

# COLLECTIONS ASSESSMENT FOR PRESERVATION (CAP) REPORT

Prepared for



## CATOCTIN FURNACE HISTORICAL SOCIETY JULY 7-8, 2022

### **What is the Collections Assessment for Preservation (CAP) program?**

CAP is a program that provides partial funding toward a general conservation assessment to help small and mid-sized institutions improve collections care. CAP is designed for small to medium-sized institutions whose entire collections and facilities can be assessed in a two-day site visit. CAP provides an opportunity for staff to work with professional consultants to establish a prioritized set of recommendations for improving collections care.

CFHS is grateful to the CAP assessors for their suggestions for improved care and stewardship of the structures and collections in our care. We have already begun work on implementing many of the recommendations in this report and are seeking funding and volunteers to assist us in this important endeavor. If you would like to get involved with this effort as a volunteer, please email us at [info@catoctinfurnace.org](mailto:info@catoctinfurnace.org).

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# Table of Contents

<b>I. OVERVIEW OF REPORT .....</b>	<b>1</b>
A. <i>Introduction to Assessors .....</i>	1
B. <i>CFHS Description/History .....</i>	2
C. <i>Assessment Methodology.....</i>	2
<b>II. EXECUTIVE SUMMARY .....</b>	<b>3</b>
A. <i>Short-term/Urgent Recommendations .....</i>	3
B. <i>Long-term Building Recommendations .....</i>	3
C. <i>Long-term Collections Recommendations.....</i>	4
D. <i>Mission Statement/Governance .....</i>	5
<b>III. CFHS BUILDING ASSESSMENT AND RECOMMENDATIONS .....</b>	<b>5</b>
A. <i>Introduction .....</i>	5
B. <i>Rubble Stone Buildings.....</i>	8
C. <i>Log Buildings.....</i>	10
D. <i>Existing Conditions Visible at the Museum of the Iron Worker .....</i>	11
E. <i>Existing Conditions Visible at the Forgemans House.....</i>	13
F. <i>Existing Conditions Found at the Colliers House.....</i>	16
G. <i>Maintenance and Repair for Individual Buildings .....</i>	21
<b>IV. CFHS COLLECTIONS ASSESSMENT AND RECOMMENDATIONS .....</b>	<b>23</b>
A. <i>Introduction .....</i>	23
B. <i>Collections Policies .....</i>	24
C. <i>Collections Care.....</i>	28
D. <i>Specific Collections Condition &amp; Recommendations .....</i>	32
<b>V. APPENDICES AND ADDITIONAL PHOTOS .....</b>	<b>50</b>
A. <i>Rules for handling objects from National Park Service.....</i>	50
B. <i>Textile Condition Summary, Nora Frankel, Textile Conservator .....</i>	51
C. <i>Additional Photographs.....</i>	54
D. <i>Stepped and Chimney Flashing (Copper Development Association Inc.)</i>	
E. <i>Preservation Brief 47: Maintaining the Exterior of Small and Medium Size Historic Buildings.</i>	

## OVERVIEW OF REPORT

### *A. Introduction to Assessors*

Mary Jablonski is the President and a senior architectural conservator of the firm of Jablonski Building Conservation, Inc. She established the firm in 1995 to provide a full range of conservation services to a varied client base including architects and engineers, governmental agencies, institutions, religious properties, contractors, and homeowners. The type of work she performs include condition assessments; treatment development and specifications; analysis of finishes; field testing and laboratory testing; construction supervision, building and probe investigations and analysis, and historic structure reports. She has more than 27 years' experience as an architectural conservator. She earned BA in History from the University of Massachusetts, and MA in History from the University of Sussex, and an MS in Historic Preservation from Columbia University. She is an Adjunct Associate Professor at Columbia University, where she taught "Conservation Workshop" from the Fall 2002 to 2015 and "American Architectural Finishes" from the Spring 2005 to the present. She is a Fellow with The American Institute for Conservation of Historic & Artistic Works and a Fellow of the Association for Preservation Technology. Ms. Jablonski has presented numerous papers at several conferences, published several articles on a variety of preservation and conservation topics, and edited two books on architectural finishes.

Lori Trusheim is an objects conservator in private practice. She received her M.S. and certificate in conservation from Winterthur/University of Delaware Program in Art Conservation in 1997. Her post-graduate training was carried out at the Walters Art Museum, first working on a grant project for the treatment of Egyptian hard-stone objects and then as permanent staff exhibitions conservator. In 2002 she embarked on a new venture as a conservator in private practice, providing conservation treatment and assessments for individuals and institutions. Her clients include: Walters Art Museum, National Museum of African American History and Culture, Maryland Institute College of Art, Maryland Historical Society, Maryland State Archives, Johns Hopkins University Museums, Peabody Museum, Baltimore Museum of Industry, Johns Hopkins Hospital Medical Archives, National Museum of American History, and Octagon Museum in Washington D.C. From 2015-2020 she taught an undergraduate course, "Conservation of Material Culture: Art, Artifacts, and Heritage Sites", at Johns Hopkins University. Prior to her graduate training in conservation, one of her first jobs was as a conservation technician for Agecroft Hall in Richmond, Virginia. There she delved into all aspects of preventive care for historic house museums, from regular dusting of collections to preparation of fake food. She is honored to draw upon her past experiences to provide the collections assessment portion of the CAP survey for Catoctin Furnace Historical Society.

## ***B. CFHS Description/History***

Catoctin Furnace is located on unceded land of the Susquehannock, the Five Nations, Iroquois, the Shawnee, the Tuscarora, and the Piscataway. The Catoctin Furnace Historical Society (CFHS) acknowledges this and thanks them for their strength and resilience in protecting the land and aspire to follow their example.

Four couples with a passion for history and archeology and the industrial past founded the Catoctin Furnace Historic Society in 1972. Their mission was to preserve the industrial past in what remains of log and stone houses in the village of Catoctin Furnace. While three of the houses are owned by the CFHS and one is leased by the CFHS, the rest are privately owned. The village is located on Maryland Route 806, east of US 15.

The village is within the Catoctin Furnace Historical District which also includes remains of a furnace stack as well as a cemetery containing the remains of enslaved furnace workers.

## ***C. Assessment Methodology***

The method used for the CAP assessment follows a set of guidelines established by the Foundation for the American Institute of Conservation (FAIC), the organization administering the grant program. Initially, both assessors are given a copy of the museum's application, and responses to a site questionnaire completed by museum staff. These documents essentially begin the assessment process, introducing the assessors to the museum and its collections, and providing insight on the museum's objectives and goals for the CAP assessment. Assessors received both documents from FAIC on March 17, 2022. Conservators conducted pre-site visit phone call on June 30, 2022, which provided initial introductions and allowed assessors to request additional information. The conference call, attended by both assessors, Elizabeth Comer, President and Theresa Donnelly, Assistant Director, also set the agenda for the site visit. At the request of the assessors, staff at CFHS generously shared the following documents prior to the site visit: master inventory list for collection (excel document), access to the shared google drive, documents related to the Museum of Ironworker (architectural drawings, well/sewer plans, pre-renovation photographs, various contracts/work orders for repairs, preliminary structural plan/report, Maryland Historical Trust inventory form, drainage improvements, archaeological investigations and lighting spec sheets), documents related to the Collier's Log House (history of house, MD Historical Trust easement changes, historic structures report, archaeological reports, and floor plans). Conservators were also supplied with images of the clothing found in rafters of Forgerman's House and the clothing inventory/catalogue as assessed by textile conservators from Winterthur Museum. The assessment site visit for CFHS was performed on July 7 and 8, 2022. Assessors met with Elizabeth Comer, Theresa Donnelly, Cindy Poole (volunteer) and Dominic Curcio (part-time paid staff). Nora Frankel, textile conservator, joined the assessment team on the second day to assess a collection of textile artifacts that are designated as a high priority for treatment and display by the museum staff. Sections written by Nora Frankel are labelled 'NF' in parenthesis. After the completion of the site visit, the assessors worked both individually and jointly to prepare a report of their findings and recommendations for the museum. The report combines the museum's goals and concerns with the observations and concerns of the assessors. The museum is given the opportunity to

review a draft of the report, a final version of which is subsequently created and submitted to both the museum and the CAP program. A follow-up phone consultation is scheduled with the museum one year after the final report is filed. The table of contents at beginning of this report is included to aid with accessing the content.

## II. EXECUTIVE SUMMARY

The Catoctin Furnace Historical Society's dedication to preservation and education is commendable and the site is a unique asset for Frederick County and the state of Maryland. Assessors witnessed multiple positive attributes at the institution, all of which were echoed in the strategic plan prepared by Hanberry Associates, LLC in February 2022, and include professionalism, inclusivity, collaborative mindset, highly successful grant funding, and innovative programming. With the 50<sup>th</sup> anniversary of the site approaching, CFHS is laying the groundwork for their next 50 years. Their application and award for the conservation assessment survey from FAIC exemplifies their sincere intention for historic preservation. It is our hope that the suggestions outlined in this report will help them allocate their resources to fulfill their preservation initiatives.

### ***A. Short-term/Urgent Recommendations***

1. Initiate an integrated pest management program for all buildings, following by a housekeeping plan.
2. Install a battery back-up for sump pump in the Museum of the Ironworker and any other building in which they are installed.
3. Repair the exterior envelope of the Collier's Log House as quickly as possible.
4. Remove water from the basement of the Carty-Miller House.
5. Address the water infiltration issues at the Forgerman's House.
6. Assess and re-treat as necessary all historic iron artifacts slated for display in the new blacksmith shop.
7. Move the collection textiles housed in the Collier's Log House to a climate-controlled space. Use a black cloth to cover the textiles at the Museum of the Ironworker when museum is closed.

### ***B. Long-term Building Recommendations***

1. It is understood that the CFHS is not in the architecture or historic building contractor businesses. However, they should have a committee or someone willing to become versed in understanding historic building technologies pertinent to their buildings to review all work, including repairs and maintenance that is undertaken. There are several resources that can assist with technical knowledge. These include the National Park Service Preservation Briefs

and Historic New England's White Papers. These may not always be up-to-date, but they are useful tools.

- <https://www.nps.gov/tps/how-to-preserve/briefs.htm>
- <https://www.historicnewengland.org/preservation/for-professionals-students/property-care-white-papers/>

2. It is also advisable that a consultant, well versed in historic building technologies who has worked with rubble walls, log houses, and timber framing should review the proposed repairs and shop drawings provided by contractors for the repairs.
3. Take pictures of all elevations of the houses at least once a year and compare the photographs to the previous years. It will help identify deterioration when it starts and before it becomes serious and expensive to repair.
4. Replace rotted wood immediately. It allows water to infiltrate the building.
5. Keep all wood painted and expect to paint every 5 years or as needed.
6. Keep a checklist of what needs to be inspected at each building and have each item initialed and dated each time it is inspected to ensure it was done.

#### Semi-Annually

7. Inspect the interior areas around the chimney in all the buildings for any sign of water infiltration. If any is found, make repairs to chimney flashing immediately.
8. Inspect the water shedding system to ensure it is intact and functioning properly and that the leaders are not filled with debris. Flush with hose if found to be clogged.

