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KEWEENAW NATIONAL HISTORICAL PARK
Historic Structure Report

November 1, 2019



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1. Executive Summary

Historic Structure Report Summary

This Historic Structure Report (HSR) presents both a thorough documentation of the Calumet and Hecla Public Library and a vision for its future use. By identifying features that convey the historic significance and character of the building and site, evaluating the condition of those features and recommending treatments, the report serves as guide for the preservation of the structure's historic assets and a road map for its rehabilitation.

In 1992, Congress established Keweenaw National Historical Park (KEWE) to commemorate and interpret the rich copper mining heritage on the Keweenaw Peninsula, located on the western coast of Michigan's Upper Peninsula. The Keweenaw Peninsula is home to the Lake Superior Copper Range, which held vast deposits of copper that attracted the mining companies which would dominate US copper production from the 1840s to the 1880s.

Keweenaw National Historical Park is a partnership park, combining limited federal ownership and partnerships with private owners, other public entities, institutions and non-profit organizations.
The park includes two units, Quincy and Calumet.

The Calumet unit focuses on the companies that mined the Calumet conglomerate lode, the Calumet Mining Company to the north and the Hecla Mining Company with assets south of Red Jacket Road. The companies merged in 1871 and in 1895 envisioned a public library, financed by the company for the benefit of the community.

Designed by Boston architects Shaw and Hunnewell and completed in 1898, the Calumet and Hecla Public Library is a contributing structure to the Calumet National Historic Landmark District. In 2001, the structure became an asset of the park.

The intent of the HSR is to document the physical evolution of the Calumet and Hecla Public Library, to describe the current conditions, and to recommend appropriate treatments. Documentation of historic significance and the evaluation of integrity provides the framework upon which treatment recommendations are based. All treatment recommendations follow the Secretary of the Interior Standards for the Treatment of Historic Properties.

The present condition and condition assessment for each feature is documented in Part 1. Part 2 describes treatment recommendations for the preservation of these features and the rehabilitation of the structure.

Project Purpose and Need

The purpose of this project is to document and record the history and current conditions of this structure and to propose a plan for its preservation and continued use via a technical and multi-disciplinary approach. The recommendations are meant to inform continued use of the library for NPS museum services outreach to partners and the base of operations for the NPS Lake Superior Collections Management Center, a consolidation of museum collections from Isle Royale National Park, Keweenaw National Historical Park, and Pictured Rocks National Lakeshore. Since the Park's acquisition of the library, it has functioned as the Keweenaw

History Center with functions divided between staff offices, artifact and archives processing areas, and museum object and archival storage. Keweenaw NHP's 2009 Facility Plan described the future of the structure as continuing to serve these office, storage and processing functions while adding spaces for expanded research and oral history listening.

Treatment recommendations are also intended to inform a future interpretive role for the library related to the theme of corporate paternalism. The plan envisions dedicating space to interpretive exhibits focused on the theme of corporate paternalism, which Calumet & Hecla practiced and of which the library was a product. The library's two well-preserved historic reading rooms are currently used for museum collections storage. As part of a larger vision for the care of partner and NPS material heritage, this project will provide recommendations to preserve and enhance the building's value for interpretive purposes.

Methodology and Research

History Methodology

The primary goals of the history section are to provide accurate information regarding the historic context and to clarify the evolution of the building. The park archives provided the bulk of source material for historic research. Extensive historic structure data, drawings and work records already carefully complied by the park staff facilitated further technical exploration. Research also drew on other completed studies of the district, including the 2013 Cultural Landscape Report for the Calumet Unit Historic Landscape.

Historic Structures Report Methodology

The HSR presents documentary, graphic, and physical information for the Calumet and Hecla Public Library. Study of primary historic documents (original drawings, historic photographs, newspaper articles and company records), preliminary historic structure reports prepared by the park, record rehabilitation and restoration drawings, and park maintenance records laid the foundation for the analysis. A week-long site investigation sought to challenge this analysis with the goal of accurately documenting both past and current conditions. The assessment process involved a multidisciplinary approach to more fully understand the building and its alterations.

Existing Condition

Field observations contributed to descriptions of each extant feature and attendant condition rating. Features observed and analyzed by discipline included the following as applicable by building:

Architecture: roofing system, chimneys, exterior walls, porches, windows, doors, interior finishes, life safety and accessibility in accordance with the Architectural Barriers Act (ABA).

Structure: foundation, floor framing, roof framing, ceiling framing, wall framing, lateral system, seismic resistance and load requirements.

