National Endowment for the Humanities
Sustaining Cultural Heritage Collections

New York State's Collections in the Balance: Planning HVAC Optimization at the Cultural Education Center

Narrative

Introduction

Project overview. The New York State Education Department (NYSED) Office of Cultural Education (OCE) seeks a planning grant from the National Endowment for the Humanities to support a planning project for HVAC optimization in the Cultural Education Center, Albany, NY. In April 2019, OCE conducted an on-site environmental assessment, which identified critical needs for improvement of our collection environments, among them several possibilities for optimization of selected air handlers that serve some of our most significant collections.

OCE encompasses the State Museum, Library, and Archives, which together hold New York's vast and diverse collections in trust for the people of New York. The focus of the planning project will be our home, the Cultural Education Center (CEC) building, a 1970s architectural showpiece, which houses the collections of the three institutions. Our specific focus is the entire CEC 3rd floor (170,000 square feet) and the CEC 7th-floor vault (1,400 square feet) of our 11-story, 1.5 million square foot building. Respectively, these areas serve as our principal museum collection storage area and our high-security vault containing the most significant treasures of the Library and Archives.

Through the planning project, OCE aims to improve the environment for these significant and at-risk collections by planning and implementing changes to HVAC operations and controls. Ultimately, our goal is improved stewardship of collections, combined with responsible use of energy resources in the context of a landmark structure and interagency collaboration, innovation, and investment.

Our building is both spectacular—a massive monument to the strength of government—and unwieldy. Wrangling the 1970s-vintage air handling equipment to meet even human comfort needs is a challenge for the most expert and experienced engineers. However, opportunities abound; we have the support and commitment of dedicated staff from multiple disciplines and agencies, a mature preventive conservation program, a new government-wide commitment to sustainability, and the validation of worthy collections.

Organizational profile. OCE is responsible for the stewardship of the vast and unparalleled collections of the New York State Museum, Archives, and Library—institutions that house and share the most comprehensive collections of New York State's cultural, human, and natural history. Collection development in all three institutions is guided by relevant sections of the New York State Arts and Cultural Affairs Law and Education Law, which direct the acquisition of collections that have been determined to have sufficient historical value or other value to warrant their continued preservation by the state. All three institutions actively acquire collections that meet the legal and institutional criteria for preservation. Together we employ about 325 full-time employees and welcome some 500,000 visitors per year. In 2019, OCE's annual budget for preventive conservation, non-personal services, was $267,650.

These are storied institutions. Established in 1836, the New York State Museum is the oldest and largest state museum in the country, a center of history, art, and science dedicated to exploring the human and natural history of New York. Its collections rank among the finest and most comprehensive New York-based collections in existence, totaling more than four million cultural objects and 16 million scientific specimens. Today the State Museum serves the lifelong educational needs of visitors from New York and beyond through exhibitions, scholarship, programs, and publications in history, anthropology, art, and science.

The New York State Library was established in 1818 for the government and people of New York. Today the Library's collections number over 20 million items including volumes, microforms, and maps used by researchers on-site, online, and via interlibrary loan. The Library's Manuscripts and Special Collections (MSC) unit was established in 1881 to collect, preserve, and make available the manuscripts, rare books, maps and atlases, prints and photographs, broadsides and posters, musical scores, and ephemera that document the history of New York from the 17th century to the present. Among the manuscript treasures of MSC are the draft preliminary Emancipation Proclamation in Lincoln's hand and George Washington's Farewell Address.

Founded in 1971, the New York State Archives preserves and makes accessible over 250 million records of New York's state and colonial governments dating from 1630 to the present. Today they are available for research on virtually any aspect of New York's long history--not only the workings of the colonial and state governments, but also the environment, economy, society, regions, communities, and people of the Empire State. The Archives' on-line digital collection contains over 100,000 items ranging from photographs, to maps, to one-of-a-kind documents as well as the entire collection of 12,000 17th-century Dutch colonial government records. The Archives holds paper, parchment, photographic, and electronic records, totaling over 150,000 cubic feet.

OCE collections are stored in the CEC near the State Capitol in downtown Albany. Built in the 1970s, the CEC and State Capitol bookend the sprawling Empire State Plaza, Governor Nelson Rockefeller's paean to the vitality of the state and its government. The CEC features 11 floors not including basement, sub-basement, and penthouse levels and is constructed of marble-clad cast concrete in the Brutalist style. The CEC is mixed-use—it encompasses collection storage areas; public exhibit and research areas; offices, labs, and work areas; loading dock; and a print plant. The building contains some 1.5 million square feet. Collections are stored on the basement levels and all above-ground floors except for the 9th and 10th, which are exclusively office areas.

