

2011 Outstanding Architecture Project

Soleri Bridge and Plaza

By Donna Isaac and Laurel Mellett

Fisher Shotcrete, Inc., is very excited to receive the 2011 ASA Outstanding Architecture Project Award for the Soleri Bridge and Plaza project. This project was very interesting from the start and is a great example of the flexibility of shotcrete in so many applications.

The Soleri Bridge and Plaza was commissioned by Scottsdale Public Art and is owned by the city of Scottsdale, AZ. The plaza, which is managed by the Salt River Project (SRP), is a 2 acre (0.81 ha) parcel that runs along the Arizona Canal—a major canal—and is the heart of the city's downtown underground utilities. The bridge spans the 130 ft (40 m) canal and forms a new pedestrian link between downtown Scottsdale retail shops and restaurants and the residents on

the north side of the canal. Constructing this project and anchoring two 64 ft (20 m) pylons and two 22 ft (6.7 m) pylons for the bell assembly took extraordinary teamwork between Scottsdale Public Art, Paolo Soleri, the city of Scottsdale, SRP, and the entire contracting team.

The Soleri Bridge commission began nearly 20 years ago. Paolo Soleri, the internationally recognized architect, artist, and philosopher, is the man behind the design and commission of this bridge. In the 1940s, Soleri came to Arizona and studied with Frank Lloyd Wright at Taliesin West. By the 1950s, he was gaining international recognition for his design work, most notably for a bridge design that was published by the Museum of Modern Art. Soleri settled in the Paradise Valley



Final project

community in Arizona adjacent to Scottsdale. His residence, Cosanti, encompasses a gallery and studio, where Soleri lives and works on his urban planning ideas, specifically what he terms “arcology”—a blend of architecture and ecology. Located just north of the Phoenix metropolitan area, Arcosanti is a self-designed and enclosed community. It has been under construction for 40 years and is the heart of the Cosanti Foundation.

Arcosanti also houses the Soleri Archives, an impressive overview of the architect/artist’s life’s work. Whereas building communities has been Soleri’s key focus, his bridges have allowed him to experiment with space, materials, and design. Soleri’s bridge designs span 60 years, yet Scottsdale’s bridge is the first to be commissioned and completed by Paolo Soleri.

Fisher Shotcrete, Inc., was engaged by Howard S. Wright and Hunter Contracting to complete the smaller, 22 ft (6.7 m) pylons that display Paolo Soleri’s famous bells, which were cast in 1969. Shotcrete was also used for the structural walls on the canal bank, the decorative structural walls that surround the plaza as retaining walls, and the monument wall at the main entry point. These walls display an artistic drip method that is characteristic of Soleri and one that he devised for his early structural buildings at Cosanti.

This bridge was designed as a sundial and is meant to showcase solar events by allowing the sun’s shadow to be viewed as a shaft of light. The bridge is laid on a true north axis, so the accompanying pylons, with their 6 in. (150 mm) gap, allow the shadow of the sun at precisely solar noon to become a shaft of light, illuminating a red line that leads the pedestrian’s eye across the bridge. At the summer solstice, when the sun is highest in the sky, no shadow is seen. At the winter solstice, when the sun is lowest, the shaft of light reaches the bridge deck and the shadow is longest. This shaft of light can be seen each solar noon, but the length and skew of the shadow along the red line depend on the time of year. Spring and autumnal equinox celebrations also take place at this open public space. The precise alignment of the bridge was crucial, as the pylon placements were keyed from it.

Initially, the smaller 22 ft (6.7 m) pylons were intended to be closed like the larger pylons. Soleri, however, decided to open the smaller set of pylons on the southern side, enclosing the Goldwater Bell Assembly to mimick a bell cloister. The special red paint forms a unique and dramatic backdrop to the cast bell assembly by day and night. The small pylons serve as anchors and are the weight-bearing source for the bridge cabling. The formwork for these pylons was produced on site. It was a one-sided template that required the exposed surface to have a smooth



Anchor pylons shot using a template



Anchor pylons with orbital sheath and paint

trowel finish. The interior side is painted with a natural material to allow for bonding with the shotcrete and is highly resistant to the strong light from its southern exposure. The exterior of the pylons matches the orbital finish of the steel with both the larger pylons and the bridge. The outer orbital steel for the smaller pylons, however, was fabricated off site in Tucson and then shipped to Scottsdale. Engineers fabricated this outer surface as a cover so precisely that it could be slipped over the 22 ft (6.7 m) pylons effortlessly and anchored in place. Shotcrete, inherently a flexible material that requires less curing time,



Drip method

proved advantageous for this project and helped reduce the overall budget by needing only the one-sided form.

