

# designing water features



Yes, you've probably all experienced something along this line, but on one of my very first jobs as a young installer,

I had a couple who wanted a natural looking pond in their extremely flat backyard. I'm talking "Kansas" flat. There wasn't a hill, a rock, or a roll in the entire yard. They wanted their waterfall to feature a 7' drop...and still look natural, of course.

#### They Expected a Miracle

After my initial shock, I advised them that, in order to perform that kind of miracle, I'd need at least three dump trucks full of dirt (and the appropriate man-hours of work) to pull it off. Even with that, it would still be problematic. Regardless, we compromised, and I installed a pond with a waterfall featuring a  $3^{1/2}$  drop...against my better judgment. I can tell you, in the long run, I paid the price.

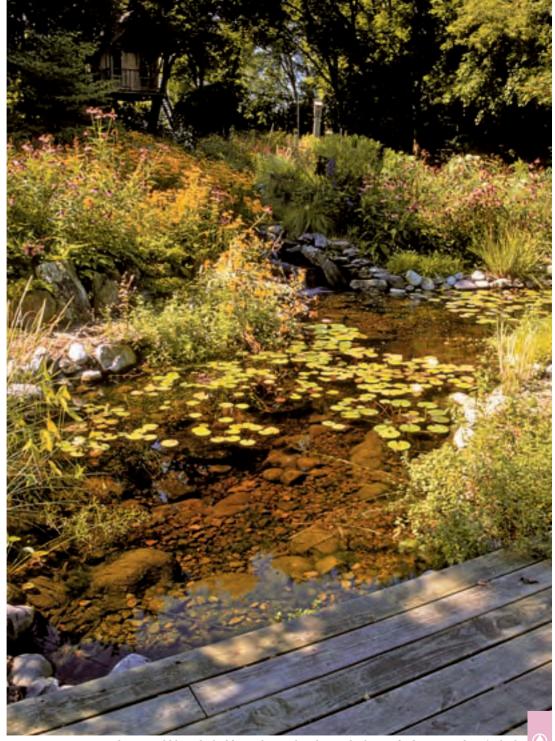
The customer was unhappy from start to finish because I failed to double the height of their waterfall. I put at least 130 hours of work into the project, which is to say I lost my shirt financially. I had to return so many times to fix a variety of related problems that I stopped counting.

#### The Moral of the Story?

The moral of the story is that each customer really just wants a beautiful, natural-looking, low maintenance pond where they can relax. If they can't accept that idea, then just walk away, because miracles aren't part of the Aquascape repertoire, and if you want to be successful in this business, they shouldn't be part of yours either.

Brian Helfrich

Construction
Services Manager



A green lawn would have looked better here, what do you think? Too bad everyone doesn't think that way. Or maybe they do—they just don't know about what you can create for them...yet!

# The Basis of Pond Design

The environmental movement that began back in the 60s, gained momentum through the 70s, 80s, and 90s. As human population figures explode, natural resources grow more and more scarce, due to the infinite appetite of commercial and developmental concerns. Environmental issues have become more and more central to our national debates on both sides of the political aisle.

Our government and corporate policies and regulatory codes have changed the ways we interact with nature. Children are taught at a young age to be environmentally responsible and to respect nature. Museums, zoological parks, and aquariums are stressing the frailty of our planet.

If we're not careful and don't act swiftly, we will continue to lose more and more valuable habitats and wild-life around the world. Oil spills are destroying huge expanses of aquatic ecosystems, while deforestation and urbanization are gobbling up giant tracts of land and displacing its inhabitants. Parks and reserves where wilderness and wildlife can prevail are only one part of the solution. But what can an individual or a family do to counteract this pending devastation? For the answer, read on.

#### **Backyard Wildlife Habitats**

With roots in the environmental movement, backyard wildlife habitats have developed and small, urban lots around the country are being transformed into miniature nature preserves. Native trees and plants flourish, providing local insects and other creatures with the food and shelter necessary for their survival. Ponds and streams are also built to supply the inhabitants with clean water. In

fact, a water feature is one of the main ingredients in a genuine backyard habitat.

