



Article: The rescue and conservation of the Lost Shul Mural

Authors: Richard L. Kerschner and Constance S. Silver

Source: *Objects Specialty Group Postprints, Volume Twenty-Three, 2016*

Pages: 36-56

Editors: Emily Hamilton and Kari Dodson, with Laura Lipcsei, Christine Storti, and Leslie Friedman, Program Chairs

ISSN (print version) 2169-379X

ISSN (online version) 2169-1290

© 2018 by The American Institute for Conservation of Historic & Artistic Works

727 15th Street NW, Suite 500, Washington, DC 20005 (202) 452-9545

www.conservation-us.org

Objects Specialty Group Postprints is published annually by the Objects Specialty Group (OSG) of the American Institute for Conservation of Historic & Artistic Works (AIC). It is a conference proceedings volume consisting of papers presented in the OSG sessions at AIC Annual Meetings.

Under a licensing agreement, individual authors retain copyright to their work and extend publications rights to the American Institute for Conservation.

This article is published in the *Objects Specialty Group Postprints, Volume Twenty-Three, 2016*. It has been edited for clarity and content. The article was peer-reviewed by content area specialists and was revised based on this anonymous review. Responsibility for the methods and materials described herein, however, rests solely with the author(s), whose article should not be considered an official statement of the OSG or the AIC.

THE RESCUE AND CONSERVATION OF THE LOST SHUL MURAL

RICHARD L. KERSCHNER AND CONSTANCE S. SILVER

This article describes how an interdisciplinary team worked together over two years to stabilize, protect, and move a 105-year-old triptych mural from the former Chai Adam Synagogue to the Ohavi Zedek Synagogue in Burlington, Vermont. The mural is a rare surviving example of traditional Eastern European painted synagogue art following the destruction of nearly every synagogue in Eastern Europe during the Holocaust. Flaking paint was consolidated and secured to the plaster, and layers of darkened varnish and dirt were partially removed from the mural. To ensure the mural's safety during the relocation process, it was faced with Crepline adhered with Paraloid B67 followed by cyclododecane reinforced with fiberglass Micro-mesh. Foam-lined plywood panels were secured against the faced mural to provide uniform, rigid support during the move. A permanent steel framework was built around the roof section of the apse that contained the mural to minimize movement of the plaster-on-lath during extrication and transport of the mural, and to enable the mural to be suspended safely in the lobby of Ohavi Zedek Synagogue.

KEYWORDS: Cleaning, Consolidant, Cyclododecane, Facing, Framework, Move, Mural, Plaster-on-lath, Synagogue, Varnish

1. INTRODUCTION

In 1910, a young Lithuanian poet, performer, playwright, and artist named Ben Zion Joseph Black was commissioned to paint the interior of the Chai Adam Synagogue in Burlington, Vermont.¹ The only historic photo of Chai Adam's early interior shows the original painted walls and the lower half of the mural (fig. 1). The entire ceiling had also been painted as a blue open sky, complete with birds, musical instruments, and cherubs. Black worked for six months to paint the mural, walls, and ceiling of the synagogue for a fee of \$200.

Chai Adam Synagogue was decommissioned in 1939 and repurposed, first as a dry goods store and later as a carpet shop and warehouse. In 1986, it changed hands again and was retrofitted as apartments. Although elements of the original historic interior were lost with each renovation, the subsequent owners apparently recognized that the 155-square-foot triptych mural painted on the plaster ceiling of the apse was significant and should not be destroyed.

When the building was sold in 2012, the historians tracking the mural realized that the only way to preserve this unique work of religious art was to remove it from the building and decided they would have to raise funds to support the move. Samuel D. Gruber, PhD, an internationally recognized expert on Jewish art and the historic preservation of Jewish sites and monuments, was engaged to research the mural's historical significance. After viewing and studying the mural, he concluded that:

"The mural is a rare survivor of the rich Jewish artistic tradition in Eastern Europe. This world of Jewish art was nearly completely destroyed in the Holocaust and remains poorly understood. It is a rare and striking painting, one of only a small number of extant synagogue murals in North America painted by immigrant Jewish artists for congregations that were still tied to their distant homelands, the Yiddish language and traditional Jewish religious practice. Nothing quite like this survives in Europe, and no mural in the United States equals the Lost Shul Mural in size, scope, completeness and Jewish meaning. Only a few highly damaged painted fragments survive from all the synagogues in Lithuania, most notably from Cekiske, the town of origin for many of Burlington's Jews." (Gruber 2014)

This narrative describes how the interdisciplinary team of conservators, conservation scientists, engineers, historians, preservation carpenters, steel fabricators, riggers, a general contractor, and an architect rescued and conserved the Lost Shul Mural.



