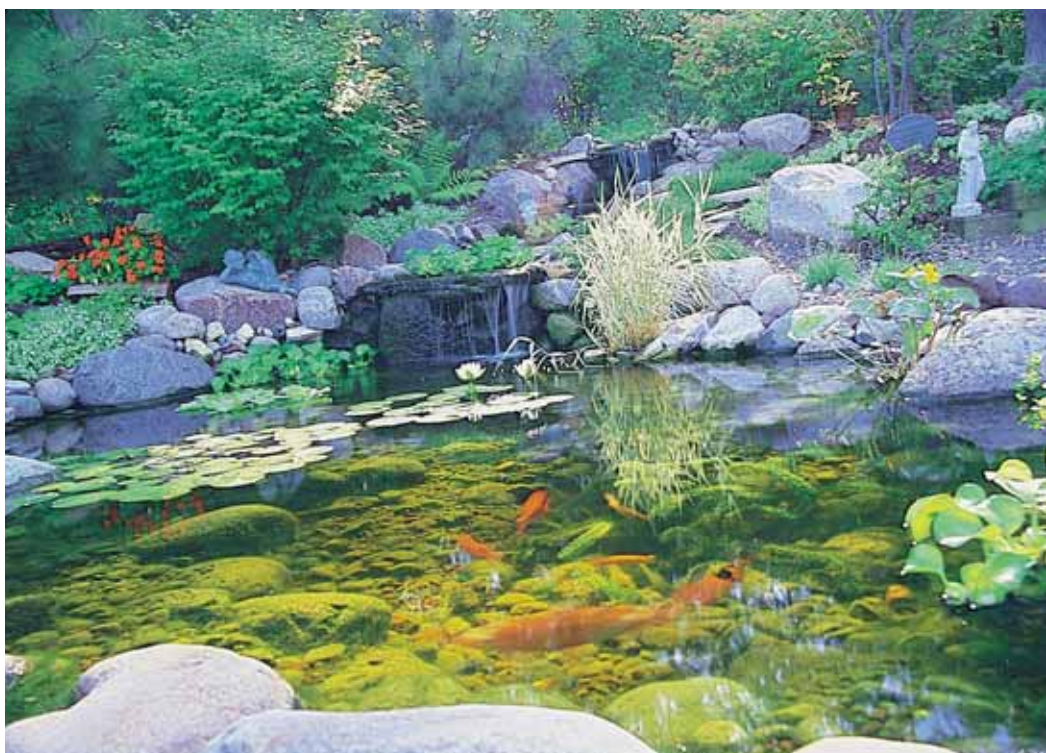
Gravel Bottoms

We use gravel to cover the bottoms of the ponds we build. Although this practice runs counter to recommendations of those who say that adding gravel makes the pond impossible to clean, I've found the opposite to be true: Gravel actually alleviates the need to clean the mulch and gunk out of a pond bottom. In fact, because ponds are "living" waterfeatures, gravel helps create a natural biosystem, providing a home for microorganisms essential to the health of plants and fish.

Gravel helps reduce the build up of muck on the bottom and gives the installation a beautiful, natural appearance. And since we've been adding gravel to the bottom of our ponds, customers have made fewer comments about clarity or general cleanliness of the water. Also, gravel acts as ballast against hydrostatic pressure, holding the liner in place while it protects it from animal damage as well as the damaging effects of ultraviolet rays.

— G.W.

Alive with Potential



It all comes together in a pond: Water, plant life, rock, fish, birds, even sculpture – all of the traditional landscaping elements integrated in unique and awesome ways.

How Deep Is Deep Enough?

Deciding how deep a pond should be is about as close to controversy as discussions of ponds can get. Those who worry about survival of their fish and plants through the winter's cold and the summer's heat will debate this topic *endlessly*.

There are many factors to consider when choosing a pond depth: the specific climate zone; the number, size and type of fish; sunlight vs. shady conditions; winterizing options; and pond size and shape – to name just a prominent few. That's more than enough variables to keep debates going.

In response to these discussions, we've developed a few simple guidelines based on our observation that a pond with a depth of two feet is generally sufficient

to support fish and plants year-round. This does *not* mean we suggest that a 2-foot pond will work in northern Minnesota or the desert of Arizona (where ponds need to be deeper), but away from such extremes, a 2-foot pond will generally suffice.