#### Yearly

9. Inspect the foundations for any deterioration of the mortar.
10. Inspect the sealant and/or mortar between the windows and the masonry or logs.

### ***C. Long-term Collections Recommendations***

1. Rehouse artifacts (provide more room for textiles in their boxes, provide better support for iron artifacts on display).
2. Reorganize of storage space to allow better access for cleaning and integrated pest management.
3. Upgrade the museum collection and registration policies (finish inventory, make separate database for collection objects, label artifacts, make collections policy/

binder consider, start disaster management plan).

4. Improve the collections care methods (provide preventive conservation guidelines to staff/volunteers, provide artifact handling guidance).
5. Plan for future textile display (acquire display case for textiles) and implement storage protocol improvements for historic reproduction clothing.
6. Determine protocol for archives (inventory, digitization, rehousing, etc.)
7. Address exhibition problems (security for cases, object condition issues).

#### ***D. Mission Statement/Governance***

##### **Mission Statement**

The Catoctin Furnace Historical Society works to study, commemorate, preserve, and reveal the unique and rich history of this late 18th through 19<sup>th</sup>-century industrial village through the preservation of architecture, art and artistry, cultural traditions, cultural landscape, lifeways and foodways of the diverse workers. Evolving from a more than 45-year focus on the European American workers at the furnace a commitment to researching and interpreting the heritage of the enslaved at Catoctin is a primary focus, as is knowledge transfer as a reparative action. This agenda, manifest in programs such as Our Heritage At Work initiative for at-risk youth and the residential “Furnace Fellows,” is undertaken to enrich young lives while restoring historic structures. Further, improvement of the lives of village residents through economic and social benefits emanating from the historic site and through participation in events is a goal of the society. This in turn, makes the historic village an attractive place to live, work and care about.<sup>1</sup>

CFHS is listed on the National Register of Historic Places. According to the website, CFHS has ten officers on the board, presided by Elizabeth Comer. The board holds monthly meetings, except for the month of August. Their work, combined with assets provided by part-time staff and volunteers, have provided the site with phenomenal growth, renovation, and visitor access. The institution gives back to the community and provides exceptional education opportunities for students locally and nationally. Their dedication to mentorship, exemplified by the recent purchase of the Carty-Miller house, which will eventually provide housing for ‘furnace fellows’ to further their study of historic preservation and museum studies and hands-on historic building maintenance.

#### **CFHS BUILDING ASSESSMENT AND RECOMMENDATIONS**

##### ***A. Introduction***

One of the long-range goals for the CFHS is to improve preservation of its collection of four historic structures: the Museum of the Ironworker, the Collier’s Log House, the Carty-Miller

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<sup>1</sup> <https://catoctinfurnace.org/>. Information retrieved from the Catoctin Furnace Historical Society Website on July 30, 2022.



House, and the Forgerman's House. All four of these structures date from the first quarter of the 19<sup>th</sup> century. The Museum of the Ironworker building is owned by the State of Maryland and the Catoctin Furnace Historical Society holds a twenty-year lease. These buildings are an important component of the CFHS collection as they help tell the story of the men, women, and children who worked and lived in the Catoctin Furnace village.

It is clear examining the buildings that CFHS has spent time and effort maintaining its buildings. The building with the most significant deterioration is the Collier's Log House; CFHS is waiting for the National Park Service to undertake repairs to the exterior log walls.

One of the most significant threats to the CFHS's buildings is water. Due to a set of environmental conditions, mostly man made, there is a high-water table and almost constant standing water in the yards of local buildings as well as in the basements. In major rain events, this is exacerbated. With the more intense rainstorms coming as the climate changes, it will become a serious challenge to CFHS.



Figure 1: Museum of the Ironworker.





Figure 2: Collier's Log House



Figure 3: Forgeman's House

To preserve historic buildings, it is important to know the building materials, the construction technology, and how these types of buildings can deteriorate. It is very obvious that CFHS has made significant efforts to repair and maintain the structures. The Museum of the Ironworker has been recently restored and the roofs of all the buildings have been recently resheathed with very solid and well-built standing seam metal roofs.

## ***B. Rubble Stone Buildings***

Two of the buildings, the Museum of the Ironworker and the Forgemaster's House are one story with attic, rubble stone walled buildings with interior timber framing. The stone is rough faced, irregularly shaped and sized but fitted together and held in place with a lime sand mortar. Usually, rubble masonry walls have two leaves, the inner and outer wall, with a filled cavity in the middle. The cavity was filled as the inner and outer walls were built up.

The thickness of the mortar beds in the outer leaves of rubble masonry walls varies considerably. A lime mortar was used for bedding the stone, both the outer leaves and the core. Mortar is particularly important in rubble construction as it prevents irregularities in the shapes of the stones from producing localized stress concentrations. Cavities between the inner and outer leaves of masonry have been observed to vary in width depending on the mason. Infill materials in these cavities also varies. The strongest form of infill was produced where the original masons filled the cavity with loose coursed rubble stones at the same time as the outer leaves were constructed. A lime sand mortar was then poured over the loose stones of the infill to form a rubble infill solid core. The weakest construction of rubble-filled walls has resulted where the cavity was simply filled with earth and relied upon the outer leaves of masonry for protection from the weather. Because lime mortars are susceptible to rain and snow over time, rubble wall buildings were almost always limewashed and later whitewashed to protect the mortar.

### *Deterioration of Rubble Walls*

Rubble-filled walls fail when water or other moisture penetrates the walls causing bows or bulges in the wall. Moisture that penetrates the inner material moves downward. It can take the fine fill materials with it leaving voids. Moisture in the core can also lead to deterioration of mortar in the joints of the outer walls weakening the wall. Repetitive cycles of freezing and thawing of moisture within walls produces expansive forces as well a failure of the mortar joints. Serious and rapid deterioration is likely to occur if the walls is bulging.

The high water table and rising damp that occurs because of it are a significant threat to the rubble building walls.

Water infiltrating the rubble walls is a serious threat to the durability of the walls. Causes of water infiltration can include the following:

- High water table
- Rising damp
- Rainwater penetrating open or cracked mortar joints.
- Failed gutters and leaders or holes in the water shedding elements.

- Rotted wood at the windows, doors or roofing trim.

Other potential agents of deterioration for rubble wall buildings are:

- Freeze thaw cycles of wet walls
- Root growth at the foundations
- Salt crystallization from water movement through the walls
- Inappropriate repairs
- Vibration from construction or even heavy traffic
- Digging at foundations without shoring



*Figure 4: Side wall of the Forgerman's House showing rubble exterior wall.*





Figure 5: Detail of rubble wall with small section of old limewash or whitewash coating.

### ***C. Log Buildings***

A log building has structural walls of horizontally laid or vertically positioned logs. The basic unit of each of these types is the one room enclosure formed by four log walls joined at their corners, called a single "pen" or "crib." The single pen was improved upon by installing interior partitions or by adding another log pen.<sup>2</sup> A characteristic of log houses is the corner construction or corner notching which provided structural integrity. As the logs were placed, there were horizontal spaces between the logs that were filled with chinking and daub. The chinking was a dry filler of wood or stone followed by a softer packing material that could be clay, oakum or animal dung. Over this was troweled the wet mix of clay and lime or a lime mortar. It was not uncommon to cover the logs with coating such as a limewash, whitewash, even an exterior cladding as protection of the daub and logs. The limewash or whitewash sealed cracks in the daub and wood and helped repel insects.

#### ***Deterioration Mechanisms***

**Water Infiltration.** Deterioration of the exterior of a log house is often caused by water infiltration. It changes the chemistry of the wood which makes it attractive to fungi and insects. Water will infiltrate failed chinking and daub as well as checks and weathered surfaces of the logs. Once wood has become saturated for prolonged periods of time it will rot.

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<sup>2</sup> Preservation Brief 26. The Preservation and Repair of Historic Log Buildings Bruce D. Bomberger. National Park Service. Accessed 8-6-2022, <https://www.nps.gov/tps/how-to-preserve/briefs/26-log-buildings.htm>.

**Deterioration of the Chinking and Daubing.** Originally, chinking referred to the solid filler of stone or wood and daubing" referred to the mortar pushed over it; however, chinking is often used to describe both. Deterioration of the chinking leads to water infiltration into the logs leading to deterioration of the logs.

**Drainage.** Water that is not well drained away from the foundations can wick up to the sill beams when there is rising damp or if water pools around the foundation in a rain event. The landscape should slope away from the house.

**Checks.** Open checks on the log's upper surface. Checks are long cracks which run with the wood grain. On a log house they do not usually pose a structural problem. However, they do allow moisture into the log interior leading to decay.

**Insect Infestation.** Wood destroying insects cause damage by tunneling through and feeding on wood. They damage and weaken the structural integrity of the wood they attack. Telltale signs of their activity include exit holes, tunnels in the interior usually hidden under the outer surface and one of the most visible pieces of evidence, "frass," a sawdust-like powder.

**Failure of the Roof and/or Water Shedding System.** The roof has an excellent standing seam roof. The flashing and water shedding systems can have holes or failure at joints that will allow water to penetrate the system.

#### ***D. Existing Conditions Visible at the Museum of the Ironworker***

The Museum of the Ironworker has had a recent renovation which includes beautifully designed addition to the back. This addition is well placed and hardly visible from the road. The renovation work to the historic building included painting of the exterior rubble wall. The white exterior acrylic latex paint was applied to imitate the original limewash or whitewash that was applied to the building. Acrylic latex is a very durable paint but it does look like a modern paint and not like a whitewash.

What appears visible under the painted surface is that the mortar repairs appear to be cement based and that the mortar joints were not tooled to replicate the original mortar joints. Cracks are visible in the stonework joints. The causes of the cracking are not known but could be because cement mortar is harder than the original mortar below it or because of rising damp.

Some of the new paint at the ground level appears to be failing. This is probably because of rising damp. The conservators were informed after their visit that this was repaired.



*Figure 6: Painted finish beginning to lift at bottom of wall where it meets the soil.*

The interior has been restored with replastering of the walls and painting of the ceiling and floor joists. The floor joists have a slide-in joint with a beveled tenon. Over time, the some of the tenons have pulled away from their cavity in the summer beam although they continue to function. Several joists have significant checking. This probably is not a concern while the second floor has limited use. A structural engineer has examined this and CFHS has documented that the engineer designed a vertical support under the center beam and approved the existing framing. This vertical support was installed during building restoration in 2019. However, if the use changes and extra load is added to the second floor for any reason, the joists should be re-examined by a structural engineer who is conversant with historic wood framing.



Figure 7: Floor joist with a V bevel tenon. Typical for the second floor joist. Several have pulled away as is shown above.

#### ***E. Existing Conditions Visible at the Forgerman's House***

The Forgerman's House has recently undergone repairs and restoration but there are some deterioration issues visible on the building that are concerning.

The cement mortar used to repoint around the rubble stones is cracking in numerous areas. This allows water to infiltrate the walls. It is not known how deeply the mortar was raked out for repointing. Cement mortar is hard, brittle and does not allow for movement. If the mortar behind it is a softer more flexible mortar, it will cause cracks in the cement mortar.