Fig. 1. Historic photo of Chai Adam interior (Courtesy of Lost Shul Mural Project)

2. RESCUING THE MURAL

Conservator Richard Kerschner first viewed the Lost Shul Mural in October 1986, four years after he was hired to establish conservation at the Shelburne Museum. Aaron Goldberg, a local lawyer and volunteer archivist at the nearby Ohavi Zedek Synagogue, requested his advice on the condition and possible disposition of the mural (fig. 2).

The building had been sold and was in the process of being retrofitted as apartments. The decorated walls and ceiling of the building had been gutted many years before and the owner was ready to destroy the large mural that was in her way. The floor of the upstairs apartment was already in place, allowing easy access to the mural. Goldberg was desperately seeking a plan to save the mural, possibly by arranging for its transfer to another organization that could move it to a safe but accessible location. Although the colors were muted by darkened varnish, the mural was in good structural condition with



Fig. 2. Lost Shul Mural as it appeared in 1986 before being isolated behind a wall, 335 x 640 x 275 cm (11 x 21 x 9 ft.)
(Courtesy of Lost Shul Mural Project)

only minor losses to the paint. Kerschner recognized that the relocation of the mural would be difficult and expensive, and after consulting with Shelburne Museum's director, informed Goldberg that the mural did not fit with the museum's collecting mission and that the museum could not accept or move it. He suggested that an alternative to destroying the mural would be to build a wall in front of it. Goldberg convinced the owner that this was a reasonable solution; the wall was constructed in the bedroom of the east upstairs apartment, and the conversion of the building to apartments was completed.

Goldberg could not forget about the mural and over the next 25 years he continued to research its history. In 2010, Goldberg and his co-archivist, Jeff Potash, formed the Lost Shul Mural Committee at Ohavi Zedek Synagogue, but were unable to obtain the rights to the mural from the building owner. However, in November 2012, the apartment building was sold and the new owner agreed to donate the mural to Ohavi Zedek if the Lost Shul Mural Committee would remove it and restore the building and apartment. Ohavi Zedek rented the apartment that contained the mural and the interior wall covering the mural was removed.

As the insulation was peeled back, it was disturbing to observe the mural's condition (fig. 3). Despite instructions given to the building owner, the mural had not been properly protected when the wall was constructed and fiberglass insulation had been placed directly against the paint in many areas. Large areas of paint were flaking from the plaster. Close comparison to 1986 photos indicated that the areas with the worst flaking had shown cracks and cupping paint even before the mural was isolated behind the wall. However, the widely ranging environmental conditions in the empty wall cavity between the slate roof and the mural aggravated flaking and caused paint to detach.

The surface of the mural had deteriorated more in the 26 years behind a "protective" wall than in the previous 76 years it was open and visible on the ceiling of the synagogue and carpet warehouse. What



Fig. 3. Condition of mural on removal of wall and insulation (Courtesy of Lost Shul Mural Project)

had been estimated as about four square feet of paint loss of the 155-square-foot painting in 1986 had increased to about 15 square feet of loss, with paint actively flaking over the entire mural. Fortunately, 90 percent of the painted mural had survived and could be saved if the flaking could be consolidated.

3. CONSERVATION TREATMENT

Kerschner was engaged to advise on conservation of the mural and review treatment proposals. He joined the Lost Shul Mural Committee that now included the two archivists who were co-directing the project and a local architect. Mural conservator Constance Silver was hired and began treatment in January 2014, working through May to consolidate and reattach flaking paint, perform cleaning tests, and remove darkened varnish and dirt from selected portions of the mural. After extensive testing, Silver settled on a consolidation technique she had used successfully in the early 1990s on an oil-on-plaster



Fig. 4. Applying BEVA D8 to areas of flaking paint (Courtesy of Constance Silver)

mural in similar condition. The chosen consolidant was BEVA D8, an aqueous, non-ionic dispersion of ethylene vinyl acetate diluted 50 percent with distilled water.

The area to be consolidated was misted with distilled water with a drop of Woolite added as a surfactant. The misting wet all the surfaces of the deformed paint, and the wetting of the substrate relaxed the detached and curled paint and eased it back into contact with the plaster through capillary action. BEVA D8 was flowed onto the fragile, wetted surface from an eyedropper or soft brush (fig. 4).

