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CNC MACHINERY HELPS CREATE UNIQUE STONE DESIGN FOR ASU FACILITY

The sky is the limit for streetscape revitalization plan

Continuing Education: Award winning projects featuring natural stone

NATURAL STONE INSTITUTE

Innovative stone solutions aid design of new church sanctuary

ARCHITECTS AND STONE FABRICATORS WORKED TOGETHER TO SUCCESSFULLY TRANSPORT AND PLACE SEVERAL-THOUSAND-POUND PIECES OF MARBLE AND LIMESTONE IN THE NEW SANCTUARY OF THE SAINT CATHERINE OF SIENA CHURCH IN TRUMBULL, CT

BY HEATHER FIORE

Photo ©Duncan Stroik

Saint Catherine of Siena is a simple gothic church in Trumbull, CT, which was constructed in 1958. Above is the old sanctuary before its recent renovation. Photo ©Duncan Stroik

Saint Catherine of Siena is a simple gothic church, which was constructed in 1958. For its 60th anniversary, the parish sought to "add a sense of magnificence" to the outdated sanctuary with the creation of a massive retablo and other liturgical elements, which collectively features 17 tons of Italian marble and Indiana limestone.

"To create something beautiful and timeless, our client, Rev. Joseph A. Marcello, was very involved for the entirety of the design and construction process," said project manager, Forest Walton, of Duncan G. Stroik Architect, LLC, in South Bend, IN. "This collaboration is really what created a successful project for both the owner and architect."

Drawing upon the existing geometry of the sanctuary triumphal arch, the new retablo stands more than 15 feet tall. When considering what materials to incorporate, there was no question, according to Walton.

"Natural stone is our favorite building material," he explained. "Indiana limestone is perfect for exterior and

Drawing upon the existing geometry of the sanctuary triumphal arch, the new retablo stands more than 15 feet tall. On the retablo, four 12 1/2-foot-tall composite columns crafted from Indiana limestone surround a diamond-matched Giallo Reale marble niche and crucifix. The cornice and columns further support an upper stone pediment and volutes, which are also all constructed of Indiana limestone. Photo ©Duncan Stroik

interior applications, carves very well and is very cost-effective. We chose Indiana limestone for its permanence, consistency and complementarity with the existing interior stonework of Saint Catherine of Siena church. The limestone, paired with the marble in our design, creates a hierarchy of materials and elements."

On the retablo, four 12 1/2-foot-tall composite columns crafted from Indiana limestone surround a diamond-matched Giallo Reale marble niche and crucifix. The cornice and columns further support an upper stone pediment and volutes, which are also all constructed of Indiana limestone. Directly in front of the retablo is a hidden limestone stair that provides access to the candelabra.

A new freestanding altar made from Botticino Classico and Giallo Reale marble connects visually to the retablo. A bronze grille on the front of the altar reveals a marble reliquary chamber for the display of sacred relics.

"To create a consistent vocabulary (with the altar), the same marbles

On the front of the altar, it contains a marble reliquary chamber for the display of sacred relics behind a bronze grille. Photo ©Amy Mortensen

were used for a cylindrical ambo and tabernacle pedestal," Walton said. "The tabernacle itself is carved from Bianco Lasa marble with Lapis Lazuli pilasters. Bookmatched Giallo Reale marble panels provide a backdrop for the two side shrine statues, and a diamond-matched central panel centers and elevates one's view of the retablo."

The retablo is a study of classical composition, with columns closely placed together and all components intact, including pedestals, bases, shafts, capitals and entablatures. A tabernacle pedestal of Botticino Classico marble with Giallo Reale panels supports the Bianco Lasa tabernacle, which features thin strips of Lapis Lazuli, a semi-precious stone that is quarried in South Asia. The striking cobalt blue stone carries such a high cost that it was only used as a $^{1}/_{16}$ inch veneer for the tabernacle's pilaster shafts, regula and guttae.

All of the marble that was used for the sanctuary was fabricated and supplied by Stone Consulting di Roberto Pagliari & Co. in Sarzana, Italy.