The mortar around the windows, especially the second-floor window on the north elevation has significant failure of the mortar around the wood frame and a crack above the window. There are signs of water infiltration above this window.

Areas around the foundations were professionally graded but over time areas around the foundations have lost some of their positive grading which leads to water penetrating the foundation walls.

Another source of water infiltration appears to be the flashing at chimney which does not appear to be well installed. CFHS has reported that this has been repaired.





Figure 8: Cracks in the exterior rubble wall mortar. Found in multiple locations.



Figure 9: Cracks in mortar over window, mortar repair failing under window, and failure of mortar at side of window.



*Figure 10: Chimney flashing installed on chimney with fasteners and caulk. Not in the masonry.*



*Figure 11: Signs of water infiltration over window.*



Figure 12: Signs of water infiltration at chimney.

#### ***F. Existing Conditions Found at the Collier's Log House***

There is extensive rot in the logs and failure of the chinking at the Collier's Log House. This not only allows extensive amounts of water to infiltrate the house but it is producing an environment that is conducive to active insect infestation that is also contributing to the wood deterioration. Frass and tunneled wood were visible during the examination.

The logs deteriorated from a series of conditions that included failure of the chinking and daubing. It was applied with inappropriate materials and poor installation did not allow water to properly shed off the wood logs.

Water staining is visible on the first-floor finishes. The amount of water entering the building is also a threat to the collection within the building.

Another concern is the flashing around the chimney. It is attached to the brick chimney with fasteners and caulk, not inserted into a masonry joint with mortar which is more durable. Caulk joints last approximately five years. Also, it is not clear if there is enough of an overlap between the base flashing the cap flashing. This should be at absolute minimum four inches and it is better if it is at least six inches.



Between the water that is penetrating the deteriorated logs and the water penetrating the outer building envelope, there is a lot of moisture in the house. This issue should be cured when the deteriorated logs on the building exterior are replaced.



*Figure 13: Logs with significant checking.*



*Figure 14: Deteriorated chinking.*



Figure 15: Wood that has rotted and is now hosting biological growth where noted with arrows.



Figure 16: Frass found at area of rot in log.





Figure 17: Log that is rotted. See figure below for water that has entered interior from this area.



Figure 18: Water staining from water infiltration through rotted exterior logs.



*Figure 19: Chimney flashing on Collier's House installed with fasteners and caulk*



## ***G. Maintenance and Repair for Individual Buildings***

### ***Museum of the Iron Workers***

The Museum of the Ironworker is in good repair as it has just undergone recent restoration. Our recommendations are for maintenance.

#### Monthly

- Track data loggers on a monthly basis. If there are any anomalies determine why they have occurred.

#### Quarterly

- On a quarterly basis, walk around the house and check on landscape grading, particularly near the leaders graded away from the building, especially at the addition where soil may settle over time.
- Check the functioning of the sump pump in the basement at least quarterly.
- Inspect the painted finish, particularly at the ground level for peeling paint caused by rising damp.

### ***Forgeman's House***

The Forgemán's House has recently undergone repair, restoration and had a kitchen addition placed on the house. But some of the repair work is deteriorating.

1. Consider applying a whitewash rather than a painted finish to the rubble exterior walls. This will help protect the soft mortar that might remain and it will also bridge some of the cracks that have opened.
2. Repair cracked mortar with a lime-based mortar.
3. Removed the damaged mortar around the second-floor window, fix the crack above and reseal around the wood frame.
4. Regrade around house to keep all water flowing away from house. Consider installing French drains around the perimeter and draining them to a dry well in the backyard.

### ***Collier's Log House***

1. Stabilizing and repairing a log that has been only partially damaged by decay or insects is always preferable to replacing it. Retaining the log, rather than substituting a new one, preserves more of the building's integrity, including historic tool marks and the wood species which may no longer be obtainable in original dimensions.

2. It is our understanding the National Park Service’s Historic Preservation Trades Center is going to perform the log house exterior wood repairs. We recommend having the repair plan be put in writing. If you do not understand any of the procedures, ask for clarification. Have the as-built repair treatment put into writing and keep it in your files. Make sure all products used are listed.
3. Chinking and daub repair should not be done until all log repair or replacement, structural jacking and shoring is completed, and all replacement logs have seasoned.
4. Daubing repair should be done seasonally. Environmental factors—building settlement, seasonal expansion and contraction of logs, and moisture infiltration followed by freeze-thaw action—cracks and loosens daubing. At minimum it should be inspected and repaired yearly.
5. Modern daubing/chinking materials should not be used. A traditional daubing mix should always be used on historic log houses. Although a small amount of Portland cement may be added to a lime, clay and sand mix for workability, there should not be more than 1 part Portland cement to 2 parts of lime in daubing mixes intended for most historic log buildings. Portland cement tends to shrink and develop hairline cracks, and retain moisture, all of which can be potentially damaging to the logs.
6. Care should be taken when removing the logs with insect infestation that the logs are removed from the site immediately and not left near any wood that will be used on the house. All wood left on the house should be carefully checked for infestation and treated if found.
7. The seal between the window frames and log exterior needs to be tight and checked carefully after all work has been completed on the house in case there is any shifting.
8. When the logs are removed, the beam ends sitting on a sill beam in the wall should be examined for deterioration before the walls are repaired.
9. The CFHS should consider the whitewashing of the Collier’s House exterior for protection of the chinking and logs. It is recommended that whitewash be used rather than a less permeable paint.

## CFHS COLLECTIONS ASSESSMENT AND RECOMMENDATIONS

### *A. Introduction*

The nature of the assessment methodology allowed for comprehensive observation of the collections with attention paid to issues reflecting problematic conditions that promote deterioration in a variety of materials. Assessment focused specialized attention on the textiles to assist with future exhibition goals. Many of the goals outlined in the CAP Site Questionnaire focus on the intention to improve collections care. Museum staff shared the following specific goals: active storage/display of historic clothing, long-range preservation/conservation plan, improve environmental conditions, and improve storage conditions.

Collection objects examined in two locations: Museum of the Ironworker (MIW) and Collier's Log House. The exhibition space at the MIW shares compelling stories using artifacts that represent the history of the site. The recently renovated space has new windows, new lighting design, HVAC, supplemental dehumidification, and a security system that is wired to the police. The exhibition space is transitioning between temporary displays (objects on cloth-covered folding tables) and more permanent displays (objects in cases). Museum staff wants to present the exhibition space as 'active storage', a feature that will be especially highlighted by a future display of clothing discovered in the rafters of the Forgerman's House. By December 2022, the museum plans to build a blacksmith shop behind the MIW, where visitors can observe blacksmithing demonstrations and view select artifacts in the collection.

The Collier's Log House, restored in the 1980's, houses museum reproduction/props and unassociated historic period furniture along with accessioned collection objects. The museum intends to further develop this space to highlight woman's work and childhood life in an historic iron village. There is no running water and no air conditioning in the house, but there is electricity and baseboard heat. The small side room on the second floor has storage for historic costumes and props used for events. The study costumes are valuable, not only for their use during special programs, but also because they were expensive to acquire, especially the boots. At time of site visit, multiple archival boxes holding a rare collection of workers' clothing recovered during the Forgerman's House renovation was also stored on the second floor, but they have since been moved to second floor of the MIW.

The third historic structure at the site, the Forgerman's House, contains antique furniture as well as reproductions, and CFHS offers the structure for rent as an 'historic stays house' for overnight rental.

CFHS does not have a conservator on staff, but they consult with conservation professionals when needed and are identifying and implementing aspects of preventive conservation to promote long-term preservation of the collection. As quoted in *Preventive Conservation for Historic House Museums*, "when preventive care practices are effective, conservation treatments will rarely be

necessary.”<sup>3</sup> The following section will describe observations gathered over the course of the two-day site visit and suggestions for improvements offered for consideration.

## ***Collections Policies***

### **1. Museum Operations**

The extent of program offerings and museum access is impressive, even more so when one considers that there are no full-time paid staff members. Staffing on the FAIC site questionnaire outline the staffing as: one full-time non-paid staff member, two part-time paid staff, and two part-time non-paid staff. During site visit, museum staff relayed that there are a total 13-14 volunteers who contribute their time as needed. Docents are trained by either Elizabeth Comer or Theresa Donnelly and there is a docent handbook that outlines items such as entry and closing of museum, alarms/keys/lights, bathroom supply check list, health and safety procedures, visitor experience, membership, and gift shop sales. The museum has a basic collections policy that should be expanded upon.<sup>4</sup>

The three main reasons to establish a detailed collections policy are:

- To provide a set of guidelines for those entrusted with collections care, providing consistency despite the potential rotating volunteers and student workers.
- To guide decision-makers as issues arise, such as how to deal with donations from the public or how to deaccession collection materials.
- To establish the foundation for a long-range preservation plan.

The American Association for Museums offers a framework for how to begin such an endeavor.<sup>5</sup> Like the docent manual, staff should create a collections policy and place it in a binder, stored in the office area for all to access. Suggested topics for inclusion in a CFHS collections policy are the mission statement, brief history of CFHS, museum collections summary, collections access and use (including art handling guidelines), acquisition and deaccession policies, loan policies (if needed), insurance policies, inventory of collections, care and cleaning of collections, housekeeping plan, fire prevention and security. The collections policy can evolve over time. Staff should consider it a long-term goal, with the individual sections written by different contributors under a single editor. Writing of individual chapters within this document is well suited for a student researcher interested in museum studies, collections management or preventive conservation.

### **2. Overall Storage Observations**

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<sup>3</sup> Merritt, Jane, and Julie A. Reilly. *Preventive Conservation for Historic House Museums*. Lanham: AltaMira Press, 2010, pg. 12.

<sup>4</sup> Link to archived webinar, ‘Essential Elements of a Collections Management Policy’ provides an outline for essential items to include in policy: [Essential Elements of a Collections Management Policy | Connecting to Collections Care Online Community](#). However, additional topics such as housekeeping, fire prevention and security as stated above should be included for a wholistic collections care plan. The book, *Museum Registration Methods 5<sup>th</sup> Ed*, by Rebecca Buck is a comprehensive guide for expert advice about museum registration policies.

<sup>5</sup> Link to AAM site: [Collections Management Policy – American Alliance of Museums \(aam-us.org\)](#).

Adequate storage, a ubiquitous challenge for many museums, is a major concern for some of the CFHS caretakers. Some staff feel that a dedicated collections storage space is not mandatory because 95% of the collection is currently on display. Others feel that the storage areas are difficult to access, for example, staff must ascend narrow steep steps to reach the props/clothing stored in the smaller upstairs room of the Collier's Log House. The storage areas currently available include the above-mentioned small room on second floor of Collier's Log House, and in the Museum of the Ironworker (MIW), the entire second floor. Additional storage, not used for collections are the closet under the steps in the display area, a small closet outside the kitchen, and kitchen cabinets. There is no climate control in the Collier's Log House, making storage of accessioned collections in this location less than ideal. Staff would generally like to see a dedicated storage area for collections and for props/clothing storage (including a dressing room for event prep), but with the additional need for office space there is currently not enough physical space to accommodate these goals. Best practices to address urgent preservation needs and storage issues include the following.

