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Water Artisans of the Year
WINNERS p. 9



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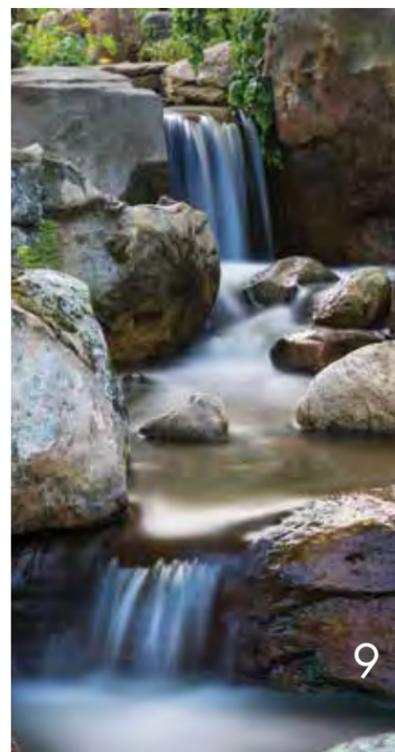
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FEATURES

9 Water Artisans of the Year COVER STORY

May I have the envelope, please? After an enthusiastic response to our first annual competition, the judges have deliberated and rendered their verdicts. Our editor, **Jordan Morris**, walks you through a stunning gallery of this year's five winning projects.



21 Meet the Judges

Our "Supreme Stream Court" features some of the most respected experts in the industry. Meet the seven members of the panel who picked this year's winners.

23 A Close Second

Because we received more than 50 submissions in this year's contest, picking just five winners was not an easy task. Some of these impressive projects deserved an honorable mention, so we've included profiles of the runners-up in all five categories.

31 Somewhere Over the Tahoe

POND CONSTRUCTION They say you can't go home again, but when opportunity struck, **Jason Steele** clicked his heels and returned to his roots near Lake Tahoe to work on a colossal construction project involving a series of waterfalls and a beautiful, winding stream. Although he was certainly not in Kansas anymore, the "Water Boss" let his authority speak for itself and created a lasting work of art near the shores of the country's largest alpine lake.

38 Can You Dig it?

It goes without saying that excavating a pond is far more complicated than just digging a hole. Aquascape's **Ed Beaulieu** takes you through the basics of laying the groundwork for that perfect pond. From ledges to berms to a rundown of various soil conditions, Ed will keep you digging without hitting rock bottom.

45 A Split Decision

In another installment of Best Pond Practices, **Kent Wallace** explores some do-it-yourself circulation and oxygenation strategies in a formal pond. Discover the benefits of an airlift system and see why it enhances the still-pond experience.

51 Tools of Engagement

ScareCrows, Boulder Buddies and Dingos... oh my! Whether these handy tools already ring a bell to you or not, **Jamie Beyer** will give you the skinny on all the essential equipment to include in your arsenal, whether your focus is installation, maintenance or a combination of both.

55 Fish Food 101 LANGUAGE OF KOI

Whether you consider your koi part of your family or a treasured pet, you should still be well aware of what's going in their food. **Joe Pawlak** takes you to school with his Fish Food 101 course. Find out what actually goes into their diet and learn the regulations that dictate it.

60 Pool of Rock

When a faraway customer wants her neglected pool converted into a koi pond, what do you do? **Mike Gannon** says, "Take the show on the road!" His ballad about an 11-hour road trip and 10 long workdays culminates in the "concert" of a lifetime for one grateful customer.



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Upcoming Events

2017

March 4 - 5

**Koi Club of San Diego
30th Annual Koi Show**
Del Mar Fairgrounds
Del Mar, California
www.koiclubofsandiego.org

March 10 - 12

Central Florida Koi Show
DoubleTree Hotel by Hilton
Orlando, Florida
www.cfks.org

July 24 - 26

SuperZoo 2017
Mandalay Bay Convention Center
Las Vegas, Nevada
www.superzoo.org

August 9 - 11

IWGS Symposium
Longwood Gardens
Kennett Square, Pennsylvania
www.iwgs.org

August 15 - 17

IGC Chicago
Navy Pier Festival Hall
Chicago, Illinois
www.igcshow.com

August 23 - 26

Pondemonium
Q Center
St. Charles, Illinois
www.pondemonium.com

October 18 - 20

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www.hardscapena.com

October 29 - November 3

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Publisher's Perspective

We Have Winners!

Oh yes, we do! It's been a crazy, but fun few months processing and organizing all the amazing entries for our first-ever Water Artisans of the Year contest. There certainly is tremendous talent out there. It goes without saying —



you guys are GOOD!

We've dedicated most of this issue to highlight the winners. Hopefully these beautiful projects will inspire you as pond season is in full swing. If you know any of the winners, be sure to congratulate them.

We received a nice note of thanks from the Wounded Warrior Project. We are very pleased to have raised more than \$1,300 for their cause.

The time has finally come to unveil the winners, so get psyched and turn to page 9!

We've got a jam-packed issue for you. Are you on the lookout for new and innovative equipment to use in the field for construction or maintenance? Jamie Beyer discusses a whole host of cool tools that you may or may not be aware of. Don't miss his complete rundown of gadget-related tricks and tips on page 51.

Our Language of Koi installment this issue is especially informative about fish foods and nutrition. Joe Pawlak provides a detailed rundown of food ingredients and the current regulations that oversee them on page 55.

Finally, Mike Gannon's article on page 60 is a great way to round out the issue. He and his team "take the show on the road," traversing four states to complete a project-of-a-lifetime for a very deserving customer. In the end, they transformed a neglected pool into a vibrant koi pond, and it was music to the customer's ears.

I'd like to say a special thanks to Ed, Kelly, Benjamin, Mike, Dave, Rick and Jason — our Water Artisans of the Year judges — for donating their time to this year's contest. Read more about them over on page 21.

As pond season kicks off, be sure to keep an eye out for projects that go above and beyond the mainstream. Chances are, they could be eligible candidates for next year's Water Artisans of the Year contest.

Stay tuned — we'll release more details about it very soon.
Happy PONDering!



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Water Artisans of the Year

The results are in for our inaugural craftsmanship contest

by Jordan Morris,
 Editor, POND Trade magazine

An artist is someone who, by virtue of imagination, talent or skill, is a creator of work that carries distinct aesthetic value. An artisan, in contrast, embodies the core characteristics of an artist but channels his or her energy into the design and creation of a craft. Thus, a masterpiece constructed by an artisan tends to both engage the senses and fulfill a practical role in the daily life of its audience.

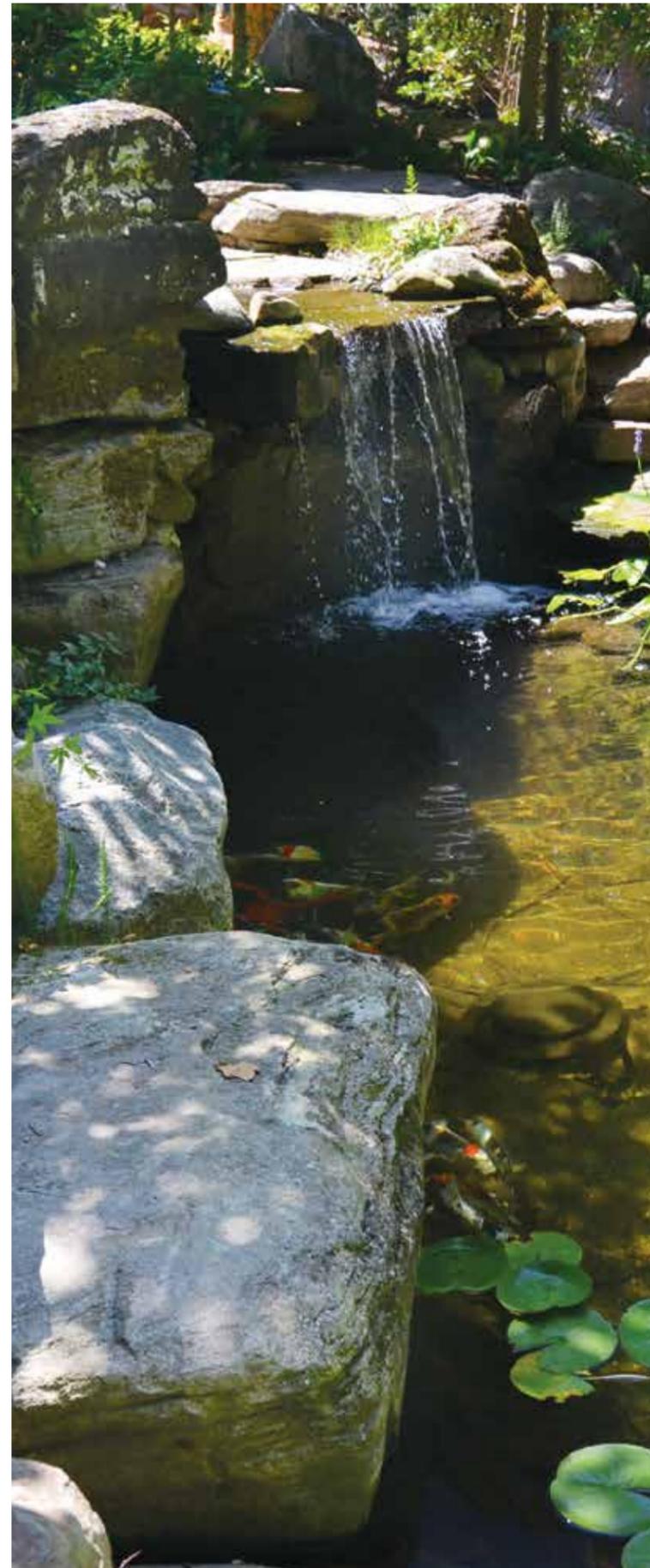
When we announced the first annual Water Artisans of the Year contest in last year's September/October issue, our goal was to aggregate and showcase the finest contracting work of the 2016 pond season — the “best of the best,” so to speak. More than 50 nominees were submitted, representing a wide range of the industry's core competencies. Each entry was accompanied

by a donation to the Wounded Warrior Project, raising in excess of \$1,300. A diverse, nonpartisan panel of judges carefully evaluated the submissions solely on the merits of workmanship, with no knowledge of the identities of specific products or contractors. Our industry already has its share of accolades, but we thought we'd level the playing field with this truly independent approach.

As you will see in the following pages, we were far from disappointed. These projects represent the collective hard work, extraordinary creativity and relentless passion of some of the elite artisans in our industry. It is projects like these from which others draw inspiration, setting the standards for the future of pond building and water gardening.

Without further ado, POND Trade magazine presents the inaugural winners of a new tradition in the pond and water gardening industry: the Water Artisans of the Year.

Meet the judges!
 Page 21



Winner **Most Naturalistic**



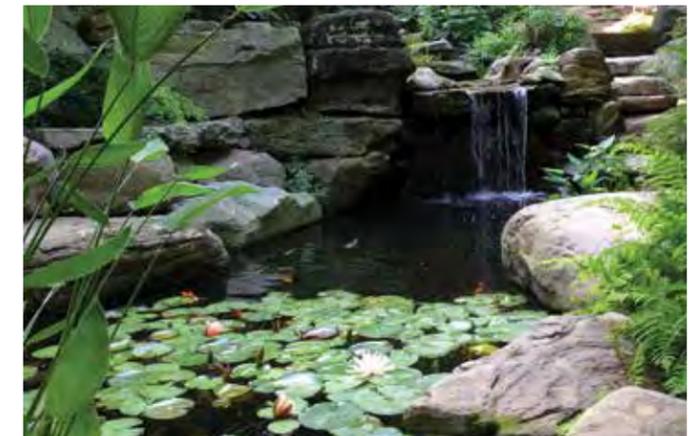
Brian Buchholtz

Brian Buchholtz is the founder and owner of PondWorks. With a background in construction, he has accumulated extensive knowledge across the spectrum of water feature design, detailing and construction through almost 25 years of experience. PondWorks prides itself in providing natural, integrated water features while relying on hands-on approaches to project conceptualization and execution. He holds a bachelor's degree in architecture from Philadelphia University.

Capturing the essence of the majestic, almost inimitable Adirondack Mountains sounds like a tall order, especially when your customer is located just outside of Philadelphia. Replicating such a unique, natural environment requires a deep appreciation for naturalism, and this masterpiece by Brian Buchholtz of PondWorks demonstrates exactly how it's done.

At the end of a long, steep walking path from a private residence, this koi pond and stream with soul-soothing waterfalls appear as though they eroded naturally from the hillside. It operates on a sophisticated control system that includes a high-flow centrifugal pump, a high-output UV sterilizer and a 30-inch biomechanical filter, but it is masterfully hidden from sight beneath mature, naturally-occurring plantings about 25 feet from the pond.

Preserving nature requires leaving no trace of man, so transporting and setting the 40 tons of firestone boulders on the mountainous property required a carefully orchestrated ballet of precision work with heavy equipment. The fact that it appears today as though Brian and his team never stepped foot on the property is a resounding testament to the craftsmanship of his team in composing this out-of-this-world treasure.





Winner Best Overall



Dean Pipito

A 23-year veteran of the pond industry, Dean Pipito is the owner of Aquatica, one of the largest waterscape firms in the United States. He and his team have aggregated a wide range of skills and competencies, creating a highly respected reputation among their peers. When they aren't working together to create aquatic works of art for their clients, Dean and his wife, Angela, enjoy spending their free time on their farm in Oconomowoc, Wisconsin.

Golfing legend Jack Nicklaus once said, "Nobody ever remembers who finished second at anything." After Aquatica completed the finishing touches on this breathtaking, custom-designed waterfall and river system at The Legend at Merrill Hills golf club in Waukesha, Wisconsin, it was clear that this landscape centerpiece was second to none.