Mechanical: heating, ventilation, air conditioning and cooling systems.

Plumbing: water supply, venting and drain systems, as well as fixtures.

Fire Protection: fire suppression systems.

Electrical Systems: infrastructure, branch circuits, general power outlets and equipment, lighting systems, telecommunications, fire alarm, security systems, and lightning protection.

Environmental: hazardous materials.

Landscape: site design and accessibility, small scale features, and vegetation.

Condition Assessment
Each feature was evaluated and assigned a condition rating. A general building condition assessment is presented first, followed by the condition assessment and ratings of each feature or component. The rating system is further described in the Part 1 overview.

Treatment Recommendations
In Part 2, treatment recommendations are provided for each feature to address the conditions previously described and assessed. A rating system identifies priorities for treatment. The prior draft described three alternatives for treatment and use. A preferred alternative has been selected from the three via a Condensed Value Analysis/ Choosing By Advantages (VA/CBA) workshop, which is documented in Appendix G. Treatment recommendations related to that alternative are now incorporated into this section.

Summary of Treatment Recommendations

Treatment: Rehabilitation
Rehabilitation is the recommended treatment for the Calumet and Hecla Public Library. The Department of the Interior defines rehabilitation as the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values. Treatment recommendations generally retain existing materials in good condition and repair damaged finishes where needed.

The rehabilitation treatment allows for altering a building to adapt to continuing or changing uses, including code and accessibility improvements and system upgrades. Such treatment aligns with the park's vision for the future use of the building with the enhancement of its library and interpretive functions.

Critical Findings
Treatment recommendations address the issues defined in the Condition Assessment. The most critical findings of this HSR are:

- Moisture intrusion persists at isolated locations at the building perimeter
- The mechanical system does not provide air conditioning, ventilation or the dehumidification necessary for the storage of archival materials
- The building is not universally accessible
- There is no second egress route from the second floor
- Traces of asbestos were detected in two materials

Park Planning

Keweenaw National Historical Park existing general management planning documents continue to provide relevant guidance, which may be supplemented through development of additional planning documents, such as this one. The Calumet and Hecla Public Library Historic Structure Report is a component of the park's planning portfolio

and fulfills a park planning for comprehensive documentation on the condition of the property, and appropriate treatment recommendations. This plan is consistent with the general guidance of the 1998 General Management Plan and helps the park to better meet the statutory requirements of 54 USC 100502, specifically the requirement to address measures for preservation of resources, and indications of types and general intensities of development.

Location Data

Keweenaw National Historical Park is located in the western portion of Michigan's Upper Peninsula, northeast of the town of Hancock. The Keweenaw Peninsula extends north into Lake Superior, and is divided in two by Portage Lake and associated canals. The Lake Superior Copper Range forms a spine down the length of the peninsula. The Calumet unit of the park sits along this ridge, in the town of Calumet, as shown on the map below.



Figure 1-1. Calumet Unit of Keweenaw National Historical Park, location on the Keweenaw Peninsula



Figure 1-2. Calumet Unit of the Keweenaw National Historical Park

Project Team

At Keweenaw National Historical Park

Superintendent	Wyndeth Davis
Historical Architect	John Rosemurgy
Landscape Architect	Steve DeLong
Historian	Jo Holt
Facilities Manager	Chris St Martin
Chief of Museum and Archival Services	Brian Hoduski
Archivist	Jeremiah Mason
Project Lead, Interpretation and Education	Kathleen Harter

Anderson Hallas Architects PC, Architects

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Project Architect	Laine McLaughlin, AIA, LEED AP BD+C

Mundus Bishop, Cultural Landscape Architects

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Quinn Evans Architects, Historical Research

Historian	Ruth Mills, MA, MS

JVA Inc, Structural Engineer

Senior Project Manager	Lawrence Graham, PE
Project Engineer	Christine Britton, PE

360 Engineering, Mechanical Engineer

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AE Design, Electrical Engineer

Principal	Jon Brooks, PE, IALD, LEED AP BD+C
Project Engineer	Kit Davidson, PE

Landmark Environmental, Hazmat Assessment

Project Manager	Brandy Howard, CIH, CSP
Site Inspector	Don Milner

Architectural Cost Consultants, LLC, Cost Estimator

Project Manager	Stan Pszczolkowski
Estimator	McCabe Karcher

2. Administrative Data

Administrative Background

Summary

Keweenaw National Historical Park was established by Public Law 102-543 in October 1992. The park is comprised of two geographically separate units, the Quincy and Calumet units. The Calumet unit focuses on the heritage of the Calumet and Hecla Mining Companies, which merged in 1871. The National Park Service owns only a small fraction of the park acreage and built assets. The remaining assets are owned and operated by various public, private and institutional entities in a unique partnership program.

