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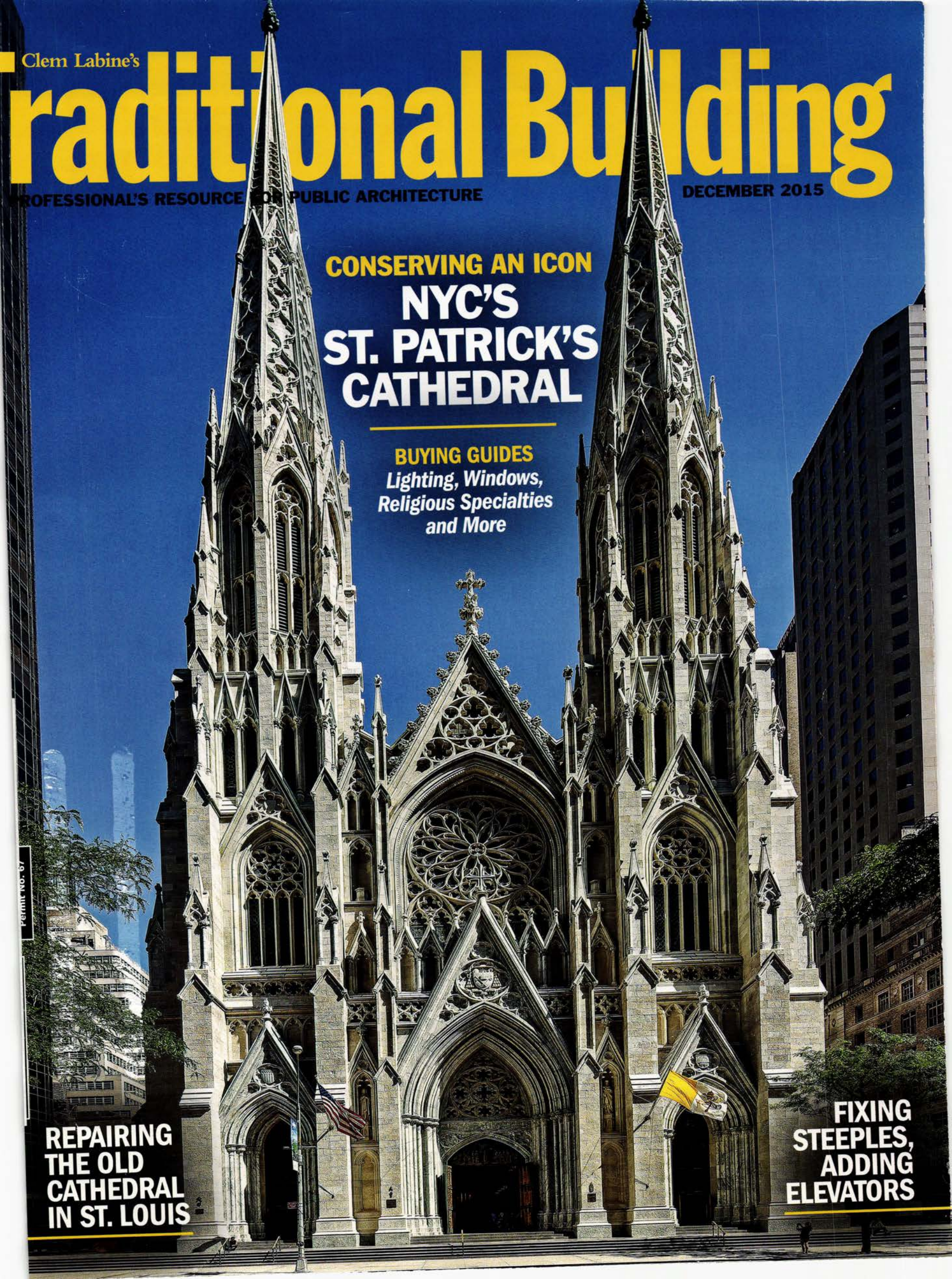
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CONSERVING AN ICON NYC'S ST. PATRICK'S CATHEDRAL

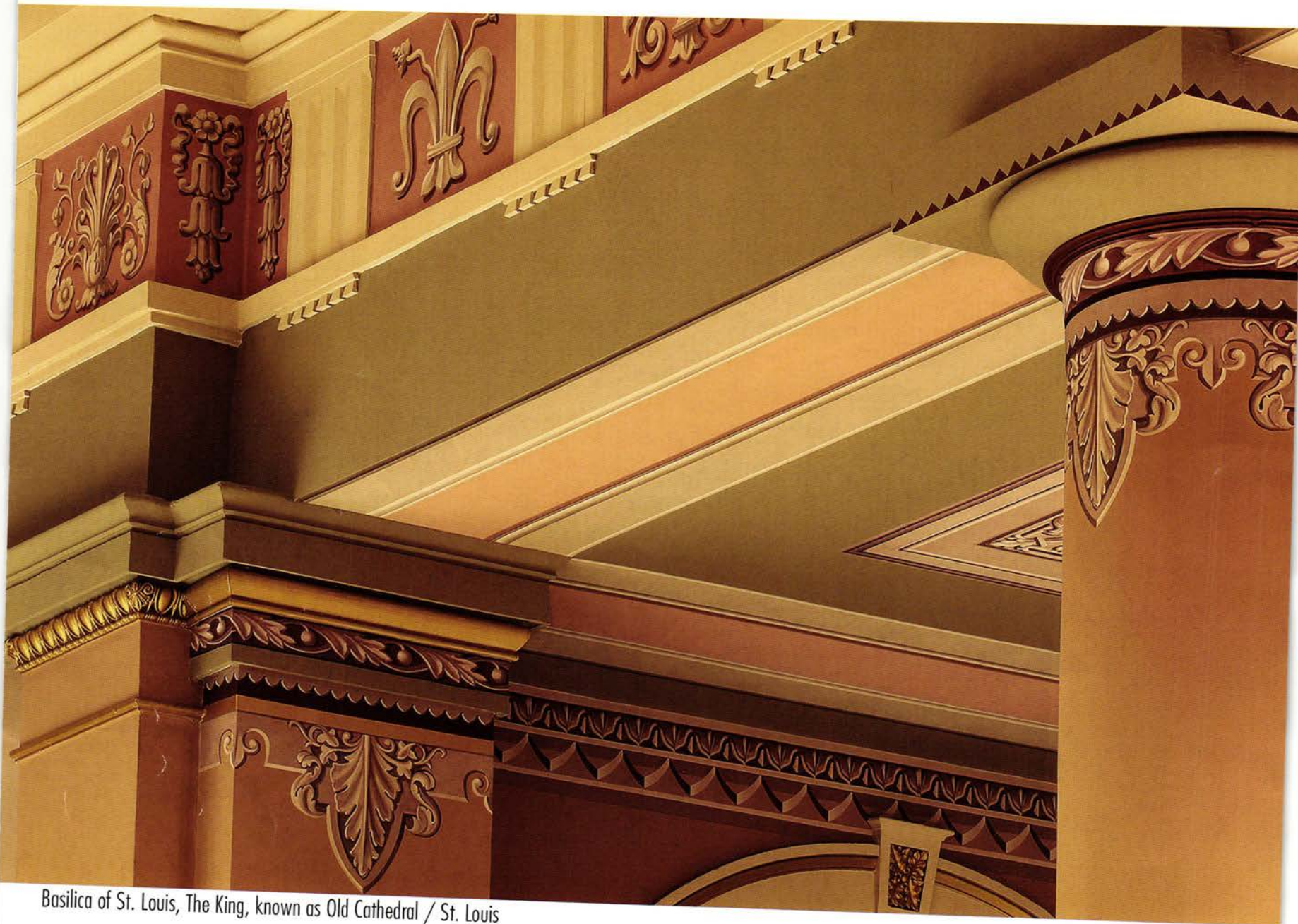
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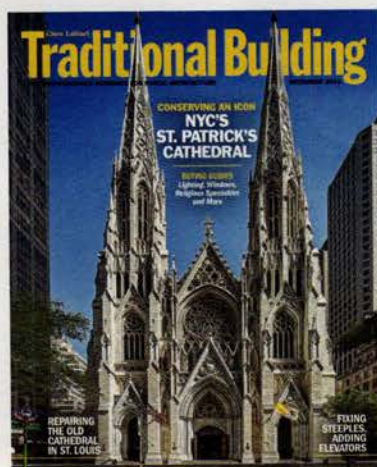
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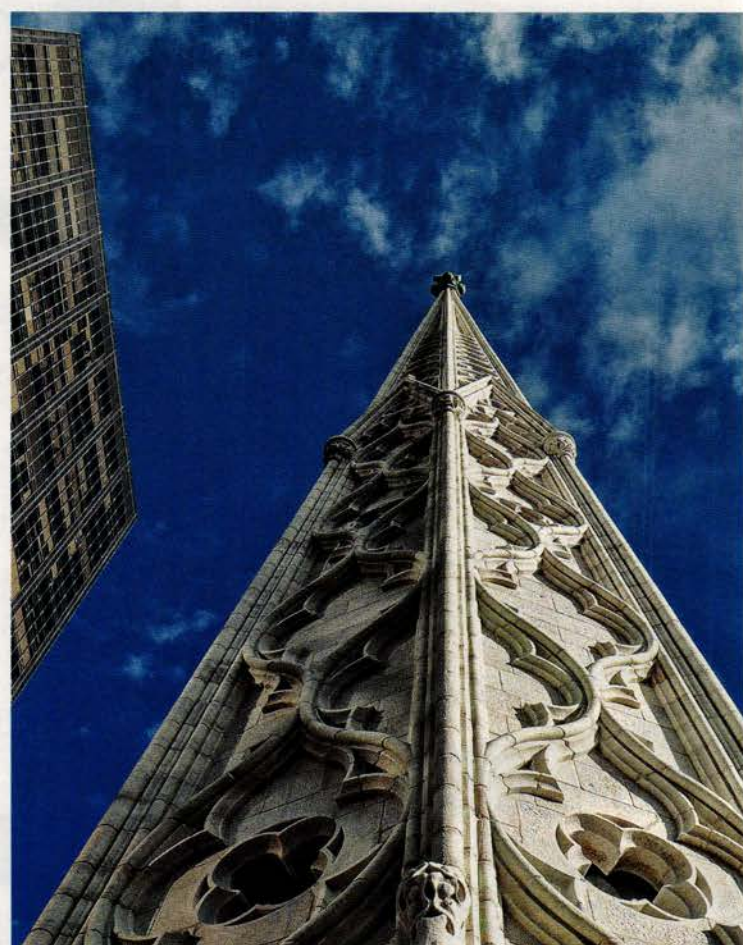
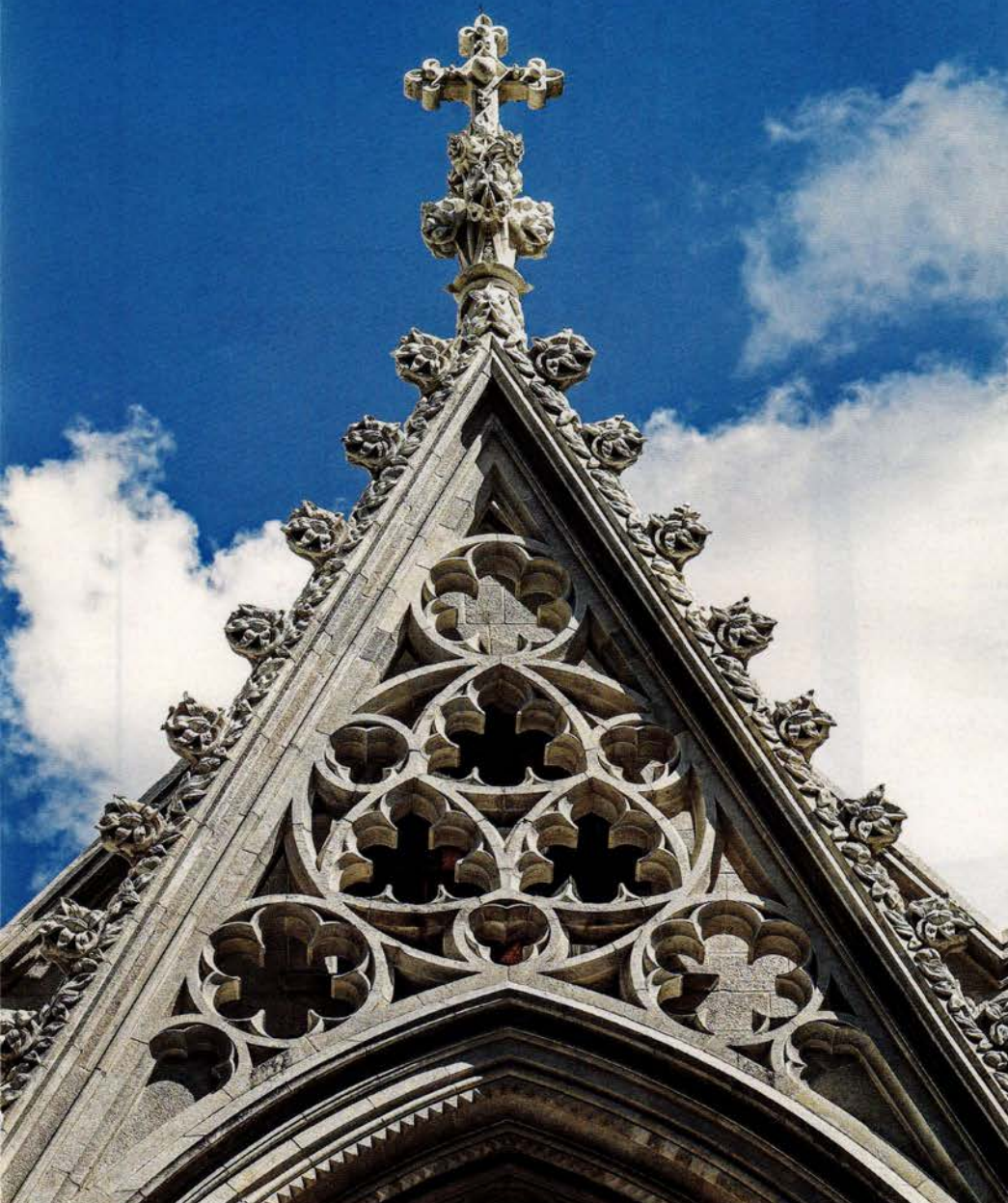
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ABOVE: This detail of one of the exterior spires illustrates the artistry of the detail on the marble exterior of the cathedral. The spires reach 329 ft. 6 in. into the sky and were completed in 1888. Photo: Murphy Burnham & Buttrick

LEFT: This central ornamental cross is located over the main entry of the cathedral on Fifth Ave. Like the rest of the façade, it was cleaned and restored. Photo: Whitney Cox

Conserving an Icon

WHEN POPE FRANCIS came to New York City in September, 2015, the city greeted him with warmth and enthusiasm – and with a just-restored and gleaming St. Patrick's Cathedral. The multi-year, \$177-million project addressed a multitude of safety program and building conservation issues for this iconic building that fills a city block on Fifth Ave.

It all started back in the 19th century when a group of immigrants saved their pennies to contribute to a new Gothic Revival cathedral designed by James Renwick, Jr. He was selected in 1852, shortly after he designed Grace Church in downtown Manhattan. Construction stalled during the Civil War, but the first mass was celebrated in 1879, and the cathedral was officially opened to the public in 1888 with the completion of the spires. The Lady Chapel was added in 1906. The

magnificent 40,000-sq.-ft. cathedral measures 396 ft. 8 in. in overall length with a height of 329 ft. 6 in. from the nave floor to the top of the spires.

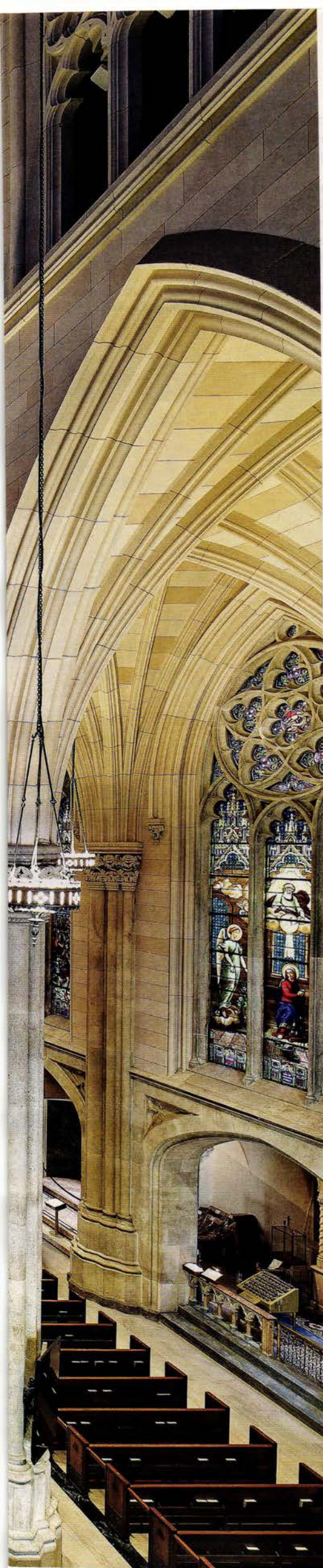
The recent restoration project started nine years ago, says Jeffrey Murphy, AIA, LEED AP, partner at Murphy Burnham & Buttrick Architects. "We were asked to do a needs assessment after Cardinal Egan had noticed a crack in a column and staff were finding pieces of stone and mortar on the sidewalk." Working with Building Conservation Associates, the firm identified a wide range of problems. "In spite of the fact that the building looked incredible, the architecture masked the fact that quite a bit of damage on both the interior and exterior existed," he explains. BCA discovered chunks of stone and mortar that could be pulled off with your hands and areas where the roof was leaking. The plaster on the interior was unstable in certain areas and the HVAC

systems were beyond their useful lives.

The needs assessment was completed in 2007 and Murphy Burnham & Buttrick was then asked to design the conservation of the cathedral. The program included scopes of work for the interior and exterior of the cathedral, the rectory, the parish house, the Cardinal's residence, the stained-glass windows, and a new heating and mechanical plant.

"We finished all of the design drawings and were about to start construction when the world financial crises came along in 2008 and put a halt to the work," Murphy explains. "Work was re-initiated with various life-safety upgrades and the rectory renovation, and then later, in 2011, we got word that we were to move forward with the full conservation project."

Building Conservation Associates (BCA) was brought in as the Restoration Consultants.



Patrick's Cathedral is unique and quite amazing in many ways," says Raymond Pepi, founder and president of BCA. "Because the emphasis was on conservation, MBB brought us in to work on the conditions assessment of the building envelope and interior, followed by assisting them with creating technical specifications, drawings and bid documents. We had conservators on site every day during construction for the last three years."