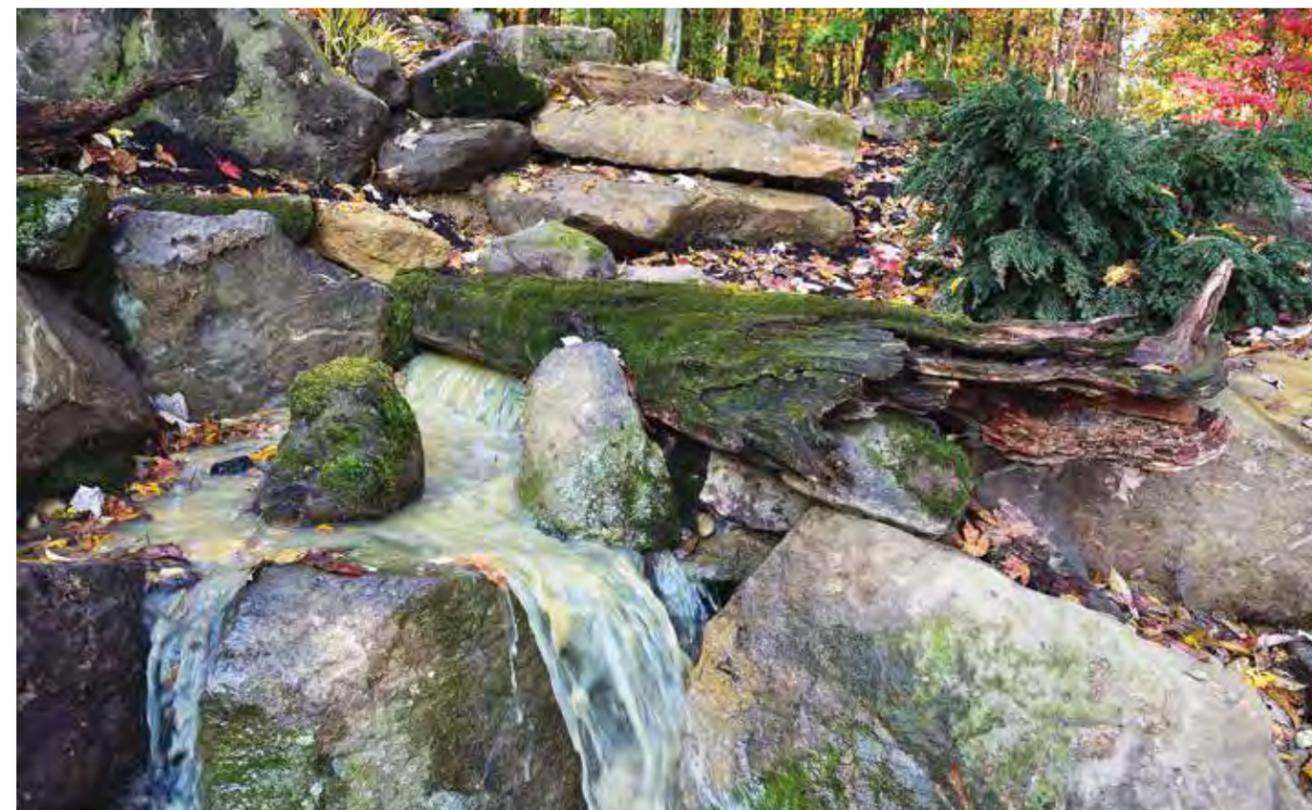
Having to mitigate the numerous challenges that come hand-in-hand with a renowned private golf course, including player accessibility, safety and widely inconsistent topography, Dean Pipito and his team found themselves constantly testing the limits of their expertise during construction, always under the watchful eye of course management. In the end, their deliverable — which included a series of crashing waterfalls, golf cart bridges, 700 tons of blue boulders and a 450-foot river meandering through the course — had become a cornerstone of the property. He incorporated enhanced vistas into an elevated playing experience, complete with elegant new obstacles for golfers to contend with.

Even if you're not a golfer, the major waterfalls create a one-of-a-kind, "surround-sound" dining experience, as club members and wedding attendees alike can dine or sip cocktails within the cascading waters, creating an unforgettable atmosphere that, as the property name suggests, borders on legendary.





Winner
**Best
Pondless**



It's not that difficult to understand why some contractors might balk at the prospect of a project that requires manipulating more than 40 tons of boulders into a pondless waterfall in a tight backyard with limited access and an extreme slope. But when a recently retired couple presented the idea to Tim Wood at a home and garden show, it was clear that they had found the right person for the job.

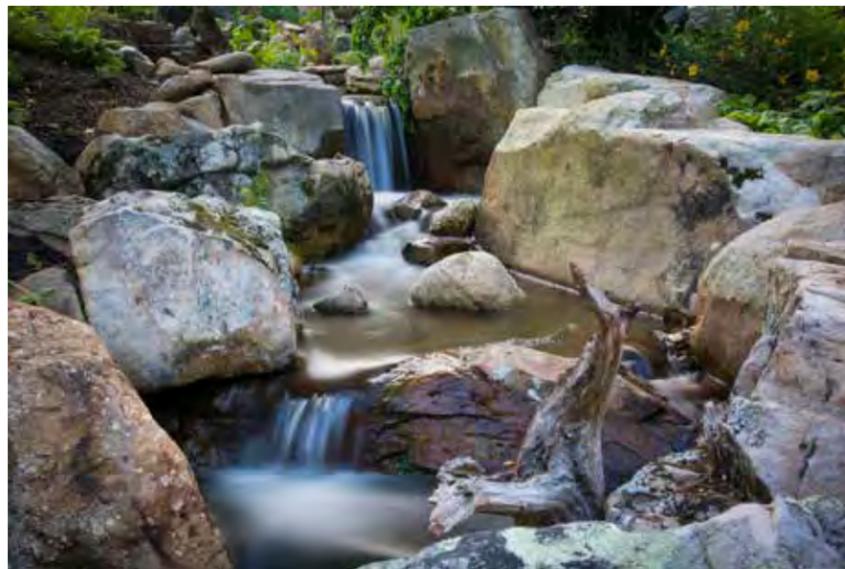
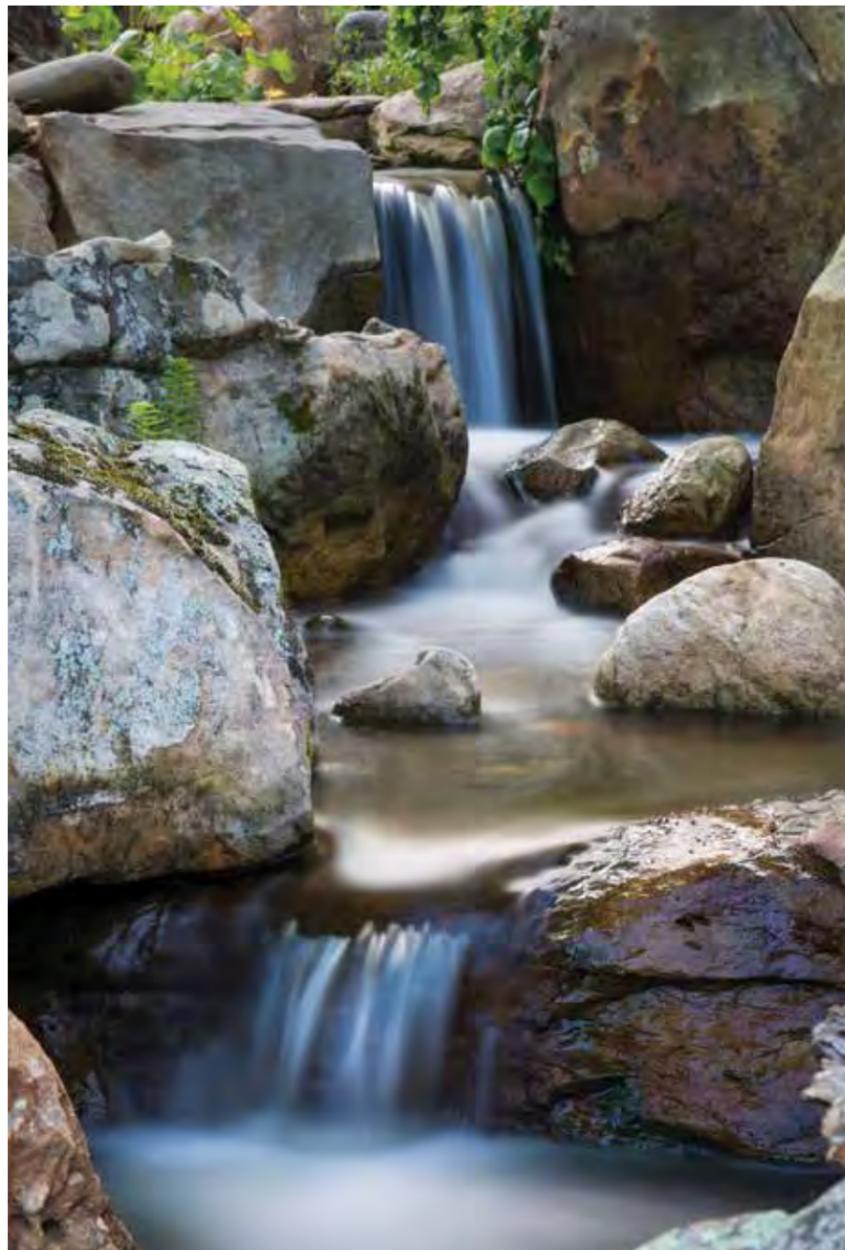
When Tim and his team got to work at the nearby residential property, they faced the daunting process of excavating massive chunks of rock — some weighing in excess of 2 tons — while navigating trees and scrounging for accessible, stable ground to position their excavator. "We had some tense moments," Tim says, remarking how their Takeuchi 285 could barely lift some of the largest boulders.

The larger-than-life, living sculpture consists of two waterfall spillways providing tranquil melodies of trickling water that flow into a 500-gallon reservoir. Tim also integrated a series of fallen logs and large sections of thick moss harvested from the nearby woods to create a naturalistic oasis that far exceeded the customer's expectations.

Tim Wood



Tim Wood is a Master Certified Aquascape Contractor and the owner of Aquatic Edge Pond & Landscape Solutions in Greensburg, Pennsylvania. He specializes in natural-style ecosystem koi ponds and water features. He also works as a consultant, providing lake management services and offering a variety of natural bacteria products developed specifically for use in lakes and large, earth-bottom ponds. When he's not on the job, he frequently finds himself participating in local organizations focused on the management of lakes and ponds.



Winner **Best Waterfall**



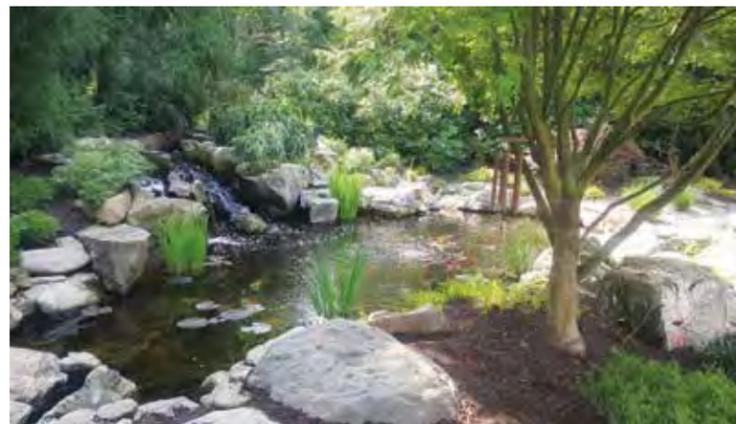
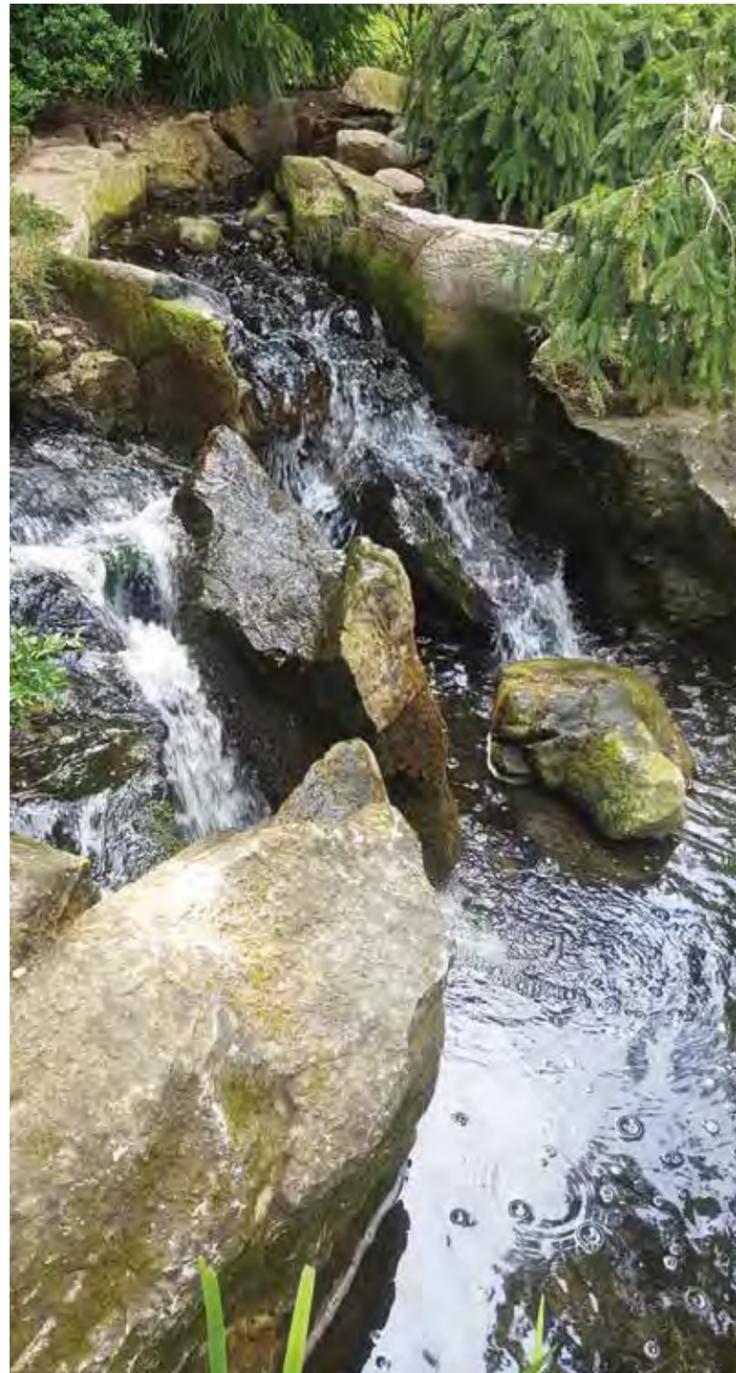
John Adams

John Adams has built ponds and features for more than 20 years, with projects spanning across 11 states. He is a Master Certified Aquascape Contractor and a certified rainwater harvesting professional who enjoys delivering educational speeches at garden centers, garden shows and other trade shows. You might have seen him or his company, Modern Design Aquascaping, on HGTV or across many of the industry's publications. Based in Friendsville, Tennessee, he is a staple of the industry in the southeastern United States.