The consolidant followed the path of the wetting agent, penetrating behind each flake. The treated area was allowed to dry slightly. Curled and flaking paint was then gently pressed back into plane using a baby wipe. The soft baby wipe allowed manipulation of the paint without it sticking to the fabric and also absorbed excess BEVA D8. This was an important step, required to avoid “gluing” grime and discolored varnish to the surface of the painting, which would complicate their eventual removal. Firm pressure was applied to the treated area with a flexible rubber bone folder through silicone-release Mylar to coax flakes flat and confirm the bond between the paint and the plaster. The treated area was further



Fig. 5. Detail of the partially consolidated sun (Courtesy of Constance Silver)

pressed into plane and heat-set with a tacking iron. A small travel iron was used to confirm adhesion to the plaster of larger contiguous areas of treated paint. Consolidation proceeded slowly in small areas from the bottom of each panel to the top (fig. 5).

Paint samples were extracted and submitted to conservator Susan Buck for cross section analysis to guide the complicated cleaning process and to identify glazes and over-paint (fig. 6). These two cross sections identified paint stratigraphy as three to four layers of early distemper wall paint directly on top of the plaster, followed by a thin coat of off-white paint and three more coats of a tan distemper paint. The mural oil paint consists of a white base coat followed by design colors, then two layers of varnish. Occasionally, glazes were used to enrich the colors, and the right sample shows a brown glaze directly on top of the orange paint. A total of 18 paint samples were analyzed.

Early cleaning tests revealed several technical issues. A layer of coal soot strongly adhered to the paint by the oil-laden varnish was the most complex cleaning problem. Black, brown, and many red paint areas were sensitive to cleaning agents, as were the brown columns and pediments because they contain multiple layers of thin glazes. All of these areas required slow and careful cleaning. Cleaning tests indicated that the varnish layers were soluble in xylene, isopropanol, and benzyl alcohol or various combinations thereof. Dirt and old varnish were removed by applying a benzyl alcohol-based solvent gel through wet-strength tissue. After the tissue was removed, dissolved varnish and soot were gently dislodged with a brush and cleared from the surface using cotton. Dwell time of the solvent-laden wet-strength tissue varied depending on the thickness of the varnish and the sensitivity of the underlying paint colors and glazes. Consolidation was completed and about 50 percent of the darkened varnish was

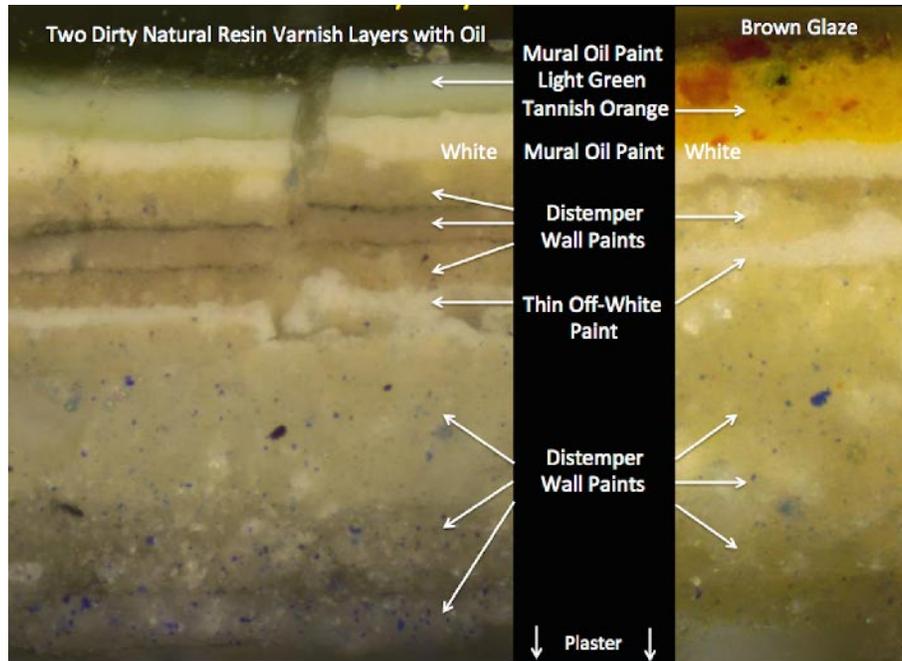


Fig. 6. Two cross sections of mural paint layers (Courtesy of Susan Buck)

removed before the mural was moved (fig. 7). Cleaning was not completed at that time since funds were still being raised to cover the cost of conserving and moving the mural. Cleaned “windows” created by removing discolored and dirty varnish layers helped fuel fundraising efforts as they were tantalizing clues to the vibrant colors hidden beneath the soot and darkened varnishes.