He points out that "the rationale for the project stemmed from material failure; where isolated areas of plaster and stone had detached from the building. When we say it is a conservation project as opposed to a restoration project, we mean there was no attempt to undo prior repairs of alterations unless they were failing or non-functional," says Pepi. "The goal was to conserve the existing fabric using state-of-the-art methods."

The building required 30,000 separate repairs, and 18,000 of those were on the marble exterior which had turned a dingy gray over the years. Most of it is Tuckahoe marble from Westchester, NY, along with Cockeysville marble from Maryland and Lee marble from the Berkshires in Massachusetts. "Because the Tuckahoe marble quarry has been closed for over 75 years, previous campaigns used a significant amount of gray Georgia marble that does not really match the creamy Tuckahoe or Lee. This inspired us to find real Tuckahoe for our repairs, which we did," Pepi points out.

"The first job was to clean the marble, using Rotec equipment, which combines water and inert mineral power under very low pressure. It works like an eraser to remove only the soiling without damaging the stone," Pepi explains. "In addition, previous campaigns had used mortar containing Portland cement, causing the stone arrises (edges) to spall. For this and other reasons, all mortar on the entire building was carefully cut out and replaced with mortar that reproduced the original texture and color and that was physically compatible with the stone."

"On the exterior, we decided not to undo other work from previous campaigns," says Pepi. "That would have been an enormous task. For example, in the 1970s they had taken the Tuckahoe marble off the five entries and replaced it with Georgia marble. To put back what was originally there would have been an enormous undoing of work that was actually in good condition. And it represented a period in time. We didn't feel justified in undoing it."

"We were much more interested in restoring Renwick's original outline, so when you look at the building you would see architectural delineation that Renwick had intended," Pepi says. "But we didn't put back gargoyles and all the triangular ornamental pieces on the spires. Our goal was to re-establish the parameters of the architectural outline of the building so it could be read as a work of art."

On the interior, extensive repairs were made to the plaster as well as to the stained-glass windows and the historic organ. The interior had also become dark and dingy because of candle soot and pollution which impacted the light in the cathedral because

the stained-glass windows had darkened.

While the interior was originally intended to be carved stone, plans changed when the Civil War interrupted construction. Renwick decided to use plaster painted to look like stone, as a money-saving measure. "Renwick wanted to use brick vaults in the ceiling, but they couldn't afford it so they used plaster, lath and wood to simulate the vaulted ceiling," says Pepi. "This reduced the weight dramatically, so ultimately flying buttresses were not required to support the building."

Although the exterior is all real stone, Pepi points out that interior columns are Tuckahoe marble, up to about 35 ft. "The capitals are plaster, and then everything above that is either cast stone or plaster. Renwick used real marble where it mattered and then everything above that was simulated."

The wood lath was cleaned from above and the plaster re-attached and repaired before it was painted three colors to give it the appearance of stone. Before this work started, a large section was cleaned and painted, to show the congregation and owners how much better it would look.

While the new painted interior contributed to the lightness of the interior, the repair and cleaning of the 75 stained-glass windows also brought more daylight into the cathedral. Murphy explains that the stained glass was in better condition than the design team originally thought. "Of the 3,200 panels, we took out approximately 6% to be repaired," he says. This work was done by Botti Architectural Arts in its studio in LaPorte, IN. They repaired and cleaned the others onsite.

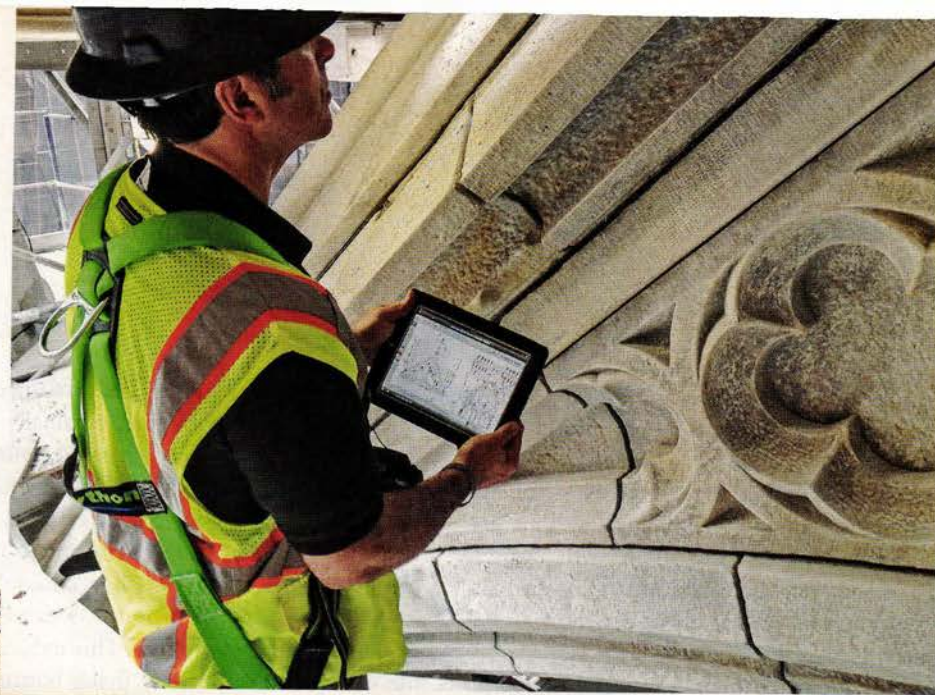
"We fully cleaned the windows, and replaced glass as needed," Murphy explains. A venting system was developed by the stained-glass team including Jean Phifer, Drew Anderson (on leave from the Metropolitan Museum of Art) and British stained-glass expert, Keith Barley, to prevent condensation and heat build-up between the protective glazing and the stained glass. This involves undetectable hinged pieces of glass that open outward slightly, to allow air to circulate between the stained glass and the protective glazing.

The cathedral's two organs were also repaired and restored. The larger one has 7,855 pipes ranging in length from 32 ft. ½-in. and a second one has 1,480 pipes. Both were restored by Peragallo Pipe Organ Company.

In addition, the two main bronze entry doors, each weighing 9,200 pounds were restored and rehung by G&L Popian. They removed seven layers of paint and restored the original patina.

A major factor in completing the work in a relatively short time frame — three years — was the use of a software program called BIM360 that stored the entire project in the cloud, allowing all members of the team instant access to it, using ipads in the field and desktop computers in the offices.

"Originally this was scheduled as a five-year project, but the owner requested that we reduce the time frame," Murphy says. "Having this tool was incredible and helped us shorten the schedule. The



BELOW: The ornate ceiling, like the rest of the interior, has been cleaned and repainted in three colors to give the appearance of stone. Photo: Whitney Cox

LEFT: Workers in the field were able to record repairs as they were made using ipads and BIM360, and the entire crew could follow the progress instantaneously on their computers and ipads. Photo: Raymond Pepi, Building Conservation Associates, Inc.

RIGHT: The restored interior of the historic cathedral is ready for at least another century of service. Photo: Whitney Cox



alternative, when new work such as a masonry crack was identified, would have been to go back to the office, make a sketch and email it to everyone, and days later the work would be done. With BIM360, we could communicate instantaneously and the work could be initiated right away."

"This was a big, complicated job," says Pepi. "Using BIM360 definitely expedited it, but more importantly, it allowed us to maintain the same quality during an accelerated schedule."

One major part of the restoration is the addition

of the geothermal heating and cooling system, now being installed. "We are currently drilling our tenth and final well," says Murphy. "They are as deep as 2,200 ft. and will deliver 240 tons of air conditioning and the required heating, using one-third less energy than a conventional plant. The wells are deeper than the World Trade Center is tall. We actually had to get a mining permit from the state of New York."

The system will serve the cathedral, the rectory, the Cardinal's residence and the parish house, while significantly reducing the amount of carbon emitted

into the environment.

"It was a real privilege to work on this building," says Murphy. "It is an iconic and incredibly loved structure. Everyone wanted the very best for this project. From the beginning, the client recognized what an incredible treasure St. Patrick's is and the workers, led by Structure Tone, treated the building with reverence and extreme care. It was a happy coincidence that the work was completed in time for Pope Francis' visit."

— Martha McDon



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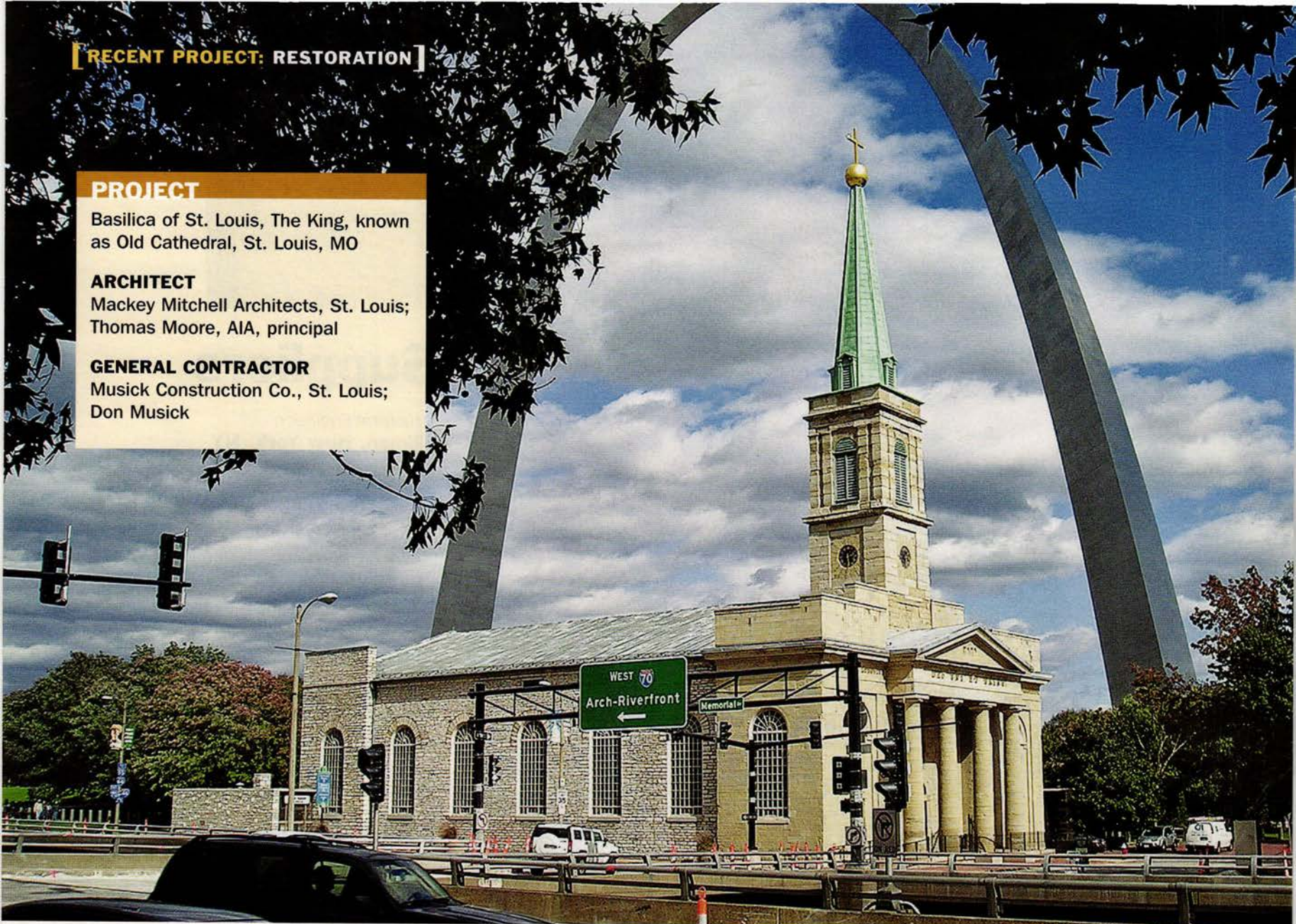
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Saving a Cathedral

THE BASILICA OF SAINT LOUIS, The King, was the first cathedral west of the Mississippi River, and until 1845, it was the only parish church in the city of St. Louis, MO. Its history goes back to 1774, when a plot of land was designated and a one-room log building was constructed in a town known as Laclede's Village. The city was later named St. Louis in honor of King Louis IX of France.

Designed by George Morton and Joseph Laveille in the Greek Revival style, the new cathedral was completed in 1834 and it became known as the Cathedral of St. Louis. In 1961, Pope John XXIII designated it the Basilica of Saint Louis, The King.

Now fondly known as the Old Cathedral, it has stood the test of time and has become a beloved landmark in the city, even as all of the buildings around it were torn down to create a national park highlighted by St. Louis' iconic arch. The cathedral is still owned by the Archdiocese of St. Louis and is listed on the National Register of Historic Places.

The cathedral may have stood the test of time, but time had definitely taken its toll. The stone

exterior was discolored and spalling and the interior had become dingy. The firm of Mackey Mitchell Architects was brought in to restore it, along with Musick Construction Co. Coincidentally these were the same two firms that had directed a renovation and additions in 1958-61.

In 2011, plans called for the restoration of the 1834 building and updating the 1960 rectory and additions. The program included stone restoration, window replacements and new HVAC systems. On the interior, it involved restoration of wood floors, removal of finishes from a 1960s renovation, new lighting, and repair of the mosaic tile floor around the altar. It was estimated that the project would cost \$15 million, and it was to be funded by private donations.

"The project got started in 2007-08 when a grassroots committee was formed," says Thomas Moore, AIA, principal, Mackey Mitchell Architects. The committee was headed up by Father Richard Quirk and one of the members was the contractor Don C. Musick, son of the contractor who had

done the work in the 1960s. Also involved was Eugene J. Mackey, son of Gene Mackey, Jr., who worked with Don Musick's grandfather in the 1960s.

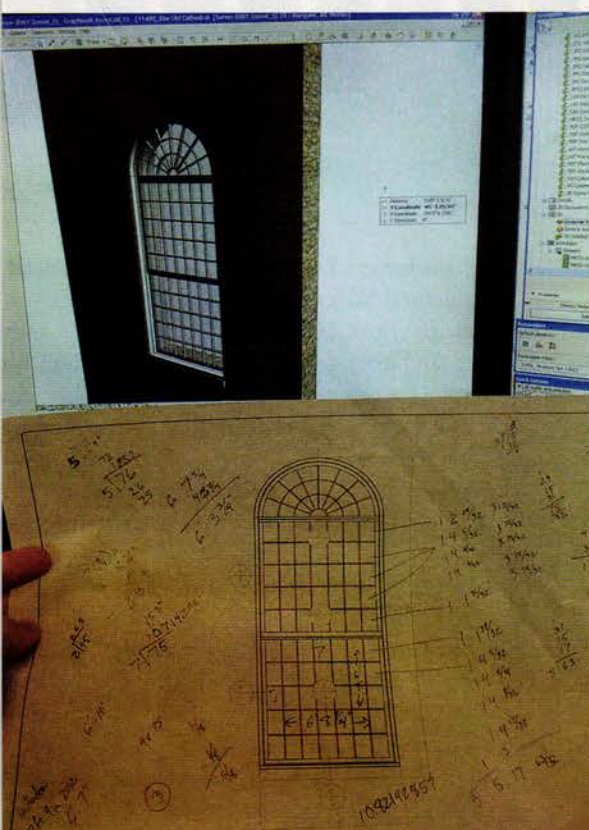
"The archdiocese elected to keep ownership of the church," says Moore, "even though it is like a donut hole in the middle of a national park. It is privately owned. Originally there were hundreds of buildings around it. They were torn down to make room for the park with the arch in the 1960s. The one building that survived was the Old Cathedral."

Work started on the exterior of the cathedral, which is 136 ft. long. "The south-facing facade and about 20% of sides are made of a stone material quarried in Joliet IL," he explains. "It was impeccably installed 180 years ago."

Stone specialist John Speweik from Chicago was brought in to assess the condition and make repairs on the exterior. "He comes from a family of stone masons. He really knows stone," Moore adds, noting that the spalling was so bad that "you could see it laying on the ground."

T: The historic Old Cathedral in St. Louis has been restored by Mackey Mitchell Architects and Musick Construction Co., the same two firms that did the last renovation on the building in the 1960s. It was the only building left standing when the area was cleared to make way for the national park and the arch.

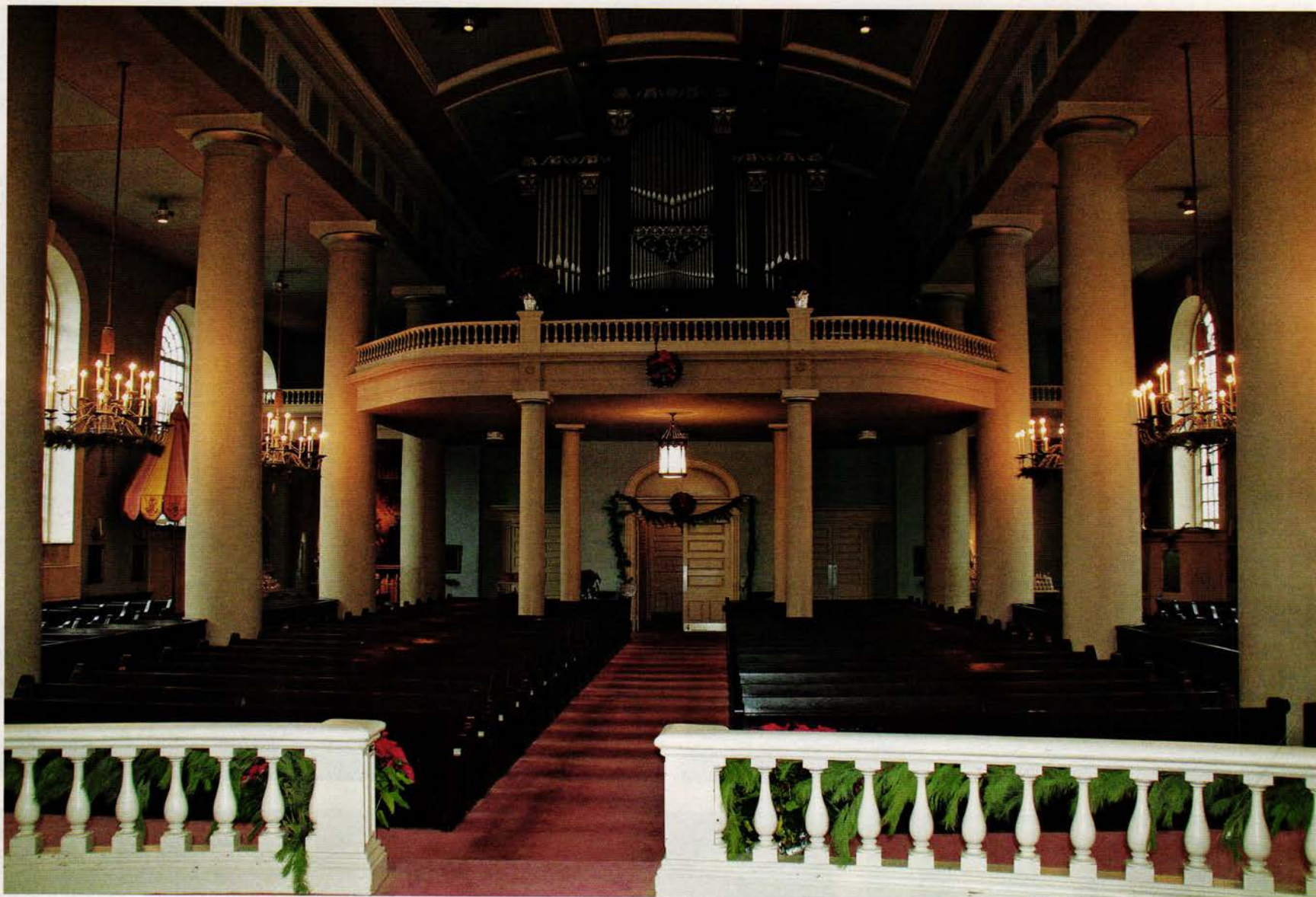
THIS PAGE, TOP ROW: John Speweik, a fifth generation stone specialist, analyzed the exterior stone piece by piece and made repairs and replacements as needed. The front façade and about 20% of the sides required major work. This part of the project took 1½ years.