The State of New York owns the CEC building. NYSED occupies the building and manages the day-to-day facility operations. The New York State Office of General Services (OGS) is responsible for maintenance of the structure and operation of the environmental systems therein through a memorandum of understanding with NYSED. Temperature, relative humidity (RH), and ventilation are controlled by approximately 50 air handler units. Steam and chilled water are delivered from centralized chiller and boiler plants operated by OGS. For over 25 years, OCE collection staff have worked closely with the NYSED building superintendent and OGS engineers to monitor, report, and record environmental conditions, resulting in detailed historical data; OCE staff maintain some 80 networked dataloggers throughout our collection and workspaces in the CEC. OGS utilizes networked sensors in both collection storage, workspaces, and return air ducts for the control of conditions.

Significance of collections

OCE has long been and remains a vibrant center of research and scholarship in the humanities and sciences. Our collections provide the essential evidence, documentation, and sources that both

ground and advance research and scholarship. While collections are stored throughout the CEC, the focus of OCE's planning project will be selected areas in the building, specifically the entire 3rd floor and the 7th floor vault. The 3rd floor holds Museum collections from both the humanities and sciences as well as collection management spaces. The vault on the 7th floor of the CEC holds the treasures of the State Library and State Archives, including rare books, rare manuscripts, and colonial, state, and national foundation documents.

The humanities collections of the New York State Museum, Library, and Archives are vast, at once diverse and complementary, and together, critical to the understanding of the seminal role of New York in shaping the political, cultural, economic, scientific, and social life of the United States. Together they portray New York as a physical place, illustrating the roles of geography, transportation, and trade in shaping the state and people. They depict New York as a place of conversation, where diverse individuals and communities argue and interact, test and share their visions for American society. They show that New York has been a magnet for leaders in the arts, industry, education, and science.

New York State Museum collections. The art collection of the New York State Museum features a broad spectrum of works relating to the Empire State from the colonial period into the 21st century. Among the collection's gems are works by genre artist Edward Lamson Henry (1841-1919). Henry, who lived and worked in New York City and the Catskills, was one of the late 19th century's foremost purveyors of nostalgia for early American life. He recorded actual artifacts and structures in meticulously crafted genre compositions recalling life in pre-Civil War America. The Henry collection includes hundreds of sketches, finished canvases, and photographs, most of which were donated by family members prior to World War II. One of the Museum's most recent and still growing acquisitions includes 1,500 works of art from the Woodstock Art Colony. Woodstock, New York, was home to what is considered America's first intentionally created, year-round arts colony—founded in 1902 and still thriving over 100 years later. Represented artists reflect the diversity of those who came to Woodstock, including Birge Harrison, Konrad Cramer, George Bellows, Eugene Speicher, Peggy Bacon, Rolph Scarlett, and Yasuo Kuniyoshi, among many others.

In the area of history, the Museum holds an internationally recognized Shaker collection, whose development began in 1926 when the Church Family Shakers of Watervliet sold their buildings to Albany County for the Ann Lee Home. The Shakers assisted Museum curators in gathering and documenting the materials from that community. Artifacts in this extensive collection include furniture, stoves, baskets, oval boxes, buckets, textiles and clothing, seed and herb packaging material, architectural elements, and cans and bottles. Our Shaker collection comprises not only finished products, but also the tools and equipment used in the production of them: basket molds, bonnet molds, farming equipment, presses for printing herb labels, presses for pressing herbs, choppers, looms, spinning wheels, sewing equipment, and casting patterns. Even raw materials such as splints for basket weaving, palm for making bonnets, and rolls of Shaker chair tape are present.

In addition to its extensive Shaker collection, the State Museum has the world's largest collection of documented New York State furniture. Among the New York City cabinetmakers represented are Duncan Phyfe (1768-1854), and collection treasures include early Hudson Valley Dutch furniture and chairs owned by Alexander Hamilton.

We hold a vast array of objects that illuminate the lives of women in New York and significant holdings related to the role of women in social organizations, including the National Organization of

Women and the ERA movement, and in the work force. Our women's suffrage collection contains correspondence among leaders of the suffrage movement, broadsides, banners, and at its center, a suffrage wagon used in marches on Long Island and New York City at the beginning of the 20th century.

The State Museum is home to the largest and most comprehensive collection of artifacts pertaining to the September 11th, 2001, terrorist attacks on the World Trade Center. The collection encompasses materials from the World Trade Center, including mangled building materials and objects of daily office life; a significant number of artifacts pertaining to the heroic efforts of first responders; fragments of the aircraft; and material documenting the tremendous global response to the attacks. This collection is one of the most accessed, requested, and loaned for exhibit at the New York State Museum.

Archaeological research at what would become the New York State Museum began in 1847, when the Board of Regents expanded the State Cabinet of Natural History to include an Historical and Antiquarian Collection. Today the Museum's Native and Euro-American collections are acclaimed for their extensive documentation of the full depth of human history in the state from its first Native American occupants some 13,000 years ago to the earliest European settlements in the 17th- through 20th-century urban developments. It is the most complete collection of New York archaeology in existence. We hold the first systematic ethnological collection in North America made by Lewis Henry Morgan during the mid-19th century. Documentation of Native American lives has continued through the collection of representative materials through the present day.