Precious, life-giving water is in short supply. Local rivers and ponds are becoming more and more polluted and/or filled in because of unchecked urban growth and commercial development. Because of this, more and more people are adding naturalistic water features

into their own backyard living spaces, and 99 percent of the projects we (Aquascape, Inc.) build are naturalistic in design. Yet if we look back in history, we see that formal water features dominate the scene. This is because nature, in the eyes of previous generations, was something to put a bridle around,





A formal pond design.

to subdue and to control. Unfortunately, there is still plenty of that mentality with us today. And it is precisely that mentality that aims to control and to profit commercially, with little to no regard for Mother Nature. Short-sighted? Absolutely. Is there an antidote? You bet. Let's talk.

In modern society, we see reversals. Our world suddenly seems to be dominated by technology and manmade structures, so the landscapes and water features we build today stress naturalization and seclusion in place of (even in the face of) technology. In designing a naturalistic feature, we need to look no further than Mother Nature herself for ideas.

## **Interviewing Your Client**

During the design process, careful consideration has to be given to the client's needs—what are they looking for? Lakeside living? A lily pond? A mountain stream? A short series of prepared questions will help you design your client's ideal water feature, and more importantly, it'll help you get the job. You may have the best design in your state, but if you can't read and accommodate the client's needs, the next guy will get the project.



#### **Initial Questions** to Ask Your Client:

- How did you get the idea for a pond?
- Do you enjoy gardening or being outdoors?
- Have you ever kept fish in an aquarium?
- What does your ideal backyard paradise look like-serene, powerful, contemplative, entertaining?

Do they want...





These questions will help you get to know your client and increase the odds of providing them with their dream pond. For example, say they decided to get a pond after hearing about it from a co-worker. The family enjoys spending time outdoors, and they proceed to tell you about a favorite vacation spot in Colorado... near a stream.

They also enjoy hiking and fly-fishing. And they keep a small aquarium at home. Because of their busy work schedules and hectic lives, they would like a place to sit and relax, to remove themselves from their daily grind. They'd like a place reminiscent of the Colorado vacation spot. From this interview, lasting only a couple of minutes, you can start to formulate a plan of what you think they'd enjoy.



- ◀ Hectic life = low maintenance
- ▼ Colorado = rocky stream



▲ Hiking and Fishing = a feature that calls you out into the property

 $\triangleleft$  Aquarium = fish and pond



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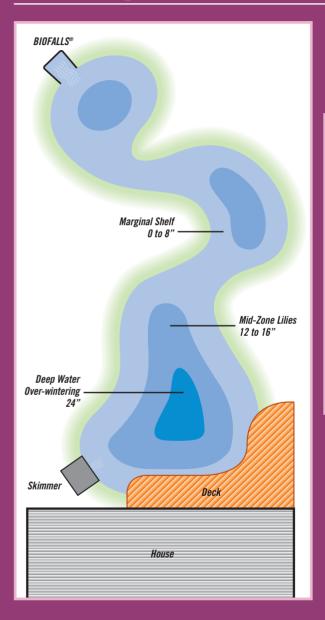


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# **Help Them Visualize Their Dream Pond**



hrough the interview, you've learned a lot about your client and their wants and needs. While describing the elements of the water feature you envision, restate what you've learned from them. In this case, you'd describe their ideal water feature as follows:

We'll start with the pond—locating it just off the deck where you can sit and relax, gazing over the water lilies and feeding the fish. The pond will be free-form in shape, with a skimmer located at the far end to keep the pond free of debris. A series of shelves will be built into the pond for a couple of reasons...



## Main Reasons for Building Shelves Into Your Pond...

Creating ledges allows easy access in and out of the pond for maintenance. This is much better than the traditional sharp drop off in which someone can slip and get injured trying to get in and out.

#### Stability

Terracing is much more stable and it reduces the risk of the walls collapsing into the pond.

#### Pondscaping

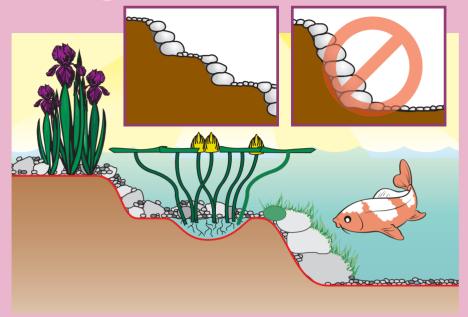
Shelves create areas for aquatic plants.

#### **Aesthetics**

The shelves create interest on the pond's bottom as well as giving it a more naturalistic appearance.

