

4.3

The Stained Glass Conservation of Trinity Church, Wall Street

Brianne Van Vorst and Drew Anderson

La conservation des vitraux de l'église de la Trinité, Wall Street – Résumé

Quand on pense à Trinity Church à New York, sa façade en grès vue de Wall Street ou du cimetière emblématique nous vient à l'esprit. À l'intérieur, l'église abrite plus d'une centaine de fenêtres en verre teinté et au plomb datant de la construction du bâtiment original des années 1840 jusqu'à l'époque de l'ajout arrière introduit dans les années 1960. Cet article explore l'identité des vitraux de l'église de la Trinité et comment cette identité a été maintenue pendant le programme de conservation.

L'identité de ces fenêtres est explicitement fondée sur leur conception, d'origine, leur état et leur histoire de conservation. La fenêtre du chœur à l'extrémité ouest est la plus ancienne fenêtre figurative de Manhattan (vers 1845) et la seule fenêtre figurative de l'église principale de Trinity. Les bas-côtés et les vitraux des parties hautes sont de la même date et sont typiques de l'esthétique et de la palette de couleur évoquant des pierres précieuses du milieu du XIX^e siècle : un fond losangé mis en valeur par des bordures peintes. L'architecte de Trinity, Richard Upjohn, était responsable de la conception du bâtiment ainsi que d'une partie importante de la conception des vitraux. L'implication de l'architecte dans la conception du vitrail est peu rare. Upjohn était un designer talentueux, mais pas un vitrier. L'énigmatique Abner Stephenson semble être apparu de nulle part pour réaliser les fenêtres. Les vitriers étaient une rareté à New York en 1844, mais Stephenson était véritablement un choix hors du commun, peintre sur verre compétent - son travail possède un style spécifique et montre une compréhension claire des matériaux et de la technique -, mais certains aspects de la mise en œuvre des fenêtres à Trinity suggèrent qu'il pourrait avoir été un vitrier inexpérimenté.

Aujourd'hui, nous voyons que l'état des fenêtres a été affecté par la modification de l'environnement extérieur de l'édifice : une ligne de train surélevée et plus

tard un métro sous l'église semblent avoir provoqué un mouvement important dans les maçonneries et dans les fenêtres elles-mêmes. Les sources documentaires ont révélé que les ruptures du verre dues au mouvement de la pierre, les actes de vandalisme et les campagnes d'entretien ont contribué à une multitude d'interventions sur ce vitrail au cours des 175 dernières années.

Les enquêtes effectuées par les auteurs pour procéder à l'état des lieux ont donné des preuves des restaurations : réparations lourdes avec raccords et bretelles de plombs ; réparations à l'aide de feuilles de cuivre ; compléments mal peints ; remplacement de panneaux entiers ; peinture à froid appliquée n'importe comment sur des fenêtres entières ; bordures aux verres anachroniques ; traces dues à la pulvérisation de peintures et différents types de vitrages de protection non ventilés. Des dégradations classiques telles que des ruptures de plombs non traitées, des pertes de peinture, des barlotières manquantes ou cassées et des déformations de panneaux ont également été observées sur les fenêtres. Les relevés ont révélé quatre baies des parties hautes avec leurs réseaux d'origine. L'inaccessibilité de ces baies de l'extérieur témoigne de leur ancienneté et donne un aperçu du passé.

Une approche axée sur la conservation a été mise en œuvre pour préserver les conditions existantes dans la mesure du possible et améliorer les éléments qui ne fonctionnaient pas correctement sans diminuer l'identité inhérente au vitrail.

Tous les aspects de ce projet ont été pris en considération pour l'entretien continu et les futurs conservateurs. Une documentation complète était nécessaire pour brosser un tableau très clair de ce qui était conservé et des matériaux spécifiques utilisés. La campagne de conservation a assuré un long avenir aux vitraux de l'église de la Trinité avec un impact minimal sur son identité établie de longue date.

The Stained Glass Conservation of Trinity Church, Wall Street – Abstract

When one thinks of Trinity Church in New York, its sandstone façade seen from Wall Street or the iconic graveyard come to mind. Inside, the Church holds over one hundred stained and leaded glass windows dating from the original 1840s building construction through to the time of the rear addition introduced in the 1960s. This paper explores the identity of the stained glass in the primary structure of Trinity Church, and how it was maintained during the recent conservation program.