RIGHT: The clock face on the tower was repaired.

ABOVE: The archtop windows were replaced with double-glazed historic replicas that feature low-e glass.
Photos: Mackey Mitchell Architects





The spalling was caused by pollution from the nearby roads and by the replacement of the original lime putty with mortar containing Portland cement in the early part of the 20th century. The lime mortar was used in tight joints (about 1/8-in.) and released moisture during freeze/thaw cycles, while the replacement mortar trapped moisture, causing the stone to spall.

Speweik and his crew analyzed the stone and made repairs and replacements as needed, a job that took about 1½ years. As Moore explains it: "Using a cherry picker, we did drawings from historic information. We drew every stone on the front elevation and 20% of the sides, and then John categorized the type of restoration required for each stone, following the Secretary of Interior guidelines for historic stone restoration. That ranged from do nothing to complete stone replacement."

The first job was to replace the existing mortar with lime mortar. Then Speweik and his crew could address the repairs in situ. He held a series of training exercises on how to remove existing mortar, and how to redress it. "No power tools were used," says Moore. "Everything was pneumatic or hand done."

Some of the stones had to be slid out further to keep the face of the wall flush; those were taken out, redressed and then put back. Portions of stone that were removed were re-used in the new mortar,

to help match the color closely. Excess stone was also used to repair other areas.

Moore points out that a number of stones – all of the belt course and the stone that was close to the ground – had to be replaced. Limestone supplied by Quarra Stone of Madison, WI, was a close match. Other stone was supplied by Earthworks of Perryville, MO.

"It was painstaking restoration," Moore stresses. "But it went beautifully. The workers were excellent. Some stones weighed as much as 10,000 pounds. It was quite amazing to see them take the stones out."

The goal was not to recreate a new building. "We wanted to keep it clean, but we wanted to make it look like an aged building, not a new building," says Moore. "We wanted the patina to show through and to halt the deterioration, and that's what we did."

Also on the exterior, the windows were replaced. The existing 1960s windows were at the end of their life, so Moore and his team replaced them with low-e aluminum windows with insulated glass that were custom made by Graham Windows to replicate the triple-hung historic original windows. He found photos and information in old newspaper photos and in the HABS files.

One last exterior item was the copper on the 45-ft. steeple. It had aged significantly over time and become unstable. The original copper

could no longer be repaired, so it was replaced with Architectural Sheet Metal of St. Louis, MO.

About this time, Randy Rathert, AIA, the archdiocesan architect, joined the project. "When I got involved, the stone restoration was already underway," he says. "I became director of building a real estate for the Archdiocese of St. Louis in 2001. I represent of the archdiocese and Father Quigley represents the parish. We are the two owners' representatives."

The project team had various ideas for how to restore the interior. "We looked at old photos and decided that there was a scheme dating back to 1890s which represented the church in St. Louis at the peak of predominance on the national scene," says Rathert. EverGreene Architectural Arts was brought in to investigate the interior and recreate it to this time frame.

They looked at photos and peeled away layers of paint and canvas to find original colors. "We could have had them hand paint in place, but budget constraints wouldn't allow that," Rathert explains, "so they painted original details on canvas, scanned them and then reproduced them on new canvas through a printing process. The canvas was then applied to the walls. All detail is from the original. There is some three-dimensional plaster that remains, and it blends very well."

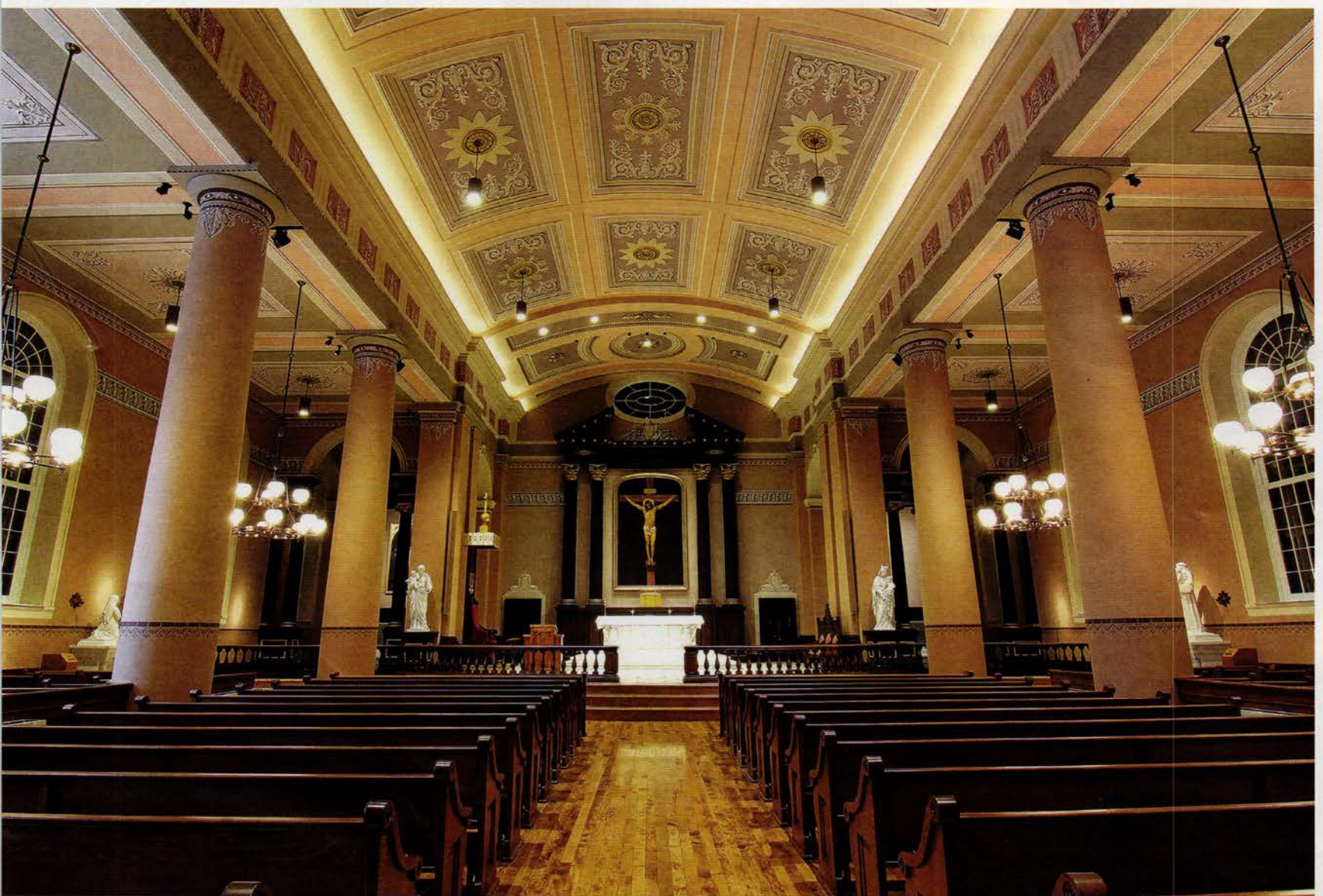
Moore adds: "It looks three dimensional, but



OPPOSITE: EverGreene's investigations revealed that the interior had been painted eight or nine times in the past. It was decided to return it to a Victorian color palette. Photo: Mackey Mitchell Architects

LEFT: Most of the new interior ornament is trompe l'oeil created by EverGreene on canvas in their studio and then applied throughout the interior. Photo: J. Bradley Photography

BELOW: The barrel ceiling reaches a height of 40 ft. The historic chandeliers were fabricated by St. Louis Antique Lighting. Photo: J. Bradley Photography



t. It's absolutely stunning. Most of it is flat trompe l'oeil work."

EverGreene was able to save the original barrel vault ceiling. The plaster had deteriorated so it was coming off of the wood lath. The artisans cleaned the back of it and injected a plaster strengthening agent. Then a bonding agent was injected to adhere the plaster back to the wood lath.

In addition, the wood floors and pews were

restored. And, when red carpet was removed, the architects found historic mosaic floor tile around the altar. They were able to restore it and replace pieces as needed.

And finally, historic chandeliers were built by St. Louis Antique Lighting Co. for the cathedral. While these are incandescent to provide a warm light, other lighting throughout is LED. Randy Burkett was the lighting designer.

"The project came in at around \$9 million, not

\$15 million as expected," says Rathert. "We were able to find ways to save money, mostly on the interior. And the cathedral stayed open for masses the whole time."

"It's a showpiece now," says Moore. "Everyone is very happy with it. The entire team brought both inside and outside architectural features back to life, helping restore dignity to this significant St. Louis landmark."

— Martha McDonald

PROJECTS

St. Patrick Parish, Parnell, MI

CONTRACTOR

Nugent Builders, Inc., Rockford, MI;
Don Sobie, foreman

St. Rose of Lima Roman Catholic
Church, Short Hills, NJ

ARCHITECT

Walter Sedovic Architects, Irvington,
NY, and Paterson, NJ; Walter Sedovic,
FAIA, LEED, Jill H. Gotthelf, AIA, FAPT,
principals

STRUCTURAL ENGINEER FOR ARCHITECT

Silman, New York, NY (formerly Robert
Silman Associates)

CONTRACTOR

Dajon Associates, Hackensack, NJ;
David Strauss, Vice President

STRUCTURAL ENGINEER FOR CONTRACTOR

Lysaght & Associates, Raleigh, NC

The bell tower at Saint
Patrick Parish in Parnell,
MI, has been rebuilt
using Versatex instead
of wood. Photo: Nugent
Builders, Inc.





ABOVE: The rotting wood on the tower was removed, and taken to Nugent Builders' shop in Rockford, MI, where it was measured, photographed and reproduced. Each side of the tower measure 10 ft. wide and the trefoils are 6 ft. wide.

LEFT: All sides of the steeple above the roofline have now been reproduced. They were assembled using modern adhesives and stainless steel fasteners. Photos: Nugent Builders, Inc.

Reaching New Heights

WO STEEPLES — one restored, one rebuilt — are now inspiring their congregations. At St. Patrick's Church in Parnell, MI, the last phase of the restoration is rebuilding the historic steeple using a contemporary material. And, in Short Hills, NJ, Walter Sedovic Architects led the effort to straighten a 163-year-old steeple that had been leaning for 40 years.

In Parnell, MI, 15 miles north of Grand Rapids, the original 1878 church, now restored, is made of old-growth wood. However, when the carpenters went to work on the 168-ft. tall steeple, they found that the wood had rotted and was becoming unstable. Using a 135-ft. boom lift, they removed 180 sq.ft. of peeling, rotted 19th-century wood, and brought the pieces back to the shop to be photographed, measured and replicated in a solid white PVC material called Versatex.

"We had replaced some rotted wood around the church, and then realized that there was a lot of rot-

ted wood around the steeple as well," says Don Sobie, foreman for Nugent Builders, Inc., Rockford, MI, the firm that completed the repairs. The same boom lift was used when installing the new pieces. "We had a lot of wind and rain that year," he says, "so it took a bit longer than expected to do the installation."

"Versatex is a cellular PVC," says Rick Kapres, vice president of sales and marketing for Versatex Building Products. People think of PVC as plastic pipe, vinyl siding or lawn furniture, but this has a foaming agent so it basically acts like wood. You can cut it, rout it and paint it. It can be used to replace any exterior pieces such as soffits, pergolas, window surrounds, louvers or shutters." The Versatex product was supplied by Standard Supply and Lumber, Grand Rapids, MI.

"We selected this material because it will outlive all of us," says Father Mark Peacock. "The wood had been there for 100 years. The new material is stain-

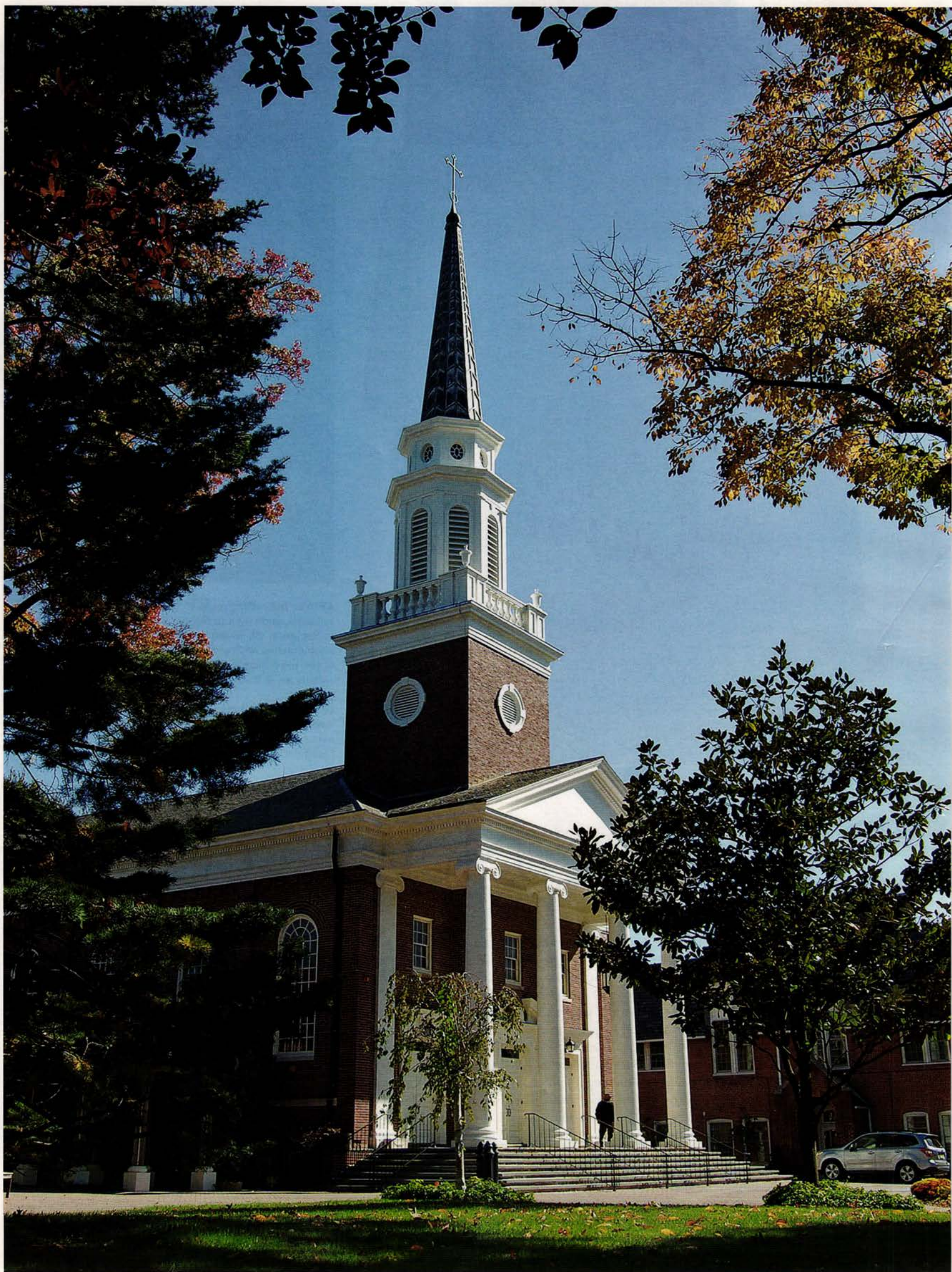
and rot resistant and is very lightweight. It is also easy to work with. The steeple has a very intricate design, with trefoils, and all of that had to be recreated."

Installation on the \$150,000 steeple-repair project was completed in the spring of 2014. "We are thrilled with it," says Father Peacock.

Old-Growth Wood

Meanwhile, another repair project decided to use salvaged, old-growth wood to repair a leaning steeple at St. Rose of Lima Roman Catholic Church in Short Hills, NJ. The 130-ft. steeple (from the ground, 88 ft. from roof) on the 163-year old church had been leaning for at least 40 years when the congregation decided it was time to investigate and finally resolve the issues causing the deformation.