#### **Efficiency**

Shelves create a more efficient utilization of materials and installation practices because it's easier to build a series of small walls over one large one.



A long meandering stream, with a series of cascading waterfalls, will start in the far corner of the property. (A) The waterfalls will start with a BIOFALLS® filter for ease of plumbing and water quality control. (B) The stream will draw visitors from the deck to find the source of the water, while its sound fills the yard with its natural music.

**(C)** The stream will start off steep and rocky with lots of boulders, and crashing water. **(D)** As we get into the mid-stream area, the water will be shallow and move quickly with lots of ripples created by gravel and stones in the streambed. **(E)** As the stream nears the pond, it starts getting wider, deepening and slowing down. The pond is filled with aquatic vegetation and fish.

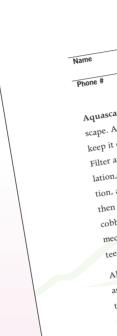








**Note:** As you are describing this, you should be showing them your portfolio of pictures so they can visualize what you are talking about.



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Once you show them the pond size, shape, and location using a garden hose, you can start filling out the price sheet and plug in the different components. This is made easier by purchasing the supplies in kit form where every part is compatible with the other, and each item has a purpose in the design.

After all the items are entered, and stone quantities are calculated, labor hours can be estimated and plugged into the pricing sheet. The items are totaled and the excited clients can rationalize the price for peace and tranquility.

> When the sales person fills out the contract (to the right, which has no prices listed), they refer to a separate price list in their portfolio to fill in the prices on the estimate sheet.



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## The Design

#### The Shape of the Design

Let's start with the shape—using irregular flowing lines are key in the planning stages. Unfortunately, we normally have small geographic areas to work in, so size is also a factor that needs to be taken into consideration. Homes, driveways, patios, and decks are just a few of the items intertwined with a water garden design.



Here's how we leave our ponds. We like to say it's like a Christmas tree without decorations. Now it's time for the landscapers to move in. If you do landscaping too, you've just sold a couple thousand dollars in plants. Can you say icing on the cake?

#### How Pond Size Affects the Design

Ponds vary greatly in shape and size. There are many design considerations that are based on the desired size of the pond.

#### Large Ponds

When designing large ponds, usage needs to be considered. Why is the client interested in such a large pond? Dreams of lakefront property? Lots of fish? Swimming? Keeping in scale with the property? The list can go on and on. The fact is, they want water, and lots of it.











#### The Edge Treatment

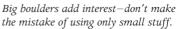
One of the most important parts of pond design is the edge, because that's what everyone's going to be looking at. There are several different ways to treat the edges of a large pond, but the common goal is always to hide the liner and create a transition from the pond to the terrestrial areas of the property.

On large projects the perimeter stones are typically larger, but not around the entire pond. The large rocks look large because of the (relatively) small rocks that surround them. If the entire pond is filled with large rocks, things will look out of proportion. The same goes for using only small rocks. The best ratio is 1:2:1 (1 part small, 2 parts medium, 1 part large). This has worked well for us, but it's still best to experiment and find out what works best for you and your clients.





Notice the mix of larger boulders down to the small river pebbles.



#### **Planting**

The next thing is planting the pond. Make sure you leave enough room for plenty of aquatic plants, as they not only help naturalize the pond, but they also play a huge role in keeping the pond healthy by removing excess nutrients.

#### Where's the Pump?

Depending on the size of the pond and its usage, skimmers may not be the only form of housing a pump. Wet wells can also be used, so they must be figured into the equation. See more on wet wells in chapter 14.



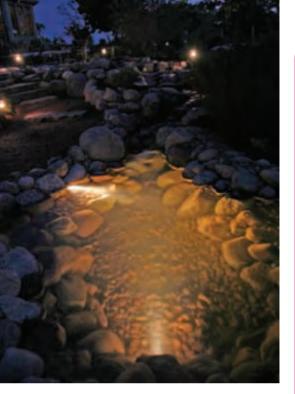
#### Waterfalls

The waterfalls should be kept in scale with the size of the project, so larger boulders and berms need to be created. The time it takes to create such large falls is often tough to calculate. We use a simple formula:  $\frac{1}{2}$  hour per stone with two people and a machine operator.