That said, one of the biggest mistakes a pond builder can make is to go too deep. Yes, if a pond covers an acre, it can run to a 15-foot depth, but if you try to make an 11-by-16-foot pond run to a 4-foot depth, you'll run into trouble: The angles and extent of the pond's slope will be so great that placing stones will be difficult; worse yet, steep slopes are more subject to collapse!

– G.W

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FIBEROPTIC LIGHTING DETAILED IN LEAFLET

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HAYWARD POOL PRODUCTS offers literature on SuperVision, its line of fiber optic lighting. The leaflet includes information on cost-efficiency and versatility. Also included is information on crystal-clear illumination with EndGlow underwater lighting fixtures for dramatic highlighting of spas, stairs, swim outs and caves as well as tips on how to add color to your presentations with SuperVision's wide variety of models and potential lighting designs. **Hayward Pool Products**, Elizabeth, NJ.

BROCHURE OUTLINES POOL/SPA ENCLOSURE LINE

Circle 101 on Reader Service Card

CCSI's "Garden Prairie Pool & Spa Enclosure" is a twelve page, four-color brochure detailing a full line of enclosures designed to give customers a light, airy garden environment. Color-coated aluminum frames and rafters stand up to the moisture and chemicals from pools and spas far better than conventional construction. Enclosures are available in single- or double-slope configurations and can be freestanding or attached to an existing building. **CCSI**, Clearwater, FL.



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QUIKSPRAY offers a flyer on its Carousel Heavy-Duty Pump for the spray application of heavy-bodied cement coatings in the production of artificial rocks and waterscapes. The pump uses peristaltic principles; no moving parts come into contact with the material, which translates to low maintenance.

The system also can run dry indefinitely without sustaining damage. **QuikSpray Inc.**, Port Clinton, OH.

FLYER DESCRIBES FIBEROPTIC SYSTEM

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TELEDYNE LAARS/JANDY PRODUCTS offers a single-sheet, four-color flyer detailing its Sheer Radiance fiber optic lighting system. Designed for ease of installation and maintenance in uses with pools, spas and fountains as well as decks and landscapes, the large-core fiber optic system has a variety of available colors that can change to fit any mood. **Teledyne Laars/Jandy Products**, Novato, CA.



PRODUCT INFORMATION CARD

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BROCHURE HIGHLIGHTS STAIN-REMOVAL PRODUCTS

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JACK'S MAGIC has prepared a four-page, full-color brochure defining its complete line of products for the prevention and removal of a variety of metal stains from swimming pools and spas. Also included in the brochure is information on stain-testing kits, water clarifiers, filter aids, non-chlorine shock and water-test kits designed for use by professionals. **Jack's Magic**, Clearwater, FL.

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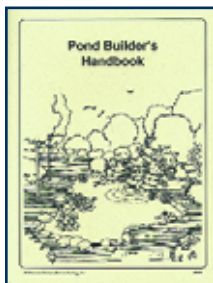
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AQUATIC ACCESS INC. offers a single-sheet flyer on its pool lifts. The hydraulically powered, deck-mounted device has a height-adjustable seat that turns a full 180 degrees over the deck for complete ease of access. Capable of lifting 400 lbs. at 55 psi, the system works with a garden hose and has upper and lower controls for use on deck or in the water. **Aquatic Access Inc.**, Louisville, KY.



40-PAGE HANDBOOK FOR POND BUILDERS

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RESOURCE CONSERVATION TECHNOLOGY presents "Pond Builder's Handbook," a 40-page guide to installation of anything from lilly and rock ponds to more elaborate koi ponds and garden fountains. The booklet discusses selection of pond liners as well as the plumbing and circulation systems needed to support installations of various types. **Resource Conservation Technology**, Baltimore, MD

SHELL AND DECK MATERIALS INTRODUCED

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TXI has published a flyer describing its Contour line of shell- and deck-construction materials for use in swimming pools and other waterfeatures. The line includes white cement, calcium carbonate, natural pebbles, ceramic aggregates, colored-glass aggregates, color pigments, coping, filter sand, plaster finishing tools and more – all from a single supplier. **TXI**, Dallas, TX.



