

A Jewel in the Woods

By Bill Drakeley

It happens only rarely, but occasionally you run into a client who wants to do things out of sequence. Working with a property owner who insists on an unconventional approach to a project can be a challenge. However, it definitely helps when that client is also open-minded, imaginative, and absolutely set on achieving brilliant, gemlike results.

Most often, we are asked to work on projects where there is an existing home that needs a watershape. Just as commonly, we are brought in when a home is being built at the same time as a new pool and its associated environment. In the case described in this article, however, our client owned a 20 acre (8 ha) site with little more than a modest existing farmhouse on the property. While he planned to replace that structure eventually, he told us, having teenage children meant that the fun parts needed to come *first*.

We could not argue with his logic, so we signed on to build a pool, a spa, and the surrounding decking, while the adjacent tennis court and pool house were to be handled by other contractors (Fig. 1).

A BOLD VISION

Our work on the property, located in the wooded hills of Roxbury, CT, actually started several years before the pool project came into focus. Back in 2006, Drakeley Pool Co. (Bethlehem, CT) was contracted to build a meditation pool to memorialize the client's late wife. The water feature was situated in a garden area where the two had been married and included an antique olive press.

This was our introduction to both the client and the setting. His architect had sought us out based on our skills in concrete construction and our reputation for building unique water features throughout the region. It was a straightforward job, but it required a tremendous amount of sensitivity and creativity.

Our thoughtfulness on this project led the client to contact us when the discussion turned to the new pool and spa. When that time finally came, however, we were working in somewhat of a vacuum: there was a place on the plan for a house, but there were no fixed reference points when it came to scope and scale to guide us.



Fig. 1: Working with a property owner who insists on an unconventional approach to a project can be a challenge, but when working together, the final watershape can achieve brilliant, gemlike results

What we *did* have, fortunately, was the certainty of the adjacent tennis court—so we used its size and proportions to trigger our thinking. We drew up preliminary ideas for a side-by-side pool/spa composition, linking its features into the lines established on the paved surface just one level above our working space. Both pool and spa featured knife-edge-slot, perimeter-overflow designs that gave them the appearance of floating above the surrounding deck.

The watershapes and tennis court are not exact counterparts—at 25 x 80 ft (7.6 x 24 m) overall, the pool/spa footprint is not regulation tennis court size—but there is nonetheless a strong sense of visual balance. To articulate the connection, we aligned the pool's top step with the steps leading down from the court, tying the two levels together whether you are looking up from the pool deck or down from the court.

But even though the client was quite imaginative and creative, he wanted more detail than our sketches showed. So, equipped with our plans and photographs of the property, we worked with Skip Phillips and Greg Boruff at Questar Pools & Spas (Escondido, CA) to generate a computer-assisted, three-dimensional (3-D) presentation package.

The client was pleased with the 3-D renderings, commenting that what he was seeing was just what he always wanted. He then began describing the watershapes as the “jewels of the property,” using a word that would take on unusual significance as the project progressed.

DEVILISH DETAILS

We started our work in earnest, excavating the site and encountering the usual run of small fieldstones as well as moisture-retaining cohesive clay soil that leads to significant freezing-and-thawing pressures. Not wanting to take any chances of the decks heaving, we installed a subdeck/subpool dewatering system that constantly drains to an outlet pipe located downslope from the pool.

We then set about forming the spa and its unusual pair of thermal ledges alongside the pool and established everything required for the two vessels' perimeter overflows (Fig. 2(a)). The pool and spa were to have entirely separate plumbing systems—separate surge tanks, separate circulation systems, separate *everything*—but what they did have in common was a narrow wall that marked the divide between them (Fig. 2(b)).

For design purposes, that wall had to be thin—no more than the width of the coping system we were using. This had consequences: We knew that if we tried to insert our customary slot-drain piping for both vessels into such a narrow wall, the shotcrete coverage of the two pipes would have violated the basic American Concrete Institute (ACI) concrete cover requirements and would have been so minimal that our annual freezing-and-thawing cycles would eventually end up shattering the wall.

Technically we would have designed the common wall between the spa and main pool as two slot-overflow systems. This means a gravity polyvinyl chloride (PVC) trunk



Fig. 2(a) and (b): The pool and spa cover a lot of ground—nearly the size of a regulation tennis court, which meant using a massive amount of reinforcing steel and pipe, and keeping track of the large number of PVC lines as they moved toward and into the equipment vault/surge tank bunker

line for each atmospheric flow off each edge (pool and spa). The main-trunk PVC gravity lines for each pool would have to have been installed adjacent to one another inside the 18 in. (450 mm) thick common wall for pool/spa connection. Inside dimensions for PVC piping are 6 in. (150 mm) and 4 in. (100 mm), respectively. Add the PVC wall thickness to this and you end up with almost 12 in. (300 mm) of plastic taking the place of concrete within the common wall. On top of that, add two layers of No. 4 (No. 13M) reinforcing bars with a 1/2 in. (13 mm) diameter and one can see that there is not enough room to get quality placement of wet-mix shotcrete around the entire diameters of both pipes, especially because there would be no spacing gaps between each pipe to get the recommended 3 in. (76 mm) of concrete coverage. With the plastic pipe taking the place of concrete and steel, winters in New England would have surely damaged the pool wall in such a way that watertightness and bond of the surface textures would have been difficult.