#### **Estimating**

Calculate the number of stones, and cost per stone, to get your total. You may also want to add a small percentage, until you're comfortable with this rate. The amount of rock needed for that BIOFALLS® filter will remain the same, other than the height at which they're set. Remember, on larger ponds, the BIOFALLS® filtration will need to be supplemented, with a bog filter. Stones can be worked into the pond's perimeter creating a huge planting area. Or they can be located further away from the pond, which will help make a natural transition from the pond to the other landscaping. If this method is used, simply

# **Pond Pricing Standards**

Description or Size	Liner	Rock & Gravel	Manhours
Waterfall on edge of Pond	none	1 ton 12-18" or aqua blue, no gravel	8
Waterfall set back 4-7' Double falls	10 x 10'	1½ ton 12-18" or aqua blue, ½ ton gravel	10
15' stream	10 x 20'	1 ton 6-12", 1 ton 12-18" or aqua blue, 1 ton gravel	15
Every extra 5' of stream over 15'	5 x 10'	¼ ton 6-12", 1/4 ton 12-18" or aqua blue, ¼ ton gravel	3
Grande or 2 Standards On edge of pond	none	1 ton 12-18", 1 ton 18-24" or aqua blue	12
Grande or 2 Standards Set back 4-7'	10' x 10'	1% ton 12-18", $1$ ton 18-24" or aqua blue, $%$ ton gravel	16
Grande or 2 Standards With 15' stream	10' x 20'	1 ton 6-12", 1 ton 12-18", 1 ton 18-24" or aqua blue 1 ton gravel	20

Sales Standards Pond Size	Sq. Ft.	Rock & Gravel	Manhours
11' x 11'	121	1½ ton 6-12", 1 ton 12-18", 1 ton gravel	30
11' x 16'	176	2 ton 6-12", $1\frac{1}{2}$ ton 12-18", $1\frac{1}{2}$ ton gravel	36
16' x 16'	256	2½ ton 6-12", 2½ ton 12-18", 2 ton gravel	44
16' x 20'	320	3½ ton 6-12", 2½ ton 12-18", 1 ton 18-24", 3 ton gravel	50
16' x 26'	416	4 ton 6-12", 3 ton 12-18", 2 ton 18-24", 4 ton gravel	60
20' x 20'	400	4 ton 6-12", 3 ton 12-18", 2 ton 18-24", 4 ton gravel	60
20' x 26'	520	5 ton 6-12", 4 ton 12-18", 3 ton 18-24", 5 ton gravel	75

have the water flow back to the main pond as a stream or waterfall.

Larger ponds may be estimated and built using multiple components without the hassle of extra engineering. When building and estimating these ponds, use the normal calculations but add in some extra time for detail work, and possibly for larger stones. The following guidelines are used by our crews, but may need to be polished according to your needs.



#### **Smaller Ponds**

Smaller than average ponds can actually be really challenging. Everything that goes into a regular pond has to be squeezed into a much smaller space. Don't be fooled by the size, they'll take more time than you think. Skimmers and BIOFALLS® filter are still used, and a waterfall is still built. But since they're smaller, they tend to be scrutinized more because everything is so close and in full view.

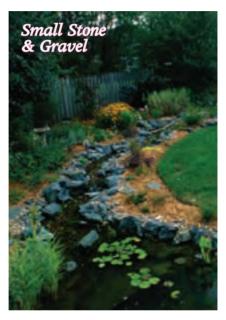
Our minimum pond cost is \$3,500, because we need to cover our day-to-day costs. Smaller ponds will still take half to three quarters of a day to complete due to mobilization, and standard installation procedures.