As a center of scientific research since its origins in 1836, the State Museum stands out as a renowned and authoritative repository of significant biological, paleontological, and geological collections, including type specimens. While these collections result from and contribute to scientific investigation, they support humanities research as well. They document the history of science, natural history museology, research methods, and the careers of North American scientific luminaries such as archaeologist Arthur C. Parker, geologist and paleontologist Robert Hall, botanist Charles Peck, and mycologist Winifred Goldring. The State Museum's records of the development of American natural science is second only to those at Harvard. As such, our science collections contribute richly to the humanities programs offered by OCE, and along with our history and art collections, are the backbone of our public programs, including exhibitions, conferences, and symposia.

New York State Archives/New York State Library vault collections. The vault on the 7th floor of the CEC holds the treasures of the State Library and State Archives, including rare books, manuscripts, and colonial, state, and national foundational government documents. Comprising approximately 4,000 cubic feet, vault collections include the draft Preliminary Emancipation Proclamation in Lincoln's hand; a rare collection of watercolor drawings depicting historical scenes in New York's Mohawk Valley in the late 19th century; the 1657 Flushing Remonstrance, colonial New York's plea for religious tolerance; New York's First State Constitution, 1777; and New York's copy of the Engrossed United State Constitution. It also holds less vaunted but equally significant records such as the original State Police footage of the Attica uprising.

Our vault contains rich documentation of leadership in the challenging era of the American Revolution: extensive correspondence between Commander-in-Chief George Washington and New York Governor George Clinton; as governor, George Clinton commanded the state's militia and maintained constant contact with Washington and with Congress during the Revolutionary War. We hold the documents found in the possession of British officer and spy John André, documenting

his conspiracy with General Benedict Arnold, then Commandant at West Point, to surrender that position to the British.

The vault is the location of extraordinary artifacts and documents that represent key phases of George Washington's career as land developer, military officer, and president. The Washington artifacts, purchased in 1873 by the State Library, include a pistol given him by Lafayette; a dress sword given him by Frederick the Great of Prussia; and a brass surveying compass made by the eminent scientist David Rittenhouse. Documents include the first draft of his Farewell Address of 1796, in his own hand; his opinion of the surviving generals of the American Revolution; a statement of his household expenses in 1789, the first year of his presidency; and a unique manuscript volume containing full-color depictions of British regimental uniforms.

Public access and programs. Collections of the Museum, Library, and Archives are used by an array of researchers, besides the daily hundreds of on-site visitors to the State Museum. Archives and Library researchers range from middle school students to genealogists to graduate students and university professors. Recent authors who have used our collections include Heather Ann Thompson, *Blood in the Water: The Attica Prison Uprising of 1971 and Its Legacy* and Sarah Handley-Cousins, *Bodies in Blue: Disability in the Civil War North.*

Here are some recent exhibitions held at the State Museum that feature materials from all three OCE collections and reflect their synergy:

- *Enterprising Waters: New York's Erie Canal* celebrates the "boldest and biggest American engineering project of its century" that unlocked the Western interior for trade and settlement and made New York City the nation's most powerful center of international trade. (On-going)
- *Votes for Women: Celebrating New York's Suffrage Centennial* paid tribute to women's suffrage in New York State and the nationally significant role of New York State leaders in women's rights and the feminist movement through the early 21st century. (2017-2018)
- *The Path to Statehood: New York's Constitutions and the U.S Constitution* provided a rare opportunity to examine New York's government foundation documents. (2016)
- *1609* was the year two worlds collided, when Henry Hudson and the Dutch sailed up the "great river" and met the Native People of New York. This major exhibition covered Henry Hudson, Native People of New York, the Dutch period in New York state, and Dutch global reach during the American colonial period and its lasting impact on today's world. (2009)
- *The Passenger Pigeon: From Billions to Zero* marked 100 years since Martha, the last Passenger Pigeon, died, and thus the extinction of *Ectopistes migratorius*. This exhibit addressed extinction, evolution, and the conservation of biodiversity. (2014-2015)
- *Annual Focus on Nature: Natural History Illustration* is an exhibit series that reflects the standards, materials, and artistry of contemporary natural history illustrators.

Current conditions and preservation challenges

The physical condition of the collections of OCE varies greatly; there are many variables, including material composition, physical provenance, previous storage and use environment, history of care, and current environmental conditions that have contributed to existing preservation challenges. Of all the variables, the collection environment is the most critical, and one over which we have an opportunity for control. For this reason, we are pursuing support for HVAC optimization, starting with this planning project. Our proposed project is the result of the successful environmental assessment conducted by Jeremy Linden of Linden Preservation Services in April 2019. Our investment in that project was the most recent step in our continued commitment to providing a

better and more sustainable environment for our collections; the recent assessment provided the data and a course of action that enable us to take the next step, this planning project.