Fig. 7. Consolidated and partially cleaned mural prior to move (Courtesy of Lost Shul Mural Project)

4. PREPARING THE MURAL FOR THE MOVE

By early June 2014, the local fundraising committee had secured sufficient funding to proceed with the move, and the Lost Shul Mural Project Team was expanded to include a consulting engineer, general contractor, steel fabricators, and a rigger and crane service. Two full-time carpenters were hired for 18 months to separate the entire apse roof section that contained the mural from the building, and to restore the historic structure by building a new apse roof after the mural was moved to Ohavi Zedek Synagogue. The co-directors retained Kerschner to advise on historic and conservation materials and coordinate conservation treatment and moving the mural. Consulting engineer and clerk of the works Robert Neeld worked with the general contractor to select and advise subcontractors to design and build the protective structure, design and construct a steel framework around the apse roof section, and move and install the roof section that contained the mural at Ohavi Zedek Synagogue.

4.1 THE PROTECTIVE STRUCTURE

The mural had been painted on the plaster-on-lath ceiling attached to the inside of the rafters that supported the slate roof on the apse of the Chai Adam Synagogue (fig. 8). The two-story protective structure built to enclose the apse of the building (fig. 9) was completed well before one of the coldest and snowiest winters on record. Windows were included in the structure to allow light into the first-floor apartment, and sliding doors on the second floor provided access to load in steel for the framework and other materials. A propane heater was installed on the second floor of the structure to temper environmental conditions in the portion of the building that surrounded the mural.



Fig. 8. The apse of the former Chai Adam Synagogue (Courtesy of Lost Shul Mural Project and Bob Neeld, PE)



Fig. 9. Protective structure enclosing the apse (Courtesy of Lost Shul Mural Project and Bob Neeld, PE)

4.2 ASSESSING, STABILIZING, AND FACING THE MURAL

During September, the slates and wood sheathing boards were removed to access the back of the laths that supported the plaster ceiling on which the mural was painted.⁹ The slates were numbered and stored for replacement on the new roof. Great care was taken to cut rather than pull nails so as not to move the rafters and risk breaking the fragile plaster “keys.” As the original sheathing boards were removed, the roof structure was strengthened and made more rigid by reinforcing all the rafter attachments with steel angle brackets.

Attention turned to further evaluation of the plaster substrate and the plaster keys. The historic method of applying plaster to a ceiling or wall was to first nail wooden laths to wall and ceiling joists, allowing spaces of approximately three-eighths of an inch between the laths. Keys are formed when wet plaster fills the spaces between the wooden laths and curls around the back edges of the laths before the plaster sets. Once set, these plaster keys secure the plaster to the laths. If the plaster is weak, the keys can break and the plaster can separate from the wall. Preservation scientist Norman Weiss and conservator Irving Slavid of Monument Conservation Collaborative Materials, Inc., were contracted to analyze the plaster, develop methods to strengthen the plaster keys, and perform the work. Their analysis of samples indicated that the plaster was sandy and quite weak. They recommended strengthening the keys from the back with three applications of Conservare HTC (hydroxylating conversion treatment). After visiting the site and observing the lath and plaster from the back, Weiss also recommended extending the keys over the back of the laths using VoidSpan CG70 Fine Grout (fig. 10). After the keys were strengthened and extended, half-inch MDO plywood was chosen to replace the old sheathing boards to better stabilize the entire structure. Marvelseal 360 was ironed onto the plywood and edges were sealed with aluminum tape to slow humidity changes within the roof/wall structure.

Facings were applied to the front of the mural to protect and secure the paint and plaster during the move. First, the paint was faced with Crepeline adhered with Paraloid B67. However, a stronger facing was required to hold the plaster together in the event that the mural was jarred during movement. A lightly self-adhering fiberglass micro-mesh, designed for repairing drywall, was applied over the Crepeline facing and covered with cyclododecane, a wax-like material that melts at 142°F. (Rowe and Rozeik 2008) The solid cyclododecane was heated in a double boiler and applied as a liquid with large paintbrushes to a thickness of about one-eighth of an inch (fig. 11). Not only is cyclododecane a very



Fig. 10. Reverse of the mural showing plaster keys from the back and the newly created key extensions, metal reinforcing brackets, and new plywood roof sheathing (Courtesy of Bob Neeld, PE)

strong adhesive; it sublimates on exposure to air, changing directly from a solid to a gas and simply disappearing over time without the use of solvents or mechanical manipulation.

Constance Silver had previously used cyclododecane to consolidate small fragments of Egyptian mud-plaster wall murals that she treated in 2006. In 2002, a team of conservators led by Perry Huston used cyclododecane reinforced with gauze to face the 1932 David Siqueiros mural *Mexico Today* in preparation for its move to the Santa Barbara Museum of Art. In 2012, the Getty Conservation Institute posted a YouTube video on the project (Santa Barbara Museum of Art 2012). It was reassuring how similar these two mural-move projects were, especially since the Lost Shul Mural conservation actions were developed quite independently.