Company owner, Roberto Pagliari, explained how he shipped more than 15,000 pounds of pre-fabricated marble pieces for the project. "I studied the shop drawings, found the material and then just started fabricating," Pagliari said. "Two months were spent on the

"To create a consistent vocabulary [with the altar], the same marbles were used for a cylindrical ambo and tabernacle pedestal," said project manager, Forest Walton, intern architect at Duncan G. Stroik Architect, LLC, in South Bend, IN. "The tabernacle itself is carved from Bianco Lasa marble with Lapis Lazuli pilasters." Photo ©Amy Mortensen

The cylindrical ambo was also reconstructd of Botticino Classico and Giallo Reale marble. Photo ©Duncan Stroik

drawings and material procurement and three months for the fabrication. When you work for a church, the quality of fabrication expected is very high."

OVERCOMING STRUCTURAL CONSTRAINTS

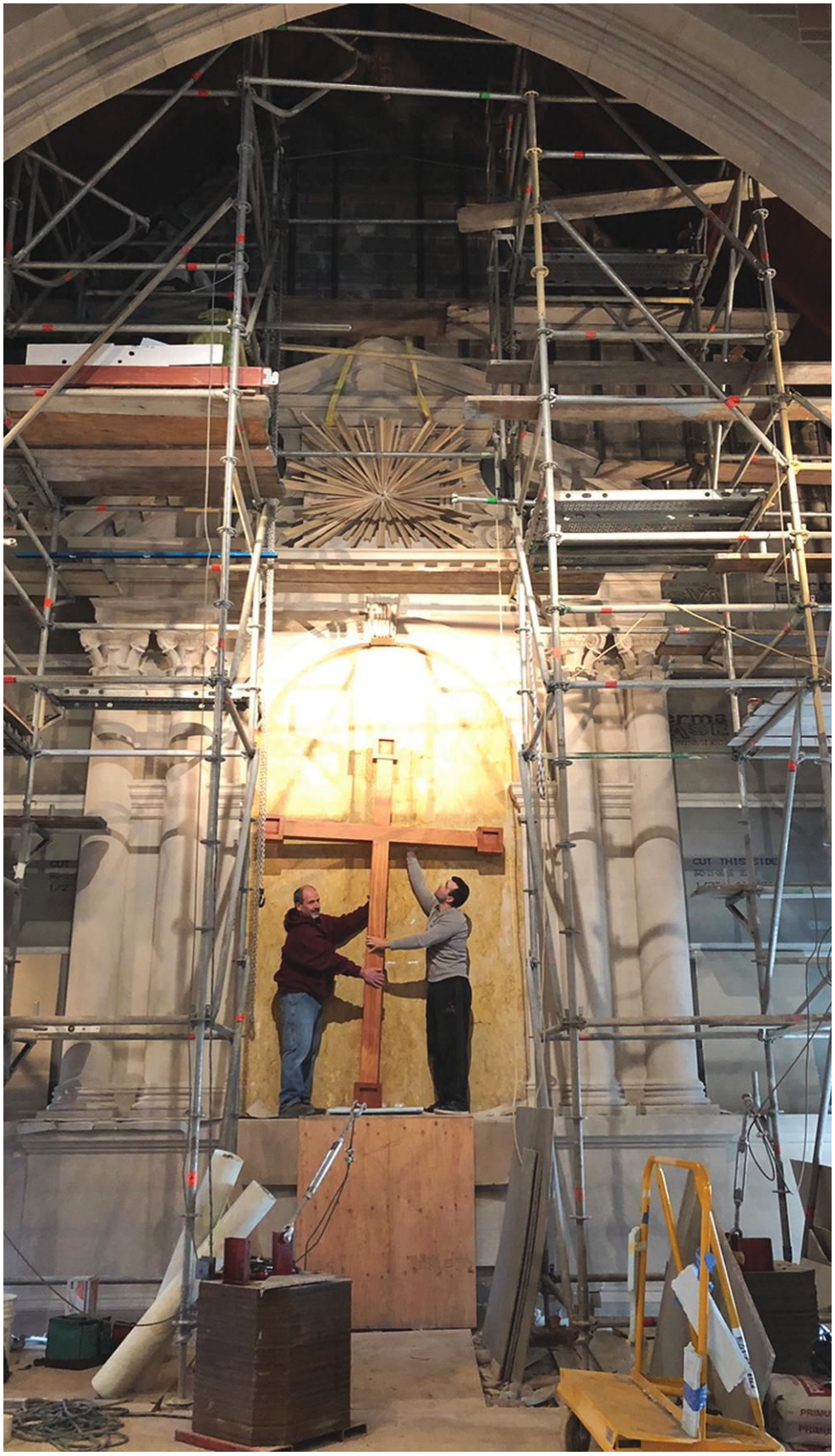
The Indiana limestone utilized for the retablo and column elements, as well as the two side shrines, altar rail and wainscot, was supplied by a fabricator in Ellettsville, IN. "We've done around 20 projects for this architecture firm," said William Bybee, president of Bybee Stone Company, Inc. "We're the only limestone fabricator Duncan Stroik will use.