Building a new waterfall amid an already existing network of waterfalls, pools and streams under the watchful eye of a master certified gardener nicknamed Llama Mama might intimidate some contractors. But, as John Adams was able to prove to a Knoxville homeowner with high expectations, a little careful craftsmanship, some locally-sourced driftwood and more than 200 tons of nearby mountain boulders can make it look as though it had been there for centuries.

This 140-foot-long, resplendent pondless waterfall integrates seamlessly into an aquatic wonderland along a stone path winding through the property. A variety of house aquatic plantings, including ferns, rushes and carnivorous plants, encircles a 3,000-gallon underground reservoir, which required a world of patience and skill to install amid the multiple springs just beneath the surface.

Llama Mama's faith in a determined contractor awarded her with the waterfall of her dreams and a welcome addition to her refuge farm for llamas, pit bulls, potbelly pigs and longhorn steer. It will have a special place in John's portfolio for years to come, not just because of the memorable customer, but also the fact that it represents some of the best work he feels his team has ever done.



Winner
**Best
Renovation**

Demi Fortuna, Ely Ayala Scott & Edwin Scott-Fortuna



Demi Fortuna and his sons, Edwin and Ely, own and operate August Moon Designs, a water feature design and build business based in Stony Brook, New York. Demi has more than 25 years of experience in most aspects of water garden design and construction and currently serves as the director of product information at Atlantic Water Gardens. He has a passion for holding seminars and lectures on some of the industry's most complex topics and presenting them in an accessible, enjoyable manner.

What do you do when you've built and maintained an alluring pond, but your beloved koi start to outgrow it?

If you're near Long Island, New York, you call Demi, Edwin and Ely Fortuna of August Moon Designs. When they arrived at the scene of this dedicated koi pond, it measured 8 by 16 feet with just 2 feet of depth. There was a hustle and bustle of more than 30 strapping koi, some of them more than 2 feet long. And, like most of our customers who are koi aficionados, this one — of course — wanted more koi.

This extreme pond makeover resulted in a 14-by-30-foot, koi mansion with 5 feet of depth — plenty of volume for its new residents.

Most of the labor was performed in a tiny space barely larger than the width of the excavator, wedged between a red maple and a group of Lawson cypress trees. Due to the minimal access and the need to haul more than 30 tons of stone, gravel and topsoil, the Fortuna fellows have dubbed this project their most difficult job of 2016. "There were times we had our doubts," Demi says. "But we're really glad we took it on — it's a beauty."



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| The **Judges** |



The Supreme Stream Court

Meet the judges who handpicked the winners

by Jordan Morris,
Editor, POND Trade magazine

One of the core duties of a judge is to serve as an impartial decision-maker in the pursuit of justice. Ideally, he or she should be equipped with a vast amount knowledge and experience in the appropriate field.

At POND Trade, we are fortunate to have numerous contacts across the spectrum of the pond and water feature industry, and we called on seven of them to evaluate the dozens of entries submitted in this year's contest. While their knowledge and expertise in their respective areas is indisputable, we took an extra step to ensure that any personal biases — whether conscious or unconscious — could be minimized or eliminated.

We presented all entries to the judges with the names of the artisans, companies and products

hidden or removed. Each entry consisted of a brief, 50-word description along with up to four photos. They submitted their rankings based on this information alone, and when tallied up, the contractors with the most votes in each of the five categories were crowned winners, with second-place vote-getters receiving a runner-up honorable mention. Two of the judges serve on POND Trade's Editorial Committee, an advisory board that meets occasionally to discuss the publication's editorial content. Employees of POND Trade magazine with knowledge of the contestants' identities did not cast votes.

In the end, the results speak freely for themselves, with pure craftsmanship and talent shining through, above all else. We feel that justice was served without favoritism or any unnecessary "pond-tification."

From left to right based on the photos above, meet the seven industry leaders who served on our inaugural judging panel on the next page.

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Ed Beaulieu is one of the longest-serving employees at Aquascape, having started in construction in 1993 and advanced to his current position as the director of contractor development and field research. With degrees in zoology and marine biology, Ed is considered one of the industry's top experts in water feature design.

Kelly Billing of Maryland Aquatic Nurseries is one of the most published experts on water plants. She is a Maryland Certified Professional Horticulturist and has more than 30 years of experience in the water gardening industry.

Benjamin Timmermans, who was named the 2015 Helix Pond Contractor of the Year, is the president and lead designer at Liquid Landscapes Inc. in Asheville, North Carolina. He has degrees in recreation and wildlife management and has personally completed hundreds of waterscape construction projects over several decades.

Mike Miller is the manager of Pondliner.com's Pond Pro Shop in Shawnee, the "Water Garden Capital of Oklahoma." He specializes in pond and water-garden education and teaches 16 classes at the shop spanning a wide variety of disciplines. His passion is working to bridge the learning gap between beginners and professionals who love ponds and water gardening.

Dave Duensing is an industry leader and educator on exceptional water features, with an influence that extends throughout the world. He is the owner of several construction and consulting companies that specialize in using natural rock to craft living water features. He is well known across multiple industries, having starred in the Animal Planet TV series "Pool Master."

Rick Smith is a veteran of the pond and water-gardening industry, with more than 30 years of experience spanning a variety of roles and companies. He is currently the director of sales at EasyPro Pond Products.

Jason Lenox has been in the pond construction business for almost three decades and is known for building some of the largest water features across Illinois. He co-owns Ponds Inc. of Illinois and is one of the architects behind the Water Artisans of the Year contest, which he originally suggested on POND Trade's Facebook page.

Runners Up



A Close Second

These honorable runners-up are worth mentioning

by **Jordan Morris**,
 Editor, POND Trade magazine

If there was one thing the judges agreed upon unanimously, it was that this year's competition was wildly impressive, and not all decisions came easily. In a couple of cases, a category winner edged out his competition by just one vote.

Here are the runners-up in each of our five categories. You might see a couple of familiar names.

On behalf of POND Trade, I'd like to thank each and every contractor who submitted an entry this year. I'm proud that we raised more than \$1,300 for a worthwhile cause — the Wounded Warrior Project.

Do you have what it takes to be a Water Artisan of the Year? Start keeping track of your best work, because all projects completed before Nov. 1, 2017, will be considered eligible for next year's contest. Stay tuned for more details.

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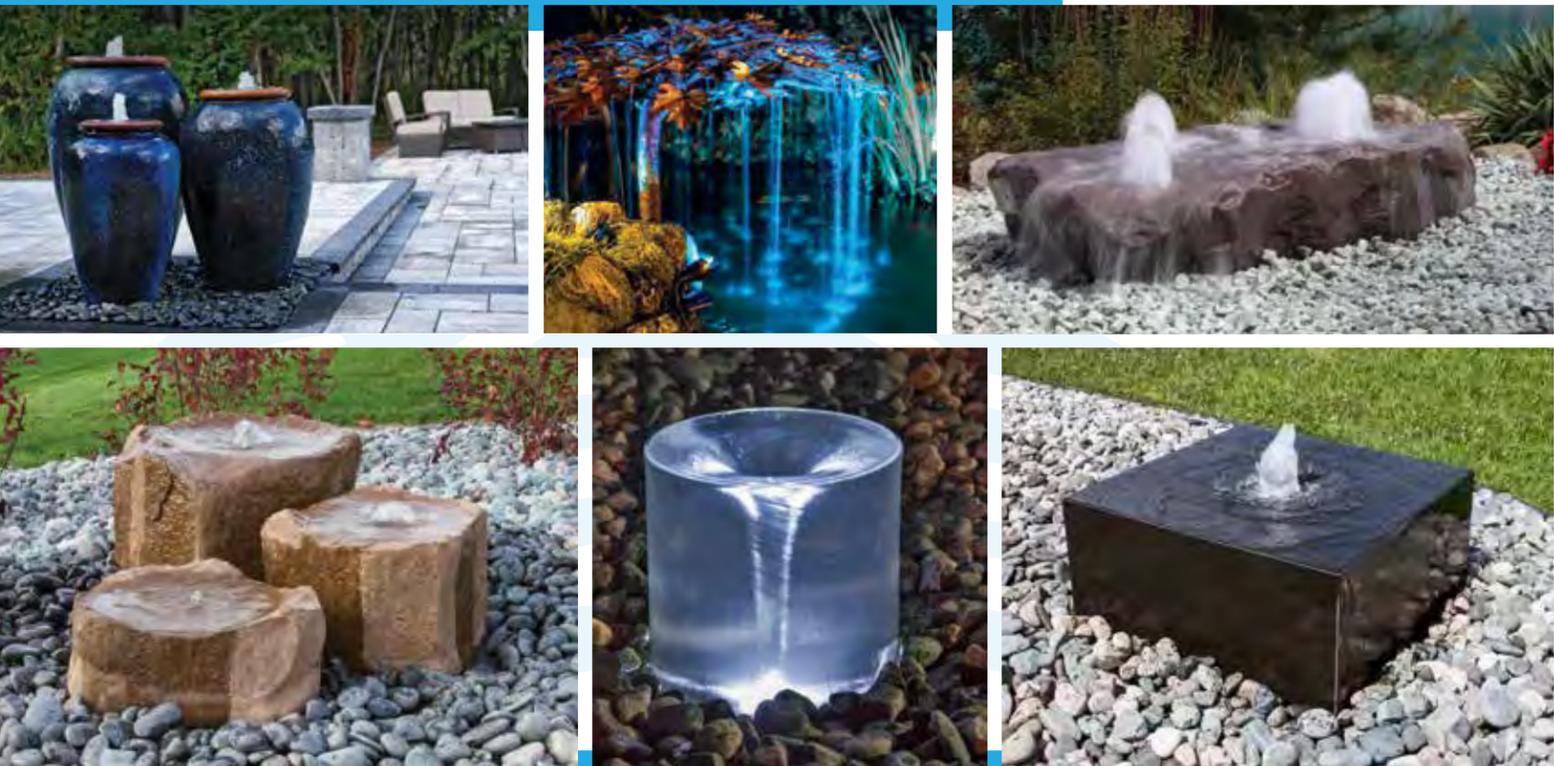
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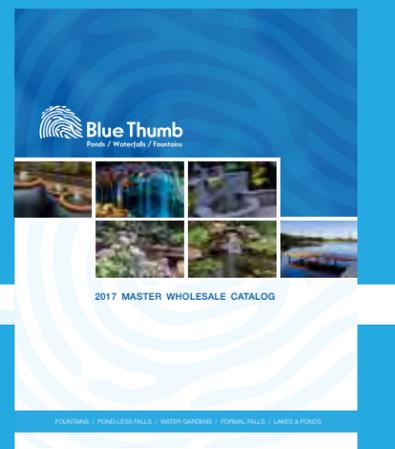
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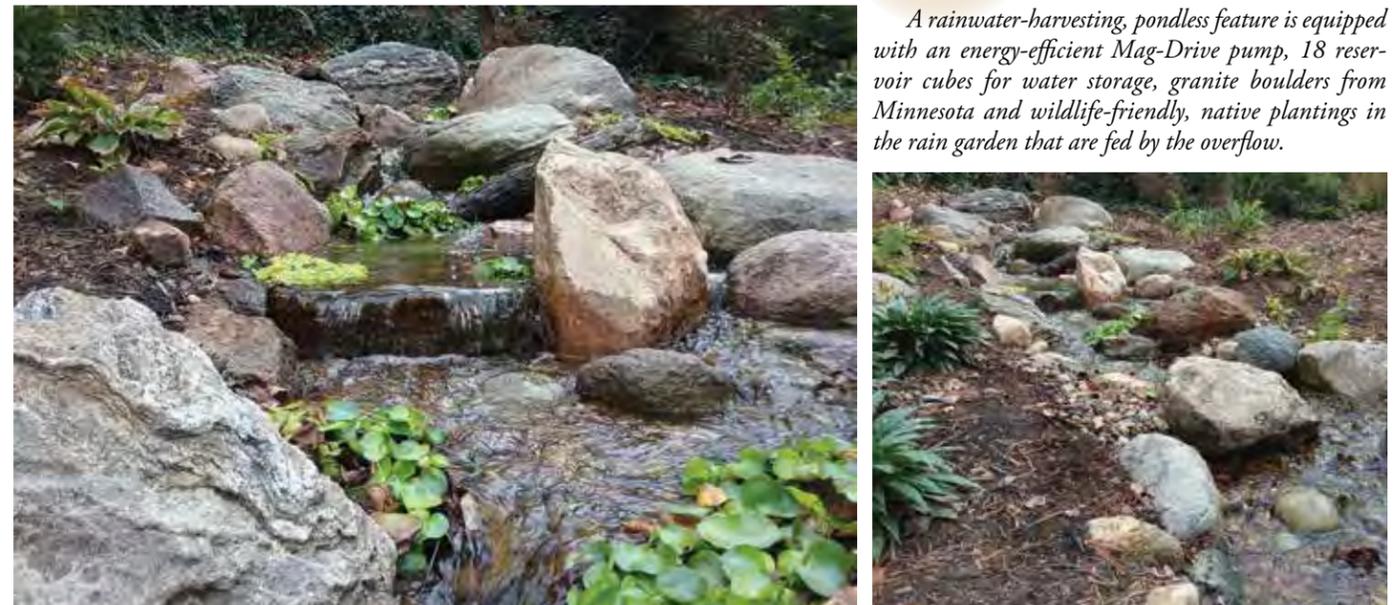
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Runner-up
Best Pondless