Eighteen inches of plaster bordering the bottom of the mural and two 6-inch-wide vertical strips of plaster bordering the left and right sides of the mural had to be removed so that the three large adjoined triangular sections of the mural could be separated from the rest of the building (fig. 2). In preparation for detachment, a double facing of Crepeline and cyclododecane over fiberglass mesh was applied to the front of the plaster and reinforced with short pieces of wood lath (fig. 12). Master carpenter Ray O'Connor worked with conservator Silver to remove the plaster borders. A hacksaw blade was inserted behind the plaster and used to cut through the plaster keys, freeing the half-inch layer of the faced painted plaster from the lath. After these sections of plaster were removed, it was possible to detach the exposed laths without damaging the plaster at the perimeter of the mural. Removing the laths revealed the apse roof rafters where they joined the end wall of the building and the apse wall joists where they met the base of the roof. It was then possible to saw through the nails connecting the roof rafters and wall joists to the rest of the building and completely separate the apse roof that contained the mural from the structure.



Fig. 11. The left side of the mural is faced with Crepeline. The right side has cyclododecane applied over fiberglass Micro-mesh on top of the Crepeline facing (Courtesy of Bob Neeld, PE)

4.3 BUILDING THE STEEL FRAMEWORK AND PROTECTING THE PLASTER

A steel framework was custom-built around the apse roof section that contained the mural assembly following plans created by the project's engineering firm. Though such frameworks usually are designed to restrict movement of the protected structure to 1/10 of an inch, this framework was designed to restrict movement to one 1/100 of an inch because of the fragility of the plaster keys. A three-dimensional detailing model was created from extensive existing building documentation to allow most of the steel to be prefabricated and carefully inserted into place without need for modification. Efforts to keep welding off-site and bolt the framework together around the mural proved too complicated, so the framework was welded together on-site. Fire blankets protected the back of the mural assembly and a fire watch was implemented during and after welding. The framework was required not only to securing the mural during removal and transport, but also to enable the mural assembly to be suspended from the steel-reinforced ceiling of the lobby of Ohavi Zedek Synagogue.

As the framework was being constructed, polyethylene sheet was secured over the mural to prevent the cyclododecane from subliming too quickly, and to provide a barrier between the mural and the foam pads that would protect and secure the plaster during the move. The beam across the front of the mural was required to stabilize the framework during the move and to support a floor in front of the mural to facilitate bracing of the foam pads (fig. 13).

Foam padded panels were built to secure the plaster substrate in place in case sudden jolts broke plaster keys during the move. They were constructed of MDO plywood covered with 1.5-inch urethane open-cell foam wrapped with Tyvek. The panels were pressed firmly against the mural and temporarily braced while a wooden frame was built to secure them in place. The wooden frame allowed pressure to be applied evenly to compress the foam against the plaster. The panels were hinged so that they could be carefully tilted back from the top down to check for loose plaster after the move.

A cross-section of the mural assembly after detachment from the building is shown in figure 14. The steel frame is labeled in yellow. Marvelseal covers the back of the plywood roof sheathing to mitigate



Fig. 12. Removal of painted plaster borders from lath (Courtesy of Lost Shul Mural Project)

humidity changes within the roof cavity. The ends of the laths nailed to the front of the rafters are visible. The layer of plaster on which the mural is painted covers the laths, and it is possible to view the keys that were formed when the wet plaster was forced into the spaces between the laths. Black ZIP Tape covers and seals the edge of the plaster and lath. The foam padding is pressed and secured against the face of the mural by the wooden frame.

While the mural was being prepared to move, the lobby of the Ohavi Zedek Synagogue was being prepared to receive it. The synagogue was built in 1952 and is an exemplar mid-century modern design. Although not designed to house the mural, the lobby is a perfect height and width. A steel-beam superstructure was fabricated and installed in the lobby to support the suspended three-ton mural assembly. A sturdy platform was built in front of the entrance to receive the mural and the glass wall had to be removed for the mural to enter the lobby, and then be rebuilt (fig. 15).



Fig. 13. Plywood and foam pad being positioned on the front of the mural over top of a polyethylene protective covering (Courtesy of Lost Shul Mural Project)

5. MOVING THE MURAL

After nine months of preparation, move day (May 6, 2015) dawned bright, warm, and sunny. The first action was to remove the roof to provide access to the mural. A crane lifted the roof and lowered it to the ground, where it was settled on rollers and pushed down the street and out of the way (fig. 16). Lifting straps and chains were attached to lifting points on the steel framework that surrounded the mural. The entire apse roof section had been jacked up a few inches the day before to insure that it was detached from the building. Once the steel-enclosed apse roof was completely supported by the crane, it separated easily from the building.