Trinity's architect, Richard Upjohn, was responsible for the building design as well as a significant part of the stained glass scheme. The enigmatic Abner Stephenson appeared as if from nowhere to fabricate

the windows. The identity of the stained glass is built upon and inextricably linked to its design: reflecting Victorian stained glass iconography and jewel-toned color palette; construction: the windows in the main part of the church were fabricated on site; and its conservation history: continued maintenance intended to preserve one of the building's most distinguishable qualities. The Chancel window at the west end is remarkable as the oldest figural window in Manhattan and the sole figural window in Trinity's main church. Condition surveys carried out by the authors showed physical evidence of the previous restorations: heavy repairs with cumbersome mending and strap leads; copper foil repairs; poorly painted restoration infills; wholesale replacement of panels; indiscriminate cold paint applied across entire windows; borders made

of glass not available at the time of the original fabrication; back spray from interior painting and various types of unventilated protective glazing. Typical degradation such as untreated breaks, paint loss, missing or broken saddle bars and bowing were also seen throughout the windows. The surveys revealed four bays of entirely original clerestory tracery. The inaccessibility of these bays from the exterior evidenced their originality and provided a glimpse into the past. The project was also met with a uniquely American challenge: asbestos.

A conservation-focused approach was implemented to preserve existing conditions wherever possible and improve upon the elements that were not functioning properly. Consideration was given throughout all aspects of this project to ongoing maintenance and future conservation. Extensive documentation was required to paint a very clear picture of exactly what was conserved, and which specific materials were used. The conservation campaign has ensured a long future for the stained glass at Trinity Church with minimal impact to its long-established identity.

The Character of Trinity Church

The history of Trinity Church spans three hundred years. The iconic building situated at 75 Broadway is the third Trinity Church built on this site (fig. 1). The current structure was begun in 1839 and finished in 1846. The identity of the building and its stained glass comes from those responsible for its creation: architect Richard Upjohn and glazier Abner Stephenson. They created the first example of Gothic Revival



Fig. 1. Trinity Church, exterior. Photograph by Trinity Church and reprinted with their permission.

architecture in New York and the earliest surviving American-made figural stained glass in Manhattan. The identity of the stained glass is built upon and inextricably linked to its design: reflecting Victorian stained glass iconography and jewel-toned color palette; construction: the windows in the main part of the church were fabricated on site; and its conservation history: continued maintenance intended to preserve one of the building's most distinguishable qualities. Trinity Church has been designated a National Historic Landmark since 1976.¹

Richard Upjohn came to America in 1829 as a carpenter.² By 1833 he was marketing architectural plans and elevations. In 1834 he moved to Boston and worked for various architects as a draftsman while marketing his own designs. During these early years, he befriended the rector of Trinity Church, Boston: Dr. Jonathan Mayhew Wainwright. Wainwright was called to fill a vacancy at Trinity Church, Wall Street.³ By the time he arrived, the second Trinity Church on Wall Street (c. 1788-90) was in disrepair with a dangerously sagging roof. Upjohn was called to New York to assess the building in 1839.⁴ The repair of the existing building was not possible, and Upjohn submitted plans for a new church in 1839.⁵ Construction started that year.

¹ National Register of Historic Places, Trinity Church, New York, NY #76001252.

² Everard UPJOHN, *Richard Upjohn: Architect and Churchman*, Columbia University Press, New York, 1939, p. 23.

³ UPJOHN 1939, pp. 31-47.

⁴ UPJOHN 1939, p. 48.

⁵ UPJOHN 1939, pp. 49-50.



Fig. 2. Trinity Church, window C219, Chancel stained-glass window. 2020. Photograph by Whitney Cox, reprinted with permission of Trinity Church.

