The Herbert F. Johnson Museum of Art (HFJ) at Cornell University requested an NEH Sustaining Cultural Heritage Collections Planning grant to assemble an interdisciplinary team of curators, conservators, building experts, and architects to explore methods of sustainable preservation for more than 23,000 prints, drawings, watercolors, portfolios, and artists’ books in the collection. Project objectives included: 1) studying existing lighting, design, and climate of a dedicated print room where the majority of these works are stored; 2) identifying passive measures that might be implemented to increase the collection’s longevity and safety; 3) assessing the breadth and variety of the collection and individual storage needs; and 4) investigating state-of-the-art storage methods to better house these works and identify expansion opportunities. In addition, we examined ways in which we could incorporate a new adjacent study room for use by scholars, researchers, and small seminar groups. This project coincides with a parallel effort to upgrade building systems and a comprehensive lighting project to align with ongoing investments in collections care, accessibility, and preservation.

The Johnson’s works on paper collections are the largest and most heavily used for teaching and exhibition, the area that grows the fastest, and is also potentially the most vulnerable. A founding member of the Williamstown Art Conservation Center, we have a proven long-term commitment to the safety of our collections and as we anticipate the renovation of the print room, this NEH grant has allowed us to examine existing conditions, consider necessary upgrades to the environment, and forward our long-term goals for the collection. As a university museum (and now even more imperative than ever), these are the top goals of our 2017-2022 five-year plan: 1) strengthen and diversify our integration into the intellectual and cultural life of Cornell to enhance student experience; 2) present art as a catalyst for deeper understanding of the world and our place in it; 3) steward the global art collection as a valuable resource for Cornell and beyond; 4) build an inclusive, team-oriented culture of continuous learning and accountability; and 5) guide and grow HFJ’s resources for long-term financial sustainability. Key to our planning is our historic I. M. Pei building, considered an artwork itself, ensuring that it operates efficiently and that we employ best conservation practices within. This NEH planning grant proposal has enabled us to address the last unrenovated space in the original 1973 building (an addition to the building was completed in 2012).

Detailed reports provided are from our partner consultants: RIT Permanence Institute, the Williamstown Art Conservation Center, and Samuel Anderson Architects. Each lays out the specific conclusions that were reached and suggestions for proceeding with the print room renovation. These reports were shared with staff and with each of the partner consultants.

**RIT Permanence Institute:** Our initial meeting was held in December 2019 at the Johnson Museum with Kelly Krish and Christopher Cameron. At that time they placed data trackers throughout the print room and in other adjacent areas that shared similar environmental conditions. Follow up meetings were held via Zoom with David Ryan, the Johnson’s building manager, Nancy Green, project manager, and Krish and Cameron.

The goals of the project were:

- analyze the preservation quality of current environmental conditions provided by the mechanical systems,
and provide short and long-term recommendations to improve preservation and energy-efficient operation, while considering the building envelope.

Due to constriction of the 1973 building, some of the recommendations they suggested such as a box-in-box construction, renovation with separation of occupancy from the print room itself, and off-site storage cannot be instituted without changing the museum’s teaching mission and, in some cases, the actual building envelope.

Other suggestions, however, particularly relating to environment, should be part of project planning going forward:

**Install dedicated HVAC.**
The renovation plans offer an opportunity to reorganize the zoning for the third and fourth floors. Currently, the mechanical system serving the Print Room also serves three offices and the staff break room on the third floor. Ideally, the collection space would be separated out so that it can be controlled differently than spaces for which human occupancy is the only concern.

**Address condensation and light concerns for the windows.**
As mentioned in “Building envelope”, staff have noted that the windows of the collection space tend to have condensation on them in the winter months. This is caused when the temperature of the windows, cooled from outside conditions, is below the dew point of the space. The winter dew points in the collection space hold steady at around 36˚F (see graph below). However, the temperature outside is typically below 36˚F for at least 30% of the year.