"We set up a tilt meter to monitor the tower for a year," says Jill Gotthelf, AIA, FAPT, principal, Walter Sedovic Architects, the firm that led the



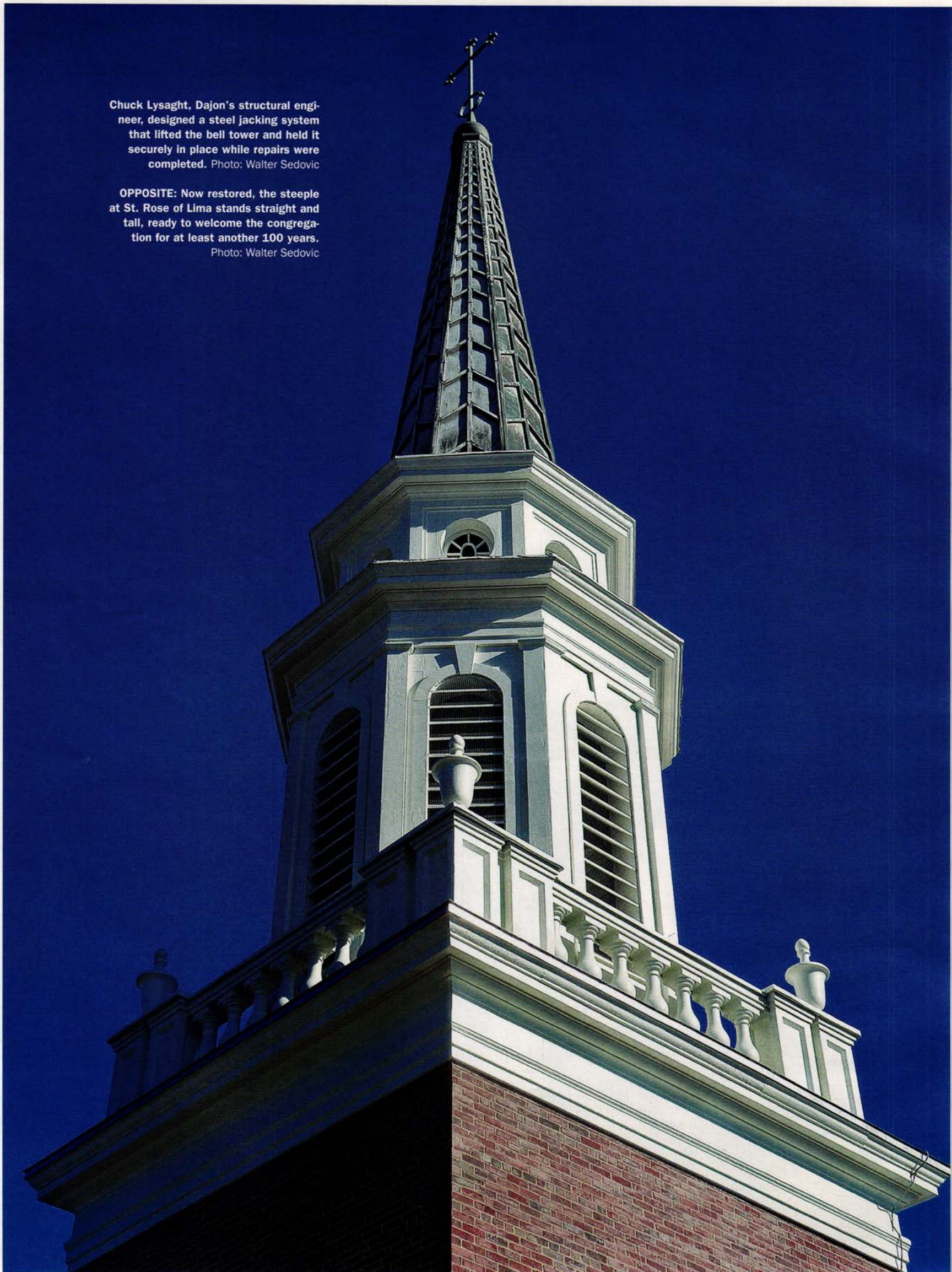
The project included repairing the balustrade, the louvers and ornament such as the urns that had deteriorated over the years. Photo: Jill Gotthelf

OPPOSITE: The leaning steeple at St. Rose of Lima Roman Catholic Church in Short Hills, NJ, has now been repaired and straightened using old-growth salvaged wood in an effort led by Walter Sedovic Architects. Photo: Jill Gotthelf



Chuck Lysaght, Dajon's structural engineer, designed a steel jacking system that lifted the bell tower and held it securely in place while repairs were completed. Photo: Walter Sedovic

OPPOSITE: Now restored, the steeple at St. Rose of Lima stands straight and tall, ready to welcome the congregation for at least another 100 years. Photo: Walter Sedovic



air project. "We found that although the tower survived through storms, including Sandy, it continued to move back to its off-center position. It was not in immediate danger of falling, but the deterioration was continuing to get worse."

The problem was that the steeple was not draining properly, and over the years water was damaging the wood, particularly the timber sill plate and the columns forming the tower and belfry. "Water was pitching back to the sill plate instead of draining," says Gotthelf. "An earlier fix had encased the sill plate in concrete, but it continued to deteriorate."

"The decision was made to right the tower and to restore its deteriorated timber structure, drawing from ancient Japanese splicing techniques," says Walter Sedovic, president and CEO. "We created an inline vertical splice, using timber-jacking technology that harkens back a couple of thousand years."

Old-growth wood salvaged from two locations, the Barnum & Bailey Circus building in Bridgeport, CT, and the Bulova Watch factory in Bridgeport, NY. "We haven't cut down a tree in 100 years," says Sedovic.

He adds that this type of wood deterioration in old wood churches is a common problem in many countries. "At the intersection of the steeple and its base, which is usually the belfry, there is always an allowance for drainage that never seems to work properly over the years," says Sedovic. "When it stops working, the water backs up into the belfry, leading to deterioration. The knee-jerk reaction is often to replace all of the framing and build a spire out of steel."

The repair involved replacing the sill plate in its entirety (encased in a later intervention of concrete, it was virtually non-existent), then surgically restoring the deteriorated section of timber columns. "We kept the belfry, but now the water goes where it needs to go, and the sills are protected," says Gotthelf. "At the same time, we had the opportunity to restore and replace other elements, such as the balustrade, urns and molded detailing." Also repaired were the oval windows at the top of the steeple. They were rebuilt and new hardware was added, so they are once again operable, allowing convective air currents to temper the tower's interior conditions. In addition, a new access hatch was added, in a hidden corner, facilitating much easier access to the steeple exterior for ongoing preservation maintenance.

The final touch is a three-tiered (belfry, upper steeple, and spire) exterior LED lighting system, which is anticipated to be in place before the holidays. This will allow the church to light the exterior in both white and, if desired, multiple colors to celebrate different occasions throughout the church and community calendar.

The successful execution of this project by Dajon Associates of Hackensack, NJ, was the culmination of years of advance planning, a credit to the ingenuity of the contractor and their concern for the site and defined preservation goals. "We put a jacking system in place and lifted the tower from the building, picking it up about 14 inches," says David Strauss, vice president. "Once it was elevated, we could get to the deteriorated sections and rebuild them in place. We matched all of the



existing profiles and also restored the ocular windows and the louvers."

He explains that normally a project like this would involve taking the steeple from the building, lowering it to the ground, doing the work and then putting it back. "That is very expensive," Strauss says, "so we thought of ways to be more competitive. One way was to lift tower up in place."

Designed by Chuck Lysaght, Dajon's structural engineer, the jacking system consisted of two (inner and outer) steel structures. A rigid steel assembly was fastened securely to the existing concrete slab of the steeple. The outer legs of the assembly went up, taking the entire bell tower with it, while the fixed section held everything in place. "When all of the work was done, we

brought the tower back down and fastened it in place," says Strauss. "Then we took the steel away."

"And everyone breathed a sigh of relief," says Sedovic. "With the source of its longstanding initial problems now corrected, this stunningly restored steeple is poised to welcome the congregation for generations to come," he says.

Gotthelf adds: "A project with so many complexities requires the strong leadership of the owner and that was provided masterfully by Joan Schultz, Pastoral Associate for the Ministries and Development."

The project came in at \$250,000 construction costs, and work took about three months, with the tower reset in its plumb position in September of this year.

— Martha McDonald

PROJECTS

Trinity Church, New Haven, CT

ARCHITECT

Robert Orr & Associates, New Haven, CT; Robert Orr, FAIA, principal; Susan Bridgewater Odell, AIA, project manager

St. Patrick Church, Enfield, CT

ARCHITECT

Baker Liturgical Art, Plantsville, CT; Brian T. Baker, president and owner; Wojciech Harabasz, architect; Chuck Davenport, head project manager; Ed Leahy, assistant project manager; Jim Pecorelli, assistant project manager.

Lifting Spirits and People

WHAT'S THE NEWEST TREND in church restorations and renovations? According to anecdotal evidence, it could very well be the addition of elevators. There is no historical precedent for this newly desired amenity. For generations, aging congregations were content to climb steep steps to be closer to the lord. Caskets were carried into and out of churches on the backs of broad-shouldered pallbearers, and baskets of celebratory wedding flowers were conveyed to the altar by hand.

But there is a growing awareness of accessibility issues and a feeling among pastors and parishioners that the church should welcome visitors easily. (Under the Americans with Disabilities Act, church compliance with equal-access rules is voluntary.)

The elevation of elevators, as these two projects from Connecticut illustrate, is also a matter of

convenience and safety. With no slippery steps to climb, everyone has peace of mind – and no excuse for staying away from the pews in winter weather.

Trinity Church

Off and on for nearly six decades, the congregation of Trinity Church on the Green, founded in 1752 in New Haven, CT, had been trying to find a way to install an elevator in its sanctuary to transport the elderly and infirm between floors.

The architecture was sacred. The building, designed by Ithiel Town in 1816, was thought to be the first Gothic Revival structure in America; the stained-glass windows were by Louis Comfort Tiffany; and an antique Aeolian-Skinner organ spanned the nave. The congregation has looked at plans that skirted the sanctuary, but they involved exterior excavations, making them too costly to implement.

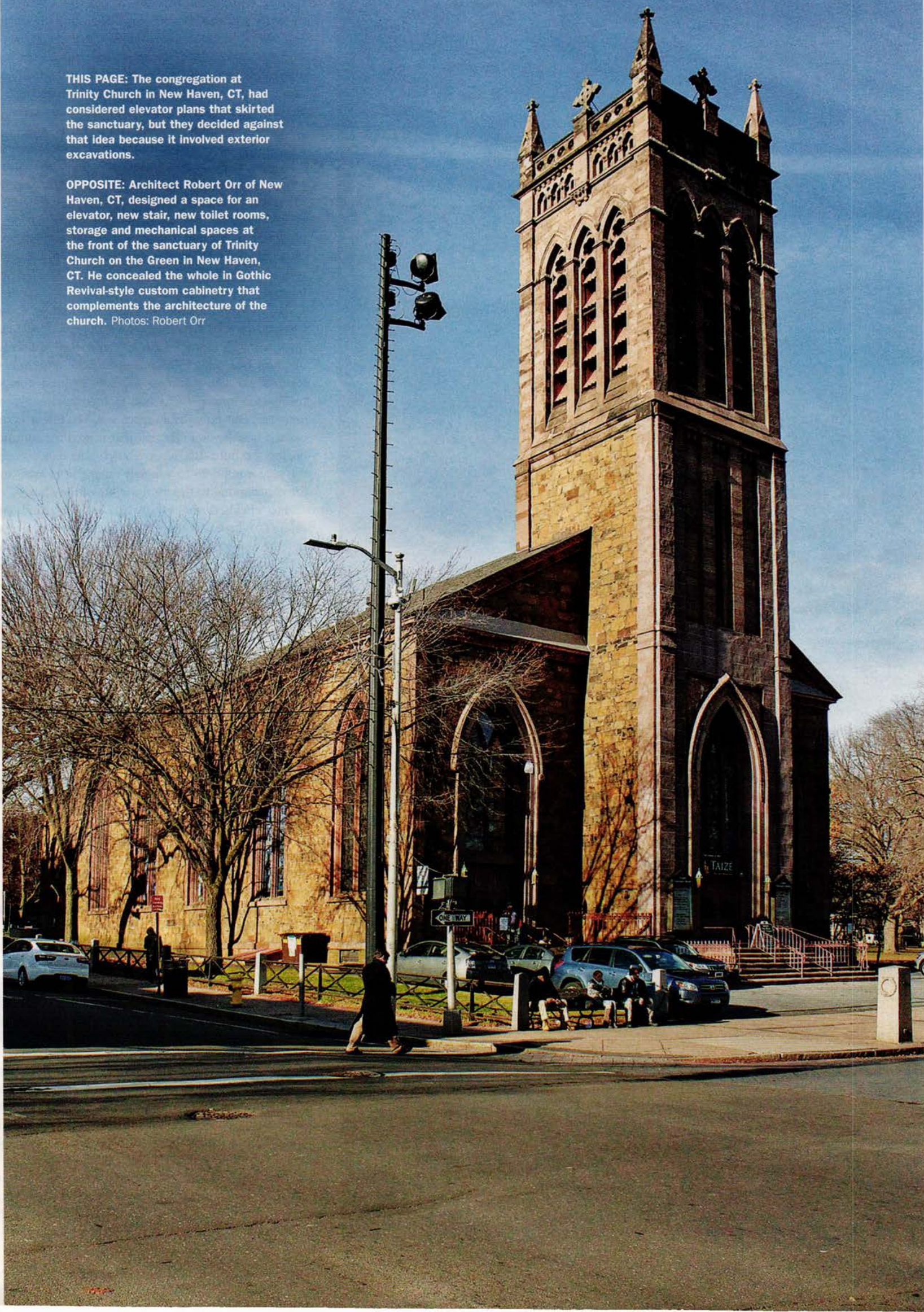
The issue dated to 1961 when the church embarked upon a major excavation that lowered the crawl space to create a full-height undercroft for its expanding programs. Four narrow staircases then challenged even the ablest ambulators were the sole link between the spaces.

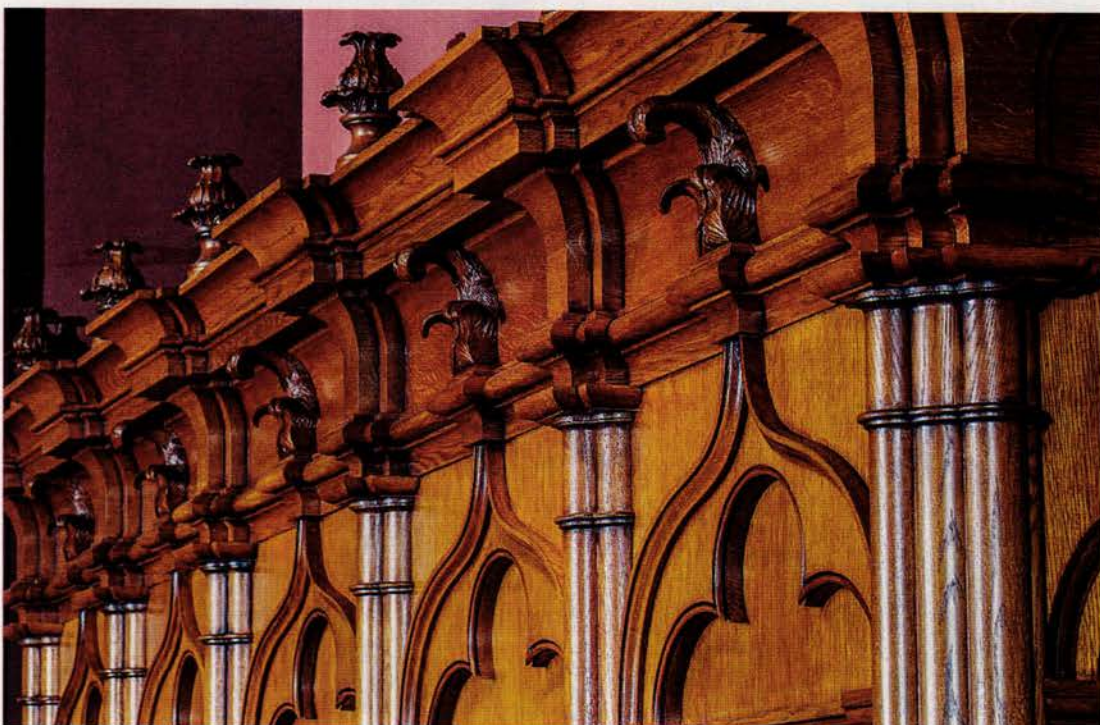
Things stayed in a state of suspension until 2007 when architect Robert Orr, FAIA, whose eponymous firm has been centered in New Haven for more than 30 years, came up with a solution that saved the architecture and satisfied the budget. Orr, who trained at Yale and held a five-year apprenticeship with Philip Johnson and then Al Greenberg, employed the same philosophy in all projects. "Whether rustic or refined, our designs try to look as though they've always been there," he says.

In the case of Trinity Church, Orr encountered numerous structural obstacles that added nearly

THIS PAGE: The congregation at Trinity Church in New Haven, CT, had considered elevator plans that skirted the sanctuary, but they decided against that idea because it involved exterior excavations.

OPPOSITE: Architect Robert Orr of New Haven, CT, designed a space for an elevator, new stair, new toilet rooms, storage and mechanical spaces at the front of the sanctuary of Trinity Church on the Green in New Haven, CT. He concealed the whole in Gothic Revival-style custom cabinetry that complements the architecture of the church. Photos: Robert Orr





year to the schedule and a significant increase to construction costs, which topped out at \$361,500. During demolition, Orr discovered that the 3-ft.-thick masonry wall that the elevator shaft was going to straddle and the foundations of column clusters had not been underpinned in the 1961 renovation. Instead, the brilliant structural engineer, Henry A. Pfisterer, had designed a creative system of cantilevers. In addition, there were water-table issues and other "surprises," Orr says.

"It was a simple enough project," he says. "But the conditions – physical, historical, code and political – made it complicated, and it took on all the effort of project eight or ten times its size." And size was one of the greater restrictions. "It was a challenge to shoe-horn everything into 800 sq.ft.," he says. "It was even more challenging because the church had three renovation projects going on at the same time by three different architects. And it had to be done quickly. The original timeline was six months."

By moving a bathroom and reconfiguring a stairwell, Orr and project manager Susan Bridgewater Odell, AIA, made enough room for the elevator shaft, which had to open on two sides. To accommodate the other functional features – a new stair, new toilet rooms and storage areas and mechanical spaces – Orr had to incorporate 3 ft. of the sanctuary. But no worship space was lost: The structure created doubles as a side altar that is used for communion during the holy days when church attendance swells. "In this way, it responds to a higher calling," Orr says, "suitable for contributing to the liturgical life of the church."

He enclosed the whole in an articulated custom cabinet whose Gothic Revival design was inspired by the engravings of Gothic structures made by 18th-century garden designer Batty Langley. "I selected Langley's work for three reasons," Orr says. "First, it was contemporaneous with the early beginnings of Trinity; second, English precedent is appropriate for a church whose roots are planted in English soil, and third, his designs explored a unique combination of Gothic and Classical forms, similar to the original architect's Gothic and Classical detailing for Trinity."

The white oak cabinetry, made by Eric M. Rose and Paul Carlson of Rosewood Custom Cabinetry and Millwork of Killingworth, CT, blends seamlessly with the richly ornamented architecture of the sanctuary. And that was Orr's objective: To make the form recede into the background of church even though it makes a statement and stand in the front of the sanctuary.

"A wooden cabinet is all one sees," he says. "Although the cabinet design in its entirety does not replicate anything within the church, every one of its details finds precedence close by. The result is a new addition that looks fresh yet familiar. The familiarity is in the details, whereas the freshness is in the overall concept."

To make the cabinetry seem as though it is what Calvert calls "an organic living tradition of the church," Rosewood matched new materials to old and used reclaimed wood when possible. The finish, achieved by a multi-step process that included bleaches, stains, glazes and hand-painted and hand-rubbed applications, "matches the mottled look of 200 years of constant use," Orr says.

Orr was thrilled to be the one chosen to execute such a humble yet significant project. "Everyone worked together, and everyone wanted the best for the church and building for the long term," he says. "The church has been there a couple hundred years and will be there a couple hundred more."

And Orr will be there to mark at least a part of the passage. "I'm a longtime member of the church," he says. "Every time I see it, I am reminded again that it contributes to the magnificent grace all around."