GUTTERS FOR USE WITH RIM-FLOW POOLS

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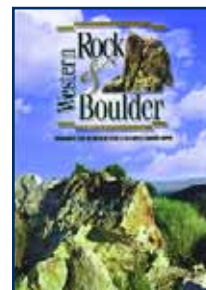


GRATE TECHNOLOGIES has announced the release of a line of custom-made fiberglass gutters for deck-level, beach-entry and wet-deck pools. Manufactured to order for each job, they can be formed into a variety of straight, angle or radius sections. Each gutter is made of reinforced fiber polyester with a 5-oz structural mat for strength. **Grate Technologies**, Naples, FL.

MEDIA KIT FOR BOULDER LINE

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WESTERN ROCK & BOULDER offers a full-color, four-piece kit describing its selection of 1- to 2-ton boulders for use in all types of landscapes for monumental or decorative purposes. The kit highlights the vivid colors available in these mineral-rich boulders and details the fact that delivery is included in the price. **Western Rock & Boulder**, Fallon, NV.



COMPREHENSIVE COVER BROCHURE

Circle 110 on Reader Service Card



COVER-POOLS offers its most extensive brochure ever, providing a complete overview of the company's line of automatic and manual safety covers. The 20-page booklet contains more than 60 full-color photographs highlighting new options and application ideas for both the Save-T Cover II automatic system and the Step-Saver manual covers. It also outlines training programs and rapid order processing. **Cover-Pools**, Salt Lake City, UT

POND SYSTEMS HIGHLIGHTED

Circle 111 on Reader Service Card

POND SWEEP MFG. CO. has released a pamphlet detailing its line of skimmers and biological filters for watergardens, koi ponds and commercial waterscapes. The 8-page, full-color pamphlet offers complete product specifications along with a description of the construction elements involved in a typical watergarden or fish pond. **PondSweep Mfg. Co.**, Yorkville, IL.



BLADES FOR CUTTING BRICK AND TILE

Circle 112 on Reader Service Card

MK DIAMOND PRODUCTS offers masonry blades with specially formulated diamond-bond segments designed to promote fast, true cutting as well as blade durability and operator safety. The company also offers tile blades designed for clean, precise cutting, long service life and value. **MK Diamond Products**, Torrance, CA.



FLYERS DETAIL POOL-PLASTERING EQUIPMENT

Circle 113 on Reader Service Card

MACALITE EQUIPMENT offers leaflets highlighting its full line of trowels, spike plates, plaster hoses, white rubber boots, nozzles, brushes, rollers, pails, fittings and more, including easy-flow nozzles for pebble application. The company also makes plaster mixers, distributes plaster pumps and has a service department that can handle most plaster mixers and pumps. **Macalite Equipment**, Phoenix, AZ.



SHEET-WATERFALL SYSTEM HIGHLIGHTED

Circle 114 on Reader Service Card

POLARIS POOL SYSTEMS offers a slick, four-page, full-color brochure covering its PowerFall system. Available in a variety of sizes, shapes and colors, the systems offer virtually unlimited design possibilities while achieving a uniform sheeting action and shape. The brochure also details the system's FiberFall option, in which fiberoptic lights send rainbows of colored light splashing through the waterfall. **Polaris Pool Systems**, Vista, CA.



BOOK OFFERS TIPS ON WATERFEATURES DESIGN

Circle 115 on Reader Service Card

AQUASCAPE DESIGNS introduces the first book ever written exclusively for contractors interested in tapping into what the company describes as the "fastest-growing trend in the Green Industry": the surging popularity of waterfeatures. Featuring more than 200 color photographs and in-depth business advice, this book is intended to change the way you approach, sell and install ponds, streams and other waterfeatures. **Aquascape Designs Inc.**, Batavia, IL.