Brook Preskowitz from the Williamstown Art Conservation Center visited the print collection spaces in the Johnson Museum with Green in May 2021. Her task was to address four concerns:

a) study the existing lighting, design, and climate of the print room where the majority of the collection is stored

b) identify passive measures that might be implemented to increase the collection’s longevity and safety

c) assess the breadth and variety of the collection and individual storage needs

d) investigate state-of-the-art storage methods to better house these works and identify expansion opportunities

Her report also addresses many issues such as housing, consistent matting, and buffers within solander boxes to restrict movement, all things that would be an ideal project for staff to work on while the print room itself is being renovated, since the collection will have to be moved to another space and could be addressed holistically. Costs of upgrading solander boxes, new interleaving materials, and re-matting would not be insignificant but should be included in any plans for the new print room as well as dedicated staff to work on this aspect of the project. In addition, Prekowitz’s report noted the issues of excess light, temperature and humidity control that were addressed in RIT’s report.

**Samuel Anderson Architects** (represented by Mandi Lew, Senior Associate, met with staff on several occasions, via Zoom, as well as meeting once with Krish and Cameron from RIT. SAA developed four scenarios for the 4th floor and HFJ staff discussed the pros and cons of each via meetings and through follow-up emails. One of the most important results is the conclusion that
this is a bigger project than anticipated and will need to include reinforcement of the beams on the floor below and, in the process of this work, possibly reimagining the work spaces there (currently housing administrative staff).

SAA looked at the existing works on paper collection and how it is stored in terms of type of work, volume of work, fragility, storage type, existing housing, system efficiency/inefficiency, use & access patterns, and density. The following was determined:

- The current storage organization works well and shall be maintained.
- Current solander box density (the number of works on paper in each box) is assumed to be acceptable.
- Solander boxers are preferred to be stacked one high, but looking at the loss of storage space, it was deemed that two high is acceptable. (The boxes are currently stacked two high.)
- Redistribution of size III and IV prints and drawings into additional flat files to reduce the load in each drawer is desired.
- Full extension flat file drawers are preferred.
- Pull out reference shelves built into the furniture systems are desired for ease of handling.
- Assume anticipated collections growth of 100 WOP per year.

SAA reviewed ideal parameters for collections storage that could be incorporated into the new Print Room scope, while still respecting the physical constraints of the historic building. It was determined that the following should be included:

- Ease of access. Provision of a clear, easily maneuverable path between elevator and collections storage furniture for carts and A-frames, including door hold opens tied into the fire alarm system.

Adjustments to the lighting system for all new LED lighting to serve the newly configured spaces, including gallery lighting for viewing works on paper.

- Security. Reconfiguring of spaces to secure the Print Room functions from visitors accidentally wandering off of the elevator. Access to the Study Room should be restricted to staff, students and visiting scholars and access to the Print Room should be further restricted to museum staff and interns only. Visual connections between the spaces for monitoring by staff should be provided. Security system devices including card readers, motion detectors, and security cameras tying into the existing museum security system, should be utilized.

- Fire separation. A 2-hour rated fire separation should be maintained around the densely stored collections, including a fire shutter to separate the 4th floor from the 3rd floor at the opening in the SE corner.

- Fire detection. In addition to standard Fire Alarm system (smoke detectors, horn strobes, etc.), the new spaces should include a VESDA early smoke detection system.

- Fire suppression. It was agreed that a wet pipe sprinkler system should be incorporated into the space. (None currently exists on the floor. There are currently existing sprinkler systems on the lower floors of the museum.)

- Structure. The Study Room floor loading capacity is limited, and not suitable for dense works on paper storage. Recommended loading capacity at compact storage
for works on paper is 200psf and recommended deflection is L/700 (although L/480 may be acceptable). Targeted reinforcing of the structure to accommodate the load of additional storage has been recommended by the Cornell University’s Structural Engineers, weighed against the cost and disruption to adjacent spaces.

- Ease of access. Provision of a clear, easily maneuverable path between elevator and collections storage furniture for carts and A-frames, including door hold opens tied into the fire alarm system.
- Adjustments to the lighting system for all new LED lighting to serve the newly configured spaces, including gallery lighting for viewing works on paper.

Ideal parameters that will be deferred until a later date include mechanical system and building envelope adjustments as well as rezoning of the mechanical system to accommodate the new Print Room floor layout. The addition of UV film at exterior windows is being carried in the cost estimate but will need to be studied in more depth in conjunction with envelope and climate control upgrades.