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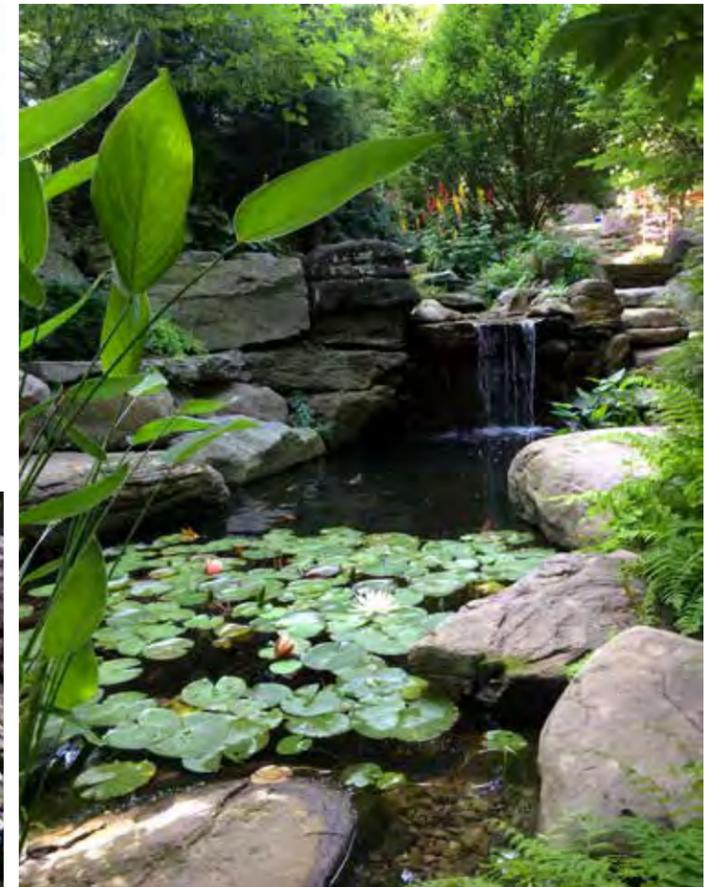
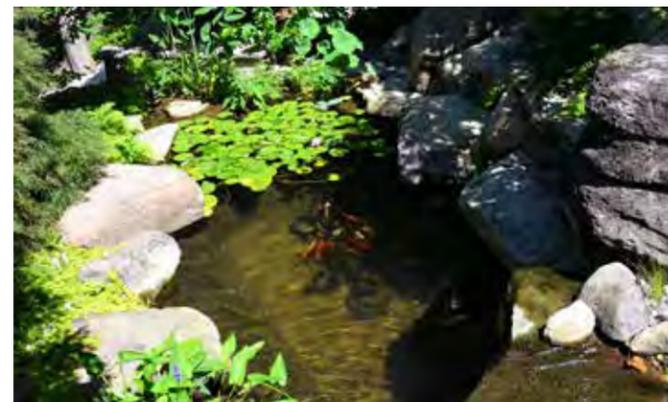
A rainwater-harvesting, pondless feature is equipped with an energy-efficient Mag-Drive pump, 18 reservoir cubes for water storage, granite boulders from Minnesota and wildlife-friendly, native plantings in the rain garden that are fed by the overflow.

Runner-up
Best Overall



Brian Buchholtz
PondWorks
www.pondworksonline.com

This waterfall and koi pond can be reached at the end of a custom-built, descending walkway on a long, narrow, tree-covered property outside Pittsburgh, Pennsylvania. This destination water feature is virtually invisible from the street and adjacent properties, providing the homeowner with a private retreat and a place of solace.





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Runner-up
Most Naturalistic



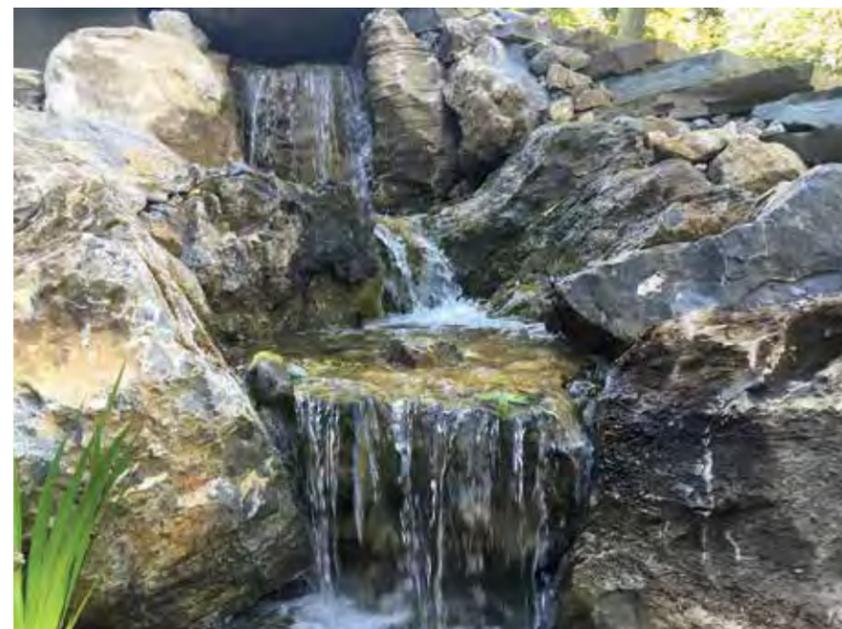
Tim Wood

Aquatic Edge Pond & Landscape Solutions
www.aquaticedgeconsulting.com

Pulling from his expertise in natural lake management, Tim Wood designed this feature with timelessness in mind, going for a naturalistic look that could have existed in centuries past, or 100 years in the future. All wood accents and boulders — some covered in local moss — were harvested from the property, enhancing its enduring essence.



Runner-up
Best Waterfall



Bobby Kenyon

C.E. Pontz Sons
www.cepontzsons.com

This project included a large ecosystem pond with a small wetland filter, two bubbling urn fountains and built-in stepping stones. The zero-edge waterfall leads to a stream that flows underneath a large, natural stone bridge, terminating at the grand falls. The breathtaking, multiple-tiered waterfall then disappears into a pondless waterfall basin, where water is filtered and recycled.



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Runner-up |
Best Renovation



John Adams

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Two separate features were torn out completely to create one massive pond-less feature, including a 3,000-gallon reservoir at the bottom to give the impression that the lower pond is fed by the top waterfall. A second reservoir was built partway up the feature to feed the top waterfall, with multiple, small cascades integrated to add flow volume on the way down.

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Native Sierra Nevada boulders add great character, and most of the largest were found on-site from the house excavation.

Somewhere Over the **TAHOE**

The Water Boss shines in the Jewel of the Sierras

by Jason Steele,
Steele's Landscapes LLC

While on vacation in July 2014, I was given the opportunity to ride shotgun on an appointment with my uncle, mentor and previous employer of 14 years, Dan Yori. Uncle Dan is the owner of High Sierra Gardens in my old hometown of Incline Village, Nevada, on the north shore of beautiful and scenic Lake Tahoe. We looked at a backyard landscape renovation, which included turning a 75-foot dry creek into a beautiful, recirculating water feature. I gave my uncle my thoughts and projected costs and told him that if he won the project, I would return to Lake Tahoe to supervise the build. Two months later, I found myself back working among former co-workers, some whom I have known for more than 30 years. The project went together seamlessly, and it turned out beautiful.

Off to See the Blizzard

In the winter of 2016, my company, Steele's Landscapes, was contacted again by High Sierra Gardens for an even larger build. It was to be 110 feet in total length with two large stone bridges meandering around large pine trees and along the beautiful summer deck and landscaping. The initial meeting with the homeowners and the preliminary design phase took place in the early spring, and as it was in a mountainous region, there was still snow on the ground. High Sierra Gardens finalized all the details, and a start date was set for the week of Memorial Day.

Not in Kansas Anymore

Steele's Landscapes is based in Wichita, Kansas, and since Lake Tahoe is 1,222 miles from the land of Oz, I utilized the local Ewing Irrigation branch in Reno, which insured the complete stock of items needed for the timely completion of the project. They drop-shipped materials directly to the job site



Many large Aquablocks were used to capture the creek water in the reservoir. The use of proper equipment saves labor and time — time better spent on a Tahoe beach!

the day before the busy holiday. I briefed my crew for the time I would be away from the shop and said goodbye to the family on Sunday afternoon.

On Memorial Day, the job site was prepped by High Sierra Gardens. They supplied all machinery and manpower to assist in this large build, and I had



Howard Doyle (above, left) of High Sierra Gardens leads the charge in rolling out the 100-foot liner. The creek and waterfalls (above, right) run the length of the backyard, connected by paths and bridges. A lovely Tahoe stream (bottom, left) leads to a shallow pool for water plants — and possibly a bear?

worked with most of the guys on the previous 2014 build. I also had another worker, the son of the homeowner. He was a very inquisitive young man home from college, where he was studying to become an architect. He quickly became what seemed like a trainee, asking numerous questions about everything from setting the pumps to performing the final detail and maintenance. It felt like I was verifying the procedure to him and myself, as I was feverously working to maintain my schedule. He had previously worked in the nursery for High Sierra, which has a natural creek that flows through it year-round. I was told that this was the inspiration for convincing his parents to create the backyard masterpiece. I enjoyed sharing his enthusiasm for the project, and it allowed me to add more personality to the build.

Handled Like a 'Boss'

The vault reservoir consisted of Aquascape products, and the pumps specified by Tsurumi were perfectly matched, so the installation was rela-

tively simple for the Water Boss. At the end of day one, all the Aquablocks were in, the reservoir was set and the two lines of 3-inch flex PVC were buried, but we were a little behind schedule from where I thought we'd be. I was given the use of a company truck for the ride to work, during which I realized how the sky-



A close-up of a couple of waterfalls created by the "Water Boss."

blue water and picturesque mountains were a great inspiration for the creek excavation and rock placement.

The only access to the top waterfalls was a skid-loader trail that crossed the creek midway up. We started the steam bed there to the top. When the trail was no longer needed, we unrolled the

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A flagstone patio overlooks this feature under giant pine trees.

remaining liner without the need for a seam. The experienced mountain crew I was working with was well versed in boulder and rock work, which allowed us to breeze through to the fourth day of the build. We finished the two main falls, set the large stone bridges, applied the waterfall foam and performed a test run while the customers were out to dinner — so we didn't ruin the surprise.

No Place Like Tahoe

Friday was reserved for the final edge treatment while the landscape crew continued with sprinklers, sod and planting. My cousin, Mark Yori, the co-owner of Phoenix Drone Service, filmed the completion of the project, and his expertise in cinematography and knowledge of

videography helped put together a great YouTube video. Finally, Saturday was spent introducing the homeowners to the new addition to their backyard and visiting other ponds and water features that I had installed 20 years earlier.

In true Tahoe fashion, the evening was spent enjoying the crisp air, eating great food and conversing with family and friends. I had an early-morning flight, and with a click of my heels, I was home within a week of the start of the build — right on schedule. These types of projects remind me of my ability to travel and create beauty anywhere. I'm currently pursuing more opportunities, so don't let a little distance discourage you from stepping out and creating your art. ☞

About the Author

Jason Steele was born in Reno, Nevada, and grew up in the Sierra Nevada mountains. He spent five years living on the island of Oahu. He started learning landscape and water features at 18 years old. He married a wonderful woman from Wichita, Kansas, where he currently lives. He has four awesome children. Jason is the owner of Steele's Landscapes LLC and is the self-proclaimed "Water Boss."



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The basics of pond excavation

by **Ed Beaulieu**,
Aquascape Inc.

We all know that a contractor can dig a hole, but do you really know the benefits of doing it right? A step-by-step excavation process will undoubtedly save you time, money, materials and headaches.

Before you begin digging, you'll want to perform a few easy tasks that will help to avoid surprises later on. First, be sure to assess the property where the pond will be located and take note of all the existing structures and utilities. Second, using a site or laser level, determine the high and low areas where the pond will most likely be positioned. This gives you a better idea of any obstacles or challenges you might need to overcome when installing the pond.