Abner Stephenson was hired to fabricate the stained glass. Glaziers were a rarity in New York in 1844, but Stephenson seems an unusual choice. The archives do not contain any information regarding his training or pedigree. Stephenson immigrated to New York with his family and arrived on 20 May 1836, on the ‘South America’ out of Liverpool, England. On the ship’s registry, he listed his age as 24 and profession as a “Herald Painter.” Stephenson’s 1844 naturalization paperwork lists his former nationality as English. It is unknown how he and Upjohn met. In fact, very little is known about him other than the aforementioned details. Trinity is the only confirmed building still containing glass fabricated by Stephenson that we have identified. The original glazing contracts between Abner Stephenson and Trinity Church exist in Trinity’s archives.⁶ The windows were fabricated on the church’s grounds.⁷

Surviving drawing fragments illustrate the breadth of Upjohn’s involvement in the stained glass, a role unusual among American architects of this period.⁸ A previous article outlines that after several solicitations for the design of the Chancel window, it was ultimately Upjohn who designed it.⁹ The cartoon was drawn by artist Thomas Hoppin and the window was cut, painted and glazed by Abner Stephenson.¹⁰ The Chancel window depicts Christ flanked by six apostles (fig. 2). The lower register and tracery contain foliage and Christian symbols. The color palette, style of painting and elements of iconography appearing in the Chancel are echoed in the aisle and clerestory windows. These elements were a planned characteristic of the stained glass scheme.

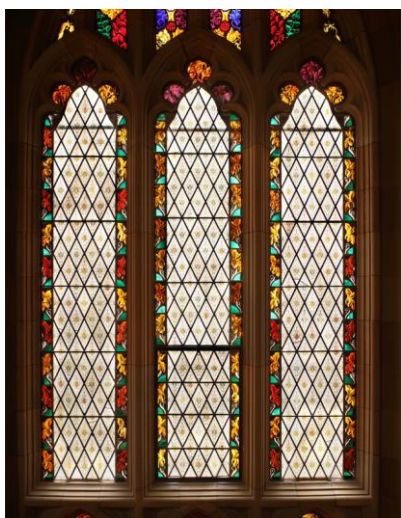


Fig. 3. Trinity Church, window A111, stained-glass aisle window. 2019. Photograph by Whitney Cox, reprinted with permission of Trinity Church.

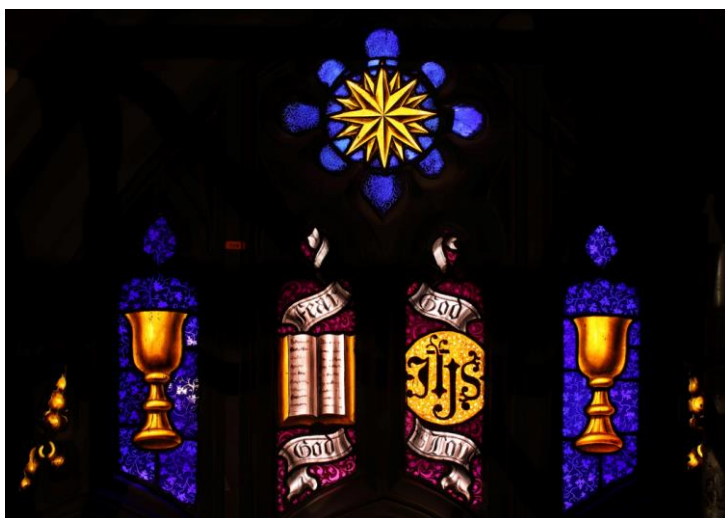


Fig. 4. Trinity Church, window B208, clerestory tracery, 2018. Photograph by Whitney Cox, reprinted with permission of Trinity Church.

The formulaic design of the sixteen aisle windows contain a printed quarry field within each lancet, surrounded by vertical colored borders (fig. 3). The quarries are colorless glass with an ornamental pineapple or pinecone, perhaps a bulb flower, with a small amount of silverstain in the center. The borders are comprised of various types of foliage, each section containing a colored accent piece. Every window has a unique tracery filled with jewel-toned colored glass painted with foliage and Christian symbols. The silverstain varies from pale yellow to rich amber throughout. It is noteworthy that the original aisle scheme still exists at Trinity. Diamond glazing is traditionally undervalued in the United States and has often been replaced with opalescent memorial windows in the early 20th century when the work of

⁶ “Memorandum of an Agreement,” contract, signed by Abner Stephenson and each member of the Building Committee, 1 July 1844, Trinity Wall Street Archives (TWSA). The Chancel window was a separate contract signed in October 1845. “Minutes of Building Committee of 3rd Trinity Church re: Stained-glass windows,” n.d. TWSA [1].