- Acquire a custom case to store and display the unique collection of workers' clothing recovered from the Forgerman's House (further discussion on pg. 46, Future Textile Case Design). Display the textiles on first floor of the Museum of the Ironworker where they will be in climate-controlled space.
- Store any accessioned textiles that do not fit in the display case in archival boxes on second floor of the Museum of the Ironworker.
- Store any props/clothing that exhibit condition problems, like mold on leather, on second floor of Museum of the Ironworker.
- Purchase tall open metal shelving to help maximize the space available in the Collier's Log House storage room. The combination of removing the boxes of clothing and utilizing more wall space should help provide better access to materials in the storage room.

The online resource, *Storage Techniques for Art, Science and History*, provides creative solutions for safely storing collections.<sup>6</sup> The only way to achieve a dedicated space for collection storage and/or props/clothing storage and dressing room would be to acquire additional property or to construct an outbuilding on the extant property. Both solutions have their own set of challenges and obstacles.

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<sup>6</sup> Link to Storage Techniques for Art, Science and History website: [Storage Techniques for Art Science & History Collections | Keeping your collections safe \(stashc.com\)](https://www.stashc.com/keeping-your-collections-safe)



*Figure 20: Storage room of log house with stacked boxes containing textiles that should be moved to climate-controlled space.*



*Figure 21: Example of storage room corner where shelving could help de-clutter the floor.*





Figure 22: Example of an active storage display case on view at Daughters of the American Revolution Museum in Washington, D.C. The base unit with pull-out drawers was custom made by Delta Designs, LTD. The hinged glass door, adjustable shelf vitrine top was custom made by Casewerks, LLC.

### 3. Inventory/Database

One vital component of a museum's collection policy includes an accessible registration plan – a clear means to label and catalogue all museum artifacts for location tracking and inventory. Part-time staff member, Dominic Curcio, is currently in the process of merging object inventories provided by Elizabeth Comer into an excel document called 'Master Inventory List'. This database will include both accessioned (historical objects with direct relevance to CFHS) and non-accessioned objects (reproductions or un-associated antiques used for visitor interpretation). These two categories could also be designated as permanent collection vs. secondary collection. The categories included in this database include object number, object report status, photograph status, museum tag on object, location, and notes. Ultimately, individual object folders should be created in the shared database to store treatment documents, condition photography, and any other information relevant to preservation initiatives. Once the database is completed, the following further organizational steps would benefit the collections management for museum.

- Establish the nomenclature used to identify various components of the museum collection (accessioned/non-accessioned vs primary/secondary collection vs replica/prop/reproduction). Using consistent language related to collection will help establish policies for the long-term care.
- Create a separate inventory document of only the accessioned objects in case quick access to collection catalogue is needed during an emergency.



- Categories to include for a separate inventory of accessioned objects include: accession number, location, basic description, materials, distinguishing marks, provenance, date of object, dimensions, and condition.
- Create a numbering system for all collection objects that designates their identity as an accessioned object vs. a reproduction, based on nomenclature established above.
- Apply accession number to all objects using a paper tag. If the tag system interferes with exhibition goals, consider an alternate labelling protocol as summarized in this tip sheet ([How to Label Historic Artifacts.pdf \(saskmuseums.org\)](#)). Contact a conservator with any questions about the best way to proceed with fragile artifacts.<sup>7</sup>

#### **4. Summary for Collections Policy**

- Create a collections policy utilizing on-line tools (see footnotes 4-5). Designate categories relevant to the institution. Create a binder to house content serving as a framework to assist with future decision making.
- Re-locate vulnerable collection objects from non-climate controlled locations to store in the MIW.
- Complete the ‘Master Inventory List’ that is already in progress.
- Create a separate database for accessioned objects only.
- Acquire written materials, either in print or online, to promote preventive conservation practices. Both the National Park Service and Canadian Conservation Institute provide excellent manuals for use by historic house museums. A recent online resource, “Preventive Conservation Guidelines for Collections,” provides extremely helpful content for institutions that care for cultural resources.<sup>8</sup>

### ***B. Collections Care***

#### **1. Ten Agents of Deterioration**

Consideration of the ten agents of deterioration, as described by the Canadian Conservation Institute, is the best way for an institution to initiate a long-range preservation plan. These threats to a collection include physical forces (art handling), thieves/vandals, fire, water, pests, pollutants, ultraviolet/infrared light, incorrect temperature, incorrect relative humidity, and dissociation. More information about each category can be found on the CCI website. The assessor designates the following agents as the most urgent - as well as the most feasible to remediate - physical forces, dissociation, pests, and environmental conditions. While a goal to address all agents of deterioration, including a disaster plan, should be part of a long-term preservation strategy, the following areas include steps to improve collections care in the short-term.

#### **2. Art Handling and Dissociation**

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<sup>7</sup> Additional resource for object labelling can be found in this video from Jefferson Patterson Park & Museum ([How to apply paper artifact labels \(OER\) - YouTube](#)).

<sup>8</sup> Link to Canadian Conservation Institute: [Preventive conservation guidelines for collections - Canada.ca](#)

While the collections policy is being created, it is a good idea to articulate exactly which staff members should have access to handling the artifacts. All staff with art handling access should review basic handling guidelines yearly as a refresher on best practices for moving artifacts. Comprehensive advice can be found in the manual, *National Park Service Museum Manual*, specifically in Chapter 6 which covers handling, packing, and shipping.<sup>9</sup>

Please see the information above, in section ‘Inventory/Database’ under the Collections Policy discussion for steps to avoid dissociation. Given that the staffing structure does not include a registrar or collections manager, establishing an accurate catalogue and labelling the artifacts is vital to keeping track of the collections. Some type of record-keeping system should be created to document whenever artifacts move from their location as reported in the database. For insurance purposes, it would be helpful to photograph all the artifacts as they are displayed in the MIW and Collier’s Log House. For example, a photograph of every display wall would record artifact location at set point in time. This could also help with the inventory if the photographs were printed out and the artifacts’ accession numbers were written on paper copy.

### 3. Housekeeping Plan/IPM

The assessors observed clean conditions in the Museum of the Ironworker, except for spider cobwebs below many of the iron stoves. Part-time staff member, Dominic Curcio stated that he vacuums weekly in the MIW using a Eureka Mighty Mite vacuum. The Collier’s Log House was noticeably dusty and dirty with dead insects collected on the windowsill. There was an ant infestation occurring around the door on the east side of the house. Some of the artifacts were very dusty as well. Wood logs in the fireplaces harbor and attract insects.

Ideally, two people should be designated for routine cleaning in the MIW and Collier’s Log House, at least monthly. Dust is problematic because it can attract insects, it is hygroscopic, and mold can grow on it. One person should clean and monitor the house structure (floors/windowsills/windows) while the other person focuses on cleaning the museum collections. Reduce clutter in storage area of log house to ease cleaning. Vacuuming of the house should include vacuuming the floors below objects, but with great care to avoid hitting the object or getting the suction nozzle too close to the artifact. House cleaning can include monitoring insect activity (see below). The vacuum’s HEPA filter must be changed every 6 months (record change date on the filter and a log sheet in the Collections Policy binder is a good place to track cleaning and filter changes). Cleaning of museum collections requires a patient and methodical approach; staff member should use a soft dusting brush to clean object surfaces while holding the vacuum nozzle close enough to collect the airborne dust but far enough away to not harm the object’s surface.<sup>10</sup> The nozzle of a regular vacuum should **never** be dragged directly along an accessioned object’s surface to pick up dust because the suction is too high. One soft wide dusting brush should be labelled for use only on paintings and

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<sup>9</sup> Link to chapter 6 in NPS Museum Manual: [Chapter 6: Handling, Packing, and Shipping \(nps.gov\)](https://www.nps.gov/learn/management/museum-manual/chapter-6-handling-packing-and-shipping)

<sup>10</sup> A good artifact dusting brush can be found at Talas: [Museum Dusting Brush | TALAS \(talasonline.com\)](https://www.talasonline.com/museum-dusting-brush) but the metal ferrule needs to be covered with blue tape to prevent accidental scratching from hard metal edge. Japanese Hake brushes without metal ferrule also make good dusting brushes: [Japanese Hake Brushes | TALAS \(talasonline.com\)](https://www.talasonline.com/japanese-hake-brushes)

frames. Likewise, it is recommended to designate one brush for each material to avoid any cross-contamination, for example there would be one brush for iron, one for copper, and one for wood, etc. Make a dusting/cleaning log for objects in the collection, including a section for any condition observations and concerns.

The best way to monitor and mitigate insect activity is by implementing an integrated pest management system. More information about IPM can be found online, such as free content from the Northeast Document Conservation Center.<sup>11</sup> Place sticky traps with clothes moth pheromones in every room of each building.<sup>12</sup> Additional plain sticky traps on the floor may be useful, as these will indicate other species present.<sup>13</sup> Check traps monthly and record any insect activity (download an insect identification chart). Utilize ant bait instead of chemical sprays to eliminate ants. Remove wood logs from fireplaces and acquire replica logs made from inert material (or enlist help of an artist to cast wood logs in plaster and faux paint them).



*Figure 23: Cobwebs on underside of stove in Museum of Ironworker.*

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<sup>11</sup> NEDCC article about IPM: [3.10 Integrated Pest Management — NEDCC](#)

<sup>12</sup> Dr. Killigan moth sticky trap: [Amazon.com: Dr. Killigan's Premium Pantry Moth Traps with Pheromones Prime | Non-Toxic Sticky Glue Trap for Food and Cupboard Moths in Your Kitchen | How to Get Rid of Moths | Organic \(6, Blue\) : Home & Kitchen](#)

<sup>13</sup> An example of sticky trap from museum supplier is: [Insect Sticky Traps \(10-Pack\) | Pest Control | Environmental Control | Gaylord Archival](#). Similar types can be found in local hardware stores or amazon as well.



*Figure 24: Dead insect in windowsill of Museum of the Ironworker.*

#### **4. Environmental Conditions**

The Museum of the Ironworker (MIW) is air-conditioned, but they currently use a dehumidifier in the gallery space as a short-term solution to address high humidity that would accelerate corrosion of iron artifacts. CFHS has recently received a grant to retrofit the MIW HVAC with humidity control. Staff reported that the MIW humidity hovers around 45%. Retrofitting the HVAC is an excellent initiative to promote the long-term preservation goals of the museum. CFHS dedication to preservation is also reflected in their recent purchase of two WiFi dataloggers from Lascar electronics. Each datalogger has cloud-based monitoring by use of ‘Easy Log Cloud’. The building assessor compared her handheld monitor to the datalogger in the Log House and found a 12% variance (Log House datalogger read 69% and handheld monitor read 81%). The devices are relatively new, and staff has not had time to investigate data logger calibration and monthly report generation, but this should be carried out to improve the datalogger performance and interpretation of data.