Also remember to look at construction access points for the property; this will help you determine your options for the excavation process. Are there any gates, narrow walkways or steps that might block equipment access?

Site Assessment

As you walk around the pond perimeter, determine the high and low areas in relation to the main viewing area. Most ponds are located next to a patio — this would be the starting point. We like the water to come right up to the viewing area, so we typically set the water level 2 to 3 inches below the level of the patio. Once the water level is established, make the entire pond perimeter a minimum of 2 inches

above the water level. At the back edge of the pond where the waterfall is located, the level should be much higher, depending on the final waterfall height. All measurements taken from this point forward are in direct relationship to the water level.

Most properties have a gentle slope leading away from the home for water drainage. Be sure to adjust your calculations to compensate for this slope. In severe situations, you will need to bring supplemental soil to the project to create the desired elevations. If the slope is coming toward

Remember to look at construction access points for the property; this will help you determine your options for the excavation process.

**Can You
DIG
it?**



the home, it will allow you to create dramatic waterfalls, but it will also increase the time of the excavation and the amount of soil generated.

Why Build Ledges?

When you begin your pond excavation, be sure to include ledges along the perimeter. If someone were to accidentally or purposefully walk into the pond, you want to avoid a dangerous drop-off. Ledges act as a safe staircase, as opposed to a slippery slope. They also add strength and stability to the pond. Terracing is much more stable and less likely to collapse than a steep, tall wall.

In addition, ledges provide aesthetic appeal.

To add strength and stability to ponds, be sure to incorporate ledges (top) during excavation. Ledges provide aesthetic appeal (bottom, left) and create shelves for plants that require different water-depth levels. As a general rule of thumb, large equipment (bottom, right) is needed when excavating ponds larger than 600 square feet.



Natural ponds don't have symmetrical levels, and neither should man-made ponds.

If you create a proper ecosystem pond, the water will be clear, with the pond floor visible. Ledges provide layers and contours, adding interest to the pond's interior. Pond ledges also provide shelves for aquatic plants; different ledge depths are perfect for planting the many different species that are available. For example, marginals will grow in 1 to 12 inches of water, while waterlilies and oxygenators prefer 12 to 36 inches of water.

The first pond ledge is typically 6 to 10 inches deep and should be dug around the perimeter of the entire pond. Remember, this ledge should be covered in gravel, so a ledge that is 6 inches deep will become a 4-inch-deep ledge after the gravel is installed. Ledges can vary according to their usage, but they do not have to be perfect. The goal when creating a pond is to copy nature, and natural ponds don't have perfectly level or symmetrical ledges graduating toward the bottom of the pond. When the first ledge is completed, you can mark out the next area to be excavated.

Remember that the vertical walls of the ledges will be covered with boulders or larger rocks, and the flat areas will be covered in gravel. If you will be using all hand-placed stones, make sure you keep

Pond ledges also provide shelves for aquatic plants; different ledge depths are perfect for planting the many different species that are available.

your ledges a maximum of 12 inches tall; otherwise, you'll be stacking multiple rocks on top of each other, which will increase the allotted amount of time for stone placement. Ideally, use one or two rocks to cover the vertical walls. If you have equipment on-site, you'll have more freedom to use larger boulders to create deeper ponds with taller vertical walls. Make sure the end price reflects the additional costs incurred by the increased time and materials necessary to complete the task.

The width of the ledges should also

vary according to the pond design. I typically use narrow ledges that are 6 to 10 inches wide in the foreground and wider ledges of 16 to 24 inches in the background. The reasoning behind it is simple: the foreground area adjacent to the patio or viewing areas is where your clients will spend their time feeding and viewing their fish. This allows ample space for the fish to swim up close to their owners.

The background area is the zone where the pond transitions into the surrounding landscape. The wide, shallow ledges are perfect for mass plantings of aquatic plants to help with this transition. The other area that needs careful consideration is the point where the stream or waterfall enters the pond.

This is a very important section for many reasons, from aesthetics, function and costs. From an aesthetic point of view, what type of water entry point is desired? A large, dramatic waterfall or a



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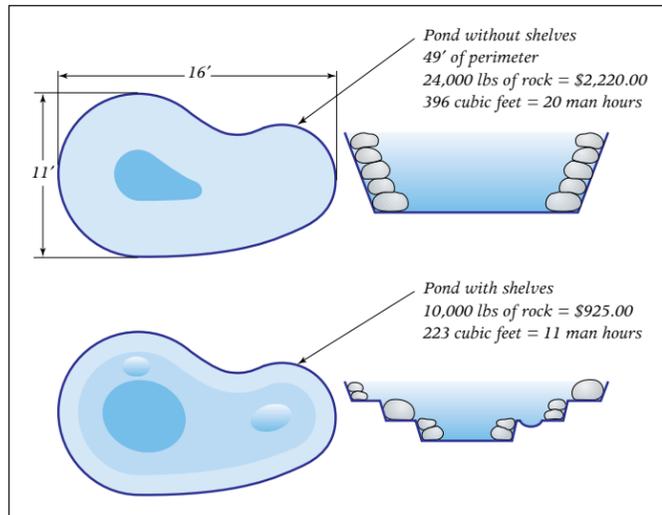
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small riffle zone? The depth of the water at this entry point has a major impact on the success of these designs. If the water is deep at this point, it will dictate the size of the boulders necessary to frame the waterfall. It will also change the sound of the waterfall, with deeper water creating base tones and shallower water making treble tones.

Shallow water at the entry point of a swiftly moving riffle area will create a natural rippling effect on the water's surface and aid in the overall pond circulation. I typically default to shallow water near the waterfall or stream entry, because it gives you the greatest number of options.

From a function and cost standpoint, deep water near



Pond ledges result in labor and material cost savings.

the waterfall requires larger boulders and a longer amount of time. Water quality is typically better with shallow water, as it will help with overall pond circulation and debris removal.

Building the Berm

The filters and piping are laid during the excavation phase as well. The biological filter is always set first, and the flexible piping follows. This is important for optimal effi-

ciency of the crew. The excavated soil can be used to create a berm around the biological filter, and its size should be equivalent to the size of the pond. In other words, if the pond is 11-by-16 and 2 feet deep, the berm should be 11-by-16 and 2 feet high.

If the biological filter is set higher, more soil will be needed to disguise it, and it may seem out of place. If it's set lower, the berm will need to be more spread out in order to use the soil. Each site should be evaluated to determine how high or low the waterfall should be. Soil usage is often an overlooked part of the construction process, and you don't want to be left having to remove soil from a project.

If the quality of the soil is

poor, organic topsoil can be brought in to be used for future plantings. The larger and broader the berm, the easier it will be to naturally incorporate plantings to help a water feature look as natural as possible.

Challenges of Poor Soil Conditions

Digging can be fun, but there are many soil types that can cause all sorts of pond-excavation challenges.

Clay Soil: Spring and fall are the best times for excavation because the clay is softer. Midsummer requires a pick-ax to chisel through the hardened clay. Clay soil in certain areas is notoriously bad, so the selling price of the job should reflect the extra time needed to complete the excavation if the soil causes difficulties.

Rocky Soil: In addition to requiring a longer digging time, rocky soil brings other challenges, including a hard subsurface to deal with after the digging is complete. In this instance, you can lay several layers of underlayment to act as an additional cushion under the liner. In severe cases, place a layer of the fabric on top of the liner where larger boulders will be set.

Bedrock: This is the toughest, because it takes much longer to dig than any other type of soil. Depending on where the rock layer is found, the pond may need to be built completely or halfway above grade. The deeper you can dig, the better the pond will look. It's tough to make a pond look natural when it's sitting 18 inches above the surrounding soil. In certain parts of the country, jackhammers are a necessary piece of equipment. It's the only way to cut through the hard layers. It can be a slow process, but extreme conditions call for creative solutions.

Sandy Soil: In sandy, loose soils, the digging is a piece of cake, but it's almost impossible to cut a ledge into it. The easiest way to handle this problem is to dig the pond with a flat bottom, with the side gently sloping

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into the middle. Once the pond is dug, you have two options. Either place boulders on the sloping sides and put gravel on the bottom, or place boulders on the bottom and backfill behind the rocks, creating gravel and boulder terraces. Planting areas and irregular ledges can be created with this method.

Considerations for Large Projects

For larger projects of 600 square feet or more, large equipment is needed to help with the excavation, large boulder placement and material handling. Once the decision is made to bring in a piece of machinery, you can take full advantage of it.

Typically, large projects run over \$10,000. Skid-steers and backhoes are the two most common pieces of equipment, but cranes and loaders can be used as well. A skid-steer can be effective in excavating the top shelves of the pond, but the bottom and final shaping should

still be done with hand tools. A good backhoe operator can maneuver around enough to do quite a bit of digging, but some handwork is still necessary to clean things up. If you don't own heavy machinery due to cost, you can subcontract the machine work. The cost of the subcontractor is calculated into the price of the project.

Whenever heavy equipment is added to a project, remember to add additional time to the project for equipment-related damage to the surrounding property that may need to be repaired or, at the very least, discussed with the clients. This includes ruts and compacted or destroyed turf.

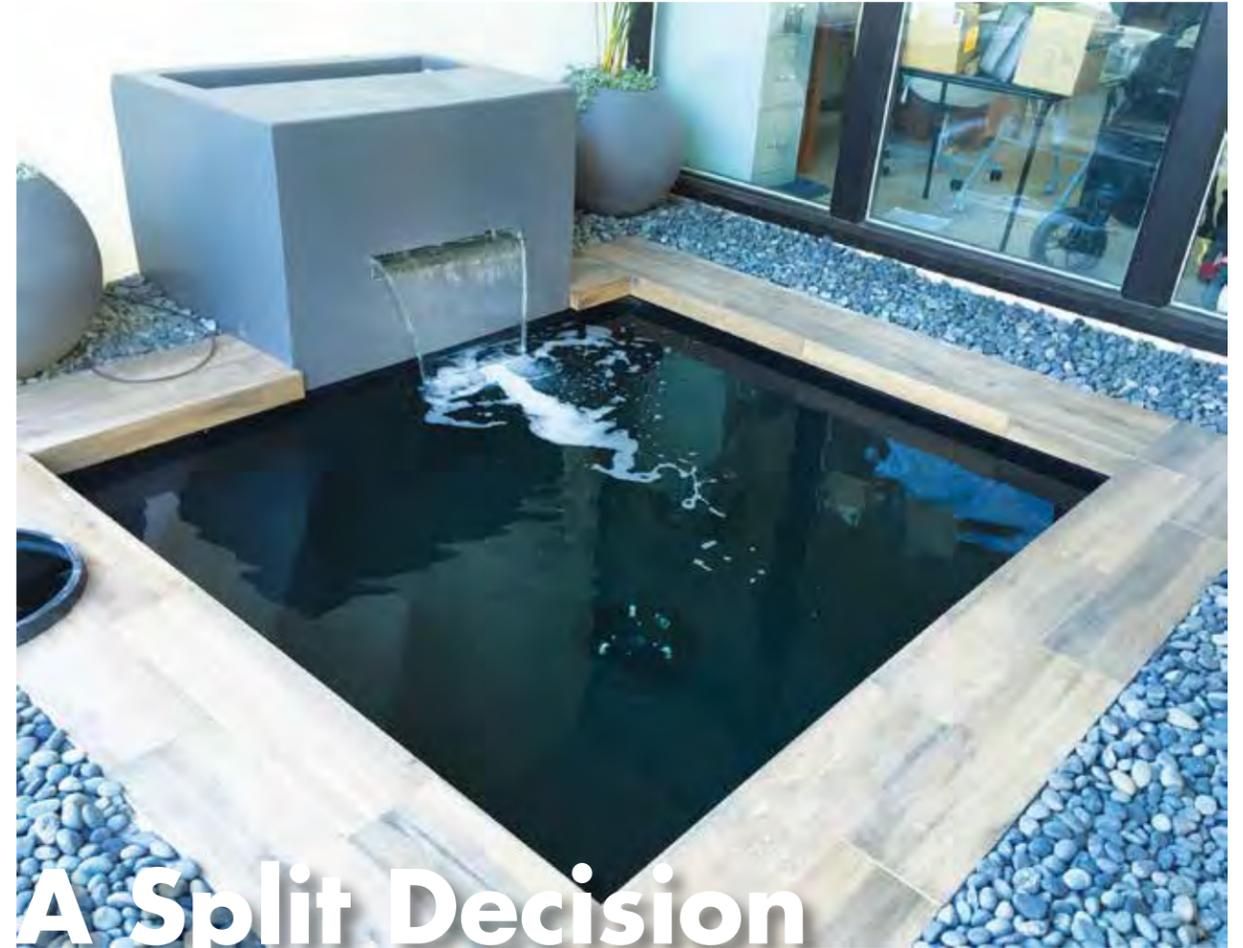
Sometimes there is a little more to excavation than meets the eye, but it's still fairly basic and just requires some common sense. If you start your project on the right foot and avoid creating extra work for yourself, everything else will fall into place, and you'll undoubtedly save time and money in the process. 

About the Author



Ed Beaulieu came to Aquascape in 1993 as a construction laborer, but a little creativity and a positive outlook on life and business helped catapult him to the position of director of contractor development and field research. Ed has successfully built over 1,000 custom-designed ponds, from small backyard water gardens to large lakes and commercial water features. He holds a bachelor's of science in zoology with an emphasis in limnology and master's studies in marine biology.

Ed's work has been featured on the cover of Architectural Digest, Better Homes & Gardens special interest publications, Nature's Garden, Irrigation and Green Industry News and more.



A Split Decision

Do-it-yourself circulation and oxygenation in a formal pond

by **Kent Wallace**,
Living Water Solutions

Creating an airlift system to both circulate water and oxygenate a system at the same time is one of my favorite pond construction techniques.