Tower Solution

In the historic village of Thompsonville, CT, (a census-designated place, CDP, in the town of Enfield) St. Patrick Church is an iconic and very visible landmark. The towering brownstone building, which has housed the Roman Catholic congregation since the mid-1880s, anchors the corner at Pearl and High Streets.

When Brian T. Baker, president and owner of the full-service design-build company Baker Liturgical Art of Plantsville, CT, was called upon to install an extra-large elevator in the structure, he knew that it would be a delicate and tricky balancing act to design an extension that would not call attention to its 19th-century nativity.

This was not the first major work that had been done on the church. In 1949, the interior of the church had been rebuilt after a votive candle caused a fire that collapsed its slate roof, destroyed its vintage stained-glass windows and gutted the inside. And, there was already a small utilitarian elevator, which was more of a rudimentary lift. It had been added decades ago, and was tucked into a side doorway to take parishioners to either the basement or the nave.

Baker's company, which has worked on some 100 church restorations and renovations around the country in the last 35 years, initially was asked to design

a space for a small passenger elevator for the 20,000-sq.-ft. building that is home to 800 worshippers. After the plan was presented, the church decided that it wanted to expand the idea.

"The old, original elevator didn't solve all the problems through the years," Baker says. "The stairs leading up to the main entrance of the church are quite steep and slippery, and bringing caskets into the sanctuary for funerals is very difficult and sometimes dangerous. Father John Weaver, pastor of St. Patrick's church, asked us to develop a solution that incorporated a dual-purpose elevator to be integrated into the existing structure."

Baker and his team conceived a round tower similar to the ones bookending the front of the church. They positioned it on the same side of the building as the existing elevator, which was removed during Baker's renovation. They placed it strategically between a set of stained-glass windows for the maximum aesthetic effect. "This was the perfect place for it," Baker says. "You can drive right up to it, so it's very accessible for wheelchairs as well as hearses carrying coffins."

Because the church is in an historic village, the design had to be approved by the planning and zoning board as well as the town's restoration committee. The process, which took four to five months, pulled the project into

OPPOSITE, TOP: Rosewood Custom Cabinetry and Millwork of Killingworth, CT, executed Orr's design, which was based on the work of 18th-century English garden designer Batty Langley. The finish was antiqued. Photo: Robert Orr

OPPOSITE, BOTTOM: Hand-carved details include trefoil accents on the cabinetry. Photo: John Kane

ABOVE: The brownstone building housing St. Patrick Church dates to the mid-1880s. The elevator shaft was placed on the other side of the front entrance. Photo: Ed Leahy



the winter of 2014, one of the East Coast's more brutal. "We lost a lot of time because of the snow," Baker says. "The project took us a year to complete, which was much longer than we anticipated."

But the weather wasn't the only challenge. The construction itself presented what Baker calls "surprises." With the original architectural plans lost to time, Baker and his team did not know that their foundation was faulty. "When we started excavating, we discovered that it was only rocks," Baker says. "So we had to underpin it with the foundation of the church. This added to the cost and difficulty."

Getting the tower to look like the church also took time and effort. "We matched the brownstone, sourcing a couple a companies that provided remnants from bridge abutments and old buildings," Baker says. "The only difference is that the tower looks cleaner, but it will patina with age to fit right in."

To further the old-new look, the tower's roof is clad in architectural shingles. "The church originally had a slate roof, but it was replaced with shingles," Baker says.

Although the tower, which serves as the elevator shaft, has no windows, the brickwork on the front contains an outline of a Palladian window that matches the shapes of those on the surrounding walls.

The vestibule that leads to the shaft echoes the style of the church right up to the cast finial that meant to evoke a cross.

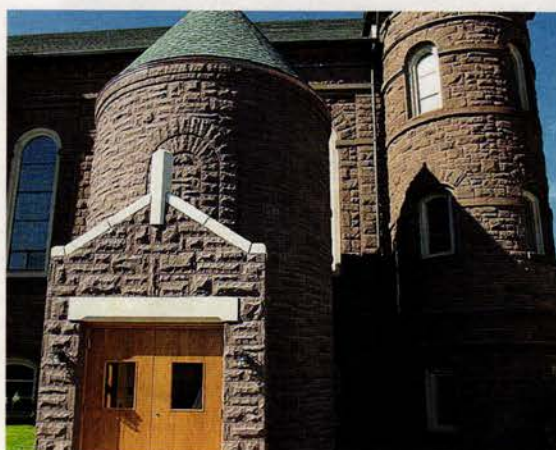
To place the turret perfectly in the past, Baker's team trimmed the floor-to-ceiling vestibule windows in custom oak; their aluminum frames are designed to accommodate stained-glass windows should the church wish to add them.

The pair of oak doors, which open and close automatically to make it easy to move caskets and wheelchairs in and out, feature leaded-glass panels that are in sync with the style of the vintage ones on the church's front entry.

Part of the beauty of Baker's plan is that it didn't disturb the landscaping. "The most major things we did," he says, "were corrections of the walkway and cutting in a handicap ramp."

Although Baker has not been commissioned to design many elevator shafts during his long career, he expects to field more requests as more congregations make accessibility for all a priority. He considers the St. Patrick project a model. "You don't see many elevators with circular towers," he says. "It fits the building nicely. That's what I'm most proud of."

— Nancy A. Ruhl

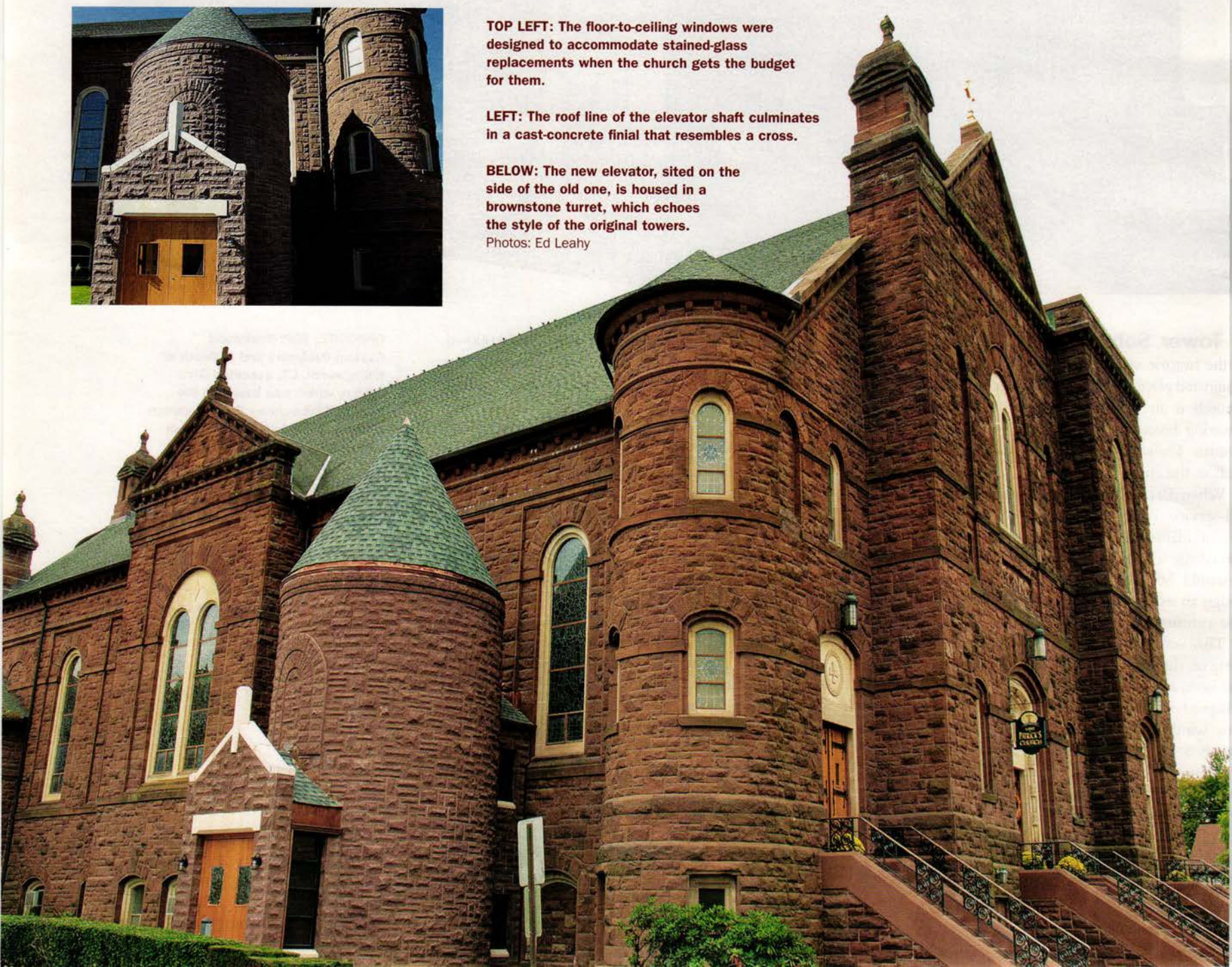


TOP LEFT: The floor-to-ceiling windows were designed to accommodate stained-glass replacements when the church gets the budget for them.

LEFT: The roof line of the elevator shaft culminates in a cast-concrete finial that resembles a cross.

BELOW: The new elevator, sited on the side of the old one, is housed in a brownstone turret, which echoes the style of the original towers.

Photos: Ed Leahy



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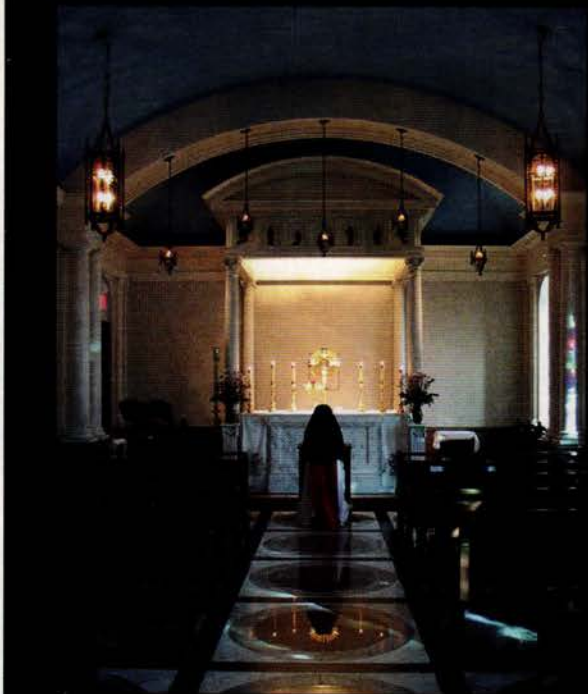
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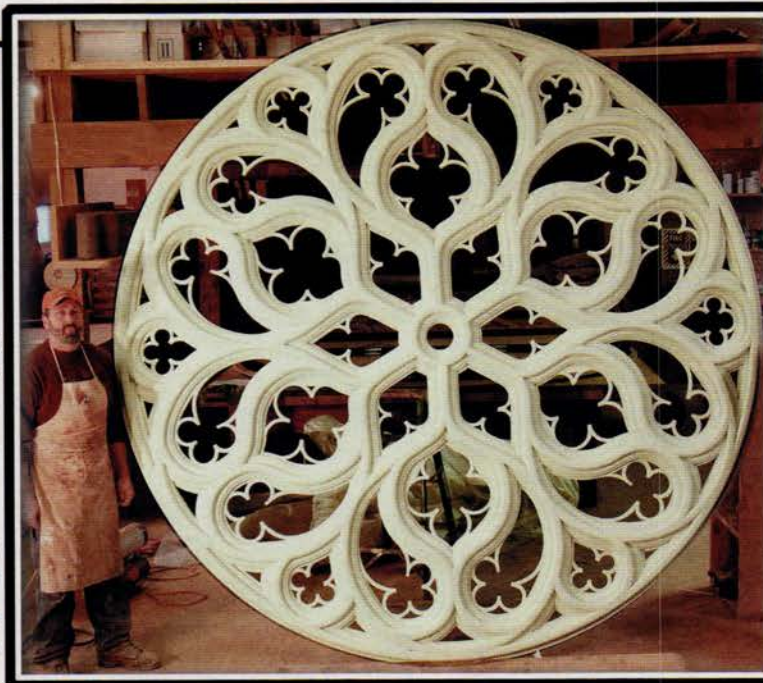
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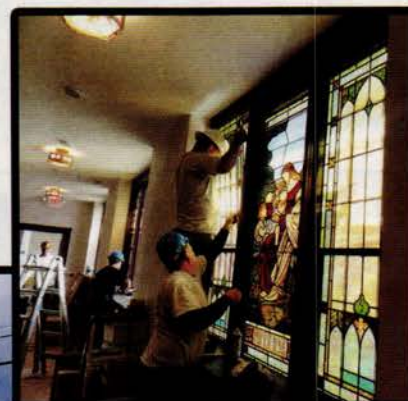


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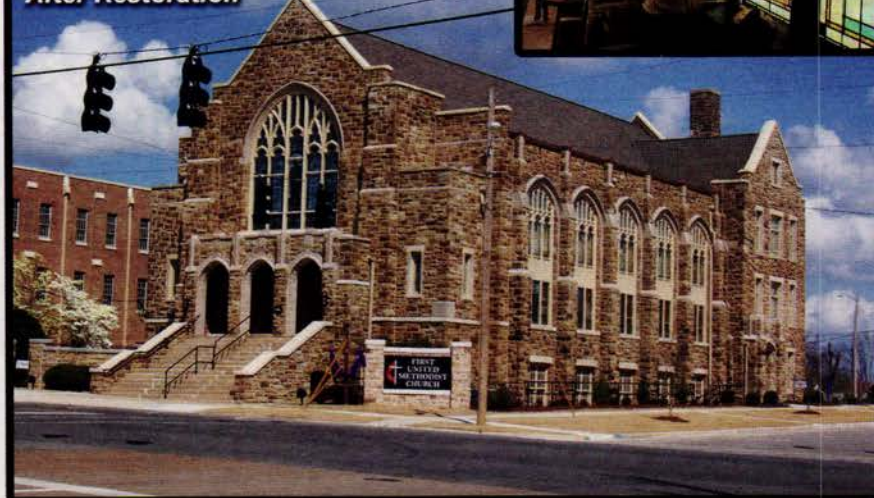
Bovard Studio's Woodshop created this new rose window frame with plantation grown mahogany for the First Presbyterian Church in Fort Smith, Arkansas. Note: We also fabricate and install ornate aluminum frames.



Before Restoration



After Restoration



Before and after photos of the F4 tornado damage to the First United Methodist Church of Cullman, Alabama restored by Bovard Studio Inc

Louis Tiffany's "The Good Shepherd", exhibited at the 1893 World Columbian Exhibition. Tiffany's stained glass masterpiece was restored by Bovard Studio Inc. for St. Luke's United Methodist Church in Dubuque, Iowa.

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Bovard Studio designed and fabricated this stained-glass window, reminiscent of the famous tapestries of "The Senses" at the Cluny Museum in Paris.

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Conrad Schmitt Studios created new stained glass in the traditional style for Duncan Hall at the University of Notre Dame, Notre Dame, IN.

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800-969-3033; Fax: 262-786-9036
www.conradschmitt.com
New Berlin, WI 53151

Creator, conservator & restorer of decorative painting: stained & art glass; ornamental plaster work & ceilings; gilding; murals, mosaics & statuary; for public & religious buildings; since 1889.

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www.dapratorigali.com
Chicago, IL 60126

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Glass Heritage, LLC

563-324-4300; Fax: 563-324-4321
www.glassheritage.com
Davenport, IA 52806

Art-glass studio: fabricator & restorer of stained glass & leaded glass; custom blown glass; sand blast etching; glass painting.



The Hyland Studio restored the stained glass in St. Lawrence the Martyr Catholic Church in Santa Clara, CA.

Hyland Studio, The

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www.hylandstudio.com
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Swiatek Studios designed and fabricated this altar for the Cathedral of St. Catherine in St. Catharines, Ontario.

Swiatek Studios

597-6683; Fax: No fax

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Wemann Metalcraft fabricated the metal altar for St. Therese's in Collinsville, OK.

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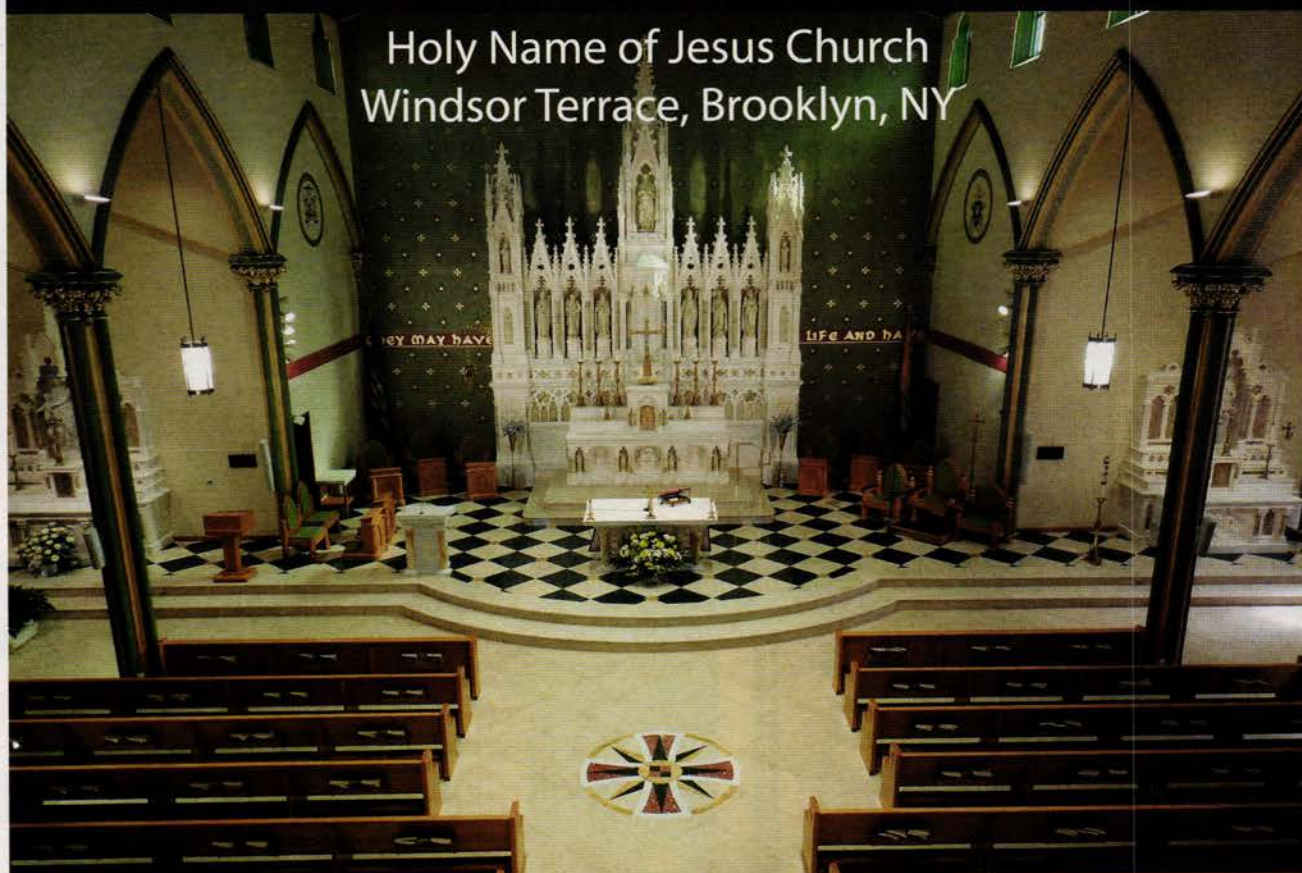
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Holy Name of Jesus Church
Windsor Terrace, Brooklyn, NY

30 Ton Historic Marble Altar, the centerpiece of the renovation.

The above restored altar was to be originally placed as a side altar for St. Patrick's Cathedral in Manhattan. Proving to be too large, this classic marble altar, designed by James Renwick Jr. was erected in St. Vincent de Paul in Williamsburg Brooklyn in 1881. One hundred years later, St. Vincent de Paul was sold and the altar was dismantled and each piece was numbered, then crated and placed into storage. The altar arrived at Holy Name of Jesus Church in 15 crates and 470 numbered pieces. The pieces were then painstakingly cleaned, restored, fitted and assembled by skilled artisans taking almost eight months to complete. Two side altars underwent the same process.