There is both physical and data-based evidence of environmentally driven degradation in the collections stored on the CEC 3rd floor and in the 7th-floor vault; these collections, perhaps our most significant, are at the greatest risk. Collections stored on the 3rd floor run the gamut for a large, historic repository of objects dedicated to the history, art, and science of New York, including:

- Paintings and art, including stretched canvas, panel paintings, and works of art on paper;
- Furniture and decorative arts;
- Historic and modern textiles, ranging from the colonial period to the present;
- Architectural elements ranging from wood to stone and metal work;
- Historical documentation, including parchment, paper, and photographic materials, as well as modern popular culture materials;
- Archaeological collections and natural history specimens, including both organic and inorganic materials.

The range of media in this mixed-use, human-occupied environment poses a set of challenges both administrative and environmental.

Museum 3rd floor conditions. On the 3rd floor wood furniture has sustained visible veneer delamination and splitting from fluctuations in RH. Winter levels as low as 10% are particularly concerning. Paper-based artifacts stored on the 3rd floor have suffered mold damage, with potential continuing risk for materials stored close to the exterior walls. On occasion, major events such as a power surges can result in rapid environmental fluctuation. On July 2, 2018 a power surge that went unattended resulted in a 30% RH spike in our 3rd-floor collection ranges. Organic materials on the 3rd floor experience rapid rates of chemical decay each summer, with 20th-century artifacts such as plastics and film at particular risk. We are currently addressing vinegar syndrome afflicting several important collections of acetate film. To date, the only factor keeping the collections from even faster rates of chemical decay are the extremely dry winter conditions, which, as noted above, cause significant preservation issues on their own.

The 3rd floor storage spaces are served by a total of four air handlers, with ACMs 4 and 5 serving the central core and ACMs 3 and 6 serving the four corners of the floor.[1] Originally designed as combined storage, work, and office spaces, the floor holds the majority of the Museum holdings housed at CEC. Because of their growth, collections have taken over several former office areas. Room and wall locations have changed many times over the years, with little consideration of air flow, balancing, or other environmental consequences.

From a zoning perspective, the 3rd floor is largely an occupied collections area, limiting potential long-term preservation quality due to the need to maintain human comfort. The floor has significant exterior perimeter exposure; loads from the exterior walls affect the operation of all four systems. Nearly all the storage areas on the floor are served by multiple units, creating a situation where environmental issues can be difficult to resolve without unit-by-unit analysis.

Archives and Library vault conditions. While other spaces have significant preservation and operational concerns, the 7th-floor vault environment constitutes an emergency for OCE, both for humidification as well as for general rates of chemical decay. The fact that the room is zoned

[1] See Appendices for LPS, *Collection Environment Improvement Plan and Assessment*, 2019.

independently, makes it a strong candidate for architectural improvements (e.g., thermal insulation and vapor barriers). As the repository of some of OCE's most significant holdings, the vault is a top priority for renovation planning.

Materials stored in the vault, as on the 3rd floor, are at risk of all forms of environmental degradation; chemical decay, particularly with any mid-19th- to 20th-century materials, and mechanical decay of vellum, parchment, and leather objects are particularly concerning. While the original design of the room adhered to the best available science of the day, knowledge of materials degradation has advanced significantly since the late 1960s. The dedicated air handler (ACL-5) and the vault's architecture are not capable of maintaining the preservation quality environment--cool temperatures and moderate RH conditions--necessary for this collection. From a temperature perspective, control is not the concern. Rather, the issue is that the temperature is simply too high for long-term preservation and the system is unlikely to be capable of anything better. There is visible evidence of the low RH in the winter, when it is often in the single digits, with mechanical degradation of vellum, parchment, and leather objects, seen in the form of severe planar distortion and efflorescence.

The Time Weighted Preservation Index (TWPI) of 52, the value that LPS calculated, is far too low for the significance of these unique materials. This is Lincoln's draft of the Emancipation Proclamation. We must find a sustainable path to improved preservation.

Sustainability. While OCE does not currently have data regarding energy consumption levels for the 3rd floor or 7th-floor vault, we recognize that we must gather that data and set sustainability goals in the context of collection preservation. This planning project will introduce sustainability as a value to our operations as collection stewards and environmental managers. At over four acres, the 3rd floor is the largest in the CEC. The four air handlers that serve it are the largest systems in our building and unchanged since they were designed in the 1970s. Based on outside air usage, combined with lack of thermal and vapor barriers in the external envelope, we know that we are using a significant amount of energy to maintain sub-optimal conditions for collections. Our partner agency, OGS, is actively making sustainability improvements across the Empire State Plaza but as yet has not included OCE or the CEC in their efforts because of the potential risks to collection preservation and longevity. The one exception is the recent transition to LED lighting in the CEC. The benefits of this HVAC optimization planning will be to identify appropriate energy savings opportunities without causing a negative impact on our preservation environments. This project will further strengthen our internal practices and partnership with OGS and bring our energy consumption and sustainability goals into alignment with our statewide energy planning objectives.