The Log House is not air-conditioned, but baseboard heaters provide heat in the winter. Attempting to impose a climate-controlled environment in the exhibition space of the Log House would be detrimental to the building materials of the house. For now, it is best to avoid storing collection materials in the Log House. The building has a strong smell of mildew when one enters the house. Purchasing a few window fans may help air out the space, with one fan in a window pulling air in and the other fan pushing air out. This would be highly recommended for anyone working in the second-floor storage area when the weather is appropriate. Lighting conditions and recommendations will be included in following section under ‘Exhibition Conditions’.

## 5. Summary to Improve Collections Care

- Implement an integrated pest management plan (IPM). Download an insect identification chart to assist in recording insect activity.
- Implement a housekeeping plan for scheduled cleaning, along with an integrated pest management plan. Change vacuum HEPA filter every 6 months.
- Create training protocol for staff to review best practices for art handling.
- Print and post in the office *Framework for Preserving Heritage Collections Strategies for Avoiding or Reducing Damage*: [CCI EN framework poster.pdf \(canada.ca\)](https://www.cci-en.ca/framework_poster.pdf)
- Consult online resource as questions arise: [Preventive conservation guidelines for collections - Canada.ca](https://www.cci-en.ca/preventive-conservation-guidelines-for-collections-canada.ca)
- Establish inventory catalogue, label artifacts, and system to record object movement.
- Schedule site visit with fire department, conduct training for fire extinguisher use with primary staff/volunteers. Survey smoke detectors and record battery changes. Store smoke detector maintenance (battery replacement) in Collections Policy binder.
- Begin research to compile information needed for a disaster management plan.

### D. Specific Collections Condition & Recommendations

#### 1. Textiles (NF)

##### a) Accessioned Textiles Condition

Accessioned textiles consist almost exclusively of garments and textile fragments recovered from the walls and ceilings of the Forgerman's House during restoration. As a result, all textiles have an overall moderate to high level of degradation. Soiling, including dust, frass, disintegrating fibers, plant matter, encrusted stains, rust, plaster and other building debris, and water damage are present on all garments to varying degrees. Some have large accretions of plaster, paint, and other building materials on their surface that are heavy and causing stress and abrasion to the fabric when handled. Water damage, likely from rain, has resulted in dye bleed in some areas, in some cases causing red dyes to transfer to adjacent fabric. Rust stains are also present from oxidized ferrous metal fasteners. Water may also have solubilized dirt, organic acids, and roofing materials, redepositing them throughout the fabric, resulting in uncharacterized staining. Animal waste also contributes to some of the staining present from insects, squirrels, rats, and other species.

The textiles are all crumpled, with deeply set creases because of their use as insulation. While most of the garments are recognizable, many are missing major components (such as sleeves or backs), and several are only top seams. This may be because hemmed areas are less likely to be useful for other stitching projects. In some instances, buttons appear to have been removed, presumably for reuse, prior to stuffing between the rafters. Almost all extant metal buttons and notions had some degree of rust. Some fragments are too small or damaged to be recognizable as specific clothing items. While

some wool items show signs of past insect predation, the collections have been frozen and no active infestation was found.

The age and uncontrolled environment have caused some of the fabrics to lose structural integrity. Polished cottons, already brittle and in some cases with pest-attracting starch, were typically found in worse condition. Acidic degradation within cellulose fibers such as cotton and linen are natural with age, but accelerated by UV, visible light, humidity, and contact with acids, possibly present as natural organic acids in wooden rafters. Fibers have become brittle over time as a result and are more likely to break or become powdery.

These garments were heavily worn and often repeatedly mended. This is in part what makes this collection so unique, as workers' clothing is rarely preserved, and the multiple campaigns of repair of varying levels of skill provide a tangible history of the lives of these workers and their families. However, the hard use and often rugged repairs has left many of these garments incomplete and fragile, which was compounded by their use as insulation.

There is a small collection of leather shoe fragments. These are probably vegetable tanned and have likely shrunk with the repeated heat and moisture from weather conditions. They are also brittle and powdering.

#### b) Accessioned Textiles Storage (NF)

The recovered garments are currently stored in the Collier's Longhouse in 30" x 18" x 7" archival blue board boxes, layered between acid-free tissue. While these boxes are sufficient for short to medium term storage, their internal packing can be improved. Several boxes are overfilled (most notably box marked 28-30), which results in too much weight pressing down on the objects at the bottom, further applying pressure to their creases and degrading fibers. The current system also requires handling of multiple objects to locate a specific item, and excess tissue can sometimes hide small fragments. While most objects have paper tag item numbers attached, the tissue separation of objects is not always clear, and some items have fragments that appear not to be numbered and are in danger of being disassociated. Loose fibers, dirt, and other debris has collected at the bottom of the boxes. This can be a pest attractant, cause soiling of neighboring textiles, and results in the disassociation of fiber fragments from their original item.

While the current boxes are sufficient for short to medium term care, some improvements are recommended. Limit the number of items per box. Ensure items are separated by a sheet of acid-free tissue that is large enough to cover the footprint of the box with only one object per layer. This ensures that an object can be lifted out by the acid free sheet without disturbing the contents, will contain any fragments, and will reduce confusion over item numbers. Consider storing smaller scraps and fragments in a separate box or smaller boxes, possibly separated by item in polyethylene bags to ensure they remain together. Ensure that all detached fragments of one item number are labelled on the item to prevent disassociation.

Consider moving items to a climate-controlled area without a history of mold or mildew, such as the office in the Museum of the Ironworker. While these items have survived this



long in fluctuating conditions, they are still vulnerable to biological attack from pests and microorganisms, which is best prevented in a climate-controlled space with less clutter that undergoes regular housekeeping.

c) Recommended Treatment for Textile Exhibition (NF)

These items are considered by the Historical Society to be archaeological, and therefore much of what may be seen as damage could be also considered evidentiary. However, in their current condition they are difficult for visitors to view and interpret as garments due to heavy creasing and soiling, most of which is a result of their use as insulation rather than workers' clothing. They are also at a greater risk for continued deterioration without some basic conservation intervention. As it is the intention of Catoctin Furnace Historical Society to highlight this collection with a custom visible storage system, the following steps are recommended to maintain their multiple histories of use while improving their visibility and supporting their long-term care:

- Light surface cleaning with HEPA-filtered vacuum by a textile conservator. This is to remove loose debris that can be abrasive to fibers, attractive to pests, and obscures the fabric.
- Humidification treatment by conservator for more complex garments. While the creases are evidence of the textiles' second use as insulation, these deep creases prevent visitors from being able to view and appreciate the items as articles of clothing and making better use of the custom visible storage. Additionally, sharp creases can become points of stress that may result in fiber breakage. Therefore, some humidification to relax hard creases and assist in laying out garments for better viewing is recommended.
- A select number of items may be good candidates for a slightly more involved conservation treatment, potentially including additional dry cleaning, wet cleaning, and light fabric stabilization. These items then could be displayed mounted if desired, allowing visitors and researchers to better view their construction and historic repairs. Any conservation treatment would reduce the evidence of their past storage but maintain all evidence of their life as worn garments. Cleaning and stabilization would also aid in any pattern-making for reproduction.

d) Props (NF)

Unaccessioned textile items consist of historic reproduction garments and home furnishing textiles. While these items do not need the same level of care as historic accessioned items, they are still valuable and proper care will extend their useful life. Additionally, extending a preventive care program to include these items can help reduce risks such as pest infestation that may harm the entire collection.

Historic reproduction garments are currently stored in the Collier's Log house on covered hanging racks. Reproductions appear in good condition, although they were not closely examined as part of this survey. Several steps can be taken to aid in their long-term care.

- Continued storage in hanging racks is acceptable with a muslin or Tyvek cover placed over the rack to reduce dust deposition and light damage.



- Clothing can be washed as needed. Not all articles require laundering after use, but items next-to-to skin and worn for an extensive period on warm or humid days should be considered for washing. Cotton and linen can be machine washed in cool or cold water and hung to dry. Wool items can be machine washed in cold water with minimal agitation. A washing machine basin without an agitator is preferred. Wool items should be laid flat to dry to prevent distortion. It is recommended to use a gentle detergent with no fragrance or optical brighteners. If articles become wrinkled, they can be steamed with a garment steamer.
- Leather shoes should be wiped clean with a damp cloth after use. Leather items that are used regularly may be polished with standard commercially available products. Shoes, especially boots, may benefit from soft inserts if they do not maintain their shape when not worn.
- Prop textiles within the Collier's Log house should be routinely vacuumed with a HEPA-filtered vacuum to reduce dust accumulation, which can eventually become ingrained as well as a pest attractant. Once every one to three months is ideal.
- All textile props should be included in routine housekeeping and IPM measures. Pheromone traps for cloths moths should be placed near any wool, fur, or leather items and checked monthly. This is especially important to ensure infestations that begin in prop items do not spread to accessioned objects. Pests that are a risk to museum collections prefer dark, dusty, undisturbed areas. Therefore, efforts to reduce clutter and regularly clean around prop items can reduce overall risk.



*Figure 25: Muslin or Tyvek cover recommended for costumes to minimize fading and protect from dust.*

## 2. Iron Artifacts

Numerous iron objects are displayed in the main gallery of Museum of Ironworker. Five iron stoves are placed throughout the space, two folding tables hold larger iron tools and machine parts, smaller objects are placed on open wire shelves in two rolling metal storage shelves, a few objects under vitrines, and a few items on a windowsill. The objects are in fair condition, but many spots on the metal surfaces are spalling. Small flakes of iron are scattered around the objects on the tables and the oven door by the fireplace has a large surface loss from spalling. Pinpoint spots of active rust are visible where the surface has spalled away. The spalling is likely due to a combination of inherent vice (natural instability of iron), touching/handling from visitors, accidental contact with vacuum during routine cleaning.

The Maryland Archaeological Conservation Laboratory at Jefferson Patterson Park & Museum treated many of the iron artifacts and CFHS shared the treatment reports with assessors. Their treatment protocol included desalination, tannic acid treatment, and coating with acrylic resin to slow the rate of corrosion. The reports advise that objects be stored in a climate-controlled space. Further discussion with the lead conservator from the MAC lab, Nicole Doub, confirmed that the chosen coating system for the iron performs best in a climate-controlled space, however there are other more robust coating systems that could be used on iron that will be stored in a non-climate-controlled environment. She also confirmed that the newly exposed iron spots

caused by spalling could be treated on site and that the objects would not necessarily need to be sent back to the MAC laboratory.

The iron andirons in the main room of the Log House show a significant amount of corrosion and would benefit from treatment, including a more durable protective layer like a siloxane coating as described by Nicole Doub at the MAC lab. The expense of treatment for non-accessioned objects may not fit within the budget constraints for the site, but a collections policy should explain the rationale for treatment or non-treatment. This would benefit future caregivers for the institution.

It's important to remember that the surfaces of historic and archaeological iron artifacts are relatively fragile in relation to the objects weight. The corrosion removal process inevitably leaves the metal surface craggy and pitted. Also, internal cracking from past handling/use is not visible without x-radiography. When handling and storing these artifacts, care should be taken to make sure that the object's weight is evenly distributed.