The renovation included:

- Bring the whole church floor up to existing building codes and install structural steel to support the altar.
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- Installed new heating and air conditioning, upgraded the electrical systems.
- Installed new chandeliers with LEDs.
- Upgraded liturgical appointments and furnishings and relocate tabernacle.
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- Custom made millwork for new gathering space. New pews installed.



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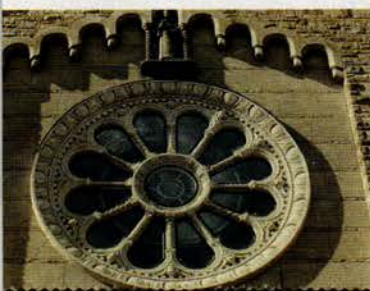
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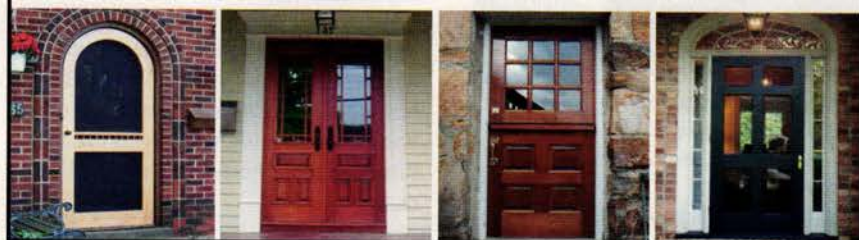


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This hollow metal window was built by **Heather & Little** for the Roebbling Museum in New Jersey.

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www.heatherandlittle.com

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Hopes Windows fabricated the doors for this historic building

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www.hopeswindows.com

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Innerglass Window Systems supplied interior glass storm windows for this historic building.

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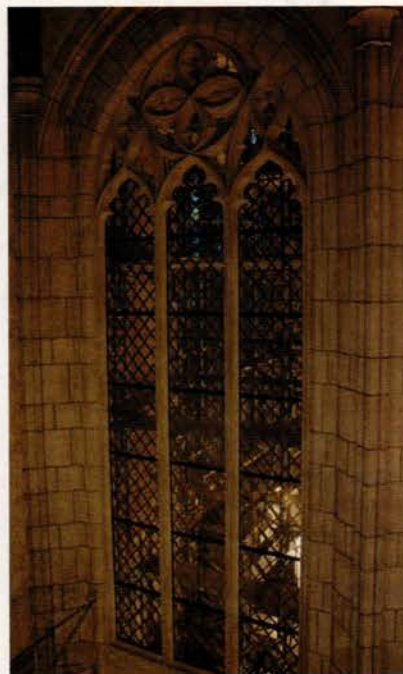
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The round-top C416RT entrance door with matching "Manhattan" screen and storm door was fabricated in solid mahogany by **Vintage Doors**.



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& glass panels available.

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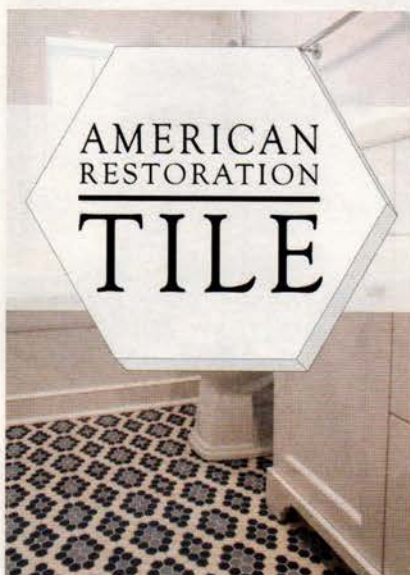
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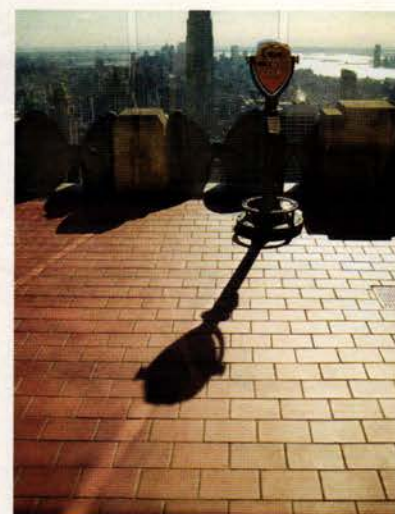


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The model #W136-E14 brass electrified chandelier from **Ball & Ball Lighting** is a reproduction of an 18th-century candle-burning fixture.

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The Artisan Drumcliff Pendant Bowl from **Crenshaw Lighting** features a solid-brass bead and reel banding, heavy gauge quatrefoil appliques, individually custom-slumped glass bowl lens panels, and custom-machined stem break beads arranged in the Fibonacci sequence.

Crenshaw Lighting
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www.crenshawlighting.com
Floyd, VA 24091

Manufacturer of decorative lighting fixtures: period & custom designs; historical restoration & reproduction; lighting for worship.

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This chandelier, model #9600 from **Deep Landing Workshop**, has a 23k gold-leaf finish and a hand-carved spindle

Deep Landing Workshop
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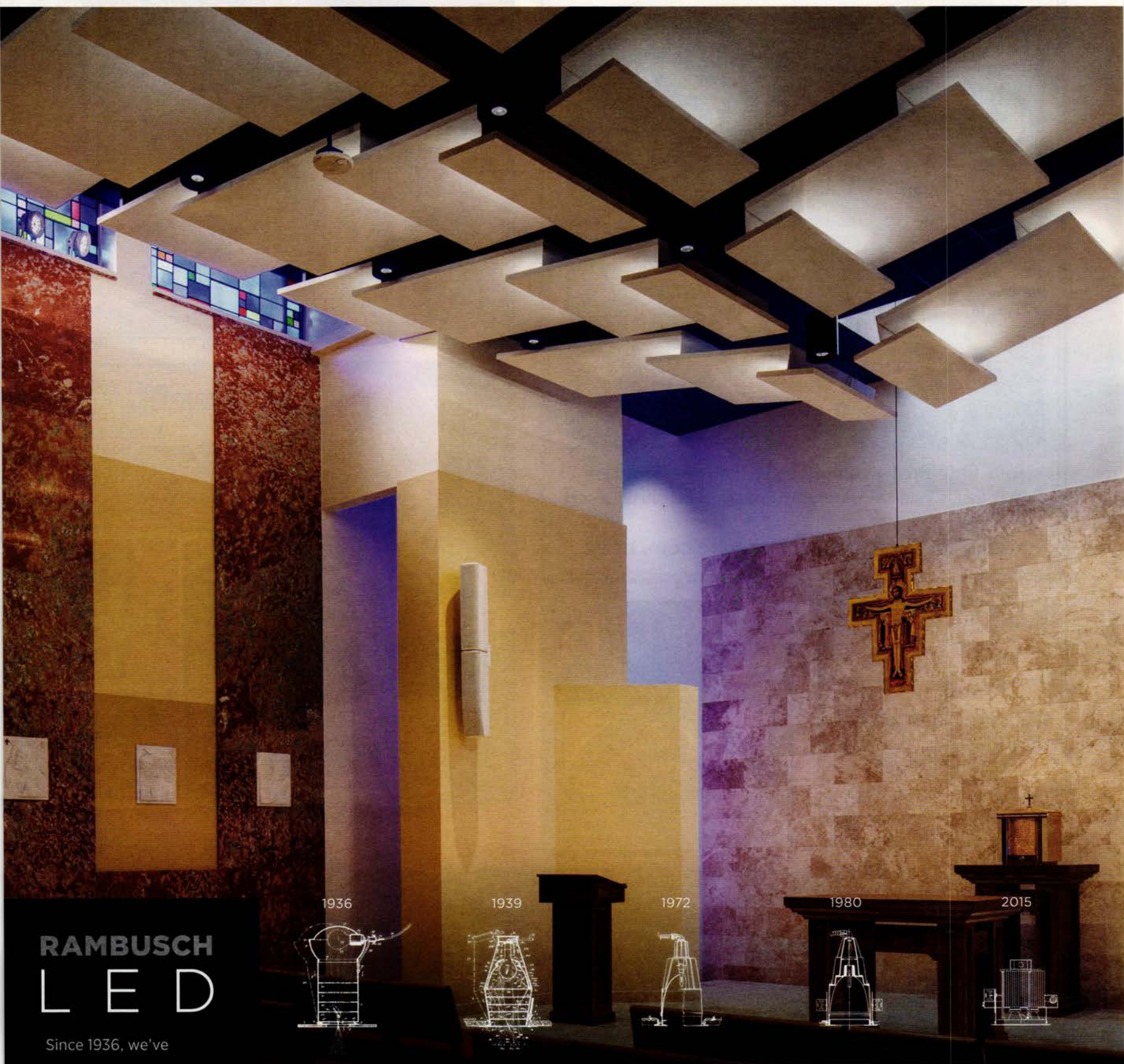
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Derek Marshall Lighting

800-497-3891; Fax: 603-685-2855

www.derekmarshall.com

Sandwich, NH 03227

Manufacturer of lighting: Art Nouveau, Art Deco, Arts & Crafts, traditional, transitional & contemporary; sculptural sconces, table lamps & pendants; new designs & custom lighting & finishes.



This Victorian-style chandelier, model #18008 from **Gaby's Shoppe**, measures 36x12 in.

Gaby's Shoppe

800-299-4229; Fax: 214-748-7701

www.gabys.com

Dallas, TX 75207

Manufacturer of handcrafted decorative iron drapery hardware: for curved & angled bay windows & arches; 30 standard finishes; more than 100 finial options.

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This hexagonal lantern from **Herwig Lighting** can be altered for custom designs and sizes.

Herwig Lighting

800-643-9523; Fax: 479-968-6422

www.herwig.com

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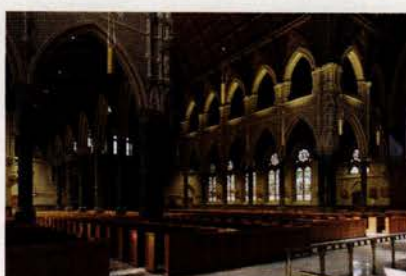
818-706-1990; Fax: 818-706-1988

www.lanternmasters.com

Westlake Village, CA 91362

Custom designer & manufacturer of lighting: interior chandeliers, pendants, ceiling flushes & sconces & exterior lanterns including wall, flush wall, pendant, post & pilaster; many architectural periods; historical reproductions.

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Rambusch refurbished 50 year-old sanctuary lanterns with LED, then re-lit the entire congregation with new LED over side-aisles and downlighting high over the center aisle, at Cathedral of Sts. Peter and Paul, Providence, RI.

Rambusch Lighting Co.

201-333-2525; Fax: 201-860-9999

www.rambusch.com

Jersey City, NJ 07304

Designer & fabricator of custom & engineered lighting for 100 years: for churches & public spaces; conservation & replication of lighting fixtures.

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These ca. 1920-1930 bronze sconces were refurbished by **Schiff Architectural Detail**; they are 60-in. tall x 24-in. deep.

Schiff Architectural Detail, LLC

617-887-0202; Fax: 617-887-0127

www.schiffarchitecturaldetail.com

Chelsea, MA 02150

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The Paul Revere hanging lantern was fabricated by **Scofield Lighting**.

Scofield Lighting

610-518-3999; Fax: 610-518-7264

www.scofieldlighting.com

Downingtown, PA 19335

Creator of historic lighting: 17th through 19th century inspired lanterns, sconces, ceiling lights & chandeliers; finished in natural, bronzed, leaded, oxidized copper or aged tin; collection is customizable to the specific needs of projects & clients.

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The lighting fixtures at Old Christ Memorial Church in Pensacola, FL, were supplied by **St. Louis Antique Lighting**.

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314-863-1414; Fax: 314-863-6702

www.slalco.com

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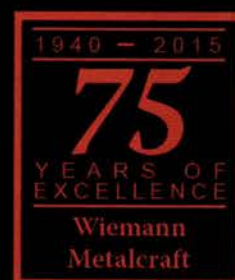
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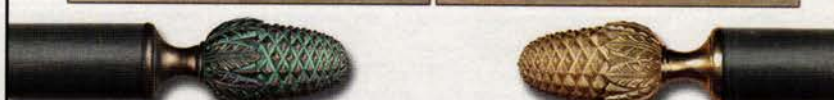
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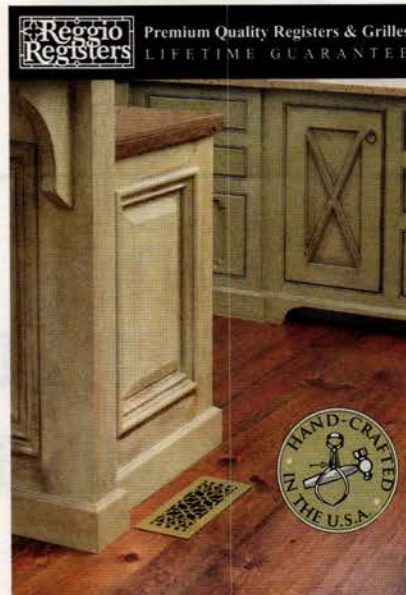


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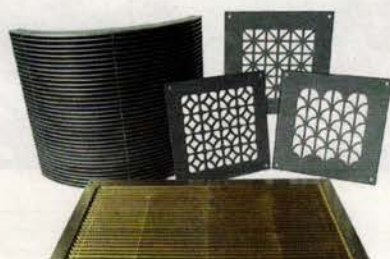
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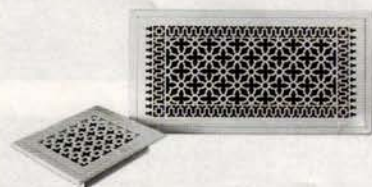
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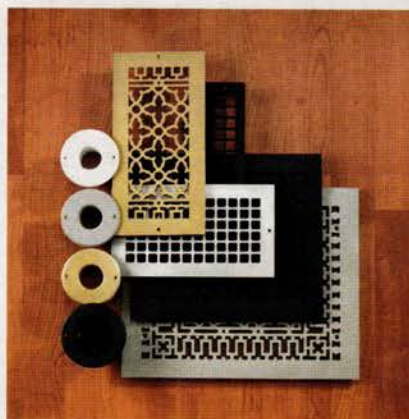
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Schiff Architectural Detail fabricated these ornate railings for an historic neighborhood.

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www.steptoewife.com

Toronto, ON M1S 3L2 Canada

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The Albany is one of the historically styled cast-iron staircases available from Steptoe & Wife; it is adapted from a design that first appeared in England around 1870.