Continued on page 62



POOL ENCLOSURES

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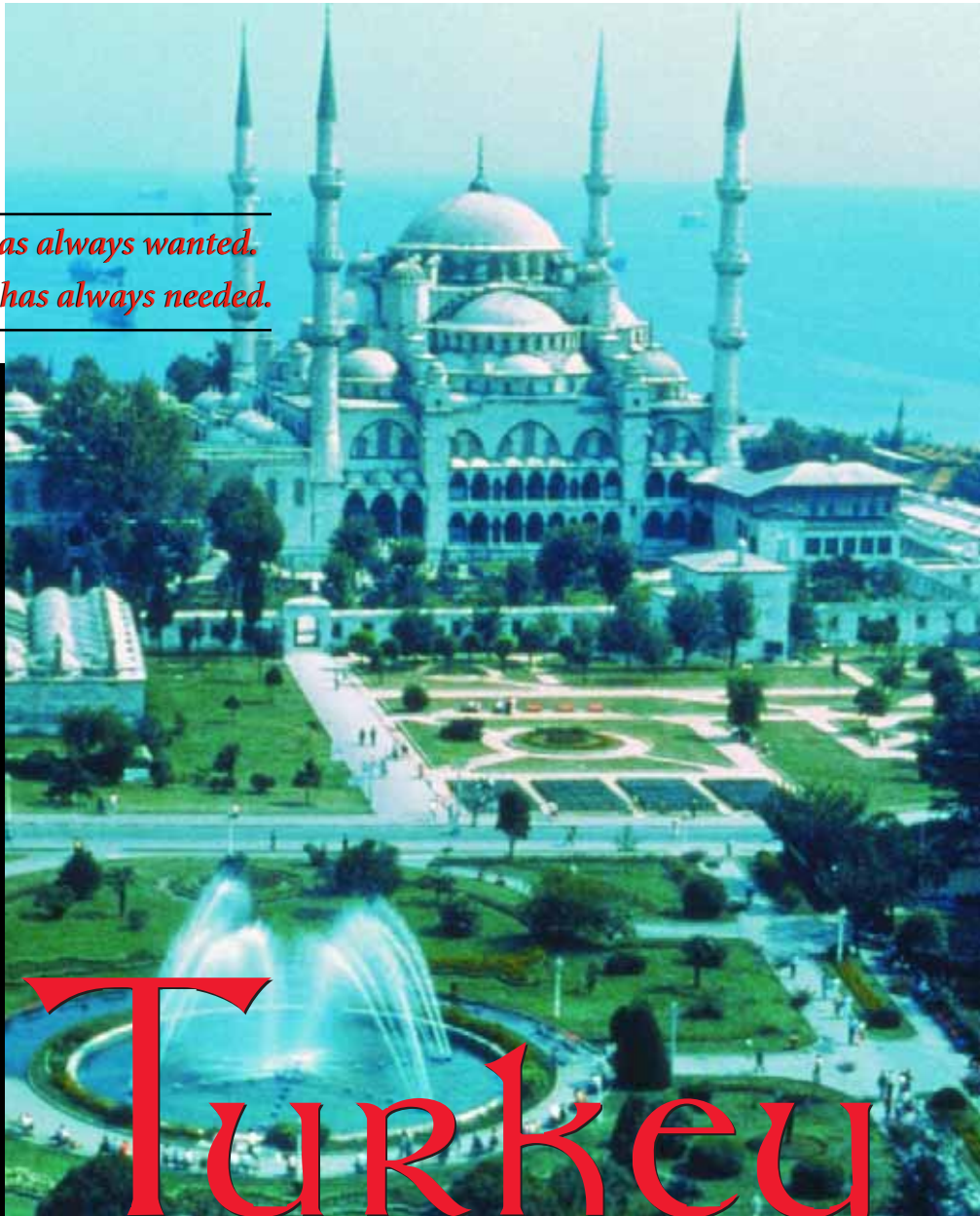
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COVER MAKER OFFERS SAFETY BROCHURE

Circle 116 on Reader Service Card

LOOP-LOC has released a four-page, full-color brochure outlining the safety features of its swimming pool covers. Strong enough to support the weight of an elephant yet designed to allow rain and surface water to pass right through, each cover is custom-fit to a pool of any size or shape. The brochure also notes the availability of a free promotional videotape. **Loop-Loc**, Hauppauge, NY.



MULTIMEDIA INFORMATION ON CHEMICAL FEEDERS

Circle 118 on Reader Service Card



G.H. STENNER & CO. has released a multimedia kit on its line of chemical feeders: A 24-page, full-color catalog offers product specifications, details on parts and tips on installation, maintenance and troubleshooting; the compact disk contains the full catalog and downloadable files in PDF format; and a pocket guide (also available in Spanish and French versions). **G.H. Stenner & Co.**, Jacksonville, FL.