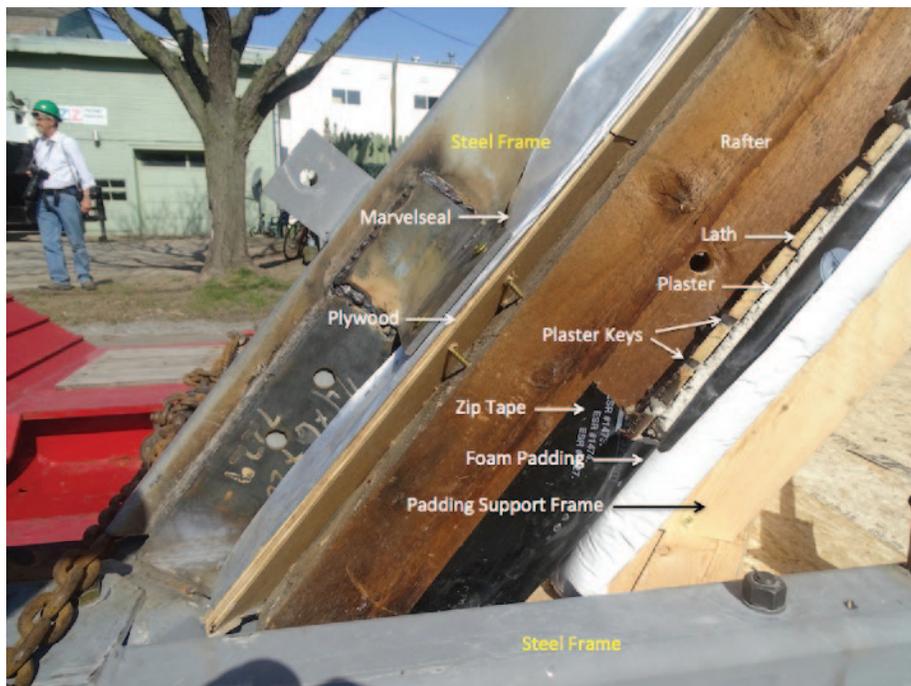


Fig. 14. Cross-section of roof structure and mural (Courtesy of Bob Neeld, PE)



Fig. 15. Entrance to Ohavi Zedek, the new home for the Lost Shul Mural (Courtesy of Lost Shul Mural Project)

The steel-framed and padded mural floated slowly upward, and a few minutes later it was resting on the bed of the waiting truck. As the truck moved away from the building, the roof was rolled up the street and lifted back into place to protect the open end of the building during the construction of the new apse roof, complete with the original slate.



Fig. 16. Crane removing roof (Courtesy of Lost Shul Mural Project)



Fig. 17. Mural being moved to platform (Courtesy of Bob Neeld, PE)

Trees had been trimmed back from the road and potholes had been filled to insure a smooth ride for the delicate cargo. The slow, careful, and uneventful 0.3-mile journey to Ohavi Zedek Synagogue took only about 15 minutes. As soon as the crane had replaced the roof on the protective structure, it drove to the end of the temporary access road that had been built across the lawn at Ohavi Zedek. The truck transporting the mural had to drive up the synagogue's wide entrance to position the mural on the building side of the utility wires and within safe reach of the crane. Steel plates covered the walkway to protect it from cracking under the weight of the truck and mural.

The crane lifted the mural from the truck and moved it to a custom-built platform (fig. 17). Several methods of moving the mural from the truck into the building had been discussed including using forklifts to lift the mural, drive it into the lobby and raise it into position. After much discussion, all agreed that the safest method was to attach temporary wheels to the bottom of the steel support structure, then use manpower to roll the 7,500-pound structure into the lobby and carefully maneuver it into position. The mural rolled into the opening with 1 inch of clearance at the top (fig. 18).

All were relieved that the move had been completed without so much as a bump to the mural. Although it would be two more weeks before the protective padding could be removed, we were confident that no damage to the plaster would be found as the mural had been under close observation from the time it separated from the apartment building until it was positioned in the Ohavi Zedek lobby. The entire move that was planned for 11 hours had been completed in less than four hours, a testament to meticulous planning.