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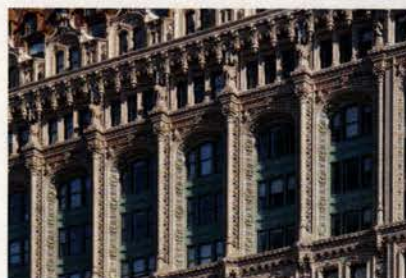
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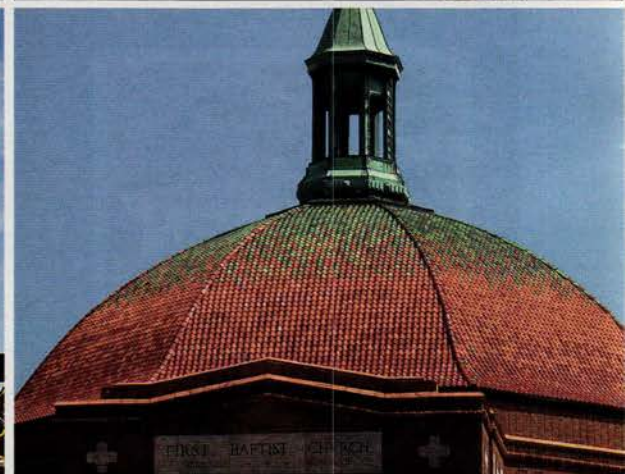
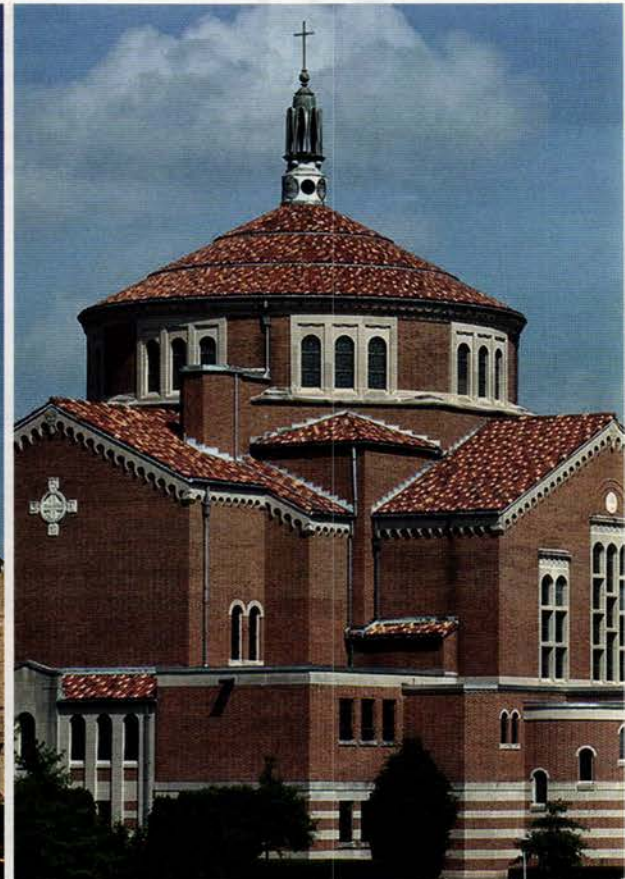
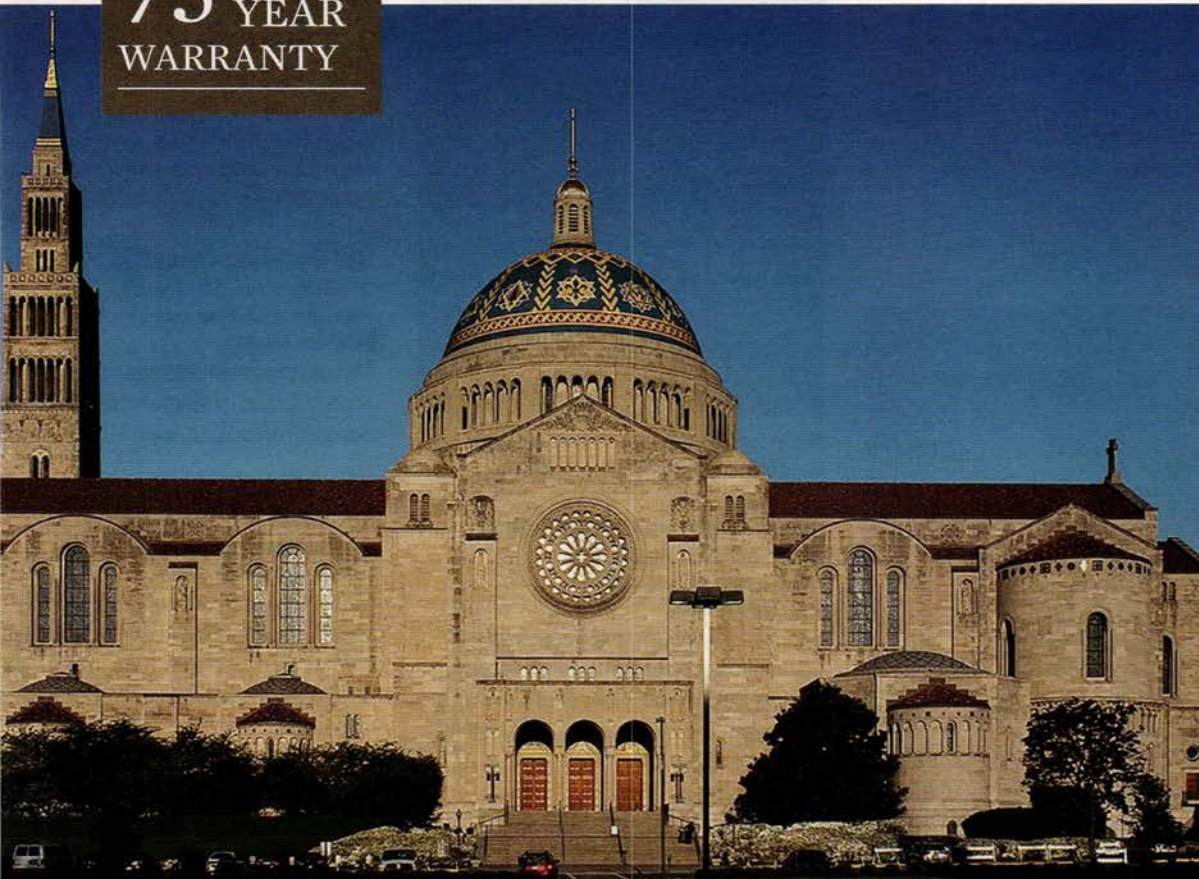
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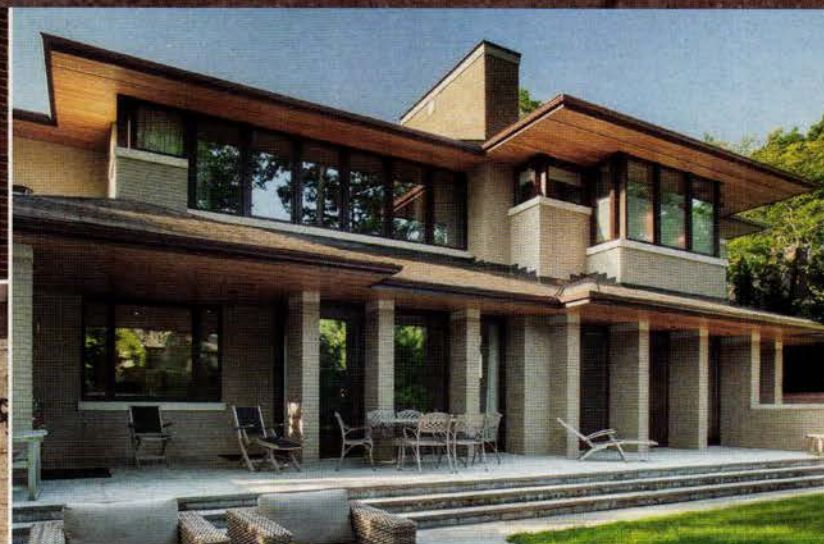
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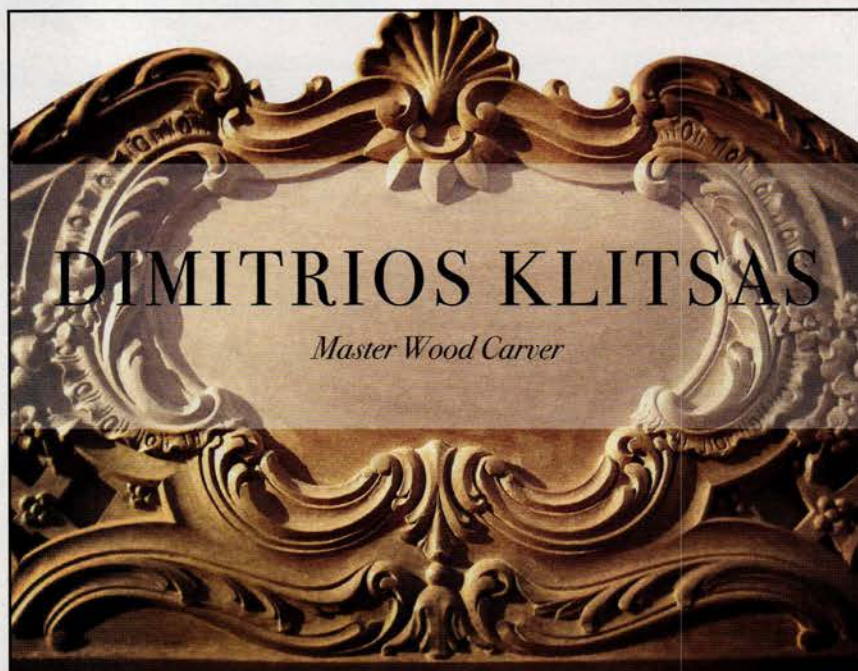
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FOR MEN.

Reviewed by Milton Grenfell

Mankind's Art

Roman Pilgrimage: The Station Churches

By George Weigel and Elizabeth Lev

Ignatius Press; hardcover; 464 pages; \$39.95

ISBN: 978-0-46502-769-9

In our peculiarly secular age, it is easy to be unaware that most of mankind's art has been created in service to God. Of course, this should be obvious, since our word culture springs from the word cult, and worshipping God is what cults do. But if it is acknowledged that religion, since time immemorial, has been the very heart of culture, we are forced to conclude that most of all that has been written or said about art for the past couple of centuries, inasmuch as it ignores religion, is flawed by not just a large lacunae at its center, but rather a whole universe of meaning left unexplored.

Yet here, at what some have termed the end of the modern era, George Weigel's book, *Roman Pilgrimage*, boldly launches an exploration into what, for most post moderns, is terra incognita, a place where art, architecture, religion and time meet and intimately intertwine – the station pilgrimage churches of Rome.

And there could be no better cicerone than Weigel to lead us through this foreign land of mystery. He is well known as a leading theologian, papal biographer, Catholic apologist, educator, Senior Vatican Analyst for NBC, and author of numerous books, including the international best-selling two-volume biography of St. John Paul II. But less well known, is his deep understanding of the philosophies that underlie modern architecture vs traditional architecture, as evident in his brief but insightful musings on the vacuity of the modern architecture of Paris vs the profound beauty of Notre Dame de Paris, in his book *The Cube and the Cathedral*.

For this expedition, Weigel has assembled a masterful crew of complementary skills, namely Elizabeth Lev, noted authority on Roman art and architecture, and his son and talented photographer, Stephen Weigel. A long-time friend of the author, Lev, in addition to her encyclopedic knowledge of Rome's art and history, understands the religious aspects of her subject, and can ably communicate it. The photographs by Stephen Weigel capture exquisite details and little known views, to artfully convey the sense of wonder intrinsic to any voyage of discovery.

The book is structured about the Christian 40-day penitential season of Lent, and the following eight-day Easter Octave. The Roman station church Lenten pilgrimage, dating back to the early fourth century, proscribes a visit each day to a different specific one of the 40-plus "station churches," each a resting place of a martyr and/or relics. The purpose of Lent, as the author puts it, is to relive the "adventure of God in salvation history." Thus the pilgrimage is fundamentally an inward spiritual journey.

Yet, as one traverses the city of Rome and these churches, the many layers of all these revealing the rise and fall of scores hundreds of princes and principalities and centuries of art and architectural change, make this a journey through time as well. The common ground between these two journeys is beauty. Citing the Swiss theologian Hans Urs Von Balthasar, Weigel notes that if "beauty, the often forgotten transcendental, is, in late modernity uniquely magnetic in drawing us to experience anew the good and the true, the transcendentals often obscured by modernity – then beauty can be a unique pathway to God."

The book presents for each day of Lent and the Easter Octave



St. Mary Major: High altar, ceiling and baldacchino, one of the photos by Stephen Weigel

the scripture reading for the Mass and Daily Office, followed by a meditation on these and the saint or saints associated with that day's station church. These meditations are of such theological erudition and profound thought, and in such pellucid prose that the book is experienced as much on a religious level as it is on an aesthetic one, much to the benefit of both.

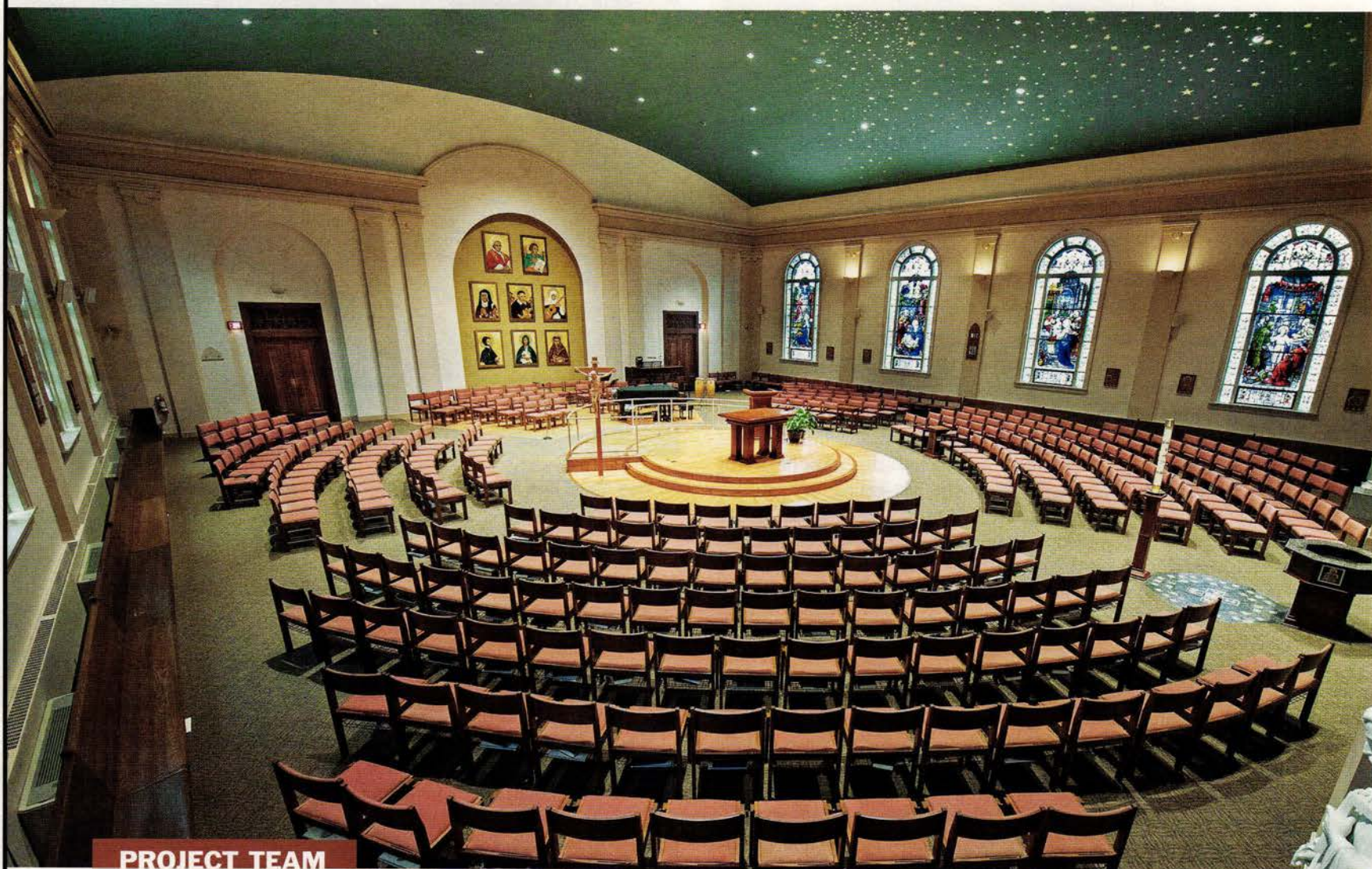
These inspired meditations are followed by Ms. Lev's incisive observations on the art of each station, and its correlative history. The art and architecture, in turn, are illustrated by Stephen Weigel's exceptionally discerning photography. For the latter, it's regrettable that, perhaps due to budget concerns, the printing was on matt rather than a coated paper, thus rendering the black-and-white photos less crisp than they would have been otherwise. On the other hand, to have a handsome hardcover book of such high quality content and copious heft for under \$40 was perhaps worth this concession.

Furthermore, with the book at this price, which includes helpful maps of Rome (one for each week, showing the designated churches of that day, and the marked pedestrian routes between them) there is no excuse for it not being in the library, and Roman holiday suitcase, of every serious student of Rome. But since the book weighs in at two pounds, it should be pointed out that for the traveler it is also available as an e-book (with ALL the photos in color), ready to be pulled up on one's smart phone in an instant – along with the address and rating of a nearby trattoria.

There have been, and are, many guidebooks to the pilgrimage churches of Rome. Their problem has been, that at least since the 19th-century Aesthetic Movement, our leading cultural lights have inclined to make art a religion, and the artist into a kind of god. This has been analogous to the theological mistake of worshipping the created rather than the creator.

In *Roman Pilgrimage*, the Weigels and Lev have corrected this problem, and in doing so have restored two millennia of Christian art to its full meaning and purpose. It is this deep, more transcendental dimension of art – the cult aspect of culture – that this book brings to light. In doing so, these perspicacious explorers have done a singular and invaluable service for the cultural life of our times.

Washington, DC based architect, Milton W. Grenfell, NCARB, CNU, has exclusively practiced traditional architecture since 1986. His widely published work ranges from tea houses to townhouses, mantel pieces to town centers, with particular emphasis at present on residential and religious projects. See www.grenfellarchitecture.com.



PROJECT TEAM

DESIGNER: Richard S. Vosko, Ph.D., Hon. AIA; **LITURGICAL CONSULTANT:** C. Elizabeth Rowe-Manning; **ARCHITECTS:** Kerns Group Architects, PC and Lacey Thaler Reilly Wilson, LLP; **CONSTRUCTION MANAGEMENT:** Wainschaf Associates, Inc.; **MEP:** MH Professional Engineering, PLLC; **LIGHTING:** Rambusch Studios; **SOUND:** C. Elizabeth Rowe-Manning; **CUSTOM WOODWORK:** David Fuller; **ICONOGRAPHER:** Christine Simoneau Hales

Repurposing Places of Worship

In the mid-1970s I visited the vacant 19th-century mills in North Adams, MA. This historic property once housed small-scale machine shops that produced printed textiles and electronics. The dramatic transition from the Second Industrial Revolution in the United States to the age of advanced computerized technologies rendered these businesses obsolete. Today many of the buildings are home to the Massachusetts Museum of Contemporary Art (Mass MOCA). It is a stunning, vibrant and successful example of a repurposed traditional building.

There are myriad examples of the adaptive reuse of buildings. The most common ones are in the market place where a retail franchise takes over a store once used by another business. For the most part, these are spaces where the occupant concludes that the original purpose of the property is no longer profitable or practical. With costly overheads and upkeep, the owner usually has no recourse other than to sell the property to someone who may repurpose it. Often courageous civic leaders, community-minded developers, ambitious entrepreneurs and talented architects turn the space into thriving venues like Mass MOCA.

Something similar is occurring in the field of religious architecture. At least three factors are influencing the shape and purpose of many

houses of worship: 1) the emergence of non-denominational churches, 2) the closure of mainline churches and 3) the adaptive reuse of churches by vibrant congregations who own them.

The emergence of non-denominational churches.

Several research centers point out that, in recent decades, there has been a steady transformation of religious behavior in the United States. The numbers of those who have left the religion of their childhood, joined other religions or are now unaffiliated, are increasing. This circumstance has created a competitive religious marketplace. New awakenings are taking shape in the form of emerging independent churches.

The rise of the non-denominational church building boom escalated in the late 20th century. The so-called mega-churches rivaled large traditional houses of worship but lacked the appearance of the familiar Neo-Gothic or Classical styles. However, architectural classification did not matter to the worshipers. They were more interested in what was taking place inside these sanctuaries.

In recent years, however, beginning with the economic downturn in 2008, construction of these colossal churches has declined in some regions. Also, the continual use of social media and other technological

advancements has made it possible for pastors to connect with members and seekers without being confined to a single fixed structure.

The standard building program now includes the adaptive reuse or repurposing of abandoned business centers or schools and churches once owned by other denominations. Turning these spaces into flexible houses of worship has become a financially wise strategy especially for fledgling congregations.

The closing of mainline churches. While burgeoning non-denominational churches are adapting spaces to accommodate their congregations, other older established religions are facing a different situation. They must decide what to do with underused church facilities.

