

White Paper

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Project Director: Ralph Wiegandt

Institution: George Eastman House

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Grant ID No.: PF-50373-13

Project Title: Comprehensive Environmental Assessment

Project Director: Ralph Wiegandt / Stacey VanDenburgh

Institution: George Eastman House

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Project Summary

George Eastman House, d/b/a George Eastman Museum, (the “museum”) received a planning grant award from the National Endowment for the Humanities to conduct a comprehensive environmental assessment of its building complex. Conducted by a team of internationally-recognized consultants with expertise in museum environments and environmental preservation, the assessment provided a holistic review of the museum’s building envelopes, mechanical systems, and environmental needs. The project resulted in the *Environmental Improvements Plan*—a core document that will guide the museum toward implementation of sustainable preservation environments for its world-class collections. Supplemental funds supported implementation of a pilot project, designed with the consulting team, which focused on the photography vault.

Background

Founded in 1947 and opened to the public in 1949, the George Eastman Museum was established to operate and maintain a museum of photography and allied pursuits as a memorial to George Eastman, founder of Eastman Kodak Company. The mission of the George Eastman Museum, as an educational institution, has three interrelated goals:

- Provide leadership in the fields of photography and cinema;
- Preserve and develop our world-class collections related to photography and cinema, as well as George Eastman’s estate, a National Historic Landmark; and
- Serve our communities, in Greater Rochester and elsewhere.

A preeminent museum of photography and motion pictures, the museum collections include more than 450,000 photographic objects; 28,000 films; three million other objects and associated ephemera related to cinema; 16,000 technology objects; and 50,000 library volumes. The museum’s strength is rooted in its multiple collections—unrivaled in both scope and depth—and its commitment to exhibition and scholarship to create a humanities framework that relates the meaning of photography and cinema to the global community of lives and culture.

The museum complex includes the 35,000-square-foot Colonial Revival mansion, built in 1905, where George Eastman resided until his death in 1932. In 1950 the 500-seat Dryden Theatre was built and attached to the mansion. In the late 1980s, a 79,000-square-foot building, the Archives Building, now referred to as the 1989 Building, was constructed on the property to house the museum’s photography, motion picture, and technology collections, library and gallery space for exhibitions. An extensive restoration of the interior of Mr. Eastman’s mansion was undertaken in 1989 and it opened to the public in 1990. In 1995, The Louis B. Mayer Conservation Center was built off-site to house the

museum's collection of volatile and rare nitrate films. In 1999 the Eastman Archive and Study Center was established in the historic house. In 2012 the museum restored the historic Palm House; in 2013 the Dryden Theatre was renovated; and in 2015 the museum embarked upon a major restoration of the exterior envelope of certain elements of the historic mansion.

Preservation Challenges

The 1989 Building was constructed very rapidly to meet an incentive deadline imposed by Eastman Kodak Company in order to receive a donation worth \$16 million. In addition, it was constructed below-grade to comply with the requirements of the local Preservation Board, which would not allow the roofline of the structure to overshadow the roofline of the historic mansion. Limited financial resources and external pressure to expedite construction resulted in the elimination of necessary but costly humidity-control equipment. The 1989 Building contains separate vaults for the photography, film, technology and library collections, but adequate humidity controls were not installed during the original construction of the building. Over time the museum upgraded the HVAC systems in the safety film vault and the library's main stacks and special collections vaults. While the 1989 Building resulted in better climate conditions for the collections than had existed previously and kept them in Rochester during a very troubled time for the museum, the structure did not meet all the desired facility requirements.

The historic nature of the mansion coupled with multiple building additions and the absence of a comprehensive environmental assessment plan have resulted in a host of preservation challenges throughout the museum. Modifications and retrofits to existing systems have created a patchwork of mechanical systems, rather than a well-planned unified system. As a result, the museum is currently being serviced by 25 different air handling units. This localized approach presents inefficiencies in both operation and maintenance of units, and also limits the museum's ability to implement environmental sustainability measures. It has also led to preservation related issues in some parts of the museum such as the Gannett Foundation Photographic Study Center and the moving image safety film vault. The study center, located directly below the safety film vault, has no means for humidity control and often experiences condensation on its ceiling. This is a result of high relative humidity (RH) levels in the study center during summer months interacting with the sub-cooled concrete floor of the safety film vault, which is maintained at 40°F/30% RH.

The photography vault, the technology vault, the conservation laboratory, the exhibition preparation areas, and the gallery spaces all lack dedicated humidity controls and are unable to maintain acceptable preservation conditions. Rapid fluctuations in relative humidity place the museum's photography collection at an increased risk and make it

difficult to perform certain types of conservation treatments, prepare photographs for exhibition, and provide access to researchers.