⁷ UPJOHN 1939, pp. 54-55.

⁸ The Upjohn collection of architectural drawings by Richard MICHELL and Hobart UPJOHN: Architectural drawings papers and records, 1827-1910. Dept. of Drawings & Archives, Avery Architectural and Fine Arts Library, Columbia University, New York, N.Y. K-13 1B.

⁹ Julie SLOAN, “‘The richest colors imaginable’: The stained glass of Trinity Episcopal Church”, Wall Street, NY (1846), *The Journal of Stained Glass*, vol. XXXVI, 2012, p 56-77.

¹⁰ *Ibid.*

designers like Louis C. Tiffany and John LaFarge flourished in popularity. At least once, Trinity Church considered replacing the existing stained glass with new (1932).¹¹ The change was never executed, implying that the church was self-aware of its fundamental identity.

The original clerestory lancets were replaced in 1967. Documentation in the Trinity archives from 1932 provides evidence of paint loss to lancets within the clerestory level,¹² further substantiated by a 1967 unpublished research paper.¹³ It is assumed that the aesthetic ramifications of paint failure triggered the replacement of the clerestory lancets. Only the original clerestory tracery glass survives and, like the aisle, is jewel-toned in color and painted with foliage and Christian symbols (fig. 4).

Upjohn and Stephenson were early in their careers at the time they received the commission for Trinity Church, but their combined efforts in design and style set the tone for the Gothic Revival style in America. The consecration of the Church and its windows was recorded in the May 1846 *New York Herald* article,¹⁴ which praises the ambitious colored and painted glass. Trinity Church quickly became a distinguished icon in lower Manhattan and has retained the majority of its original glazing, maintaining an ageless, yet period-distinctive, character.

Existing Conditions

Typical Conditions

The stained glass in the church was set in a glazing groove with mortar. The exterior, and in some cases the interior, of the windows were caulked over several times as part of “general maintenance” campaigns.¹⁵ Any natural stone movement was exacerbated by both the construction of elevated train lines (beginning in the 1870s) and the subway, run under Broadway directly in front of Trinity Church, in 1904. The impact of the subway was recognized by the city of New York, and in 1935 a report of examination of the church tower and Interborough Rapid Transit subway was published.¹⁶ The masonry moved significantly over time, especially at the east end of the building causing stress breakage throughout the windows. Breakage also ensued from vandalism. For example, on 30 September 1977 “a vandal threw rocks through practically all of the lower stained-glass windows on the north and south sides of Trinity Church.”¹⁷

Given these conditions, nearly all of the windows were restored, some several times. This included the cleaning, repair, replacement, and re-leading of the windows in at least six different decades (1914, 1932, 1946, 1977, 1990s).¹⁸ Although the intention during these campaigns was to maintain the original appearance of the stained glass, original materials were often sacrificed to improve aesthetics. The 1932 restoration included more than one thousand new diamonds and three hundred pieces of border.¹⁹ In cases where existing materials were retained, antiquated repair techniques (such as grozing glass to allow for a lead repair) irreversibly changed the original material. Protective glazing was inconsistently added over time, giving the exterior of the building an unbalanced façade. The only original lead identified was in four tracery openings in the clerestory level: no original lead survived in the aisle or Chancel.

¹¹ With thanks to Building Conservation Associates, Inc for providing preliminary research. TWSA Property Management Collection, Box 539, File 5.

¹² With thanks to Building Conservation Associates, Inc for providing preliminary research. “Letter from Heinigke and Smith to Reverend Stetson.” TWSA Property Management Collection, Repairs 1924-1939, Box 539, File 5.

¹³ TWSA Property Management Collection, Box 539, File 5. Margaret H. TUFT, ‘The Stained Glass of Trinity Church, New York’, unpublished paper, 8 November 1967, Avery Library, Columbia University.

¹⁴ “Consecration of Trinity Church,” *New York Herald*, 22 May 1846, 1.

¹⁵ The word caulk relates to the application of a weatherproofing substance of any or all but not limited to the following materials: polyurethane, butyl, silicone, asbestos, latex, acrylic, vinyl.

¹⁶ Ralph A. CHAMBERS & Harry ENGLANDER, “Trinity Church, Broadway and Wall Street, New York City: report of examination of the church tower and Interborough Rapid Transit subway”, 1935, Avery Library, Columbia.