SERIES: Best Pond Practices

This is an installment of an ongoing, multi-part series. Be sure to watch for further installments in future issues!

Almost any pond can be built using an airlift system in some fashion, but formal designs lend themselves to airlifts more often than garden designs. Formal ponds are generally located in courtyards or implanted in hardscape with a small spill or no water feature at all. Using airlift circulation can be an important asset, allowing full oxygenation without

the use of a waterfall or the constant visual appearance of a column of bubbles in the water.

Recently, I received a call from a new client who wanted a small koi pond at the entrance of her home. She was remodeling her home in a very contemporary style and wanted to manage and construct as much of the pond as they could themselves, just as she had done with the rest of the remodel. The only water feature was a small spill against the wall. I supplied a basic plumbing layout along with the parts, equipment and installation instructions, and she ended up doing an excellent job. Even though she didn't completely understand how the airlift system could work without a mechanical pump, she went along with it. I promised her that if she were to construct it just as I had proposed, all she needed to do was to plug it in, and it would work.

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Far left: Prefilter and aerated biofilter with airlift. Middle: Vertical pond return drain with air ring. Right: Prefilter with static basket and outlet valve assembly.

A Game of Twos

There were two issues to deal with: first, the lack of any space out of plain view to place equipment, and second, the above-water spill feature. The spill was to be approximately 24 inches wide and about 18 inches above water level. A living water feature with the still-pond, formal look needs both oxygenated filtration and fine particle removal, so I proposed a split system.

The bottom drain would connect via a 3-inch, gravity flow pipe to a 55-gallon drum prefilter. From the prefilter, the water would flow into an airlift-operated, downflow biofilter and back to the pond. The media in the downflow biofilter was to be oxygenated, which makes it difficult to trap fine particles, so I proposed an upflow-sand and gravel filter system for the spill operated from a submersible pump in the skimmer. With only 18 inches of room between the wall and pond shell, there wasn't much space for the filtration against the wall and nowhere else to hide an above-ground filter. A skimmer needs a minimum of approximately 1,500 to 2,000 gph to operate well, which is fine for a 55-gallon drum-sized filter, but one 30-gallon drum wouldn't flow enough to work. Thus, I went with a pair of 30-gallon drums at 18 inches in diameter.

I provided the upflow-sand and gravel filters built using a pair of 30-gallon drums and connected the spill to the fronts of both. Finding a stainless spill that would work proved difficult, because most stainless spills come with a 1-inch inlet that is too restrictive for a gravity-

flow system. The client ended up ordering a spill that I modified by blocking the 1-inch inlet and adding two 1.5-inch bulkheads that barely fit.

I have cut up my share of spills over the years to adapt them to gravity flow. It would be helpful if one of the manufacturers would make a stainless spill series with inlets large enough for gravity flow. A pair of 1.5- or 2-inch, threaded bungs would be perfect, as they easily can be bushed down or blocked, if necessary.

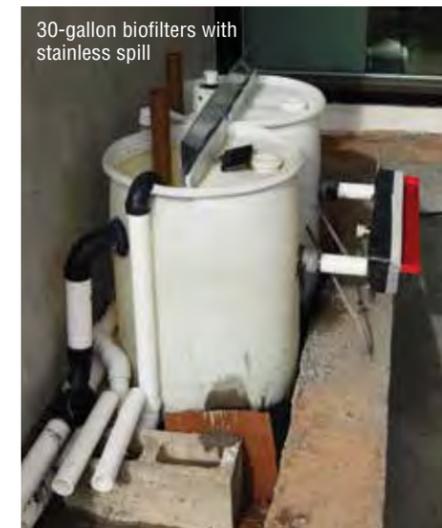
Operation DIY

The customer used her landscape crew to dig and trench for the pond, filtration and plumbing. They hired a concrete company to do the rebar and shell and managed the inspections without a hitch. I gave them a list of things the inspectors would be looking for. The pond was to be fairly square, so steps for egress were formed in one corner, and the existing courtyard lighting proved enough to pass the lighting requirement. They coated the surface with Herco rubberized pond coating, because they could do that themselves. The drain, skimmer face and returns were all mechanically clamped, as you would do for liner or polyurea.

Water from the airlift biofilter returned to the pond in two ways: one 3-inch line that returned through a vertical pond return through the center of the drain, and a 2-inch line split into two 1.5-inch returns in opposite corners. This allows most of the water to return up through the center of the pond with just enough

coming in through the corner returns to create a slow rotation.

The upflow sand and gravel filters and spill assembly were encased in a cube of concrete with just enough of an opening in the top to access the filters. A 40-watt ultraviolet light assembly of my



own design was installed in a downflow configuration in one of the sand and gravel filters to keep it out of view. I like hiding UV lights inside biofilters because it makes mounting and hiding them much easier. When installing a UV light in a downflow configuration, it is important to drill a small vent hole at the top to allow air along with a small amount of water to escape back into the system. The small vent hole prevents the entrapment of air, which can gradually form an air space that displaces water in the housing.

Air Traffic Control

The prefilter is one of my 55-gallon drum, static prefilter kits modified slightly for an airlift. While the inlet line from the bottom drain is 3 inches, the outflow from the prefilter basket and the connecting pipe between the prefilter and biofilter are 4 inches to promote better flow and lower pipe friction between the prefilter and airlift. The upflow airlift pipe is also 4 inches, so it makes sense to keep them all 4 inches. The basket screen outlet in the center of the prefilter has a valve made into it to isolate the tank when cleaning. This eliminates the burying of a 4-inch knife valve between the filters along with the expense of the valve. Water travels from the prefilter through the side of the biofilter tank at its base directly into the airlift. At the top of the 4-inch airlift upflow pipe sits a horizontal diffuser, which pushes the water out in all directions over the media in the filter.

The air coming from the air pump is split into two lines, one for the airlift and one for an air ring around the outside of the airlift upflow pipe. This air ring oxygenates the media and creates an upward and downward flowing motion in the tank, acting much like a moving bed with no floating media. I've called this system an Air-Driven Dilution Reactor, or ADDR. My media of choice for these is Bacti-twist because of its free-flowing nature and ease of maintenance, but many different media types can be used. I've built several of these filters with moving bed media, and moving beds are much more manageable



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This may sound complicated, but the end result is a small, formal pond in a courtyard with no visible equipment except for two small air pumps and the power supply for the UV light against a separate wall.

in a downflow configuration.

No matter what the media choice is, water travels up through the filter media, around the center and down through the media along the outside in a continuous cycle. The water exiting from the top of the airlift diffuser mixes with the water coming up the center of the filter and flows across to the outside, where it flows to the bottom. The cycle continues with the volume of water generated by the airlift exiting through the lower support plate and back to the pond. The air bubbles in the airlift and the ADDR are purged in the biofilter, with the water returning to the pond stripped of bubbles.

The only other accessory for the pond is an aeration ring on top of the bottom

drain cover. This diffuser ring is operated by a small air pump on a timer to come on occasionally, or to be used as a backup in case of emergency.

Placid Perfection

This may sound complicated, but the end result is a small, formal pond in a courtyard with no visible equipment except for two small air pumps and the power supply for the UV light against a separate wall. At 9 by 8 feet and just under 4 feet deep, this pond is approximately 2,100 gallons, with the only motion a small spill at one end. It's very much a still-pond experience, and my do-it-yourself clients did an excellent job. ☺

About the Author

Kent Wallace was born and raised in Las Vegas. Kent spent most of his adult life in the automobile industry at independent shops and dealerships, including his own shop as a racecar fabricator at age 24. Then, in 2001, a neighbor asked Kent if he could build her a koi pond like the one Kent's father had.



From that point on, pond building became his new passion. That first pond he built was submitted to Better Homes & Gardens magazine and won Best Courtyard Nationwide in their special-interest publication.

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Essential equipment for installing and maintaining water gardens



Quick Coupler (shown here is a Banjo Coupler)

by **Jamie Beyer**,
Midwest Waterscapes

Installing and maintaining water gardens has really changed over the years. Just like almost everything else, technology and innovation have made our profession easier. Once a new piece of equipment is discovered, you start to wonder how you ever got along without it before.

I'm going to attempt to increase your awareness about the process of discovering important equipment, hopefully increasing the efficiency of your job. Some of these ideas are not necessarily new to the market, but they might be new to you.

This equipment can be organized into three distinct categories: equipment that every installer should have; equipment for maintaining a water garden; and equipment installed in the pond to make life easier for the water gardener.

Must-Haves for Installers

Knowing the elevation lines around a water garden is extremely important to ensure the water goes where it is supposed to. There are three basic pieces of equipment that measure elevation accurately: the transit, the rotary laser leveler and the Zipline.



ScareCrow



Zipline

The Zipline is a precision elevation measurement device that sets in just seconds. It's truly a one-person operation. The first time an installer witnesses the use of a Zipline, it turns into an obsession. I had been very proud of my rotary laser leveler — and I still am — but after using a Zipline, the laser leveler seemed obsolete. Of course, you can still use a transit, which I did for years, but it takes two people to operate, and we all know the expense of labor. A rotary laser leveler is better if you have a one-person operation. The laser leveler takes some time to set up, because the tripod that the leveler is attached to needs to be absolutely level and stable. Both work well, but the Zipline does not need a tripod or line of sight. It can also be interfaced with a computer.

Installing a water feature requires the removal of

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The Toro Dingo is an example of a "walk-behind" mini skid steer.

dirt and the installation of stone, which can be very heavy and almost impossible with just a wheelbarrow, so motorized equipment is preferable. Getting in tight spots around an existing landscape is an interesting challenge with most pieces of heavy equipment. In some situations, the landscape can be torn up rather easily, or the openings between buildings and other permanent structures can prevent access with most motorized equipment

— except for the mini "walk-behind" skid steers. The larger variety of these have a rated operating capacity of around 1,000 pounds.

The Dingo made by Toro is one of the first on the market. These machines can do a lot of work in a short amount of time. They also can perform tasks in tight spots that would otherwise be extremely difficult with hand tools. They are expensive, but it is possible to rent one and try it out before you spend

the money to purchase one.

Moving large stone, of course, requires heavy equipment. Lifting and placing a stone in precisely the right spot requires it to be cradled by either chains or straps. Using 4-inch-wide straps makes the job of handling a stone easier than using chains, but a new invention called a Boulder



The Boulder Buddy

Buddy is a combination of choker straps that cradles stone securely. The Boulder Buddy goes on and comes off easily, as demonstrated in videos that can be found on the internet. I'm actually going to order a Boulder Buddy for myself! Over the years, I have usually used one or two 4-inch choker straps around the boulders, but I am looking forward to the apparent simplicity of the Boulder Buddy.

Mandatory Maintenance Tools

One of the first pieces of equipment that I recommend for reducing the amount of effort to maintain a water garden is a continuous, nonstop pond vacuum. This can save a lot of time in removing sediment, especially if a pond has a sediment pit in the bottom after installation. I define the sediment pit in the bottom of the pond as a 2- to 4-square-foot area that is 6 to 12 inches lower than the rest of the bottom of the pond. The majority of the sediment migrates to this area and can be occasionally

vacuumed out. The pit should be devoid of any gravel or stone so that the sediment can be easily removed. If there is not a sediment pit, the vacuum can still be a very useful piece of gear.

Maintaining water gardens where the water temperatures are very cold can be miserable without a pair of shoulder gauntlets or waterproof gloves that extend to the shoulder. They allow a water gardener to work in deep, almost freezing water. Of course, rubber gloves that extend just beyond the wrist will work in shallower situations.

Knowing the exact volume of a water garden is critical when adding various treatments. Whether the treatment is for chlorine removal, algae control, a disease outbreak or the determination of the fish-to-volume ratio, calculating the exact volume is very important. Of course, you can take the dimensions of the pond and perform the calculations for volume, but such calculations are almost always not entirely accurate. This could be due to the irregular edge present in a lot of ponds, shelves that might have been installed or the amount of stone that has been added at one time or another. You can also determine the volume by timing how long it takes to fill a known-volume container and then extrapolating that number from how long it takes to fill the pond. This is a more accurate method, and I have used it many times. However, putting a water meter in line with the hose that fills the pond will enhance accuracy and save time. These are inexpensive and very easy to use. For any installer, this is a time-saver, and your clients will appreciate knowing the exact volume of their ponds. Make sure that you provide this information to them in written form, as it can be easy to forget.

Adding fertilizer to an underwater plant is an interesting challenge for a lot of us. Of course, the fertilizer tabs have made this job easier, but, in a lot of situations, the tab will fall apart before it can be pushed to the root area of the plant. I have discovered that a balling gun used to administer medications to large animals works very well at getting the fertilizer tab down into the root zone of the plant. I also use a dibble to create a hole in the soil before the loaded

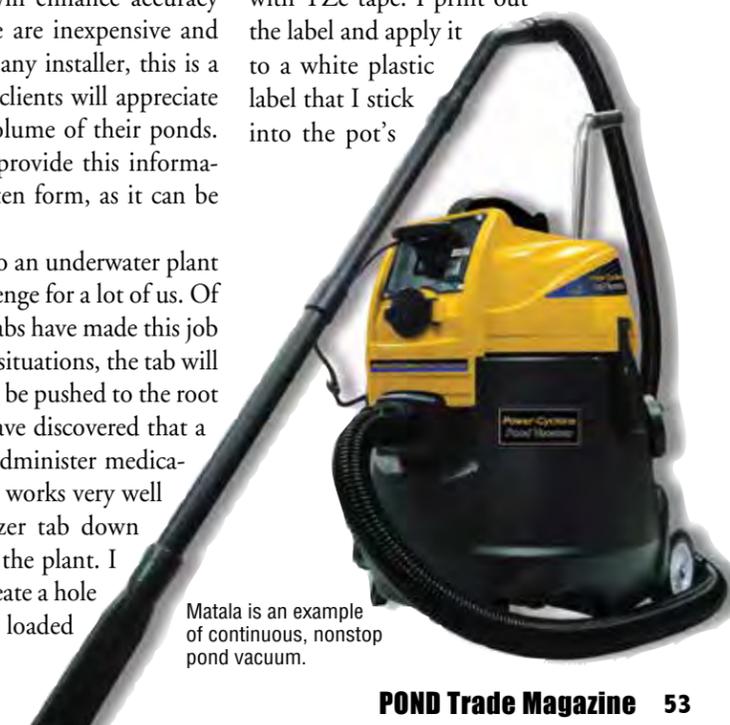


Brother labeler

balling gun is used. The roots and rhizomes of the plants may be very tight, so using the dibble first allows easy access for the balling gun tip to be pushed into the root zone.