6. INSTALLATION AND DISPLAY

A week later, four chain lifts were suspended from the steel support beams and the steel framework containing the mural was lifted to its permanent viewing height of 11 feet, the same height from which it was last viewed by men praying in the Chai Adam Synagogue in 1939. The mural was suspended from five 3/4-inch diameter steel rods, each of which alone could support the 6,500-pound weight of the mural. The foam pads were carefully removed and there was no evidence of any loosening or detachment



Fig. 18. Mural being rolled into the building (Courtesy of Bob Neeld, PE)

of the plaster substrate. The plywood floor was removed and the front stiffening beam and floor steel supports were unbolted from the rest of the structure (fig. 19).

The conservators had predicted that the cyclododecane would sublime in about three months, so the grand unveiling was planned for early August. Figure 20 shows the back of the mural assembly, the



Fig. 19. Mural lifted to viewing height and steel floor support being removed (Courtesy of Bob Neeld, PE)



Fig. 20. Mural suspended at viewing height in final configuration (Courtesy of Bob Neeld, PE)

steel framework and suspending rods. Lighting Services Inc. LumeLEX 2024 dedicated LED track lights are visible on the west wall, as are Hunter Douglas designer screen shades that block 90% of the western light when lowered in the late afternoon (fig. 20). As the temperature at the height of the mural was about 15°F warmer than at occupant level, a destratification fan was mounted at the ceiling peak to ensure even mixing of the air. Real-time temperature and humidity readings from sensors mounted high and low on the wall are transmitted to the Internet by a Hobo RX3000 Remote Monitoring Station. These data are used to optimize the speed of the fan for effective mixing and low noise. A PEM2 data logger and eClimateNotebook are also used to monitor environmental conditions.

7. COMPLETING CONSERVATION TREATMENT

Mural conservator Silver returned in November 2015 to refine cleaning methods to completely remove discolored varnish and grime from a total of about 10 square feet of the mural. The time required to clean, fill, and in-paint representative areas of loss was quantified to inform an estimate for the final stage of conservation treatment that may also include restoration of missing design areas.

While performing several test cleanings, she determined that the B67 facing was more difficult to remove than anticipated and the historic varnish layers were less soluble than before the mural was faced and moved. It is possible that application of the hot cyclododecane increased crosslinking in the varnish layers, or perhaps chemical components of the cyclododecane changed varnish solubility parameters. Although the cleaning is somewhat more challenging, it is still possible to safely remove the varnish layers, soot, and grime to reveal the vibrant original colors. These test cleanings indicated that benzyl alcohol and NMP (N-methyl-2-pyrrolidone) gels are effective in removing the varnish layers. The heavy fixed soiling embedded in early varnish layers can be removed using diluted Enviro Klean 2010 All Surface Cleaner, a mild aqueous cleaner composed of an alcohol with a chelating agent. The cleaning tests also confirmed that the paint is stable and well attached to the plaster. In fact, now that the entire wall structure is in a stable environment, many cracks through the plaster that had developed while the mural was walled up have closed.

8. CONCLUSIONS

The clerk of the works for this project, the head of a major Burlington, Vermont, engineering firm, frequently commented on the complexity of this multidisciplinary project. Although experienced in managing engineering aspects of much larger projects, he noted that working with unknowns inherent in historic materials and structures, such as the condition of the plaster keys or the strength of the 100-year-old plaster, and specialized products such as cyclododecane, Marvelseal, and Conservare Hydroxylating Conversion Treatment added a degree of uncertainty and complexity not inherent in more conventional engineering projects.

The knowledge and advice of an experienced conservator familiar with object conservation materials and techniques as well as various aspects of building preservation was essential to inform and coordinate actions of the treatment conservator, carpenters, conservation scientists, general contractor, architect, engineers, steel fabricators, and riggers. The coordinating conservator also informed and advised the project managers on curatorial decisions required at various stages of the project.

The successful move of this mural is largely attributable to the skills, ingenuity, can-do attitude and caution that master carpenter Ray O'Connor and his skilled and careful assistants brought to the project every day. Their exemplar efforts confirmed just how critical highly skilled and cooperative craft professionals are in solving technical problems and keeping such complicated projects on track.

The two-year rescue of the mural is complete. The mural assembly supported by its metal framework is safely suspended in its permanent exhibition space (fig. 21). The new owners of the Lost Shul Mural are pleased with the suspended presentation of the mural and do not intend to further integrate the century-old mural assembly into the mid-century building lobby. Decisions are still being



Fig. 21. Lost Shul Mural, final configuration in lobby of Ohavi Zedek Synagogue, May 2016 (Courtesy Richard Kerschner)

made regarding reintegration of paint losses that occurred over the nearly 40 years the mural was isolated behind the apartment wall. Efforts are underway to raise the funds required to complete conservation treatment and to establish a permanent educational exhibit in a public space adjoining the lobby of Ohavi Zedek Synagogue. The exhibit will celebrate Burlington's historic immigrant community and feature the rescue, conservation, and interpretation of the Lost Shul Mural.

