

Scheiner Watershape



View from house over terraces and main pool

The homeowners live and work in Manhattan with their teenage son. When they want to relax, however, they all head upstate to their home overlooking the Hudson River Valley. They recently renovated their weekend home—now in a distinct modern style—so the existing vinyl liner pool no longer related to the new look. The homeowners approached us to design and construct a watershape that would not only open up the view to the valley but also fit their modern taste.

After several drafts, our final design consisted of a perimeter overflow spa and negative edge swimming pool, with a multi-level runnel system connecting the two bodies of water. Within the main pool, there was a dividing wall that created a private sitting area in the shallow end. The

homeowners were excited about the unique spaces that were proposed. Now we had to focus on turning this unique watershape into a reality, which took significant thought and preparation.

We decided to employ the shotcrete process, as it would allow for the efficient creation of the repeating curves seen in the pool design as well as the creation of the multiple shapes and elevation changes within the runnel and spa complex. The dry method of shotcrete proved particularly versatile on the project, as it allowed breaks in the shooting, thereby giving the crews shaping the details time to catch up. Strategies were discussed during advance meetings with the shotcrete company, and we ultimately decided to shoot the project in four phases.



Stone-filled bags used to create floor profiles of pool and catch basin



Reinforcing steel of main pool with interior dividing wall



Main pool being shotcreted with tapered and curved negative edge



Walls formed for raised perimeter overflow spa



Large diameter plumbing to reduce water velocity and increase efficiency



Overflow spa with connecting runnel beyond

After the demolition of the existing pool, focus was put on the construction of the new pool and its catch basin. The location of the undisturbed grade was determined through site analysis, which was also of proper bearing capacity (1000 lb/ft² [4882 kg/m²]) as required by the structural engineer. This information was used to calculate how far away from the house the pool could be located to give the desired effect of the negative edge. Where the negative edge pool sits on the property is a critical choice as it relates to the downhill views.

Construction began with excavation and the stacking of crushed stone bags that created the various floor profiles. Much consideration was taken with the forming, ensuring the forms were properly braced to avoid vibration during the shotcrete application. Wood forms were used in lieu of the more common “steel-tex” material to help achieve the necessary rigidity.

Reinforcing of the shotcrete was accomplished by the use of No. 4, Grade 60 deformed steel reinforcing bar. Besides the obvious addition of

tensile strength, the reinforcing bar was installed within the interior elements of the pool (steps, benches, and dividing wall) to aid the nozzle man in applying the shotcrete in a timely manner.

Using a 4:1 mixture, the shotcrete company began the first phase by applying 80 yd³ (61 m³) of shotcrete to the pool shell. Careful to throw out rebound and trimmed material, they left a tapered, clean joint between the negative edge wall and adjacent catch basin. After stripping the forms and cleaning and saturating the shotcrete joint to a saturated surface-dry condition, the catch basin structure was shot using 23 yd³ (18 m³) of shotcrete. The next 7 days were spent soaking the structures to aid in hydration. The pool’s structural shell was now complete.

The second half of the project focused on the perimeter overflow spa and multi-level runnel system leading into the pool. The first step was to form the bases of the spa and runnel system. Beneath the runnel, we excavated down 3.5 ft (1.1 m) and installed local 0.75 in. (19 mm)



Spa with red concrete panels overflowing to runnel into pool



Interior dividing wall just under the surface of main pool



Stone walls with piers bordering negative edge



Still surface waters of spa and pool reflecting in the late afternoon

crushed stone as engineered fill to protect against frost heave. Phase 3 occurred about 2 months later, at which time the spa base and runnel were shot using a total of 15 yd³ (11 m³) of shotcrete. The fourth and final shotcrete phase came later that month and entailed shooting the spa walls, benches, and steps, which took 12 yd³ (9 m³) of shotcrete.

The shells were now ready for the installation of fittings and masonry finishes: natural stone, ceramic and glass tile, aggregate plaster finishes, and custom precast red concrete panels on the spa. By this time, the outside temperature was dropping and the winter winds were picking up, so the remainder of the finish work was put on hold until the spring.

As we found out early on, it was relatively easy to design the structures, but building them was quite a different story. The success of this watershape relied on moving water without loss; shotcrete's abilities and characteristics enabled that success.

Although this project eventually included landscaping, masonry, and carpentry, there is no doubt that the focus of this property was to be the pool. The versatility of shotcrete allowed all phases to proceed with relative ease to create this unique pool setting, much to the homeowner's satisfaction.

We are positive that without the use of shotcrete, we would not have been able to accomplish this multi-dimensional project.

The Outstanding Pool & Recreational Project

Project Name

Scheiner Watershape, Hudson River Valley

Project Location

Cold Spring, NY

Shotcrete Contractor

Shur Shot Gunit Corporation

General Contractor

Group Works LLC*

Architect/Engineer

Group Works LLC*

Material Supplier/Manufacturer

Shur Shot Gunit Corporation

Project Owner

Marcia and Richard Scheiner

*Corporate Member of the American Shotcrete Association