Instead, we set the wall up as a monolithic structural concrete wall and cut out channels on both sides before it



Fig. 3: Construction included the special slot-drainage system built into the narrow wall dividing the pool and spa

fully cured (Fig. 3). On the pool side, the slot empties into several dropouts, and on the spa side, we cut the slot with a slight rise in the middle, so gravity will lead water to the sides of the spa and their drainage pipes. While it was a lot of work, it was the right engineering solution for this detail and created the very specific look we wanted.

We used toe-kick recesses to aesthetically rid the pool floor of unsightly plastic fittings. To accomplish this, we took 3 ft (0.9 m) anti-entrapment, narrow-strip drain fittings, inverted them, and placed them on the vertical side of the benches or steps (Fig. 4). A very important aspect in using



Fig. 4: Formed toe-kick recesses for the pool and spa circulation systems

this approach is to box out the forms in a 3-D format to allow for overhead or cantilevered concrete placement. This requires a qualified shotcrete crew and nozzleman to shoot around this boxed form to not trap rebound and get full encapsulation of the fitting.

The original design featured glass tile applied to the interior of the spa as well as the tops of the pool steps. As the project progressed, the client decided to further expand on his “jewel” concept by having us tile the pool from end to end. The client had previously selected a custom blue blend of 3/4 in. (19 mm) glass mosaic tile from Bisazza (Miami, FL) for the pool house. Now he wanted us to carry that look throughout *both* watershapes, creating magnificent, sparkling jewels in the middle of the property.

Because we had been operating under the assumption that the pool would have a plaster finish, we had created a radiused floor/wall connection and left the concrete in much rougher condition than we would have had we known the pool was to be tiled.

The new tile finish, chosen by the owner after concrete placement, changed the required final surface texture. By this point, we had already tested the shotcrete at 6000 psi (41 MPa) and had tank-tested the shell, filling it to verify its watertightness.

With standard plaster, a cut or rodded concrete texture creates a roughened surface that provides terrific bond and hold for that surface. Wet-mix shotcrete mixtures generally have a coarse aggregate size of 3/8 in. (10 mm) max. This rough 3-D bond plain is ideal as a securing mechanism for final submerged pool plaster. However, it is not perfectly straight in vertical and horizontal planes. A glass tile would follow these peaks and valleys in the surface and the variation would be very noticeable. So, we added a smoothing combination of pool plaster and Laticrete® products to densify the shot surface and level out the bond plane to the exacting surface requirements of the glass tile (Fig. 5).

As we continued tile installation, the stonemasons placed the granite decks—a beautiful material honed to give it a slightly rough, slip-resistant texture.



Fig. 5: Smoothing the shot surface to level out the bond plane

HILLTOP BEAUTY

Although the work under our purview went smoothly, we experienced a fair share of communication issues with the general contractor who worked on the pool house. As part of our work, we had set the foundations for the walls and step systems leading up to both the tennis court and the pool house. Without consulting us, the contractor cut away certain portions of that foundation and managed to cut through some of our lines in ways that gave rise to both tension and consternation on site.

Those issues were ultimately resolved—and yet another lesson duly learned on the importance of jobsite communication across disciplines. We soon completed our work, including the rigging of a downslope building that contains two surge tanks, twinned equipment sets, an equipment-storage room, a generator bunker, and a secure space for the homeowner to use for storage.

Eventually, a grand home will take shape at the end of the pool opposite the pool house, and the view from the watershapes will shift away from the nearby trees and over to the longer, far lovelier downslope view. Sheltered from the breezes, the watershapes stand 1/4 in. (6 mm) below the deck surface, giving them the glassy, reflective, jewel-like appearance that captured the homeowner's imagination during the design process (Fig. 6).

While the client's focus was rightfully on the visual appearance of the final project, as a company we must balance that sort of aesthetic perspective with the raw practicalities of ensuring the structures are mechanically, hydraulically, and structurally sound and durable. The fact that we can do so without sacrificing aesthetics is what has earned us our reputation in our region and in the industry.



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Examiner for the ACI Certified Nozzlemen program on behalf of ASA, 2016 President of ASA, an ASA Technical Adviser, a Genesis 3 Platinum member, and a member of the Society of Watershape Designers as well as Chairman of its Advisory Board. Drakeley teaches courses on shotcrete applications at the Genesis 3 Construction School, World of Concrete, and numerous other trade shows. He is a contributor to Shotcrete magazine and other industry publications.



Fig. 6: Completed pool and spa

Solemnity and Beauty

As is mentioned in the accompanying text, our first project on the property was constructing a fountain the client—a widower with two teenage boys—wanted to establish as a memorial to his beloved wife, who had passed away some years earlier (Fig. 7).

She had worked in and loved the property's garden area, which had been the setting for the couple's nuptials years earlier and was the obvious choice for placement of the memorial. The client was very clear about what he wanted: an antique stone olive press set in a basin with water flowing over a millstone core. With the certainty of his vision driving our work, the task was a simple pleasure.

More importantly, we impressed the client and his architect with the trouble-free quality of our work—a fact that led to far greater involvement with the property later on.

—Bill Drakeley



Fig. 7: Memorial fountain