WALL-CAP FORMS HIGHLIGHTED IN LEAFLET

Circle 117 on Reader Service Card



STEGMEIER CORP. offers a four-page, full-color leaflet describing applications for its line of wall-cap forms. Available in five styles, the forms clamp onto the top of a wall and provide for an elegant, seamless finish. Specifications for the concrete and application techniques are included, as are tips outlining the entire process. Also included is a guide to cap profiles. **Stegmeier Corp.**, Arlington, TX.

FREE-STANDING SCREEN ENCLOSURES

Circle 119 on Reader Service Card

AQUA-CLOSURE SYSTEMS introduces a free-standing pool enclosure designed to create a higher level of comfort for those lounging at poolside. The enclosures screen out bugs, leaves and other unwanted elements while allowing breezes in. Prefabricated for easy installation, the enclosures are suited to any climate and come in standard and custom sizes. **Aqua-Closure Systems**, Hudson, FL.



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Circle 120 on Reader Service Card



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BROCHURE ON TRAILER-MOUNTED CONCRETE PUMPS

Circle 121 on Reader Service Card



SCHWING AMERICA INC. presents a four-color brochure detailing its entire line of trailer-mounted concrete pumps. Designed for use with concrete, grout, shotcrete and other

materials, the systems range in size from the model *P-88*, which pumps up to 25 cu. yds. per hour, to the *WP 1250X*, with an output of 95 cu. yds. per hour. The brochure includes technical specifications and an options list. **Schwing America Inc.**, Lino Lakes, MN.

LEAFLET HIGHLIGHTS PROGRAMMABLE CONTROLLER

Circle 122 on Reader Service Card



SANTA BARBARA CONTROL SYSTEMS has released a flyer on its Chemtrol PC 2000, a microprocessor-based controller with a four-line LCD display and numeric keypad. In addition to ORP and pH control, the unit offers optional temperature sensing as well as optional displays on conductivity or TDS. Advanced communications options allow for remote supervision, management and technical support. **Santa Barbara Controls**, Santa Barbara, CA.

AUTOMATIC CLEANER FOR COMMERCIAL POOLS

Circle 123 on Reader Service Card

AQUA PRODUCTS has published a tri-fold pamphlet on the Ultramax, an automatic cleaner designed to reduce the effort, manpower and money needed to keep commercial pools clean. Ultramax pumps water through a 2-micron filter as it sweeps the pool, picking up everything from algae to large leaves and more. The pamphlet also offers information on the rest of the company's full line of automatic cleaners. **Aqua Products**, Cedar Grove, NJ.



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Continued from page 66

presents that that you'll probably never use the term *coulomb*. We simply need it in the chart in order to have an electrical term comparable to the gallon, and just as the gallon is millions and millions of molecules, the coulomb is millions and millions of electrons. Also, including the coulomb leads us logically to the *ampere* (the special name given to coulombs per second), thus providing us with a time-related unit corresponding to gallons per minute.

It's a shame that we have never given "gallons per minute" a special name of its own; I've always thought *glugs* had a nice ring to it.

SORTING THINGS OUT

You can "read" this handy chart as two sentences:

#1: Water. The pressure created by the pump forces water to flow through the pipes and valves, overcoming the friction losses of the system. Higher pressure provides for more gallons per minute.

Table 1

Description	Electricity	Water
The basic unit	Electron	Water molecule
The name for a quantity of the basic unit	Coulomb	Gallon
The name for flow , expressed as quantity per measure of time	Ampere	Gallons per minute
The source of the energy to cause the flow	Battery or generator	Storage tank or pump
The name of the force that causes the flow	Volt	Pressure
The name of the resistance to the flow	Ohm	Friction loss or head loss
The most common conductor	Wire	Pipe
The most common control device	Switches	Valves

#2: Electricity. The voltage created by the battery forces electrons to flow through the wires and switches, overcoming the ohmic resistance of the circuit. Higher voltage provides for more amperes.

A shorter version of that second sen-

tence is, "Volts push amps through ohms."