*Figure 26: Spalling iron with active rust at center of stove door in Museum of Ironworker.*

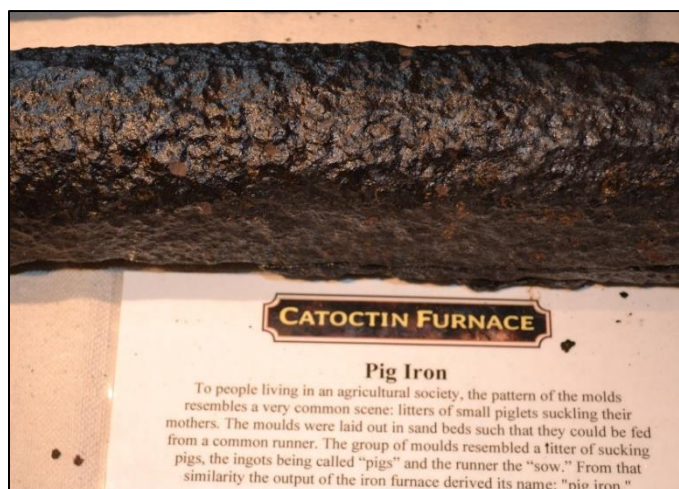


Figure 27: Spalling iron with metal flakes scattered around objects at the Museum of the Iron.



Figure 28: Spalling iron with metal flakes scattered around objects at the Museum of the Iron.

### 3. Non-Iron Metal Artifacts

The objects on view in the Collier's Log House are mostly reproductions or props/antiques not directly connected to CFHS, but as the exhibition plan for this space evolves, CFHS staff may want to consider how the object's condition relates to its interpretation from the visitor's point of view. Most of the objects, like the objects on the mantle in the main room on first floor, are in excellent condition. But the copper kettle below these objects is very dirty with a thick layer of dust, some cobwebs, and a significant amount of green corrosion. This variance of condition sets up a visual discrepancy in the interpretation of the objects.

Some of the other copper alloy objects appeared very dirty, such as the candleholder with the hurricane globe on the wooden dresser across from the mantle in the main room of the Log House. Some of these condition issues could be remedied by routine object dusting as described 'Housekeeping Plan' under the Collections Care section.





*Figure 29: Copper alloy kettle with corrosion, dirt/grime, and cobwebs on hearth in first floor main room, Collier's Log House*



*Figure 30: Corrosion on copper alloy and dirty glass globe on candlestick in first floor main room, Collier's Log House.*

#### **4. Composite Artifacts and Wood/Furniture**

The seasonal environmental fluctuations in the house will cause wood to expand and contract, resulting in extensive paint loss on the crib that is visible today. Conservation treatment to clean and consolidate the extant paint is highly recommended for long-term preservation of this object. Consolidation treatment will introduce adhesive below flaking paint layers to stabilize the paint and slow the rate of paint loss with the object housed in an unconditioned space.





*Figure 31: Crib on second floor of Collier's Log House has significant paint loss. Conservation treatment to consolidate extant paint is recommended to slow the rate of deterioration.*

The large bellows in the corner of the Log House is in very poor condition. The surface is very dusty/dirty; the wood is stained, gouged, and has insect damage; the leather is brittle, torn, distorted and fragmentary, and the iron components are rusting. CFHS plans to have the bellows fully restored for use in the future blacksmith shop; the bellows was purchased by Elizabeth Comer's father and does not have direct provenance to CFHS. This restoration should have written and photographic documentation for the record-keeping of collection objects. There is also a small kitchen tool hanging on the fireplace below the pewter mugs; the iron blade is very rusty and needs to be stabilized to slow the rate of corrosion.



*Figure 32: Bellows in Collier's Log House with multiple condition issues.*



*Figure 33: Tool on mantle of fireplace in main room of Log House with unstable iron.*



*Figure 34: Insects on windowsill of Collier's house, second floor, and wooden box in poor condition.*

The furniture in the Log House appears to be in relatively good condition, but the surfaces should be routinely dusted to avoid mold growth on the surfaces. The building assessor identified frass in the building logs, indicating the presence of a wood-boring insect. This is a serious threat to all the wooden furniture inside the house if there is an active infestation.

A replica painted box in the street-facing window on the second floor of the Log House has very unstable paint. Being exposed to bright light in the window exacerbates its poor condition and the box should be moved to an interior wall to slow the rate of deterioration. The recommendations above are offered for consideration, but subsequent action will be dependent upon the institution's intent for non-accessioned objects in the long-term preservation plan. Another factor is how maintenance of displayed items fits within the exhibition narrative, for example, if the log house is meant to represent an occupied home, an object like the copper kettle would be a candidate for cleaning and coating to portray the object as it was in use.

## 5. Archives

CFHS has a compelling story to share and is a vital historical site not only for the Maryland, but for the history of our nation. The archives are a critical component of the CFHS story. Museum staff recognize their importance and have enlisted 'Digital MD' – a statewide digital preservation program run by the Enoch Pratt Free Library and the MD State Library Resource

- to scan some of their ledgers. With inevitable changes in future staffing and board members, organization and digitization of the archives will assist in the transfer of institutional memory. CFHS staff should consider how and where the archives should be catalogued and stored. Could part of the archives collection be catalogued and digitized for a student project, or should more content be given to Digital MD for scanning? Archival resources for storage can be found at companies like Gaylord and University Products for long-term storage options.

## **6. Summary of Recommendations to Improve Conditions**

- Implement a housekeeping plan for preservation and improved appearance of collections.
- Re-house the textiles as suggested above, purchase more boxes.
- Move textile collection to climate-controlled area.
- Determine extent of conservation treatment for textile collection slated for exhibition. Hire a textile conservator to treat the textiles as needed and advise on the display of textiles in a custom storage/display case.
- Implement cleaning and storage protocols for historic reproduction clothing and textile props.
- Enlist MD Archaeological Laboratory for re-treatment of iron artifacts. Review handling policy with staff.
- Consider protocol to address condition problems for historic, non-accessioned objects on view. Schedule conservation treatment accordingly.
- Establish a plan for organization, digitization and long-term storage of archives.

## ***E. Exhibition Condition and Recommendations***

### **1. Lighting**

The recent renovations in Museum of the Ironworker included the input from a lighting designer and in April 2021 a Lutron LED system installed. The bulbs in this system are LED SORAA Vivid bulbs, 3000K, 50/60 Hz. The new windows in museum are insulated, double hung, argon filled glass. There is no UV protective glazing, but the museum plans to acquire plastic scrims depicting associated landscapes from Vista print and apply these to the windows, which will block some of the UV and visible light entering the space. The installation of LED lights was a positive update because LED light has a low UV output. Unfortunately, it still produces visible light which can cause fading. Traditional recommended light exposure levels for collection objects are: 50 lux for textiles, works on paper, watercolor, photographs and 150 lux for oil/acrylic paint, polychrome, furniture. It is important to remember that light damage is cumulative and irreversible. To protect the light sensitive materials in the museum – the paintings and textiles – consider covering items while the museum is closed. Drape a dark cloth over the shadow boxes containing textiles and acid-free boards could be propped over the paintings on the mantle. Any framed, hanging light sensitive items of high value/importance in the MIW and Collier's Log house should be framed or placed in a shadow box with UV protective glazing.



Figure 35: Cover textile shadow boxes with dark cloth when museum is closed to slow rate of fading.



Figure 36: Place acid-free boards in front of paintings when museum is closed to protect paint from unnecessary light exposure.

## 2. Object Enclosed Displays

There are four cases with plexi-Glas® vitrines located in the Museum of the Ironworker. Two contain a forensic facial reconstruction of enslaved workers buried in the cemetery on site. These highly realistic objects are extremely valuable, not only from a cost perspective, but also from their connection to the site and the extensive amount of time and expertise given by the researchers who analyzed and interpreted the data to create a precisely rendered three-dimensional product. The other case contains an iron artifact. None of the plastic bonnets have security screws to lock the vitrine in place. Security screws and screwdrivers can be purchased from a company like McMaster-Carr, but the knowledge needed to measure, pre-drill, and install the screws requires an experienced hand so that the plastic bonnet does not crack and that the holes are the correct size to function as a locking system.<sup>14</sup> Given the size of the space, it is highly possible that a visitor could accidentally bump into the cases. Monitor visitor flow in exhibition space to determine if intervention to secure or weight the cases is necessary.

<sup>14</sup> A full-service art installation company like Bonsai should be able to easily install security screws for all casework.





Figure 37: Security screws can be added along bottom edge of Plexi-glas® vitrine for added security.

### 3. Textile Enclosed Display (NF)

While most of the archaeological garments are stored in the previously described blue archival boxes, some are currently on display at the MIW. These items are in a shadow-box style frame with powder-coated aluminum sides and a glass or Plexiglas top. The garments are folded and packed closely. One garment has a sleeve with some losses that has been padded out with acid-free tissue. Item number tags are visible, and a small didactic placard is placed on top to describe the item. This box is placed on top of a table, directly under bright lights.

The items are stored in a protected case, creating a suitable microclimate and most likely offering good protection from pests, depending on the degree of sealing or quality of gaskets. While a light meter was not used, it is highly likely that the amount of visible light greatly exceeds the recommended 50 lux for textiles, which can result in fading, discoloration, and acidic degradation of fibers, ultimately resulting in a weaker, more brittle fabric. It is unclear if the folds in the fabric are padded out to decrease the risk of creasing, which can become permanent and cause stress points and breakage. It is best for the garments to be displayed with as few folds as possible and to pad out any folds required. This also allows visitors to examine a greater area of the garment as well as understand its overall construction.

### 4. Open Displays

Staff feedback stressed the importance of creating a display environment that was not stagnant; they want to create a space where exhibits can change and adapt to new findings and focused inquiry. Staff also wants to create a wholistic exhibition plan for the MIW gallery to make efficient and intentional use of the space, and to employ consistent labelling for the objects. The museum recently purchased two four-tier metal rolling carts with wire shelving to display various iron artifacts. Display of artifacts on the shelving lends itself to the plan for the exhibit



area to serve as ‘active storage.’ Other larger, heavy artifacts are set onto the floor with a barrier of rigid plastic between the object and the floor.

When exhibiting objects out in the open, two important considerations include how to evenly support the object AND how to secure the object. While the function of the open wire shelving is good to optimize the space, the impact on the objects is harmful for three reasons. Firstly, contact between the wire shelving and the iron surface makes a pressure point, causing spalling in pitted and fragile areas. Secondly, it is harder to monitor spalling on the iron surfaces because the metal flakes will fall to the ground becoming disassociated with the object. Thirdly, the shelving is on wheels that do not lock, which does not provide security for the objects.



Figure 38: Iron objects on open wire shelving at Museum of Ironworker.



Figure 39: Spalling iron at Museum of Ironwork. Open shelving does not provide even support or security for object.