Dividing some plants can be difficult when the root ball is so compact that even a knife will not cut through it. Using a reciprocating saw or Sawzall makes this job so much easier, creating short work of dividing root-bound plants.

Making sure that plants are labeled with the proper names and varieties is vital to be able to sell the plants and provide information about their growth habits. In the past, I used a black marker on a white label stuck into the soil, where it was barely visible. I soon found that the marker would fade where the label was exposed, and even under the soil, it would eventually fade anyway. I have since started using a Brother labeler with TZe tape. I print out the label and apply it to a white plastic label that I stick into the pot's



Matala is an example of continuous, nonstop pond vacuum.

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Balling gun

edge. These labels have lasted for at least eight years now without any indication that the printing will fade. Some labels may get pulled out for whatever reason, so in these cases, I always make sure to include an additional label in the same pot that is completely buried in the soil, just as insurance.

Water Gardening Made Easy

Installing quick couplers in place of unions where piping is coupled together is a little more expensive, but well worth the cost. Attempting to thread a union together in tight spots can be frustrating. The quick coupler makes this job much more enjoyable for the client.

Adding underwater jets in

strategic locations in a pond will not only improve circulation in potential dead zones, but can also direct sediment to sediment pits or bottom drains. Sediment removal is so much easier if it's all in one spot.

There are a lot of land critters that can create problems for water gardeners. A piece of equipment that has solved many problems for me and my clients is the ScareCrow. It works on the principle of motion detection and then sprays water with a sprinkler head in the direction of the motion. It deters deer, great blue herons, dogs, cats, raccoons and similar critters from the surrounding area. It has a 120-degree arc of motion detection, and the sprayed water will easily cover the entire detection area. The instructions say that it will protect 1,200 square feet. The downside is that you must have a garden hose hooked up to it and charged at all times in order to deter critters. Of course, it would need to be shut off during times when people

are around. I would recommend that a client have a ScareCrow available at all times, just in case an unwanted creature shows up.

These are tools I have found that have worked for me and have saved me a lot of time and headaches. If anyone has suggestions regarding other equipment that makes water gardening easier, please feel free to contact me. ☘

Water gardening has been a passion of Jamie Beyer's for more than 50 years, and he has worked on more than 1,000 ponds. He owns several very large ponds with many different kinds of water plants and fish. Jamie has a master's degree in fish and wildlife biology and is a Lifetime Master Gardener. He is the founder and former president of the Central Iowa Water Garden Association.

Jamie currently owns Midwest Waterscapes, a consulting and installation business, where he specializes in water gardens, fountains and ponds.



Fish Food 101 (and 102!)

Navigating nutrition and new legislation

by Joe Pawlak,
Aquatic Nutrition Inc.



One of the greatest pleasures you and your customers can have with a pond is throwing a handful of food into it and watching the fish chase around, eagerly consuming it. As a pond owner myself, I still enjoy sitting and watching this activity, sometimes for hours. You might not have given much thought about a fish-food pellet beyond this point, but there is more that goes into making a quality fish diet than you might think.

Fish feed can be made from a wide variety of ingredients. Some companies have a specific formula they follow very carefully, while others

of the main components of fish food.

Animal Proteins and Fishmeal

Proteins and amino acids build muscle and tissue and are absolute musts. Think of the muscle-building powders found at health stores. Like human beings, each species of fish has a specific protein and amino acid profile that it requires for optimum health and growth.

use a least-cost formulator program that helps select the cheapest group of ingredients possible to achieve the nutrient profile they need. To any person outside the food-making facility, it can be difficult to determine the specific amounts of any individual ingredient that might be found in a product. The list of ingredients that are used is quite vast.

The following is a basis of some

To date, fishmeal remains a very important source of nutrients that has not been able to be replaced by plant-based materials, such as soybeans. They balance the amino acid and vitamin deficiencies found in cereal and grain products. They are also typically the most expensive. There are many types and grades

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of fishmeal. Menhaden meal and anchovy meal rank near the top of the list in quality ingredients and routinely cost more than \$1 per pound due to increasing demand and the health benefits it offers humans — think omega-3 fish oil pills. Lesser-quality fishmeal is also available, including those made from the leftover portions of carcasses of tilapia or catfish from processing houses. In short, not all fishmeal is derived from the same source or have the same quality. Scrutinizing a label that lists fishmeal in the first few ingredients tells you very little. Other ingredients that are generally acceptable include shrimp meal, crab meal, dried milk products and poultry meals.

Other less conventional ingredients, such as silkworm pupae, are sometimes utilized as an animal protein ingredient; however, consistent availability and the possibility of spoilage from longer-term storage require the use of higher levels of preservatives or the reduction of the feed's shelf life.

Plant Proteins

Also an important part of fish diets, plant proteins add to the protein and fat content of fish food. Starches derived from plant proteins also play an important role in increasing the water stability of the feed pellet. When balanced with animal protein products, a nutritionally complete diet can be achieved. Common ingredients include products made from wheat, soybeans, rice, corn, cottonseed meal and types of yeast. In some diets using a least-cost formulation, the label may only state “plant-protein products.” This allows the inclusion of any combination of plant products without being specific.

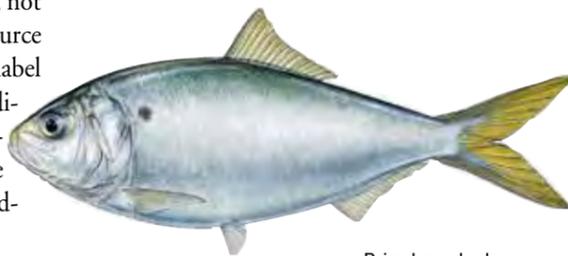
Other important additives include vitamins and minerals. Even though most individual ingredients already have vitamins and minerals in them, some are lost or degraded during the extrusion or pelleting procedure due to the heat applied. Additional amounts may be added to compensate for losses.

Fats and Lipids

Essentially, fat is energy. Lipids contain more energy per unit weight than any other dietary component. The amount of energy

needed for a fish depends on how much energy the fish requires. Cold-blooded fish do not maintain a body temperature much above their surroundings, and thus, in cooler water, they require less energy, especially during colder times of the year.

If too much fat is given to a fish, the fish could express disease or illness-related issues.



Prized menhaden supplies quality fishmeal as animal protein.

If a fish gets too little fat, it can get unhealthy or skinny. In fish foods, fat is typically applied after the pellet has been made or is included in the mix before extrusion or pelleting.

Species-Specific Diets

Just as humans and cows are both animals but eat different foods in order to thrive, the same is true for different species of fish. Koi and goldfish are different from catfish and trout, and thus, their diets should be tailored to their specific needs.

In many instances, diets produced for another species are marked and sold for a species that are not correct, especially in the case of koi and goldfish. Many times this is due to the high costs associated with custom diets, or possibly just a company's ignorance or disregard for doing what is correct. The effects may not show in the fish in the short term, but long-term effects include lower disease resistance, poor growth, tumors or deformations.

Fiber and Ash

Fiber comes from the cereal plant portions of the diet. All cereals contain some portion of cellulose fibers. This is a non-digestible portion that aids in binding the pellets together and moderating the passage of food through the gut. It is not desirable to have more than 8 percent fiber in a diet, because it would be replacing more desirable nutrients in the diet.



Intricate parts of this pelleting operation (above, left) work together at Aquatic Nutrition. Pellets are sized and screened (above, right) before packaging.

Ash is also an under-utilized portion of the feed that comes from a mixed group of ingredients, including silica or sand grains. A simple rule: the lower the ash, the better the diet.

How It's Made

Floating and sinking fish feeds are predominantly made using temperatures higher than 212 degrees Fahrenheit, producing steam. The steam acts in three ways. First, it essentially melts the starches in the diet and makes them sticky. Second, it puffs

the pellet, inducing air that makes it float. Finally, the most important part is that it adds a “kill step” to the feed. This eliminates unwanted organisms and somewhat sterilizes the feed. After the feed is made, it is fairly hot and somewhat wet and must be immediately cooled and dried. At this point, it's ready to be bagged, tagged and shipped.

New Regulations

As of Jan. 1, 2017, treating fish with antibiotic feeds requires a veterinarian feed directive, or VFD. It is now illegal to use

medications, antibiotics and medicated feeds that are considered “medically important.” This includes most commonly used compounds. A veterinarian is required to write a VFD, and compounds can only be given for prevention, treatment and control of a specifically identified disease. Until this year, there were medications available in over-the-counter feeds that were available to koi shops and their hobbyist customers. This change in the regulation is to prevent the misuse of antibiotics and the possibility of the development of resistance to the currently available antibiotics. In most cases,

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the VFD antibiotics would be directed to be used over a duration of around 10 days, always under the supervision of a veterinarian.

Under a VFD, you must establish a relationship with a veterinarian specializing in fish. A list of these can be found at www.fishvets.org. The qualified veterinarian will evaluate and write a VFD that is specific for the treatment of the diagnosed disease. This paperwork is sent to a feed company registered

to make or distribute medicated feeds. Only then will you be able to purchase the product.

Unfortunately, the time required to obtain a VFD and get the necessary antibiotics may not be short, and condition of the fish could quickly deteriorate. There is no magic bullet that can instantly fix bacterial diseases. An ounce of prevention is worth a pound of cure, as they say. Preventing aggressive bacterial organisms from taking hold is a lot easier than

treating a fish that is already infected and severely weakened.

An approach that is being developed in cooperation between Aquatic Nutrition and Blackwater Creek Koi Farms in central and northwestern Florida includes a group of natural ingredients that help fish heal quickly from injuries they may incur from a variety of sources, ranging from parasites to breeding to other environmental hazards. This new fish food is currently being manufactured at Aquatic Nutrition, and the hope is to make it available for

1938. It is comprised of new laws that require animal foods to closely follow many of the regulations already in place for human foods. According to the FDA website, it "aims to ensure the U.S. food supply is safe by shifting



Finished pellets provide bites of optimum nutrition.

the focus from responding to contamination to preventing it."

The oversight of the FSMA includes the ingredients used, the traceability of each ingredient, manufacturing practices and the traceability of finished products. Fortunately, the majority of pet food companies have already been in compliance. But unfortunately, some foreign

countries have historically cut corners, possibly to save money and lower costs. The end result of these actions cost many pet owners their beloved pets and directly led to these costly regulations for pet food producers. It is estimated that the cost of compliance to the new regulations is at least \$40,000 per year for each company. Companies that wish to produce pet foods must bear this expense and pass it on to the consumer as an increase in pricing.

The Future of Fish Foods

In my opinion, probably the biggest benefit that the internet has brought us is the availability of a wealth of information at our fingertips. The ability to access research, source ingredients and communicate among professionals has allowed the industry to grow and improve rapidly. New feed ingredients are being tested throughout the world. Substitutions for hard-to-get ingredients such as high-quality fishmeal are getting much closer to reality. Our fish and

feed manufacturers have benefited greatly from this information, and so will the end user. Necessity is the mother of invention, as they say. In the fish feed world, this is very true. We as pond keepers need safe, affordable, wholesome feeds so we may enjoy our wet pets for many years to come. ☞

About the Author

Joe Pawlak has spent his

entire life in the fish industry. He met his wife Cheryl at the World Aquaculture Conference.



Currently he is the vice president of Aquatic Nutrition Inc., where fish food and fishing baits are manufactured. He is also president of Blackwater Creek Koi Farms Inc., a series of koi and goldfish farms in central and northwestern Florida.

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Nutrition Facts

Fish require between 1 and 10 percent of their body weight per day in feed. The smaller the fish, the higher the percentage they eat.

1 ½ to 2 pounds of feed will result in 1 pound of weight gain in koi. A cow requires 8 to 10 pounds of food per pound of weight gain — a 400 percent difference!

Fish use very little energy for heat when compared to warm-blooded animals, which burn energy to stay warm.

Energy from fish food comes from the fat content. Warm water fosters more active fish, and thus a higher-fat diet.

Koi do not have stomachs. As omnivores, they have a simpler digestive track. Food stays in the fish for approximately four hours at 75 degrees. Trout have more defined stomachs, as they are carnivorous.

Protein content listed on a bag tells you very little. Quality fishmeal and corn gluten meal both contain 60 percent protein, but corn gluten meal lacks the nutrient profile that fish require.

Important vitamins in feed include potassium and calcium, both which degrade at a higher rate than many of the other ingredients.

Fish feeds should be stored in the coldest environments possible with low humidity in order to prevent mold.

the upcoming pond season. Testing at Blackwater Koi Farms has shown a lot of promise, and because it is not an antibiotic and thus lacks restrictions and side effects, it may be used continuously.