Project Activities

In 2010, with the appointment of Taina Meller as Conservator in Charge, the museum embarked upon a rigorous program of environmental monitoring utilizing the Image Permanence Institute's (IPI) PEM2 dataloggers. Subsequently, in 2012 the museum incorporated the use of eClimate Notebook software. Environmental data collected during the period 2010 through 2012 provided the basis for submission of the museum's grant proposal to the NEH.

To implement this project, the museum contracted with the following team of internationally-recognized consultants:

- Richard L. Kerschner, Conservation Consultant on Museum Environments
- Michael C. Henry, Principal, Watson & Henry Associates
- James M. Reilly, Director, Image Permanence Institute
- Jeremy Linden, Senior Preservation Environmental Specialist, Image Permanence Institute
- Christopher Cameron, Sustainable Preservation Specialist, Image Permanence Institute

A core team of museum staff was designated to work directly with the consultants:

- Taina Meller, Conservator in Charge, Kay R. Whitmore Conservation Center
- Ralph Wiegandt, Former Senior Project Conservator, Kay R. Whitmore Conservation Center
- Stacey VanDenburgh, Former Manager, Kay R. Whitmore Conservation Center
- Jamie Allen, Associate Curator, Department of Photography
- Deborah Stoiber, Collection Manager, Moving Image Department
- Michael Viggiani, Former Facilities Manager

The project team conducted a full investigation of the museum complex (building envelopes, mechanical systems, and airflow patterns) to determine its current functionality and capacity to achieve the environmental conditions recommended by conservation scientists for the preservation of the museum's collections.

Prior to their initial visit, the consultant team was provided with existing mechanical drawings, building blueprints, and HVAC schematics along with environmental monitoring data. This information was supplemented with staff interviews and open discussion during the assessment to provide the consulting team with an understanding of the existing mechanical systems and the environmental conditions throughout the museum.

Together, the consultant team and the core team determined early on that a pilot project, focused on a detailed mechanical system study and building envelope analysis of the

current environmental conditions in the photography vault should be undertaken. This involved the creation of a set of layered (AutoCAD) drawings of the air handling unit servicing the vault that could then be used to analyze process and instrumentation, testing and balancing, and airflow measurements.

In the course of the project, the consultant team made two separate visits to the museum, during which time was allocated for presentations to all museum staff and trustees. The team highlighted the fundamental importance of environmental management to the museum's mission and encouraged each staff member and each trustee to understand their role in helping the museum to achieve a sustainable environmental management program.

Accomplishments

The completion of this NEH-funded project marked the first time in the museum's history that the environmental conditions of the entire museum complex were systematically analyzed and discussed. The primary result was the *Environmental Improvements Plan*, a document that clearly identifies the environmental challenges in each area of the museum complex and provides strategies for moving toward a more sustainable future. In addition, the following accomplishments have been realized:

- Formation of the Environmental Improvements Committee comprised of collection managers, conservators, the registrar, the facilities manager, and curators from each of the museum's collection areas. This committee is charged with implementing the recommendations provided in the *Environmental Improvements Plan*. Committee meetings are held monthly and provide the opportunity for open discussion regarding progress and challenges.
- The museum designated its 2014 year-end appeal toward raising funds to complete the cost-share portion of the project. As a result, museum constituents became aware of the overarching environmental issues faced by the museum. Nearly three hundred individuals responded to this appeal, which more than attained its goal.
- A significant grant award was received from the New York State Office of Parks, Recreation and Historic Preservation to restore the East Porch and Colonnade of the historic house. Both of these areas were cited as areas of concern in the *Environmental Improvements Plan*.
- The *Environmental Improvements Plan* cited "poorly executed storage areas" as an area of concern. Based on this finding, two separate storage rooms used for the temporary storage of loaned objects and collection materials have been merged and ductwork from the library's main stacks was extended to the space in order to tap into the environmental controls available for that space. This effort has considerably

improved the environmental conditions, as well as storage and organization in the new space.

Lessons Learned

The Comprehensive Environmental Assessment proved to be a valuable learning experience for museum staff and leadership. Although weaknesses were uncovered, the product produced a strong foundation upon which the museum may build in order to secure a sustainable environment for the preservation of its collections. Lessons learned include the following:

- The pilot implementation project provided a significant learning experience that has led to necessary improvements in interdepartmental communication. Per recommendations developed with the consultant team, a local engineering firm was hired to create measured CAD drawings of the Photography Vault for analysis of the air handling systems. Unfortunately, miscommunication between the facilities manager and the engineering firm led to the creation of documents that did not meet the needs of the consultants. As a result, the desired insights were not obtained, this underscored the need to ensure that the museum's competitive bidding process is followed.
- The pilot implementation project revealed current staff weaknesses regarding their ability to understand and evaluate engineered HVAC studies without guidance from engineering consultants.
- The need for reliable documentation of the existing HVAC systems led the museum to seek out competitive bids from engineering firms in upstate New York capable of delivering proper floor plans, equipment schedules, condition assessment, control graphics and sequence of operations for each major system and water schematics for both chilled, condensed, hot water and steam. The museum has subsequently engaged mechanical engineering consultants, who have documented almost all of the museum's HVAC systems. This documentation will be essential for the museum as it moves toward implementation of the consultant recommendations.