"This was a fairly small project for us," he went on to say. "A truck and a half of stone, but a lot of work and a lot of labor."

According to Bybee, who has fabricated limestone elements for many churches and temples throughout the U.S. over the years, the largest feat was incorporating 17 tons of additional stone in the sanctuary for the new design, since there's a full basement below. "The church itself was not really built for this kind of work to go into it," he explained. "It didn't have enough space to try and land some of these very heavy pieces in place. The folks that did some of the masonry had to do a lot of extra work to get the pieces up there."

Walton said that navigating the several-thousand-pound stone pieces was the most complex challenge for all parties involved. "We needed innovative solutions that would not compromise the integrity of the design," he said. "The upper broken-pediment pieces weigh thousands of pounds and hoisting them into position within the confines of the church roof proved very formidable. Given the full church basement, even transporting the stone pieces into the church necessitated special shoring below the main aisle."

"Bookmatched Giallo Reale marble panels provide a backdrop for the two side shrine statues," Walton said. Photo ©Amy Mortensen



While new steel columns and footings were created to accommodate the heavy load, creative scaffolding within the confines of the sanctuary was also required for the installation. "Due to the size and shape of the arched pediment pieces, specialty anchors and pinning were implemented so that loads would transfer correctly into the columns below without causing any overturning from the existing rear sanctuary CMU wall," Walton said. Photo ©Duncan Stroik

While new steel columns and footings were created to accommodate the heavy load, creative scaffolding within the confines of the sanctuary was also required for the installation. "Due to the size and shape of the arched pediment pieces, specialty anchors and pinning were implemented so that loads would transfer correctly into the columns below without causing any overturning from the existing rear sanctuary CMU wall," Walton added.

For Bybee and his team, about 1,200 labor hours were spent fabricating all of the limestone pieces, which were given a smooth finish. "Most of this was done with saws and planers, then hand-cut and hand-finished," Bybee said.

For Walton and his team at Duncan G. Stroik, the project took a little over a year and a half, from design to completion. "We believe an architect should be onsite to review construction as often as is practical," he said when referring to the installation process. "When I review stone installations, I look for consistency in joint thickness. For marble floors and furnishings, we desire hairline joints or zero-joint installations. Precision installation is required when you deal with classically carved stone elements. Everything needs to be measured twice before installation and then again after. If the stone isn't installed correctly, it comes out for correction and is then reinstalled."

Since the project's completion last year, it has received praise from members and visitors, as well as national recognition, including a 2019 Pinnacle Award of Excellence from the Natural Stone Institute in the "renovation/restoration" category. "The project had an amazing dedication and has been honored with more than a few awards since its completion," Walton said. "Our client has shared that this project is already serving as inspiration for other sanctuary renovations across the country." ■

Saint Catherine of Siena sanctuary renovation
Trumbull, CT

Architect: Duncan G. Stroik Architect, LLC, South Bend, IN

General Contractor: Victor Zucchi & Son, Bogota, NJ

Stone Suppliers/Fabricators: Bybee Stone Company, Inc., Ellettsville, IN (Indiana limestone); Stone Consulting di Roberto Pagliari & Co., Sas, Sarzana, Italy (Bianco Lasa, Botticino Classico and Giallo Reale marbles; Lapis Lazuli from Afghanistan)

Stone Installer: Aisoni & Co., LLC, Closter, NJ

Structural and Anchor Engineer: Edward Stanley Engineers, Guilford, CT

A team of fabricators at Bybee Stone Company, Inc., in Ellettsville, IN, completed the limestone fabrication (seen above), while a team of fabricators thousands of miles away from Stone Consulting di Roberto Pagliari & Co., Sas in Sarzana, Italy, completed all of the marble fabrication. Photo ©Duncan Stroik