ACKNOWLEDGMENTS

The following individuals and organizations are recognized for their contribution to this project. Ohavi Zedek Synagogue; Aaron Goldberg and Jeffery Potash, Lost Shul Mural Project co-directors; Marcel Beaudin, architect; Samuel D. Gruber, PhD, historian; Bob Neeld, PE, President, Engineering Ventures; Bob Schwartz, President, Great Northern Construction; Ray O'Conner, master carpenter; Norman Weiss and Irving Slavid, MCC Materials, Inc.; Susan Buck, conservator and paint analyst; Demag Riggers and Crane Service; and Reliance Steel.

NOTE

1. Additional information on the Lost Shul Mural project can be found at <http://www.lostshulmural.org> (accessed June 20, 2016).

REFERENCES

- EnviroKlean. 2011. Prosoco. Product data sheet. Accessed April 20, 2017. http://www.prosoco.com/Content/Documents/Product/EK_2010_All_Surface_Cleaner_PDS_063011_C.pdf
- Gruber, S. 2014. Century-old Jewish mural's hidden history in Vermont. <http://forward.com/articles/191146/century-old-jewish-murals-hidden-history-in-vermon/?p=all-ixzz2qIXqC9Vo>
- Rowe, S., and Rozeik, C. 2008. The uses of cyclododecane in conservation. *Reviews in Conservation* 9: 17–31.
- Santa Barbara Museum of Art. 2012. *Portrait of Mexico today: Preserving a masterpiece*. Video. 30 min. <https://www.youtube.com/watch?v=ACRmeSkGCaA>

SOURCES OF MATERIALS

Paraloid B67, BEVA D8, Crepeline
 Talas
 330 Morgan Ave.
 Brooklyn, NY 11211
 212-219-0735
<http://www.talasonline.com/>

Conservare HCT (Hydroxylating Conversion Treatment)

Prosoco, Inc.
371 Greenway Circle
Lawrence, KS 66046
800-255-4255
<http://www.prosoco.com/>

Cyclododecane

Kremer Pigments Inc.
247 West 29th Street
New York, NY 10001
212-219-2394
<http://www.kremerpigments.com/>

EnviroKlean 2010 All Surface Cleaner

Trowel Trades Supply Inc.
206 Hegeman Ave.
Colchester, VT 05446
602-655-3166
<http://www.prosoco.com/where-to-buy>

Hunter Douglas Designer Screen Shades, 90% light blocking

21 Church St.
Burlington, VT 05401-4417
802-862-6701
<http://www.tinashomedesigns.com/>

LumeLEX 2024 Series (dedicated LED Track Lighting)

Lighting Services Inc.
2 Holt Dr.
Stony Point, NY 10980
845-942-6200
<http://www.lightingservicesinc.com/>

Marvalseal 360

University Products Inc.
517 Main Street
Holyoke, MA 01040
413-532-3372
<http://www.universityproducts.com/>

VoidSpan CG70 Fine Grout

VoidSpan Technologies, LLC
60 Washington St.
Salem, MA 01970
800-966-8643
<http://www.voidspan.com/>

RICHARD L. KERSCHNER is the principal of Kerschner Museum Conservation Services. He manages conservation projects and consults on museum environments and preventive conservation for collections in museums and historic buildings. He is Conservator Emeritus at the Shelburne Museum in Vermont, where he established the conservation department, managed preventive conservation, and directed the treatment of folk and decorative art objects, paintings, textiles, and works of art on paper for 32 years. He holds an MA and Certificate of Advanced Study in Conservation from the Cooperstown Graduate Program, and is a Fellow and past treasurer of the American Institute for Conservation and Fellow and past council member of the International Institute for Conservation. Kerschner conducts research and lectures on practical environmental control, teaches environmental management workshops, and actively participates in conservation outreach to allied museum professionals. Address: 3532 Shellhouse Mountain Road, Ferrisburgh, VT 05456-9512. E-mail: rskersch@comcast.net

CONSTANCE S. SILVER is a fine arts and architectural conservator. She was the principal of Preservart, Inc. for 23 years, an award-winning company that undertook major conservation and historic preservation projects in the United States and internationally. She has published widely in both fields. She trained in fine arts conservation in Italy at the Villa Schifanoia and the Istituto Centrale del Restauro, and in architectural conservation at Columbia University. Address: 15 Forest St., Brattleboro, VT 05301-2847. E-mail: c.s.silver@att.net