Audiences

George Eastman Museum serves a broad and diverse audience including students of all ages, teachers, researchers, scholars, conservators, curators, photography and film enthusiasts, and the general public. Analysis of our visitor surveys indicates that 65% of visitors are from out-of-state and 20% are international. Our primary audience is highly educated, with 38% having completed an advanced degree. More than 60% are first-time visitors.

Many researchers, scholars and students visit the museum to access our collections. Our traveling photograph exhibitions and film loans have engaged audiences in Spain, France, Germany, Italy, Japan, Switzerland and many other countries. Our curators, conservators, and collection staff share knowledge and specialized training in photograph conservation and film preservation at museums and educational institutions worldwide. Recently a delegation of six museum staff traveled to Pune, India upon the invitation of the National Film Archive of India and the Film Heritage Foundation of India to provide education in a variety of areas for which the museum is renowned. Indian colleagues benefited from customized education in the art of curating film exhibitions and public access to film history and preservation, as well as the art and science of poster and photograph preservation, and accessibility.

The museum annually hosts international delegates and provides expert consultation regarding collections management, curation, exhibit design and fabrication, and digitization of collections. We have assisted professionals from Nigeria, Ghana, Slovakia, Singapore, Turkey, and China. In addition, we hosted the first annual Nitrate Picture Show film festival in 2015, attracting over 200 people from 21 different countries around the world.

A virtual audience is served through our website: Eastman.org. We interact with more than 15,000 followers through established Facebook and Twitter accounts.

Continuation of the Project

The *Environmental Improvements Plan* was provided to all trustees and trustees emeriti in summer 2015. The Board's Conservation Committee has been tasked with overseeing the in-depth review of the recommendations and ensuring that steady progress is made toward their implementation. This document will be used by the museum administration and governing body to initiate a robust planning process that will address the environmental and climate control issues that the project team identified and prioritized.

A summary of the 74-page document was shared with museum staff and it has led to a better collective understanding of the environmental concerns confronting the museum.

Recommendations provided in the Environmental Improvements Plan formed the basis for a related NEH grant proposal, calling for implementation of environmental improvements in the photography and technology vaults.

This project has indirectly helped the museum to secure funding for other related projects that are focused on the external building envelope as follows:

- In 2014 the museum underwent a site condition survey of the historic mansion that served as the residence of George Eastman from 1905 to 1932. Conducted by a local architectural firm that is widely known for its expertise in historic restoration, the condition survey has prioritized areas of imminent and severe threats.
- The museum successfully applied for and was awarded a major New York State grant from the Office of Parks, Recreation and Historic Preservation to address structural issues and replace the roofs over the historic East Porch and Colonnade. Grant funds were matched with a private donor's gift to support this project. Restoration of the Colonnade, which includes roof removal and replacement, will serve as a base upon which environmental enhancements may be implemented to regulate temperature and humidity in this section of the museum. Long-term plans call for exhibition use of the Colonnade space. Colonnade restoration efforts that will occur over the next two years will support further environmental enhancements.
- In spring 2015 the museum replaced the Conservatory roof, including the addition of new drains, pitch insulation and flashing. Within the same area, four clerestory windows were removed and replaced with like materials, and storm windows were added. This project will significantly improve the building envelope and will protect the recently reinstalled North Organ from water damage.
- In summer 2015 the museum completed construction work on the Porte-Cochère to remove and replace the roof. Heat-traced drains were installed to resolve issues with ice damming that have plagued the museum for several years. Additionally, new copper flashing was added and the rotted wood balustrade that runs the perimeter of the roofline has been replaced.
- In June 2016 the museum will submit a grant proposal to support restoration and repairs to more than thirty windows throughout the historic mansion and to add 68 preservation-approved, custom-made storm windows. This effort will protect the historic house from water leaks, improve energy efficiency, and preserve the mansion's historic elements and appearance.

The administration, staff, and trustees of the George Eastman Museum are grateful to the National Endowment for the Humanities for awarding the museum a grant from the Sustaining Cultural Heritage Collections program to support this project. The resulting grant product—the *Environmental Improvements Plan*—will be used to guide the future course of the museum as it embarks upon implementation of recommendations related to issues that are critical to the preservation of the museum's world-class collections and its National Historic Landmark mansion.