Consider retrofitting the shelves to promote best practices for object storage and display. For the short term, cut thin Plexi-glas® sheet to the size of each shelf and place the objects on the plastic so they are more evenly supported. Small pieces of high density, closed cell polyethylene foam can be attached to the plastic sheet using hot-melt glue, to make small stops placed at key locations around lighter objects to prevent them from skipping off the shelves.<sup>15</sup> For more flexibility in terms of object placement, one option is for each object to have its own archival board that cradles/secures the object using foam stops in a similar way. Thin Volara foam should go below any objects with extremely pitted or fragile surfaces.<sup>16</sup> The mounting boards do not need to be much larger than the footprint of the object and should not detract from the open viewing through the shelving unit. Invisible monofilament wire can go through small holes

<sup>15</sup> This site, [PACCIN - Ethafoam® Polyethylene Foam](#), has excellent information about products used to display art. High quality ethafoam, as well as archival hot glue, can be purchased at Talas: [Archival Ethafoam Polyethylene Planks | TALAS \(talasonline.com\)](#). Another valuable resource, *Housing Archaeological Collections at Johns Hopkins Archaeological Museum*, provides housing examples: [JHU\\_Housing-Archaeological-Collections\\_LowRes\\_Interactive.pdf](#).

<sup>16</sup> [Voltek Volara Archival Closed Cell Polyethylene Foam | TALAS \(talasonline.com\)](#)

punched in the boards to secure the boards to the open wire shelving. The resulting display would protect the objects while simultaneously promote best practices for preservation to museum visitors (see photo below, although the object is not metal, the image shows a pallet storage technique). If displaying iron objects on individual boards is not aesthetically desired, lining the shelves with thin Volara foam would also help protect vulnerable metal surfaces.

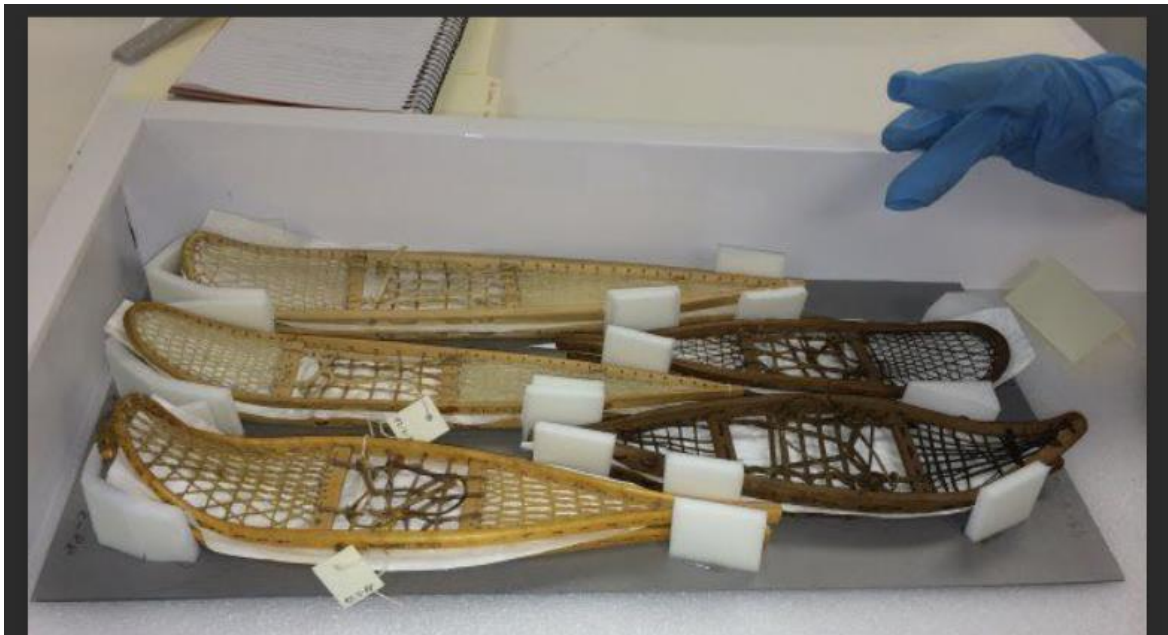


Figure 40: Example of pallet storage for artifacts. Artifact Storage: Pallet Solutions | Ellen Carrlee Conservation (wordpress.com)

When the museum updates the labels, mount them on thin archival boards so that the text stays flat while the visitor is reading. An exhibition designer can advise on effective ways to display text alongside objects so that they do not compete for space. Consider making signs to remind visitors to not touch the objects. Also, items stored on the floor should be placed on low platforms so that visitors do not accidentally walk into them (platform could be made with wheels that lock). Make a separate display table for didactic aids allowing a place for visitors to touch non-accessioned materials.

The museum plans to create a blacksmith shop housed in a new building made from heavy timbers. Their plans include displaying iron artifacts that are currently stored in the MIW, however even in a controlled environment, some of these objects are spalling. To balance preservation and exhibition needs, the assessor suggests the following protocol. Display all archaeological iron objects in a climate-controlled environment. All archaeological ironwork is at risk if stored/displayed in an uncontrolled environment because even if treated to remove chlorides, there will still be salts present that are highly reactive to fluctuations in relative humidity. Non-archaeological, historic artifacts recently treated may be ok for display in the blacksmith shop. All historic iron artifacts slated for exhibition in the blacksmith shop should be spot treated by conservators from MAC lab before installation; carefully monitor corrosion activity while on view. If bright orange spots of corrosion start to occur, the object will need

conservation treatment and a more robust coating applied. Consult with MAC lab conservators to discuss options. Consider installation of a ventilation system in the blacksmith shop to exhaust volatile organic acids from the newly constructed building; VOC's can accelerate the rate of corrosion for metals. Alternatively, consider the manufacture and display of replica objects in the blacksmith shop instead of accessioned objects. Hire a mount-maker or blacksmith to make brackets that evenly support the objects on view. Use polyolefin heat-shrink tubing on brackets to provide padding between the object and the mount.

## 5. Future Textile Case Design and Display (NF)

During the onsite survey, textile conservator took rough estimates of most garments, excluding smaller fragments and items already in display cases. The overall footprint of the measured collection totaled nearly 5,000 square feet. Garments were measured opened fully (e.g., with sleeves outspread) but wrinkles were not flattened. This may prove a challenge for visible storage in a 4' x 6' case that allows items to both sufficiently visible to visitors and stored in conditions that prioritize their long-term care. It is therefore recommended that certain garments be prioritized for display, or a rotation schedule is created.

Several options are available for visible case display storage. While technical details can be discussed with the manufacturer (SmallCorp is suggested), this section will lay down several suggestions and guidelines.<sup>17</sup> Keep the weight of the case in mind during the design process and consult a structural engineer to calculate the floor load capacity.

- The case will have an approximate 4' x 6' footprint. Height dependent on if the top of the case will serve as an additional display area.
- Case should be powder-coated aluminum.
- Drawers should be covered in Plexiglass or laminated museum glass to create a microclimate, protect from dust, and protect from visitors. There should be at least one inch of space between the textile and the drawer cover. Consider the ease of installation if rotations or loans are intended to be a regular occurrence.
- Drawers should be 2" to 6" high, with textiles displayed mostly flat. Some folding may be appropriate, and all folds should be padded out with acid-free tissue, Tyvek or scoured cotton fabric-covered batting, or ethafoam.
- A well-sealed drawer will create a more stable microenvironment and can greatly reduce the risk of pests. However, if the surrounding climate is not well controlled, there is a greater risk of issues such as condensation, which can cause damage and mold growth.
- Ideally, the bottom of the drawers should be padded with a thin, soft material. Drawers can be lined with a conservation appropriate foam such as Volara, which can be covered in an approved show fabric. Alternatively, thin padded boards made of archivable blue

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<sup>17</sup> SmallCorp contact information: [- Products for the display, conservation, and storage of art and history | Products for the display, conservation, and storage of art and history \(smallcorp.com\)](#), 1-800-392-9500, 19 Butternut Street, Greenfield, MA 01301.



board, polyester batting, and cover fabric may be placed in drawers. These can also act as a lifting board to remove items during deinstallation.

- If desired, the top of the case can be a clear display area, have a clear bonnet to display tall items, or have a 3-sided clear cover with a backboard style display. This would allow for smaller items to be mounted on top of the drawers.
- Lights should be pointed away, dimmed, or equipped with timers or motion sensors. This is especially important for any displays outside of the enclosed drawers. Bright lights may still cause glare on the Plexiglas drawer covers when opened. Furthermore, all light damage is cumulative, and bright lights are never recommended, even for shorter periods.
- Recommended environmental conditions for textiles are 60-70 degrees F and 40-60% RH. Gradual changes are safer than fast changes. Risk of biological issues (mold, pests) tend to increase at higher humidity and temperature. The case need not have additional climate control if the surrounding environment meets these standards.



Figure 41: Image of hinged glass hood custom vitrine from Casewerks mounted to a custom base cabinet made by Delta Designs, LLC. Image provided by Bill Beitel, [bill@casewerks.com](mailto:bill@casewerks.com), Casewerks, LLC.



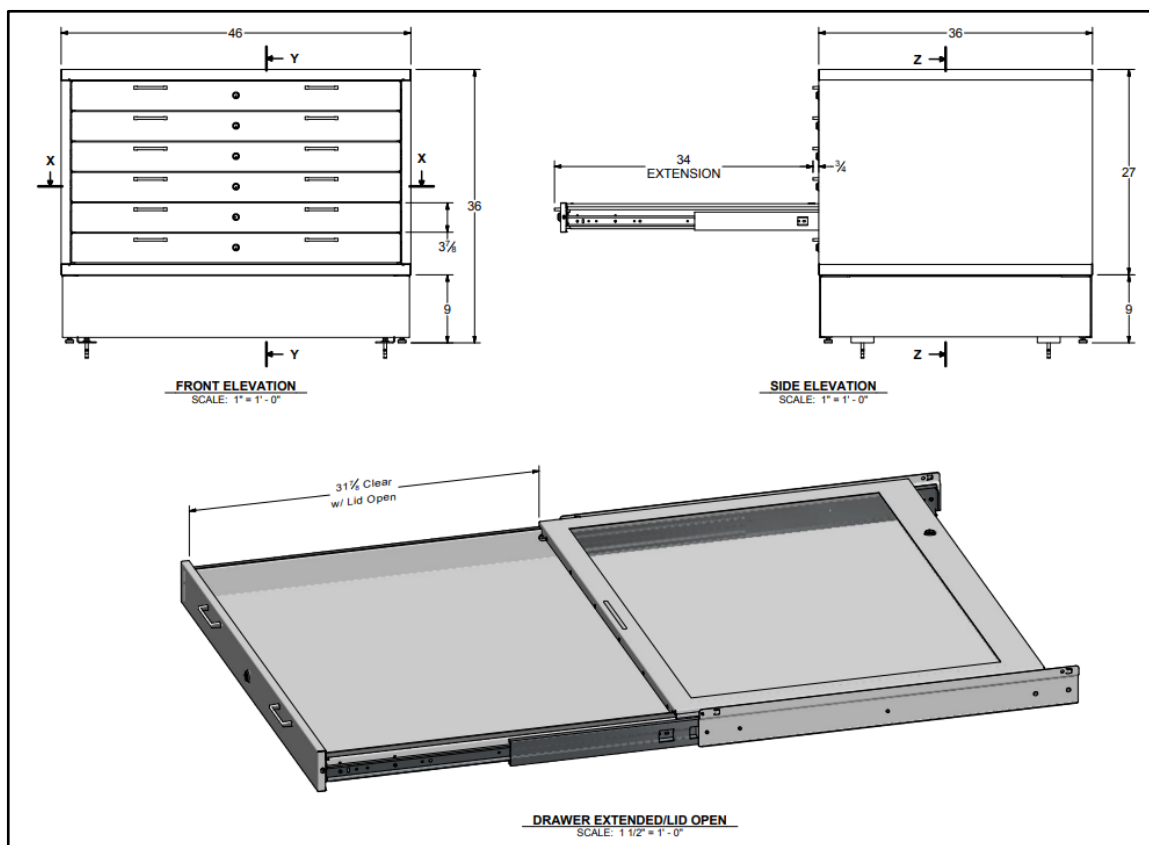


Figure 42: Sales representative, Peter Doucette from Delta Designs Ltd., provided this drawing of a custom case with pull-out drawers. Cases from this company and made from powder-coated steel, this unit weighs 757 pounds. Small-Corp makes their custom cases from medex, which should result in a lighter case than if it were made from steel.