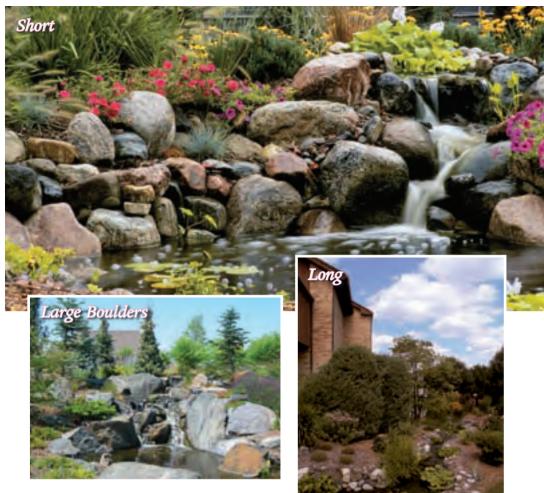
#### TIP from TEAM AQUASCAPE

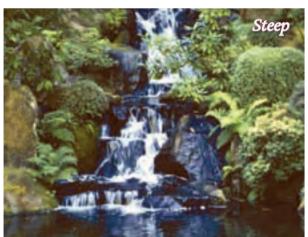
The strange thing about small ponds is they do not follow a linear pattern. A 10' x 16' pond does not take twice the time as a 10' x 8', even though it's twice the size. Pricing structures should reflect this, and potential customers should be informed as well. Explain to them that a much larger pond can be installed for an additional \$1,000 or less, depending on the individual situation. We would rather build ponds in the \$5,000-6,000 range because that's what our crews are set up for, and that's where we hit our peak efficiency.

# Streams and Waterfalls

Streams and falls will vary in styles because of geography and stone characteristics.



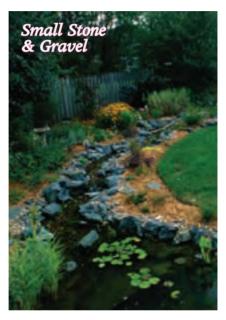


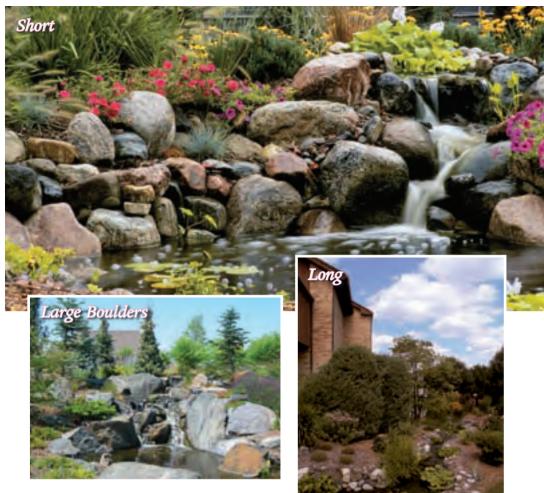


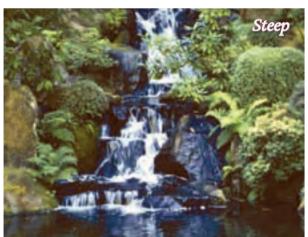


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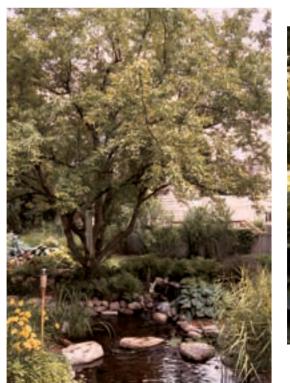




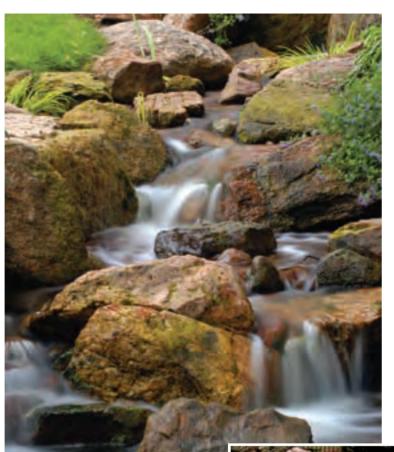
#### Stream Design

This is our favorite part of any project and it provides the greatest interest and customer interaction. Streams are highly versatile and they create nature's music as they change gradients and cross the landscape. Streams can be followed by pathways and traversed with stepping stones and bridges.









Streams are simple to build, but can easily become very difficult if a few rules aren't followed. When designing streams, the main thing to look for is elevation changes that can work for or against you. Elevations working for you will have the slope coming towards the viewing area.

This is what we dream about here in the flat plains of Illinois. Slopes of any type are few and far between. Good slopes, when encountered, make our job easier. We simply carve the hillside to create a natural area for a water course. Be sure the stream traverses across the slope to increase the viewing area and exposure, and to create a more natural looking streambed. Notice that it looks as though the water has eroded away the soil, exposing the stone underneath.