Overview of preventive conservation practices. Preservation of collections is a long-held value in OCE. In 1911, after a catastrophic fire swept through the State Capitol, then home to Library and Museum collections, state officials brought in professional restorers from the Library of Congress to save our most important treasures. In the 1960s, the forward-thinking State Library commissioned engineers at Columbia University to construct an anoxic encasement for the manuscript Emancipation Proclamation in Lincoln's hand. A special OCE team recently coordinated the conservation and re-encasement of the document. In the 1980s, the Archives and Library recruited and have since retained professional, program-trained conservators to lead the preservation staff. Since the 1980s, the Archives has been awarded millions in grant funds to conserve and reformat collections, including a 2018 Save America's Treasures grant to conserve and digitize records relating to the prosecution of loyalists during the American Revolution.

With the recent appointment of an OCE preservation officer, NYSED invested in improved and proactive stewardship of all collections, fully integrated to ensure efficient use of resources and seamless access to expertise. Preventive conservation activities, ranging from environmental monitoring to disaster preparedness to integrated pest management are led by the OCE Collections Stewardship Team (CST), which consists of collection representatives from all three institutions. A program-trained paper conservator aided by conservation technicians provides services for all three institutions in our large and well-equipped lab on the 11th floor of the CEC. For conservation of paintings and objects collections, the preservation officer leads the development of treatment specifications and selection of qualified conservation providers.

Administrative and intellectual control of collections is integral to any collection management program and OCE's is no exception. Each institution currently manages collections and their content independently using a combination of homegrown and proprietary systems. The Archives uses an EAD-compliant finding aid system which contains and makes publicly available finding aids for all archival series in the Archives holdings as well as an integrated container management module. Their Needs Assessment System contains up-to-date, series-level information about condition as well as preservation and access needs of all holdings. The Library's online catalog is the repository of data about collection content and location. The Museum maintains its collection data and selected images in Mimsy. We recognize that there are untapped opportunities for collaboration across OCE in this area and recently launched an initiative to integrate selected collection management activities, including preservation of OCE digital collections in Preservica.

History of the project

Since the 1980s, OCE has carried out targeted environmental improvement projects in the CEC. In 2005, the State Library and Archives completed a seven-million-dollar renovation of the 11th floor of the CEC, which houses historical records and rare books. The renovation included installation in our then-vacant penthouse of four new air handlers that serve the 11th floor and maintain temperatures at about 55 degrees. More recently, the State Museum created special low RH collection environments for the storage of critically humidity-sensitive shale and pyrite specimens using desiccant dehumidification. In 2017-2018, we installed new LED lighting throughout the building to protect collections and reduce energy consumption. Despite these advances, state support for major capital projects has dwindled and our approach has been to work incrementally and in phases, seeking outside support and the assistance of our colleagues in other agencies.

Hiring Jeremy Linden of LPS to perform an initial assessment is the latest in a series of efforts to improve our collection environment, finding a sustainable solution. That assessment identified several findings and needs, besides optimization studies. Other recommendations include:

- Relocation of collections on the 3rd floor from perimeter to interior spaces;
- Redesign of our datalogger system, updating our equipment and moving to a web-based, rather than networked solution *(in progress);*
- Establishment of an inter-agency environment team *(completed);*
- Strengthening our housekeeping in our public areas *(in progress).*

Methods and standards

As part of the proposed planning study, Jeremy Linden of Linden Preservation Services (LPS) will work with the OCE team, including representatives from administration, collections, and facilities staff from both NYSED and OGS, toward optimizing five total air handling units (AHUs) at the museum: four that serve the 3rd floor of the CEC, and a fifth that is dedicated to the 7th floor vault. While collections occupy nearly every floor of the facility, this approach will, as noted, allow the

team to address mechanical operation for preservation and sustainability for some of the most critical cultural heritage collections held by the state. The optimization process used by LPS consists of five key steps--documentation, data gathering, data analysis, experimentation and implementation, and assessment and maintenance--that are designed to gain a holistic understanding of the building operation, which informs appropriate potential strategies for improvement.

The initial assessment performed in 2019 provided an overview of mechanical infrastructure and potential sub-optimal operational issues in the CEC but did not allow for documentation and granular analysis of the systems to be examined as part of the planning study. Documentation will be accomplished in conjunction with the NYSED/OGS team ahead of and during the first on-site visit, and consists of bringing together the existing knowledge of the mechanical systems and building in order to establish not only the operational capability of the mechanical systems, but also to identify how aspects of the building structure, lighting, and other factors will interact with the systems operation. Additionally, the team will conduct an initial walk-through of all collection spaces to discuss material types and preservation requirements, long-term preservation goals, and aspects of how the spaces and collections are used. This documentation will build upon the initial assessment, with greater focus on the potential impacts of airflow (both original design and existing operation as impacted by past renovations) and micro-environments within the collection zones. Non-storage areas of the 3rd floor will also be examined and documented as to the amount of time collections may spend in various spaces, and any potential preservation risks associated with those workflows.