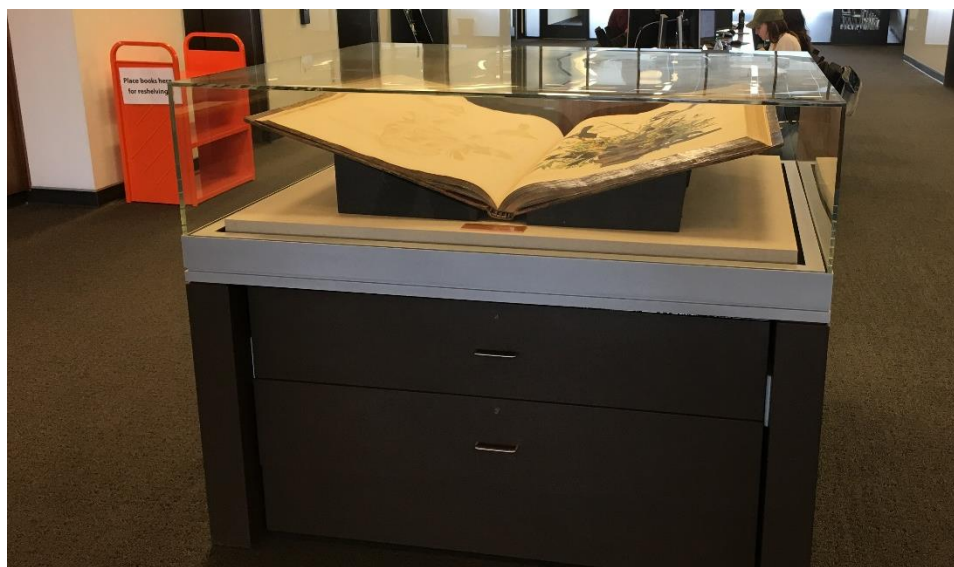


Figure 43: Sales representative, Laura Ludwig from Smallcorp, provided this image of a drawer case their company made for Tulane University. The case is made from medex. The representative stated that the drawer glides require upkeep – some customers report that the mechanism needed to be replaced after six years of hard use.

## 6. Summary of Exhibitions Recommendations

- Cover light sensitive collection objects when the museum is closed and point lights away from textiles.
- Add security screws to the cases. Monitor visitor traffic flow to determine if cases need further stabilization.
- Consult with designer and/or SmallCorp to create active storage display of textiles found in the rafters of Forgeman’s house.
- Retrofit iron objects on tiered carts for improved support and security.
- Work with MAC lab to address iron corrosion issues.

## APPENDICES AND ADDITIONAL PHOTOS

### *A. Rules for handling objects from National Park Service.*

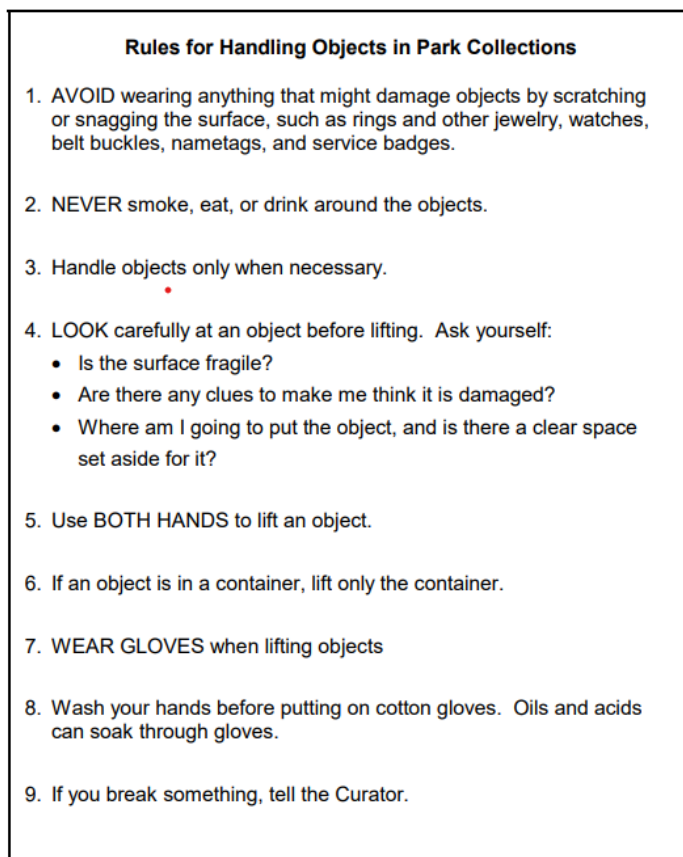


Figure 6.14. Example of Written Handling Rules for NPS Park Collections

*B. Textile Condition Summary, Nora Frankel, Textile Conservator*

Item numbe	Width (inches)	Length (inches)	Description	Materials*	complete?	structurally stable?	repairs present	Condition**	Comments
4	11	8	child's vest/undergarment	cotton, buttons	nearly!		No		Nearly complete
17	18	30	blue knit under shirt	cotton	mostly intact and complete with some losses	pretty good	No	Some losses, paint/whitewash/plaster	Interesting piece. Note that knit fabrics can distort easily if hung, must be properly supported if not displayed horizontally.
20	15	14	wool fabric scrap	wool	fragment	fragile in areas of losses		brown wool mostly intact, dyed wool seems to have been more prone to destruction -m moth or iron mordanting common issues here	This was possibly handwoven
24 a	13	3	sock	knit wool	mostly	yes, but note holes in knit fabrics can run very easily	Yes, woven rather than knit or darned patch		Interesting repair, patch rather than darn indicates was likely not done by a woman
26	18	16	vest	wool, cotton, metal buttons and buckle, possibly hemp or jute stiffener	mostly intact with some tears and losses		No	Metal buttons rusty	In relatively good condition, good candidate for display
27	30	30	black prtined plain weave cotton apron	cotton	mostly intact with some tears and losses		No	Large pieces of plaster	Mostly intact, interesting fabric, large amounts of plaster would need to be addressed during conservation prior to display
28	18	16	man's vest	facing wool(?), back facing cotton, lining and interlining cotton, metal buckle, wool or cotton batting lining	parital, major tears and some losses	No	Yes	High/moderate damage from insect grazing, acidic degradation, large amounts of plaster on surface, metal corroded.	Interesting piece, although it would require stabilization prior to mounted display
29	35	18	trousers	multiple facing fabrics, different colors of cotton denim, metal buttons, coarse muslin	has some major losses and tears	mostly, aside from tears and losses	fun and interesting repairs of colorful denim	tornm fraying, losses, some metal corrosion, crumpled, stained, dirty	Interesting and extensive repairs

Item number	Width (inches)	Length (inches)	Description	Materials*	complete?	structurally stable?	repairs present	Condition**	Comments
30	23	23	denim work short	cotton denim (undyed and indigo dyed cotton threads), metal grommets and buttons	missing back and sides, just front and sleeves	mostly, although losses are frayed	Yes	heavily soiled, some spatters, dark staining, repairs, major losses, metal corroded	Interesting piece, although it would require stabilization prior to mounted display
33	20	18	woman's blouse, black, eyelet lace	black dyed cotton, buttons, metal pins	mostly	mostly	Yes		Interesting patch on PR sleeve
34	35	20	mens trousers, undyed cotton canvas	cotton fabric, wood buttons, other buttons	mostly	mostly	Yes	Many signs of use wear, crumpled, stained (use and storage), some surface dust, rips but fairly complete	Lots of use evidence, relatively whole with many tears and holes
44	32	18	cotton dress with red piping, red decorative sleeve and collar hem, gingam pattern	cotton	mostly complete with some big tears	yes	Yes	Mostly complete, large crusty black stains throughout, red dye bleeding	Interesting piece, fairly complete. Red dye bleed indicates that if treated wet cleaning is likely not possible, although stabilization is recommended.
49	18	15	cotton frock coat	cotton, printed and plain	missing sleeves and some of back skirt	yes	Yes	Large plaster accretions, fading, structural damage, lost buttons (or removed), dark staining	Interesting piece, although large amounts of plaster may require attention prior to special display. Could be displayed with plaster showing as evidence of use but would need to be properly supported
53	21	17	twill cotton pants	cotton, plastic button	mostly complete, some big holes and tears	yes	Yes	Foxing, plaster	Nearly complete, flannel patch on backside is interesting



Item number	Width (inches)	Length (inches)	Description	Materials*	complete?	structurally stable?	repairs present	Condition**	Comments
54	27	14	pants	cotton facing, cotton muslin lining, metal buttons and buckles	some holes, missing part of front	yes, considering fragmentary condition	Yes	Large amount of plaster on reverse	Interesting piece, although large amounts of plaster may require attention prior to special display. Could be displayed with plaster showing as evidence of use but would need to be properly supported
56	23	17	shirt	dyed cotton	missing most of back	yes, considering fragmentary condition	Yes	Plaster accretions	Interesting piece, history of repairs
57	18	16	purple shirt	dyed cotton plain weave (undyed warp and dyed weft)	missing sleeves, most of bottom	yes, considering fragmentary condition	No	Large accretions of green-painted plaster	Not very complete but the tucks and gathers may be interesting
58	32	8	garment fragment	dyed/printed cotton	fragment	Brittle, not especially stable	No	Plaster, cellulose degradation	Just a fragment but the fabric is interesting, appears to be inspired by Japanese textiles. Condition is somewhat brittle, care needed during display.
*Material identifications based only on visual analysis with no magnification									
**All textiles have some degree of surface debris, staining, and creasing from their history. Additional condition issues noted here.									

### *C. Additional Photographs*



*Figure 44: Fresh wood can harbor and attract insects. Investigate replica logs for display, but Mylar should be placed between replica log and metal surface.*



*Figure 45: Thermometer often falls off the shelf and loose coin on shelf is vulnerable for theft. Explore methods to increase security of objects.*



*Figure 46: Folding table at Museum of Ironworker slated for replacement to better support the heavy iron objects.*