You'll note that volts never move, just as pressure doesn't move in a water system. Only the electrons move, and to think of voltage as the force behind this movement is absolutely correct. In fact,

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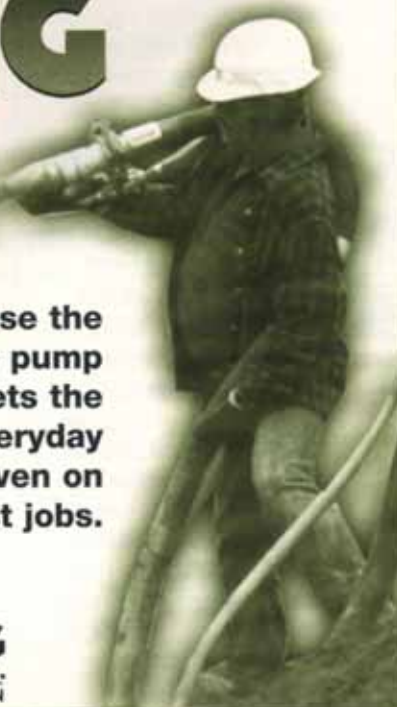
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physicists think of the devices and methods for transforming various types of energy into electrical energy as being sources of *electromotive force*, or emf, of which a volt is a unit of measure.

The six most common methods of producing a voltage are:

❑ **Friction**—a voltage produced by rubbing two materials together. We commonly refer to this as "static electricity."

❑ **Pressure**—a voltage produced when mechanical pressure is applied to certain crystals. This is called "piezoelectricity."

❑ **Heat**—a voltage produced when the junction of two dissimilar metals is heated. This is called "thermoelectricity."

❑ **Light**—a voltage produced when certain photosensitive substances are exposed to light. This is called "photoelectricity."

❑ **Chemical action**—this is a voltage produced by a chemical reaction (as in a battery).

❑ **Magnetism**—a voltage produced

when there is movement of a conductor through a magnetic field or when a magnetic field moves around a conductor. This describes all of the electricity-producing alternators and generators.

Voltage produced by friction (static electricity) is primarily a nuisance rather than a valuable commodity, but each of the other voltage sources referenced above has some real value to us. Let's take a look at them in order:

❑ **Piezoelectricity** has been used with great success by one of the pool/spa industry's major controls manufacturers. Each time you push a button on one of its spa-side controls, you cause a voltage to be generated in the button that is readily sensed by the system's electronic processing equipment.

❑ **Thermoelectricity** plays a big role in lots of pool-, spa- and sauna-heating applications. In fact, many thermostats and thermocouples rely on this technology. Also, all of those gas heaters out

there with standing pilots depend upon thermoelectricity to make their "pilot generators" function.

❑ **Photoelectricity** has had a tremendous impact on the hand-held calculator business. I recall, back in the dark ages, having to replace or recharge the batteries in my calculators every few months. Thanks to photoelectric technology, my "solar-powered" calculators no longer have any batteries.

The remaining two voltage sources—chemical action and magnetism—affect all of us, everyday and in every way. All of the electricity we use comes from some battery, generator or alternator somewhere.

Next time: A look at how these various electrical elements relate to each other—and how the watt comes into play.

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

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Easier by Analogy

By Jim McNicol

Several years ago, I was asked to conduct a seminar on basic electricity for the members of a small homeowners' association. They were working their way alphabetically through the various trade disciplines with which a homeowner might come in contact. As I recall, they had covered attic fans, brickwork, cabinetry, carpeting, decks and doors at previous meetings. I learned that I was to be followed in coming months by fences, fireplaces and gazebos. Kinda puts one in one's place.

I started off by advising the good folk that electricity isn't that difficult to understand if we examine it in terms of something with which we are a bit more familiar, such as the movement of water. I promised them that by using the simple (yet elegant) comparison of the flow of water in pipes to the flow of electric current in wires, I would have them all on easy speaking terms with the subject in no time at all.