LPS will install dataloggers in each of the in-scope air handlers as part of the data gathering phase. This data, in conjunction with data from OCE's environmental dataloggers and the available data from the building management system (BMS), will allow the team to assess the operation of each component in the mechanical operation, and aid in identifying opportunities for improved operation for preservation or energy consumption. Loggers will track normal performance of the systems for eight to nine months to establish typical performance during summer, winter, and shoulder seasons. Comparative analysis of both system and space conditions will establish a baseline of preservation performance and typical energy operation of various aspects of the systems.

Following initial analysis of the operation of the individual AHUs, the project team and LPS will seek to identify opportunities for more optimal preservation or energy operation. Potential strategies to be tested during the second stage of the project may include adjusted set points (either year-round or seasonal), experimentation with purposeful system setbacks or shutdowns aimed to establish the spaces' capacity to passively maintain environmental conditions for periods of time, adjustments in outside air control based on occupancy or other factors, or other identified opportunities based on system design and operation. OCE and OGS will seek to incorporate optimization strategies that test successfully into its permanent control strategy for the building.

Decision-making and goals through the optimization process will be heavily informed by new standards and best practices for preservation environments and sustainable operation in the museum field. Utilizing recent materials research and publications from the Image Permanence Institute, the Getty Conservation Institute, and the Canadian Conservation Institute, as well as redefined standards and guidelines from the International Standards Organization (ISO 11799 and TR 19815) for library and archives preservation and the American Society of Heating, Refrigeration, and Air-Conditioning Engineers (Applications Chapter 24, "Museums, Galleries, Archives, and Libraries" – published in June 2019), OCE will reexamine its practices for establishing

environmental criteria, and will seek to create environmental conditions that balance needs for long-term preservation with the least energy consumption possible. New control strategies for RH (beyond the traditional 50% +/- 5%), coupled with passive environmental strategies may present new opportunities for normal operation, even in the currently mixed-use zones of the CEC's 3rd floor.

In addition to documenting existing operation and identifying potential optimization strategies to use with the existing equipment, the team will also endeavor to identify future strategic capital improvements that would impact overall preservation, energy-savings, or both. OCE faces a critical challenge in that the five systems being examined are all original to the building's construction--approaching 50 years ago. The initial assessment identified several challenges related to the age and original design of the systems and building envelope. Potential future opportunities may range from redefining the existing HVAC zones to further separating collection storage from human occupancy, the creation of interior envelopes to isolate the perimeter of the building, and replacement of the existing AHUs with units that are right-sized. Our goal is to create an optimal preservation environment--one that provides the best possible preservation at the least possible energy consumption and is sustainable over time--according to updated knowledge of materials science and degradation behavior.

Work plan

The first stage of the project (first nine months of project: October 2020 to June 2021) is intended for data collection and analysis. The second stage (running for 11 months from July 2021 to May 2022) comprises the testing and experimentation period. The third, final stage (last four months of project from June to September 2022) will be used for implementation of recommendations from the preservation expert and project team, as well as preparation for dissemination of project results.

Date	**Activity**	**Responsible**
Oct 2020	Phase 1 - 1st assessment visit (1 week) from Linden Preservation Services (LPS) - Systems and building documentation, placement of dataloggers in the HVAC systems, as well as collection spaces (CEC 3rd Floor and 7th Floor Vault) as necessary.	LPS
Nov 2020-Jun 2021	- Data gathering and analysis - Scheduled conference calls between the OCE team and LPS, approximately every six weeks during this period, to monitor and discuss data gathering and data analysis - Implementation of experiments as established in Linden 2nd visit (see below).	NYSED-OGS Team LPS
Jun 2021	- 2nd visit (4 days) from LPS to verify and analyze HVAC performance for the five selected AHUs, establish experimentation and analysis schedule to assess any changes; project team meeting to decide if additional testing is necessary and the type of testing to perform; create experimental lists to perform for the next year.	LPS NYSED-OGS Team
Jul 2021-May 2022	Phase 2 - Data gathering and analysis	NYSED-OGS Team /LPS