¹⁷ With thanks to Building Conservation Associates, Inc for providing preliminary research, substantiated in the TWSA Comptroller Collection, Box 651, file 2.

¹⁸ With thanks to Building Conservation Associates, Inc for providing preliminary research substantiated in the TWSA, 7 volume Trinity publication titled *A History of the Parish of Trinity Church in the City of New York*.

¹⁹ With thanks to Building Conservation Associates, Inc for providing preliminary research, TWSA Property Management Collection, Box 539, File 5.

The Aisle

Despite their previous re-leading, the aisle panels exhibited bowing in many places. Exterior bars were retroactively soldered onto the matrix but were not set into the stone and were not providing adequate support. The extent of previous repairs in the aisle windows varies from the sporadic replacement of individual pieces to the complete replacement of entire panels. Due to poor execution, some of the replacement pieces are easily identifiable, while others closely replicate the original pieces. Previous restorers repurposed quarries, often joining two different halves together with lead. There were many cumbersome mending leads. The south side of the aisle has typically been restored more often. Inconsistencies within the quarry design illustrate different hands at work during multiple restorations.

In the early–mid-20th century, a reredos was installed in front of north aisle window 114. It appeared that this window was only restored once before the reredos sheltered it from further intervention. Window 114 became the point of reference for identifying original quarries. The diamonds identified as the oldest (given the paint color, design, and condition) show no evidence of brushstrokes. The schedule of completion for the aisle windows, containing nearly 6,500 diamonds, was approximately ten months.²⁰ Given the lack of brush strokes and short production timeframe, it is our opinion that the original aisle windows were mass-produced, perhaps transfer printed. Diamonds identified as original exhibited lost or fragile paint.

The two east-facing aisle windows (101, 116) were replaced entirely in the past. The border pieces were sympathetic to the borders elsewhere in the aisle windows, but the quarries themselves were a very dark gray, entirely out of keeping with the rest of the windows.

Another notable aspect of the aisle windows is what we referred to as the “shoulder piece.” In nearly all of the panels, the corner quarries at the stone cusps were broken (likely during past removals) and a replacement piece inserted. In most cases, the replacement piece was clear glass with matte heavily applied; in a few cases, there was a re-purposed quarry. We do not know if the shoulder pieces were originally a continuation of the quarry design or the border design.

The Clerestory

Like the aisle, areas of the clerestory tracery had been restored multiple times. Given the height of the nave and documentation in the archives, work undertaken on the clerestory windows was done from the exterior side aisle roof. The four bays on the west end of the church do not have an aisle roof underneath the clerestory level. Thus, windows 208-211 were not accessible from the exterior and escaped restoration since their original installation. These are the only four tracery openings containing original lead.

The lack of proper interior access coupled with breakage resulting from stone movement led to dozens of replacement pieces and unsatisfactory repairs throughout the clerestory tracery. Aside from the small amount of original lead, the rest of the clerestory tracery was releaded in the 1940s and 1990s. The 1990s restoration entirely replaced approximately 13 panels. Regrettably, the replacement panels were made significantly smaller than their openings. Other panels treated during the 1990s restoration campaign used a combination of original glass and replacement pieces.

As mentioned above, clerestory lancets were entirely replaced in 1967. The 1967 windows were printed with a fleur-de-lis on yellow glass surrounded by a stylized foliage border: an interpretation of the original clerestory design. It is important to note that although the windows were replaced, the Victorian design of diamond quarries inside stylized borders was maintained. The lancets were all set into steel and bronze frames, many of which were ill-fitting, and voids were filled with backer rod and caulk.

The Chancel

The multiple interventions undertaken on the Chancel window were obvious by the size and condition of the lead and further evidenced by information in the archives and graffiti on the exterior of the stained glass. Noticeable replacement pieces permeate the window, as in the example of St Matthew’s head. The window had also been cold painted on many occasions with dark paint and/or shellac. In

²⁰ Stephenson’s contract was signed on 1 July 1844. The majority of the windows in the church were complete by May 1845 as per “Trinity Church, New York,” from *N.Y. Mirror*, [Baltimore] *Sun* (May 27, 1845), 1.

some areas, the cold paint was applied across the lightest areas of the window *in situ* and extended over the lead came. A photochrome from c. 1901 shows the presence of exterior glazing, suggesting that the abundance of light coming through the window required mitigation.²¹ This “smoke glass” was later removed and cold paint was applied, possibly to minimize glare. The glass paint was discovered to be fragile, and the fragility likely factored into the decision to apply cold paint in the past. The various applications of cold paint throughout the window have been affected by moisture and natural deterioration, causing a blotchy and inconsistent appearance.