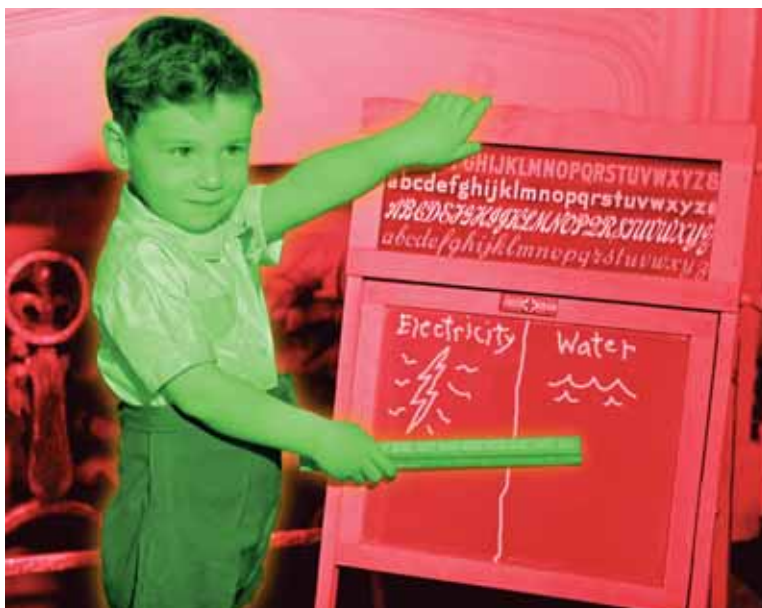
Within three minutes I was in deep trouble: When I talked about a centrifugal pump pushing the water, a gentleman asked how a pump worked. When I described water flowing through a pipe, I was asked why more water flowed through a big pipe than through a small one. We went down several avenues, roads, paths and alleys, but somehow I always managed to drag 'em back to things electric.

EASIER PATHWAYS

Obviously (and thankfully), these are not the sort of questions I get when describing electricity to members of the watershaping industry. And that simplifies the task considerably, because the water-flow/electric-current-flow analogy is a very good and appropriate way of getting comfortable with the interrelationship of *amps*, *volts* and *ohms*.

Let's see if I can put a slightly different twist to this than you may have seen in the past.

Before describing the similarities between the water cur-

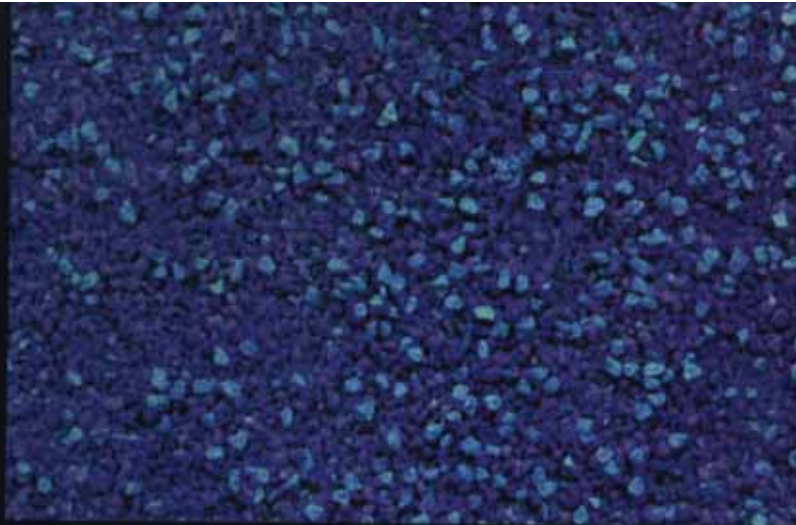


rent and the electric current, however, permit me to point out two very important differences:

- Difference #1: An electric circuit must always be a *closed circuit*, whereas a water circuit may be closed or *open-ended*. That means, simply, that all of the electric current flowing away from the source of the current (a battery or a generator, for example) must have a path of return to that source. With water, we can pump the water out of a pool and onto the ground, and it (eventually) will make its way to the ocean. That water will probably not make it back to that pool again: It's an open-ended circuit.
- Difference #2: All of the conducting components of an electric circuit – the wires, connectors, switches, and appliances – are filled with free electrons from the day they are created. For instance, a length of wire contains millions and millions of electrons waiting to serve us. Push a few new electrons into one end of the wire and an equal number will come out the other end (providing there is a closed circuit and they have somewhere to go). By contrast, all of the water pipes, fittings, valves and pumps are *empty* when we get them. Nothing happens until we supply the water.

The electricity/water analogy deserves a chart (Table I on page 64). Bear in mind as you look at the information it

Continued on page 64



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