Date	Activity	Responsible
	- Conference calls between the OCE team and LPS, approximately every six weeks during this period, to monitor and discuss data gathering and analysis - Implementation of testing per LPS 2nd visit (see above)	
May 2022	- 3rd and final visit (4 days) from LPS to perform last run of analysis, final conclusions and recommendations for any long-term optimization strategies. Team discussion and establishment of any new control parameters and guidelines to follow by the museum and by contractors - Final site meeting with OCE team and interested staff.	LPS NYSED-OGS Team
Jun 2022	Phase 3 - Write internal procedures for implementing recommendations from LPS - Implement the recommendations that can be done easily and start to plan for a future implementation phase of the more complex recommendations.	NYSED-OGS Team
Sep 2022	- Final report due from LPS to OCE.	LPS
Oct-Dec 2022	- Final White Paper and financial report delivered to NEH.	NYSED-OGS

Project team

The project team is composed of individuals with diverse skills and perspectives who share a singular commitment to this project. All the team members were key participants in the initial assessment and subsequent planning sessions and are members of our new NYSED-OGS Environment Team. Staff and our consultant were carefully selected to ensure representation of the multiple disciplines critical to success: preventive conservation, utilities and engineering, energy planning, and facilities management.

Maria Holden, OCE preservation officer, will serve as project director and OCE lead and provide administrative oversight. A member of OCE's senior leadership, Maria is responsible for the stewardship of the collections of the State Museum, Library, and Archives. Trained as a conservator, Maria previously led efforts to preserve and make accessible State Archives collections as director of archival services.

Cher Schneider will serve as preventive conservation lead and advise on collections needs and impact. Cher is head of paper conservation for all three OCE collecting institutions. A Fellow of the American Institute for Conservation, Cher previously served as head of paper conservation at the Intermuseum Conservation Association.

Henry Scott, CEC building superintendent, will serve as on-the-ground liaison between the participating agencies including OCE, OGS, and LPS. As superintendent, Henry is responsible for the care and maintenance of the largest state-owned building in New York. He has extensive experience in the maintenance of HVAC systems and boilers.

Gregory Stewart, OGS energy conservation technical specialist, provides energy efficiency project coordination in all OGS owned and operated facilities statewide. Greg's duties are in close alignment with project objectives and include facility audits and evaluation of existing equipment. Greg will serve as liaison with government sustainability efforts and OGS leadership.

Nathan Aernecke, OGS plant utilities engineer, is responsible for the day-to-day operation of our air handling systems in the CEC. He brings exhaustive experience with our HVAC equipment and performance and will implement any operational changes identified by the project team.

Jeremy Linden, owner/principal of Linden Preservation Services, will serve as preservation environment consultant and lead the development of sustainable strategies for HVAC optimization. Jeremy has provided consulting services to OCE for about a year, starting with an assessment, and developed a deep and unique understanding of our building. Jeremy has extensive consulting and teaching experience in sustainable preservation environments and is active in national and international standards-setting efforts. His previous experience in archives and special collections lends insight into collection needs and realities.

Support team. OCE plans to convene a secondary team to support the project team and respond to information requests. The support team includes staff with special or supplemental expertise in the area of collections, administration, and sustainability. Members include:

Bob Berdar, Utilities Energy Management Center, OGS
Robyn Gibson, History Collections Technician, State Museum
Lauren Moore, Assistant Commissioner for Libraries and New York State Librarian
Ed Morrison, Utilities Energy Management Center, OGS
Mehna Reach, Registrar, State Museum
Tom Ruller, Assistant Commissioner for Archives and State Archivist

Project results and dissemination

Our plan is to share results and lessons learned with colleagues in state government and fellow cultural education professionals in New York and nationwide. We will document every step of the optimization process and share data, energy usage, and costs with the cultural heritage community. OCE has a strong and expansive cultural heritage network through several statewide service programs, which include the Documentary Heritage and Preservation Services for New York (DHPSNY) program, operated jointly by the State Archives and State Library and serving collecting repositories statewide. Program websites, social media, and the DHPSNY blog and podcast series will facilitate dissemination of our methodology and results. We plan to present the project white paper at meetings of professional organizations including the Council of State Archivists (CoSA), the Society of American Archivists, the American Library Association, the American Institute for Conservation, and the American Alliance of Museums. We also plan to develop a webinar on the project, for delivery through CoSA and OCE's education outlets, including DHPSNY.

We are at a point where we must identify short- and long-term strategies to improve the collection environment in our flagship home, the CEC, in order to be responsible custodians of the collections in our care. Through this planning project, the various agencies--OGS, NYSED OCE, NYSED Facilities, and LPS--will define the steps and develop a plan and budget for implementing changes to HVAC operations and controls. This project will tell us what options are available and achievable with the existing equipment, and what a path forward for mitigating risk, improving environmental performance for sustainability and preservation, and overcoming the zoning and envelope concerns might look like. The power of this partnership comes from the enthusiastic support from agency leaders at the highest level, the talent of the team members, and shared understanding of and commitment to the values of preservation and sustainability. The outcome we seek is survival of our at-risk collections and responsible use of energy resources in the context of a landmark structure and interagency collaboration, innovation, and investment.