#### Limited Stones, But Infinite Variations

Although we only use a couple of different types of rock, with varying stream construction methods we can create many different variations in the style. Show the client pictures of the different effects you can create and let them choose. We like to start out with a series of cascading falls, that transition into wide sheets of water creating a variety of sounds and sights to be enjoyed by onlookers.

#### Creating a Great View

Views from the home and surrounding seating areas are always targeted first when designing streams and falls. If the budget allows, start the









This is a totally wicked stream. The water blends

with the land because of the scarcity of stones

used, and the creeping sedum ground cover.

so people are drawn into the landscape to explore the source of the water. Interactive water features will get the greatest responses because they're fun. We're all drawn to water for many different reasons. The bottom line is that the thrill of exploration is in all of us, and we can really run with the idea of creating a miniature wilderness in an ordinary backyard.

#### The Shoreline... Where Everything Happens

The shoreline is where everything happens. The greater this area, the greater the enjoyment your clients will get from their feature. The shoreline is where the marginal plants interact with the terrestrial plantings, where we feed fish, and the path we follow during walks.



I got your nose. I got your nose!



No two waterfalls look the same, even when, like us, you use the same type of stone each time.





So how do we increase this shoreline in a small space? With streams. Deep streams are more pond-like, allowing fish to swim up into them, while shallow streams are fast moving and produce beautiful sounds. A winding stream will give you the greatest shoreline for your buck. Combining a long stream with a pond is the best scenario.

#### One Final Stream Benefit

One benefit of a stream that's often overlooked is the filtration and oxygenation of the water. Crashing falls will add life-giving oxygen to the anoxic pond depths. And larger projects should always have a stream for this purpose alone. Large ponds that are a half-acre or greater will probably never be cleaned, but their streams can be.

It's relatively easy to shut the pumps down for a day and thoroughly clean a stream bed. You'll be amazed at how effective they are as a silt trap. Cleaning the stream will help remove excess nutrients without the cost of cleaning a large pond. A good bog system will also do a good job of this in confined areas. (See bog section in chapter 3 for more information.)



### **Other Considerations**

#### **Human Interactions**

If nobody is around to hear, see, or interact with a water feature, it might as well not exist in an ornamental situation. Ponds and streams need to be designed with people in mind. Take advantage of human nature and cater to your customer's needs and wants.

If you're successful at this, your phone will be ringing off the hook. The word will spread, and you'll be treated like a hero. It may be as simple as aiming a waterfall toward the master bedroom window, or by placing a bench in the right spot. Water in general, has the ability to increase your client's interaction with the outdoors, you just need to hone your skills.





#### **Adding Other Architectural Elements**

Hardscapes

How well a project flows is directly related to how it fits alongside existing features like decks, walkways, and patios. Always bring a portion of the project right up to these viewing areas. This is extremely easy to do, and it'll only complement the present structures. In cold areas, leave a soil buffer to allow for some expansion near paver or flagstone patios or walkways, so the base does not collapse into the pond. This can be accomplished with good stone work and gravel backfill for stability.

Decks are easy to work into the pond design because they can be cantilevered over the water, giving it a dock-like feeling. The closer people can get to the water, the more they will care for and enjoy their pond. Use the existing features to create scenic vistas or areas for con-

It's more expensive to install two BIOFALLS® filters than it is to install one. In very irregular ponds, multiple skimmers are needed, or some form of water movement needs to be created to eliminate dead spots in the pond. A combination of BIOFALLS® filters and skimmers can work. It depends on you as a designer. Obviously, there are situations that need one or the other. And as you dig in, and get a little experience under your belt, those situations will present themselves and you'll figure 'em out.

TIP from TEAM AQUASCAPE

templation. Everyone has a favorite spot to sit. Ask your client where theirs is, and take advantage of that spot. They'll thank you again and again if it hits them right.

A complete environment can also be built around a simple pond. Building new hardscapes can help create the perfect spot for your client and the ultimate exterior living space, complete with a pond, a seating area alongside, it will complement the perfect planting balance.

#### Multiple Components

The components used for each project need to be considered as a part of the design phase. When do you use a Grande versus two standard BIOFALLS® filters? It comes down to the look and budget.

## A General Context, a Framework Within Which to...

Now, let's conclude by saying that pond design is really a broad topic and that the observations made in this chapter you will see referred to again and again in other chapters in this book, but they will cover the subjects in greater detail.



Can you say catch a few rays? Forget the beach—go to your own backyard.