Conservation

The CVMA guidelines and our condition surveys informed the conservation approach. All treatment prescribed during this campaign is re-treatable or reversible. Importantly, Trinity Church set goals of sustainability and greater thermal insulation of the overall building. Therefore, the stained glass conservation scope was designed from the outset to include environmental protective glazing in the Chancel and an adapted form of internal ventilation elsewhere.²²

Asbestos

Caulk and glazing putty containing asbestos is a particular problem in the United States. Caulk – rather than the traditional use of lime mortar pointing – has been used commonly in window settings for decades. Asbestos was added into building materials freely in the period from 1930 up through the 1970s. The health risks that Asbestos Containing Material (ACM) poses to humans has since been identified. ACM can become friable and inhaled when disturbed. In the State of New York, the disruption of friable ACM material triggers the need for abatement by specially trained and licensed professionals.

The glazing putty and caulk at Trinity Church tested positive for ACM. The effects of abatement became the main issue taken into consideration when determining the necessity of removing the windows. The risks were carefully weighed by the stained-glass consultants, project architects, and client.

Preliminary testing was conducted with the intention of softening the ACM. Softening the material would allow for its removal with hand tools, minimizing the level of force the abatement professionals would need to employ near the stained glass. A variety of solvents were tested. Although no single solvent was 100% successful (multiple campaigns of exterior caulking used different types of caulk), Dichloromethane based solvents had the greatest effect. The solvents softened areas of the caulk enough to remove layers of caulk with hand tools. Tools with oscillating blades were then used to free the windows at the groove.

The original conservation scope included necessary conservation treatments required for the longevity of the stained glass and stone and the introduction of new protective glazing. The success of the abatement test informed our decision to move forward with removal of the windows to permit conservation.

Aisle

After abatement and removal, the paint stability of each aisle panel was tested. Dismantling allowed access to the multitude of early lead repairs and poor replacement pieces within the center of the panels. After dismantling, both sides of the windows were gently cleaned with deionized water and cotton wool swabs. Pieces containing unstable paint were cleaned on the exterior non-painted side, and any stubborn putty was carefully mechanically removed.

Only the poorest painted restoration pieces (quarries of the wrong color glass or design) were replaced with appropriate substitutions. Thick mending leads were removed, and the glass was bonded using epoxy Hxtal NYI-1 and neutral cure silicone as often as feasible. Copper foil was introduced when bonding was not possible, and in some cases lead repairs were reintroduced. For example, where two

²¹ Library of Congress, LC-DIG-det-4a31840. Available online at <https://www.loc.gov/pictures/item/2016794157/> [accessed 1 December 2019].

²² As stated in the CVMA guidelines in section 3.2.1, protection is integral for long-term survival. Corpus Vitrearum, *Guidelines of the Conservation and Restoration of Stained Glass* (Nuremberg, 2004). Published online at <http://www.corpus-vitrearum.org> [accessed 1 December 2019].

different quarry pieces with different designs were jointed with lead, thinner lead or foil was used. The negative aesthetic impact of the replacement quarry fields in the two east-facing aisle windows (101, 116) was considered, and it was ultimately decided to replace them with a more sensitive restoration. The original traceries and existing border designs were retained and conserved appropriately.

The aisle windows were returned to the building with a bespoke protective glazing solution. An internally ventilated protective glazing system with bronze frames was unviable in the aisle due to time and budget limitations. Externally ventilated protective glazing was ruled out due to concerns of heat loss from the church interior, limited exterior jamb space and its inefficiency in reducing the risk of condensation.

With these factors in mind, a compromise was reached and a method of allowing air into the interspace was employed. This design was made possible because of the inconsistent “shoulder” pieces, all of which were unoriginal restoration glass. These pieces were removed and a vent was put in their place at the shoulder of each lancet. Two vents were introduced at the sill of each lancet; the half diamonds at the base were not releaded into the matrix but copper foiled and soldered proud of the matrix, angled to the interior to allow for some airflow. The open space was enclosed using bronze mesh to minimize insects or dust. Protective glazing of ½” laminated glass was installed against brackets (to ensure an even plane and reflection) on the exterior of the building.