NATIONAL ENDOWMENT FOR THE Humanities

Budget Form

OMB No 3136-0134
Expires 6/30/2021

Applicant Institution: *NY State Archives Partnership Trust*
Project Director: *Maria Holden*
Project Grant Period: *10/1/2020-09/30/2022*

click for Budget Instructions

	Computational Details/Notes	(notes)	Year 1	(notes)	Year 2	(notes)	Year 3	Project Total
			10/01/2020-9/30/2021		10/01/2021-9/30/2022		01/01/20__-12/31/20__	
1. Salaries & Wages								
Maria Holden, Preservation Officer	10% of (b) (6) annually	10%	(b) (6)	10%	(b) (6)	%		(b) (6)
Cher Schneider, Head of Paper Conservation	10% of (b) (6) annually	10%	(b) (6)	10%	(b) (6)	%		(b) (6)
		%		%		%		$0
		%		%		%		$0
		%		%		%		$0
		%		%		%		$0
2. Fringe Benefits								
Maria Holden and Cher Schneider	63.89% of salaries	63.89%	$12,521	63.89%	$12,521			$25,042
								$0
3. Consultant Fees								
Linden Preservation Services	Consultant services at (b) (6)/day	12 days	(b) (6)	11 days	(b) (6)			(b) (6)
Linden Preservation Services	Consultant services at (b) (6) /day (travel)	3 days	(b) (6)	3 days	(b) (6)			(b) (6)
4. Travel								
Mileage, $.58/mile	3 trips; 500 mi @	1000	$580	500	$290			$870
Parking	3 trips; $120@	2	$240	1	$120			$360
On-site transportation	3 trips; 100 @	2	$200	1	$100			$300
Lodging	16 nights; $200 @	11	$2,200	5	$1,000			$3,200
Meals	19 days; $61@	14	$854	5	$305			$1,159
5. Supplies & Materials								
								$0
6. Subawards								
								$0
7. Other Costs								
								$0
8. Total Direct Costs	**Per Year**		**$52,392**		**$48,933**		**$0**	**$101,325**
9. Total Indirect Costs	10% of total to APT		3211.8		32118			6423.6
a. Rate:								
b. Federal Agency:	**Per Year**		$0		$0		$0	**$0**
Effective Period: 10/1/2020-9/30/2022								
10. Total Project Costs					(Direct and Indirect costs for entire project)			**$107,749**
11. Project Funding		**a. Requested from NEH**					Outright:	$43,513
							Federal Matching Funds:	$0
							TOTAL REQUESTED FROM NEH:	**$43,513**
		b. Cost Sharing					Applicant's Contributions:	$64,236
							Third-Party Cash Contributions:	
							Third-Party In-Kind Contributions:	$0
							Project Income:	$0
							Other Federal Agencies:	$0
							TOTAL COST SHARING:	**$64,236**
12. Total Project Funding								**$107,749**

Total Project Costs must be equal to Total Project Funding -----> ($107,749 = $107,749 ?)

Third-Party Contributions must be greater than or equal to Requested Federal Matching Funds -----> ($0 ≥ $0 ?)

National Endowment for the Humanities
Sustaining Cultural Heritage Collections

New York State's Collections in the Balance
Planning HVAC Optimization at the
Cultural Education Center

Budget justification

1. SALARIES AND WAGES

The project director, Office of Cultural Education (OCE) preservation officer Maria Holden will devote 10% of her time to program oversight. OCE head paper conservator Cher Schneider will devote 10% of her time to advisement on collection condition and impact.

2. FRINGE BENEFITS

Fringe benefits for Maria Holden and Cher Schneider are negotiated at a rate of 63.89% per the New York State Education Department.

3. CONSULTANT FEES

Preservation environment consultant Jeremy Linden of Linden Preservation Services, Inc. (LPS), will work with a team including representatives from collections care, facilities management, and administration, to plan an optimization study for improved operation of the mechanical systems serving collections environments on the 3rd floor and 7th floor vault in the Cultural Education Center (CEC). As part of the project, LPS will monitor and analyze the performance of up to five air handlers serving collections storage environments within the building.

Specific activities include:

- On-site: Documentation, logger deployment, data-gathering, analysis, and team discussion; and
- Off-site: Document review, data analysis, writing, and regular discussions/conference calls.

The final deliverable to the OCE will be a written report covering the documentation process, system and building capabilities, mechanical and preservation analysis, overview of any testing performed, and recommendations for operational changes as well as future capital investment.

4. TRAVEL

Linden Preservation Services, Inc., charges a daily rate of (b) (6) , with travel days quoted at half-time. Travel costs are estimates, with actual costs billed unless on a fixed-price contract. Travel arrangements will be made by LPS. Meals are reimbursed at the federal per diem rate.

5. INDIRECT

Coordination of the administrative support for the grant and the project director will be provided by the NY State Archives Partnership Trust. Administrative support includes fiscal management, auditing, and reporting.