The plaza's surrounding retaining walls reflect the characteristic Soleri drip method. Soleri developed this concept of the drip walls during his early building years at Cosanti in the late 1950s. Not wanting to waste any material, Soleri used the last bit of material or slurry left in the concrete mixer for finish texturing of cast walls or panels. He did this by mixing the left-over concrete with sand, water, and some indigenous earth. This slurry mixture is then dripped on the sloped retaining wall or panel for an appealing, unique look. Soleri has joked that the motivating factor behind the development of this process is that he is a child of the Depression and therefore does not want to waste anything. Although the strength of the concrete is decreased by the additives, it remains more of a structural accent than the use of the silt or dirt alone. The walls of this plaza have thicknesses varying from 6 to 12 in. (150 to 300 mm). Soleri was on site while these walls were constructed and during the finishing process, and he often directed the crew to angle the walls in a certain way or degree. This resulted in the diamond-facet aesthetic. While Soleri did allow the crew carte blanche in cutting several of the angles, for



Drip method and earth-cast wall

the most part, he directed how the angles were cut and faceted.

Although this method does not involve shotcrete, the earth-cast panels, another signature method Soleri perfected, are displayed in the plaza. When first experimenting decades ago, Soleri realized that by just digging a hole in the earth, you could actually use a casting method that allows finished pieces to stay connected to the earth. It was through this realization that his method was honed. By creating a silt and clay form on the ground using those materials and the right balance of water, a mold is created. For the most part, the colors added to the concrete used in his pieces are earth tones, as they incorporate the colors and textures from the soil itself. The earth-cast panels displayed in this plaza are crucial to the design. Their totemic forms and size provide an almost intimate gallery setting as they rim the south edge of the plaza.

This project is a fantastic example of why shotcrete is such a great option for artistic ventures. The general construction team looked at different options to bring Soleri's vision for the bridge, pylons, and art elements to realization. Because shotcrete can structurally anchor and aesthetically please, it was selected over precast options.

Since starting out in the swimming pool segment of shotcrete over 25 years ago, Fisher Shotcrete, Inc., has been very aware of the intrinsic artistic nature of the material. The ability to have curved or skewed lines in the same space as straight lines allows a multitude of options in many types of applications. Whereas commercial applications typically don't demand

such renditions, an architectural application such as this open-air plaza is where the use of shotcrete really shines.

Over a 6-month period, 203 yd³ (155 m³) of shotcrete was placed for all elements of the project. The Soleri Bridge and Plaza was dedicated on December 11, 2010—just in time for the winter solstice!



Donna Isaac is a Senior Project Manager with Scottsdale Public Art. From 2005 to 2008, she worked as a Public Art Project Manager with the city of Phoenix Office of Arts and Culture. She also served as Public Art Manager for the

Arizona 9/11 Memorial. Isaac has been an independent art critic and journalist for newspapers and magazines in France, the U.S., and Canada. She has worked in public process and public participation internationally with the European Union and the Norwegian Ministry of Foreign Affairs, with projects in Hungary, Kosovo, and Macedonia. She has also worked with tribal communities as a Facilitator and Cultural Consultant for cultural resources and facilities. Isaac received her MA in art history and her museum training at the École du Louvre in Paris, France. She has consulted with various communities, Maricopa County, the Maricopa Association of Governments, and the state of Arizona on a variety of public art and community engagement projects.

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Project Name

Soleri Bridge & Plaza

Project Location

Scottsdale, AZ

Shotcrete Contractor

Fisher Shotcrete, Inc.*

General Contractor

Howard S. Wright

Architects/Engineers

Douglas Architecture & Planning and Steve Martino & Associates/Gookin Engineers

Material Supplier/Manufacturer

Arizona Materials

Project Owner

City of Scottsdale

*Corporate Member of the American Shotcrete Association



Laurel Mellett is the Operations Director for Fisher Shotcrete, Inc., which includes the Industrial Coatings Division of Fisher Epoxy Solutions in Gilbert, AZ. She grew up in the shotcrete industry, starting her career by helping with the

day-to-day operations of the family shotcrete business. She worked in the shotcrete business while attending Arizona State University, where she received her bachelor's degree in both marketing and management and her International Business Certificate. While participating in a university exchange program, Mellett received her Diploma of Management Studies from the University of Bradford in West Yorkshire, England. Her research interests include internal consulting and operations management. Mellett has served on many ASA committees and is a member of the American Concrete Institute (ACI) Committee 506, Shotcreting.