The Food Safety Modernization Act (FSMA) represents the first material changes to hit the pet food market since

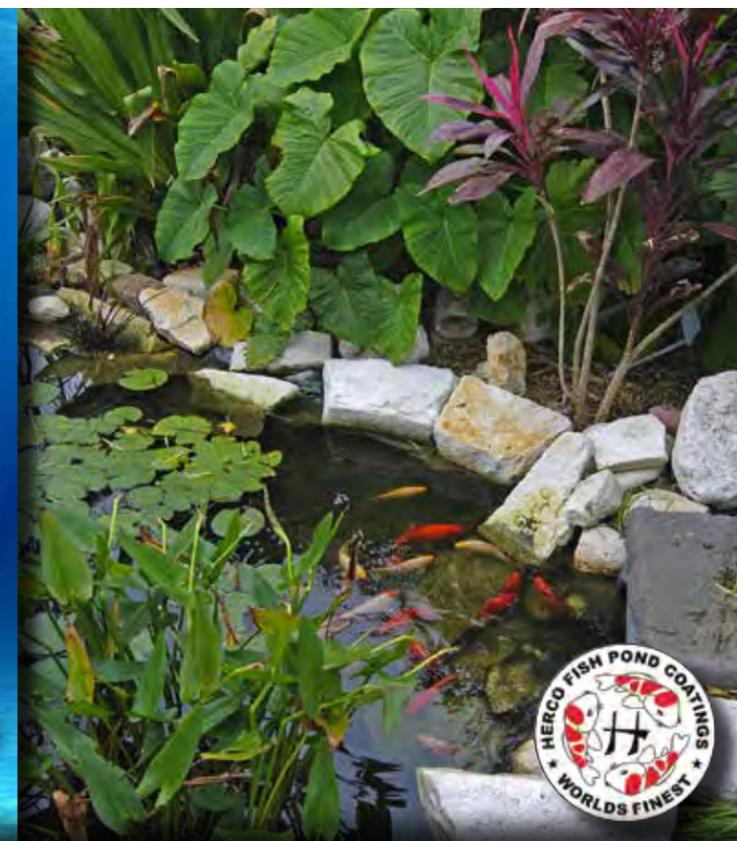
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POOL OF ROCK

Taking the transformation show on the road

by Mike Gannon,
Full Service Aquatics

Building a pond can be a bit like a rock concert. Successfully taking a show on the road requires many hometown rehearsals to make sure the performance is the way it needs to be. Each member of the group needs to know his or her role to make the rock show look effortless and wow the audience.

Many things need to happen in order to pull off a successful rock show. It starts with the setup, followed by the sound check, the first set, the second set, the encore and, finally, the breakdown. It also requires tight logistics and coordination with vendors, suppliers and even restaurants and hotels. When all these parameters have been worked out, the rock show can hit the road.

At Full Service Aquatics in

Summit, New Jersey, project inquiries come in from all over the country. Most of these don't come to fruition, typically due to the higher premium when a rock show goes on the road. However, we recently had the opportunity to hit the road for a big gig.

In July 2016, we received a one-line email that stated simply, "I want to turn my swimming pool into a pond." After some back-and-forth emails for more details, the client revealed that she was located in Tennessee. We gave her some names of local pond contractors, but she was bound and determined to work with us directly after having consumed most of our project videos online, including a two-part project video of a swimming pool being renovated into a pond. After a few conversations, it was pretty clear that we were in store for a little road trip.

The Setup

Several weeks before the project was to begin, an on-site consultation took place. I went to Tennessee to meet with the client, perform an assessment and finalize project pricing. During this time, I learned that the project would serve as a memorial for the client's recently deceased husband. Converting the swimming pool into a pond and a home for her koi was something the client had planned to do with her husband for a long time before he passed

away. It was clear that this already special project needed to be extra special.

The project was 11 hours away from our home base, so it would require us to live in a hotel, work with new suppliers and vendors in a different state and cope with an unfamiliar market. The success of the project would rely on these new and unfamiliar vendors being highly coordinated with multiple deliveries of the promised materials and equipment during 10 days of absolutely perfect weather conditions.

What could possibly go wrong?

The Sound Check

I went to meet with local rock suppliers, bulk water suppliers and equipment rental agencies, while locating all the local big box stores and making some decent hotel arrangements for the duration of the project.

We found some beautiful Tennessee mountain stone about an hour away from the project site sold by a 70-year-old little lady right off her 476-acre property.



New liner is installed (above, left) and the rocking has begun. Beautiful Tennessee mountain stone (above, right) is rinsed, and the pond is ready to fill!



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Thankfully, I found a gravel supplier even closer to the job site. Equipment rental was plentiful. Hotel accommodations, big box stores and restaurants were all within mere minutes of the job site. Delivery dates and times were set, deposits were made, hotels were booked and the rock show was going to go on — as it always must!

Back in New Jersey, the project lists were checked twice and equipment and materials were loaded up, making our trucks look just a bit like the truck from “The Beverly Hillbillies.” Our team hit the road at 5 o’clock in the morning for the 11-hour drive to the Volunteer State. Upon arrival at the job site, the excited client was surprised to see that our team went immediately to work. There was no time to waste!

Before we began, we drained the long-abandoned swimming pool. With trash pumps cranked up, the team set up the work site. When it was dusk just a few hours later, the pool had been drained, dozens of frogs were relocated and several yards of decaying, wet leaves were removed,

leaving a clean pool shell to start the next day. Sound check complete!

The First Set

Over the next several days, heavy equipment, stone screening, gravel and that beautiful Tennessee stone rolled in according to schedule. With lots of manpower and the help of a skid steer, the team began the transformative process from an abandoned swimming pool to a landscape showcase.

Stone screening was used to backfill the pool to the desired depths for the pond. Then, the underlayment and liner materials went in. The rock, stone and gravel followed quickly afterward. We crafted several luxurious fish caves and some integrated aquatic planting areas. Submersible LED lighting was installed to make for some dazzling nighttime viewing and a big wow factor.

Then it was time to install the filter components. The skimming system was composed of two skimmers that were installed in the interior of the pond instead of connected from the exterior. A submerged

pump housing was installed next to the skimmers to draw water from the lower level of the pond and distribute it through a network of water jets, circulating the interior of the pond. From each skimmer, 3-inch, flexible PVC pipe ran the exterior length of the pond, extending to large biofilters on the opposite waterfall end of the pond. All the connections were secured, and the first set was in the books.

The Second Set

As you do, we saved the choicest rock specimens for the second set. The team used larger, flatter pieces of stone for the edging of the pond, creating feeding stations and places to sit. The eye candy — the waterfall — was built 12 feet off the edge of the pond with larger Tennessee boulders and steppers to create a multi-tier, multi-cascade waterfall display with an overall height of 4 feet.

The project was progressing very nicely and according to plan. From morning until nightfall, the team was totally on our A-game, producing some pretty awesome results in a



With 12,000 gallons of clear water, this pond is ready for koi.



15,000 gallons of water in motion create a multi-tier waterfall display.

swift manner. The client, visitors, some neighbors and other contractors working on the property made their respective ways to the job site to stare in amazement at the transformation happening right before their eyes.

Once the pond was constructed, it was time to clean the interior of the pond in advance of the arrival of water trucks. After some rinsing, rinsing and more rinsing into the twilight hours, the pond was ready to be filled. Like clockwork, the local vendor showed up on time and prepared, letting the water flow. And flow it did. It was a perfect way to end the second set.

The Encore

It had been a really good show to this point, but now it was time to make some memories. The client and our entire team gathered for the startup.

First, the air pump began, throbbing to the surface bubbling and popping away. Then we started one pump at a time.



This swimming pool transformation turns a landscape eyesore into a landscape showcase.

The first pump controlled the submerged water jet system. We checked the output on each jet, and all of them ran strong, circulating water inside the pond. The second and third pumps controlled a skimmer and a biofil-

ter each, and when they were turned on, the pond immediately started skimming while the waterfall display came to life. A

cascade dropping into the pond. Next, the light show kicked on, and the interior of the pond glowed. The waterfall sparkled, and watery effects of light were cast onto the surrounding landscape. Our team performed one last number and released the client's koi into their new amazing pond. The pond was truly complete now, running beautifully. Our client shed tears of happiness and expressed many other strong emotions. The encore had made the impact we needed. Now it was time to start the breakdown, which began immediately following the last note of the Encore.

trickle became a 15,000-gallon-per-hour crescendo of water flowing, churning and jumping, with multiple cascades dropping, twisting and turning into small pooling areas. They came together into a thick, single

cascade dropping into the pond. Next, the light show kicked on, and the interior of the pond glowed. The waterfall sparkled, and watery effects of light were cast onto the surrounding landscape. Our team performed one last number and released the client's koi into their new amazing pond. The pond was truly complete now, running beautifully. Our client shed tears of happiness and expressed many other strong emotions. The encore had made the impact we needed. Now it was time to start the breakdown, which began immediately following the last note of the Encore.

The Breakdown

The rock show was a hit, but now it was time to hit the road again. Site cleanup was efficiently completed, and we loaded the gear and equipment back



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onto the trucks — a little less “Beverly Hillbillies-like” for the early-morning ride back to New Jersey.

After 10 days and 1,300 miles of travel, with five guys working from morning until night, the pond looked amazing. During that time, more than 120 tons of materials were processed, and an old swimming pool was transformed into an aquatic paradise. The pond came in at 12,000 gallons with a 4-foot maximum depth, featuring professional-grade filter components and lighting. It

was a rock show to be proud of!

As the last koi was introduced to its new home and swam off into the pond, our client quietly let us know that it was exactly four months to the day that her husband had passed away. It was not by plan, but it certainly seemed like a most appropriate situation, properly acknowledging the real meaning behind the renovation project. New life was introduced to the pond as we celebrated another life that was lost too soon. ☘



About the Author

Mike Gannon is the owner of Full Service Aquatics based in Summit, New Jersey. Mike has been a lifelong pond enthusiast and fishkeeper. Mike began Full Service Aquatics after working as a fish dealer and a stint at the New York Aquarium. FSA has been specializing in pond

and water feature design and services since 1995.

Mike is host of The Pond Hunter Radio Broadcast found on iTunes. His Pond Hunter videos can be found on www.youtube.com/thepondhunter, and he is the author of the Love Your Pond blog found on fullserviceaquatics.com.

Trade News



New Extended Warranty for APCs

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To see full press releases and additional news items, visit www.pondtrademag.com/category/trade-news

Trade News



The Secrets of Koi Unveiled!

Jos Aben's new book doesn't pull any punches in candidly revealing the secrets to koi. The devil's in the details as

he reveals what no other breeder wants to tell you, such as how to see the potential and quality on a small koi and how to identify poor-quality koi.

Learn how to see skin quality by looking at the fins and understand how body confirmation can be an indicator of future development. He reveals details about proper head shape, *fukurin* and the depth and distribution of colors and layers of the koi's skin. You'll also understand why *sumi* can appear or disappear. Aben also shares secrets of how to grow your koi, including proper diet, feeding, temperature and breeding tips. His advice will equip you with the best chance of having beautiful koi.



In the book, you will also find detailed information on breeding and selection, considering the shape, length and placement of the fins. You'll also read about the differences between male and female koi, including growing and eating behaviors, body shapes and *shiroji* quality.

It is not a book about how beautiful a koi can be. Instead, it's about how to see and recognize quality in all aspects of koi.

For more information, contact Shawn Rosen at 516/809-6771, email sales@koimarket.com or visit www.koimarket.com/product/jos-abens-the-secrets-of-koi-unravelled/.



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Aquascape's Backyard Waterfall Landscape Fountain Kit includes:

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- Kink-free pipe (1.5 inches; 10 feet);
- AquaSurge® 2000 Pond Pump;
- AquaSurge low-suction intake attachment;
- Installation kit; and
- Welcome kit.

The Backyard Waterfall Landscape Fountain Kit is perfect for DIY enthusiasts who desire an easy weekend project, but it can also be used by professional contractors for smaller projects. The 3-foot waterfall fits into almost any landscape, making it a versatile option for both residential and commercial applications.

For more information visit www.aquascapeinc.com or call 866/877-6637 (U.S.) or 866/766-3426 (Canada).



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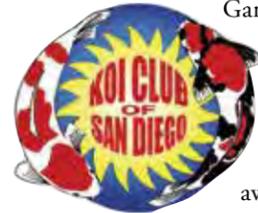
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30th Annual Koi Show: Koi Club of San Diego

Don't miss the largest west-coast koi show March 4-5 in Del Mar, California

There will be more than 300 koi on display in competition, from 6 inches to 3 feet long. Described as "living jewels," koi can live over 100 years. Learn how to build your own koi pond and waterfall, turning your backyard into a tropical paradise. Vendors selling koi art, koi T-shirts, koi fish of all sizes, pond and pump equipment, koi food, patio furnishings, pond and water garden design, solar power, water garden plants and free advice for your koi pond or water garden. Admission is free. The show is located in the Activity Center, next to the Spring Home/Garden Show, Del Mar Fairgrounds.



It's fun for the whole family!

The hours are 9 a.m. to 4 p.m. on Saturday, March 4 and 9 a.m. to 3 p.m. on Sunday, March 5. Judging starts at 9 a.m., and the awards banquet will take place at 5 p.m. on March 4.

The address of the Activity Center is 2260 Jimmy Durante Blvd., Del Mar, California.

For more information:
Dr. Bob Adler show@koicsd.org
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The International Water Gardening Society Symposium Set for August

It's official — Longwood Gardens will host the IWGS 2017 Annual Symposium Aug. 9-11, 2017. The theme will be "something for everyone, going back to the garden." Start planning now! More details are coming soon. www.iwgs.org



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