Some well-established mainline religions, especially in the 19th-century industrial corridors of the United States, are struggling to maintain their buildings. Because of aging and dwindling congregations, demographic shifts and transitions in religious attitudes, administrators have had to make difficult decisions about their properties. Without the necessary finances, the owners of these venerable religious icons are faced with the same problems as proprietors of worn-out mills and malls.

On one hand, new religions are filling a gap left by older ones and are building new or repurposing old structures to serve their needs. On the other hand, traditional mainline religions in some parts of the United States are selling the church buildings that once served as neighborhood anchors but are now all but empty of congregants.

The adaptive reuse or repurposing of a church has become an important strategy for many religious cohorts. There is the option of selling the building outright to someone who will repurpose it or keeping the property and adapting it to give it new life.

The adaptive reuse of existing churches. Not all mainline churches are closing their buildings or merging congregations. Many longtime faith communities continue to flourish and offer prayerful liturgical services, faith formation classes and social outreach programs. These groups keep their church properties and seek to make them more user friendly and attractive to their growing congregations.

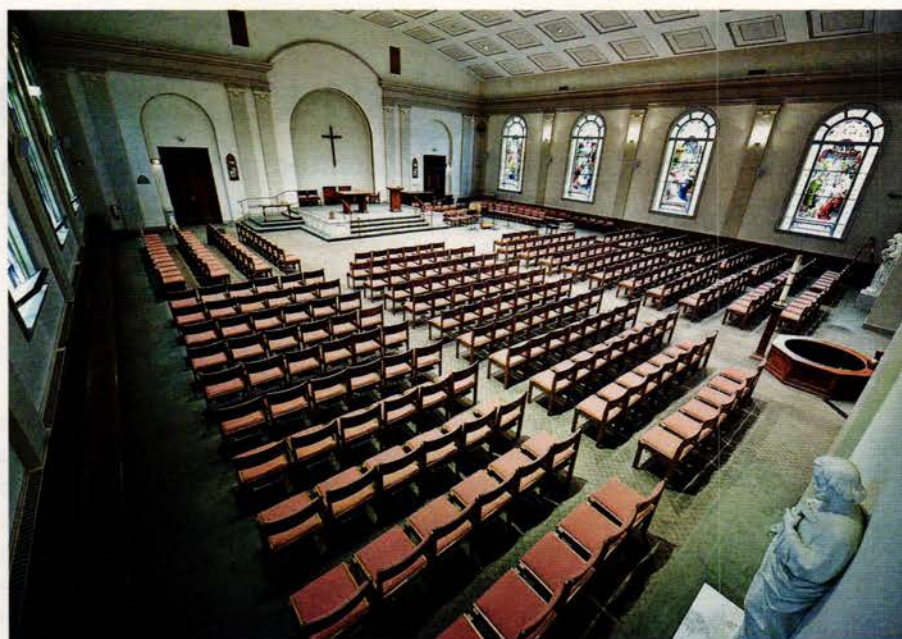
One factor that breathed new life into many churches was the landmark Vatican Two Ecumenical Council (1962-65). Over the past 50 years, Roman Catholic congregations have been adapting their older churches to accommodate the newly revised rituals of the church. This liturgical movement has affected other Christian religions as well. In fact, similarities in Catholic and non-Catholic church buildings are quite noticeable.

Saint Vincent de Paul Roman Catholic parish in Albany, NY, is a good example of an older congregation that continues to thrive. The weekend liturgies draw people from 48 zip codes and the diverse membership has grown by 18% in the last 12 months alone. The church, which seats about 450, also serves as the worship site for nearby colleges, universities and hospitals.

The congregation is known for social outreach, a spirit of courageous hospitality, inspiring liturgies, intelligent preaching and lively music. The parish offers a faith formation program for all ages and supports one of the largest food pantries in the Albany, NY, Capital District. Due to the personnel shortage in the Roman Catholic ministerial priesthood, a married woman now guides the congregation.

The parish began in 1885 and first worshiped in a repurposed wooden church bought from a Baptist congregation. The current church building was constructed in 1908 in the Greek Revival style. It was remodeled and enlarged to accommodate 1,000 worshippers in 1957. After a destructive fire, the church was reconfigured in 1985. In a remarkably creative way a whole section of the building was repurposed. In addition to the sanctuary the church now has two floors of offices and meeting rooms.

Then again in 2014 the worship area of the church building was further adapted to accomplish two goals: 1) to update the interior and 2) to rearrange the liturgical setting. Prior to this 2014 renovation the main worship space was not ADA compliant, the lighting was inadequate, there were no restrooms on the main floor and the church was not air conditioned. The grisaille paint scheme with trompe l'oeil ceiling was worn out and the



St. Vincent de Paul Roman Catholic Church, Albany, NY, before restoration (above). The restoration moved the altar to the center and arranged seating in concentric circles (opposite). Photos: Michael F. Joyce

seating plan limited the options for participation in the liturgy.

The members of this congregation understand their participatory role during worship. Based on current church instructions, the altar should occupy a place that is central in the church. In the repurposed plan all worshippers are arranged in concentric circles, equidistant from the altar table. They can see and hear each other much better and they can intimately engage with all liturgical ministries during worship. There was full support for this adaptation. No one ever contended that the congregation should restore the church to its original plan.

New pastoral leadership energized the congregation to embrace these major liturgical improvements. A series of educational and listening sessions was conducted with the congregation. Professional and committee programming exercises determined the scope of work. Responsible stewardship and attention to people who live in poverty guided the budget. The total project cost was \$850,000.

The improvements to this repurposed church consisted of new carpet and wood flooring throughout the nave, construction of a new barrier-free, wood sanctuary platform located exactly in the center of the square nave, the rearrangement of 450 movable chairs in a concentric plan around the altar platform with spacing for persons with different abilities.

The program also included the relocation of the music ministry in front of a new reflective surface to enhance the sound and reduce reliance on electronic amplification, the construction of a new baptismal font allowing for ritual options including barrier-free access for persons with different abilities, new LED lighting throughout the worship space with programmable dimming controls, all newly painted surfaces including the cosmic theme on the ceiling, the installation of eight new icons of holy men and women chosen by the congregation, air conditioning throughout the worship space and a new barrier-free family restroom in an existing parlor near the entrance to the church.

St. Vincent de Paul Roman Catholic Church continues to have an influential presence in the city of Albany, NY, because, throughout the years, its leaders have adapted its properties to changing times with care and cost effectiveness. This award-winning project is an example of how an older church building can be repurposed not only to shape the congregation's ritual behavior, but to also inspire works of justice and peace in the public sphere.

Richard S. Vosko, Ph.D., Hon. AIA, a Catholic priest, has worked as a sacred space consultant since 1970. His award winning portfolio includes innumerable cathedrals, churches and synagogues. He can be reached at rvosko@nycap.rr.com.

Reviewed by Calder Loth

The Third Time's the Charm

The Oxford Dictionary of Architecture, Third Edition

By James Stevens Curl with contributions on landscape architecture by Susan Wilson

Oxford University Press; 2015; hardcover, 1,017 pages; \$70
ISBN: 978-0-19-967498-5

Architects, architectural historians, landscape architects, and all types of architectural aficionados will find this new and expanded edition of James Stevens Curl's prodigious *Oxford Dictionary of Architecture* an essential reference. I have regularly used the paperback version of the first edition (1999) as a desk copy and look forward to having an even greater amount of trusted information at my fingertips. The octavo size (6x9 inches) does not inhibit easy physical handling. With its more than 6,000 entries, beginning with Aalto and ending with zystos, the new edition has been enlarged to include nearly 1,000 additional entries, 50% of which are related to landscape design, contributed by landscape historian Dr. Susan Wilson. This is a valuable inclusion of essential information since many architects often perceive works in isolation, overlooking the importance of landscape setting and context. How many architects know what a patte d'oie is and how it is used to relate a building to a garden or even understand its role in town planning?

Supplementing the main dictionary is a bibliography of some 6,300 entries, a testament to Prof. Curl's formidable scholarship. This addendum covers monographs, architectural dictionaries, biographical dictionaries, articles and historic pattern books. The bibliography is a useful reference in itself and assures us that Curl's definitions are based on reliable sources. Indeed, the dictionary's information is certainly to be more trusted than much of the online material so tempting for quick access.

Of course the meat of the dictionary is the succinct biographies of a host of architects, each listing their dates, principal works, and their place in history. Unlike the earlier editions, the 3rd edition includes individual entries only for the deceased. Curl rightly states in his preface that one cannot offer rounded judgment on an architect's life work until it is finished. Nevertheless, certain important living architects such as Robert Adam, Leon Krier, John Simpson, Robert A. M. Stern, and Quinlan Terry are sneaked in in the definition of New Classicism. To be fair, Frank Gehry, Zaha Hadid, Daniel Libeskind, and the like are cited in the entry on Deconstructivism.

As might be expected of a British scholar, the bulk of the architects' entries are British; however, European and American architects are adequately represented. Even so, it's tempting to scrutinize which Americans didn't make it. Conspicuously absent is Arthur Brown, Jr., architect of such masterful classical works as the San Francisco City Hall and the centerpiece of Washington's Federal Triangle.

Following the pattern of his previous editions, Prof. Curl defines an abundance of architectural features and details with heavy emphasis on terms relating to classicism. Curl admits that he had to restrain the number of Chinese and Japanese terms, which could otherwise have filled the book. Middle Eastern terms are given suitable representation.

Many entries are complemented with the author's line drawings, some 270 of which are sprinkled through the text. Though at small scale, the drawings are clear and precise, many with helpful annotations. Among the drawings are different types of moldings, rustication, capitals, and gables, as well as various floor plans. One might wish, however, that the etymology of some of the terms could have been included. Knowing the origin of such terms as echinus

or patera is helpful in understanding their appearance. On the other hand, skimming through the book provides the delight of coming across such esoterica as pastophorium and sheela-na-gig. Interestingly unfamiliar words as these make this work an entertaining and educational vehicle for casual perusal.

No work of this type would be complete without properly addressing construction details. Particularly informative are the several pages devoted to brick: brick types brick bonds, and brick pointing, all supplemented with numerous illustrations. Substantive too are the sections on arches and vaulting with their own associated illustrations, to say nothing of all the different elements of various type of ridges.

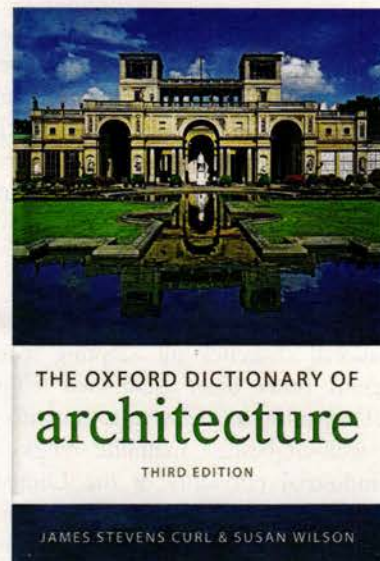
Prof. Curl is a well-known authority on classical architecture and his entries on classical forms, details, and buildings, as well as the practitioners of the various classical styles form a principal strength of his dictionary. For one so proficient in the scholarship of classicism, it may be inevitable that a degree of subjectivity (albeit informed) creeps into various entries that are antithetical to the more traditional modes. For instance, we find the following in the entry on Modern Style: "Modern Movements (there were many strands) promoted an incoherent, limited, non-architecture (with no sound intellectual basis whatsoever), which has not contributed to an agreeable environment, and indeed has succeeded all too well in creating an inhumane, alien, dangerous Dystopia."

More amusingly, his entry for piloti, (a term previously unfamiliar to me), i.e. an open ground floor, states, "It was a favorite device of Le Corbusier: its widespread adoption in the UK has created many unpleasant spaces." Such outspoken observations, whether we agree or not, make for an engaging read.

No dictionary is ever fully comprehensive, but this Third Edition is a commendable effort to fill various voids of his previous editions and to make a huge and vital subject accessible and interesting (and affordable) to a general public. Some architectural dictionaries and encyclopedias can extend to several volumes, rendering them costly and intimidating. This new edition of *The Oxford Dictionary of Architecture* admirably compresses some 4,000 years of architectural information into a concise and reliable reference.

Much of our contemporary architecture suffers from the lack of an informed laity or even informed designers. A tabula rasa does not guarantee great work. We count on Curl's and Wilson's impressive new edition to make us all more architecturally literate and in so doing, enrich the quality of our buildings and the character of their settings. This dictionary should be a required addition to the desk of any architect, builder, gardener, or inquisitive individual.

Calder Loth is the Senior Architectural Historian for the Virginia Department of Historic Resources. He is a member of the Council of Advisors of the Institute of Classical Architecture and Art where he teaches architectural literacy. He was the 2010 recipient of the ICAA Board of Directors Honors Award. He serves as Vice President of the Center for Palladian Studies in America. He can be reached at cloth@verizon.net.





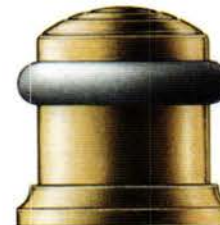
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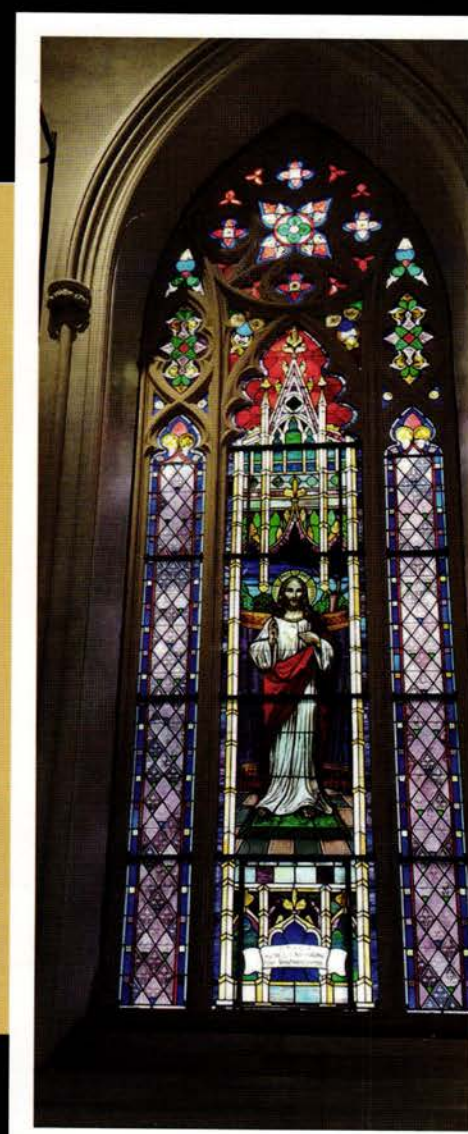
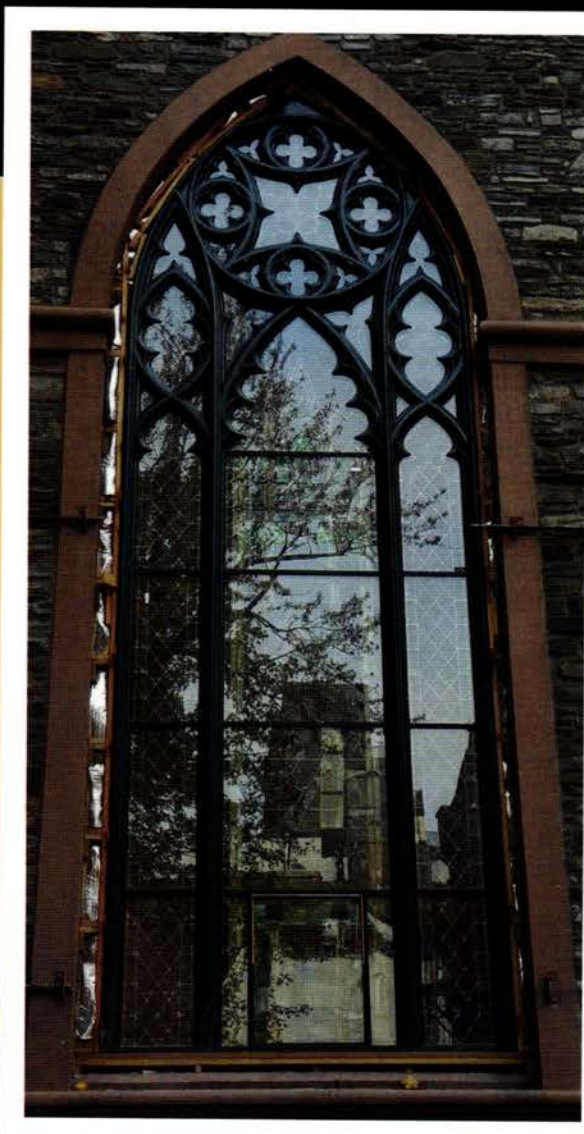
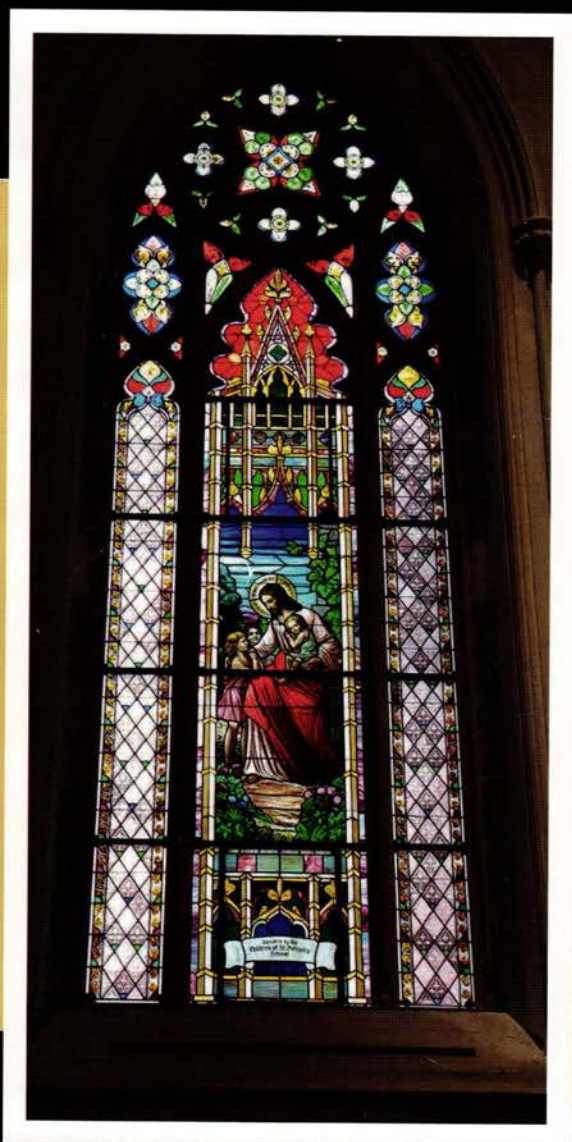
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