The panels were re-leaded with the same size and profile as the existing lead came and steel rebar was inserted next to the heart in the two vertical leads between the quarries and borders for additional support.

Clerestory Tracery

Clerestory tracery panels with very minimal damage, including those in their original leading, remained *in situ* for treatment to avoid abatement. Panels that required significant conservation were abated and removed. The 1990s-made panels that were too small for their settings were removed and cleaned. Additional perimeter lead came was added to ensure the window fit properly into the groove. The 1840s panels that were severely broken were removed for treatment. Individual pieces were extracted and repaired without re-leading where possible. When the breakage or missing glass was severe, the panels were dismantled, treated and releaded with the same size and profile as was existing. The clerestory tracery panels received the same protective glazing treatment as the aisle windows.

The project included the replacement of the 1967 clerestory lancets. The goal of the replacement was to introduce a window design that was more sympathetic to the historic fabric while also allowing more light into the church. Newspaper articles and historic photographs revealed that the 1840s clerestory windows had various border designs surrounding a repeating quarry field design, the same design template as the aisle windows. It appears that the 1967 design was influenced by what remained of the original windows. We were able to isolate four designs from the historic photographs that were reinterpreted into the new clerestory. The new clerestory windows are intended to be identifiable as new work that harmonizes with the existing Gothic Revival character of Trinity Church. Thought to future conservation was given, and the windows were designed with bronze frames, internal ventilation, and protective glazing.

Chancel

All Chancel panels were abated and removed for treatment. Once the panels were brought to the studio for conservation, it became apparent that the mixture of glazing cement used was extremely hard. Ultimately, the safest way forward was through partial releading. Only areas with the most severe mending leads or poorly painted restoration pieces were dismantled for treatment. Thick mending leads were removed and edge-bonding was used as often as possible.

Consideration was given to removing the cold paint because it was unoriginal, heavily applied and flaking off. Philosophically, it was concluded that removing the cold paint would not return the window to its original design. The Chancel window has been darkened since its inception by various methods and removing the cold paint may eliminate the familiarity and identity of the window. From a technical standpoint, intervention was unsafe for the underlying glass paint. Solvents and mechanical means were tested for possible removal. We concluded that the removal of the cold paint could also remove the underlying glass paint, which in some cases was fragile. In order not to cause damage, the cold paint was

left intact. The existing, unoriginal fillet borders were replaced with antique glass lightly matted, to renew the original appearance of the border glass.

The immense value of this window to American stained glass heritage coupled with its fragile paint qualified it for environmental protection in the form of an internally ventilated protective glazing system. This system will prevent the formation of damaging cycles of condensation on the original glass, as well as protect the original glass from mechanical and atmospheric damage, maximizing its longevity.

The environmental protection includes ¾" heat-strengthened laminated glass set into the original glazing groove. The original stained glass panels are framed in bronze and brought slightly forward to create an interspace, mechanically fastened with screws to the interior stone jambs. Lead light shields obscure any light leaks. New bronze interior support bars remain at stack joints. Saddle bars were eliminated in areas where they were not attached to lead joints and obscured the design. Exterior bronze fins were added in their place for support.

Conclusion

In conclusion, the hugely recognizable appearance of the building as well as a continued tradition to preserve it, is what comprises Trinity Church's identity. Maintaining those recognizable qualities while improving certain elements, and working to time and budget limitations, was crucial. To maintain project momentum and meet the deadline, several conservation studios were involved.

Conservation measures such as removing mending leads and inappropriate restoration pieces allowed us to return the windows closer to their original 1840s appearance. This is echoed in the new windows in the clerestory level that are much more sympathetic to the original style. The conservation approach adhered to international guidelines and had positive impacts that outweighed the limitations.

This conservation project was undertaken on a high-profile building with an invested congregation and strong community. The Church opened for services on the completion date of Christmas Eve 2019. A full congregation participated in a Festive Eucharist, where they were able to appreciate the rejuvenated building without feeling a loss of its inherent and distinctive character.