In 1974, the Calumet Downtown Historic District and the Calumet Industrial District were listed in the National Register of Historic Places. In 1989, the Calumet Historic District was listed as a National Historic Landmark for its significance in themes of business, technology, immigration and ethnic settlement, paternalism and company towns, and labor organization.

The 1989 nomination established a period of significance for the district as 1864 to 1930. [1.1] The period of significance is under reconsideration. An earlier end date around 1923, the year that Calumet and Hecla merged with other mining companies to form the Calumet and Hecla Consolidated Copper Company, is expected to reflect the subsequent decline in local mining activity and corporate paternalism on the part of the company.

Statement of Significance

The Calumet and Hecla Public Library is a contributing structure to the Calumet Historic District, a National Historic Landmark (NHL) listed since 1989. The library is a significant example of corporate paternalism, in which companies sought to maintain a healthy, stable and loyal workforce through capital investment in cultural institutions, housing and worship centers. The library is all the more interesting as an example of such a cultural institution in that it supplied materials in a wide range of foreign languages for the benefit of its diverse immigrant workforce. As relations between management and labor changed and the company struggled with profitability in the early twentieth century, its inclination and ability to support a library declined, leading to its closure in 1943.

The 1989 Calumet Historic District has a national period of significance from 1864 to 1930. This period does not include a significant period in the morphology of the structure, specifically the reconfiguration of space and addition of the vault when the structure was converted to office use. Despite these modifications, the Library has retained a high degree of historic integrity.

Related Studies

Previous studies of the Calumet and Hecla Public Library and its environs include:

Calumet Historic District National Historic Landmark Nomination, February 19, 1988 (Kate Lidfors)

Cultural Landscape Report and Environmental Assessment, Calumet Unit Historic Landscape, 2013 (Mundus Bishop)

Historic American Buildings Survey MI -426, Calumet & Hecla Public Library, 1975 (Wendy Nicholas)

1.1 Nomination to the National Register of Historic Places 1989, prepared by Kate Lidfors.

"Preservation Study: Development of a Restoration Program for the Calumet and Hecla Library for Coppertown USA" (Johnson, Johnson, and Ro.)

3. Historical Background

Historic Context

Introduction

Designed by the Boston architecture firm of Shaw and Hunnewell and constructed from 1896 to 1898, the Calumet and Hecla Library was built by the Calumet and Hecla Mining Company as an extension of its policy of corporate paternalism. The library opened on September 17, 1898, and originally consisted of a bathhouse in the basement; circulation, stacks, and librarian's office on the first floor; a reading room and hall on the second floor; and a gallery above the second floor stair hall. Following the construction of a separate bathhouse in 1911, the basement was remodeled for use by the library. After copper mining production declined in the 1920s and 1930s, the company closed the library in 1943, remodeling space in and shifting its collections to the local high school (which the company had also built) and adapting the library for office use. The company ceased operations in 1968, and the library served as office space for the company's successor landholding firms until it was purchased by the National Park Service in 2001. Since that time, it has been used to house the park's archival collections and cultural resource staff, and serves as the Keweenaw History Center.



Figure 3-1. Calumet and Hecla Library postcard, ca 1907 (source: NPS, Keweenaw NHP, Warren-Schuler--001.01-014#005),

Copper Mining and C&H

Michigan's Keweenaw Peninsula contains some of the earliest evidence of copper mining in North America, dating back over 7,000 years. The extensive copper deposits in the Peninsula have defined and shaped its history from the earliest copper workings of American Indians, through the height of industrial copper mining in the nineteenth century, to the cultural and physical evidence of that history that continues to characterize the unique cultural landscape of the region.

Indigenous cultures in the Lake Superior region mined the rich copper deposits of the region for thousands of years, working from surface deposits and shallow pits to fashion tools, jewelry, and other items. The copper trade connected inhabitants of the area to a wide-ranging economic network that extended well beyond the Peninsula. Copper also carried spiritual significance for later migrants to the area, particularly the Ojibwe, who had settled the region beginning in the late 1400s.

As Europeans and EuroAmericans reached the Lake Superior region in the 17th and 18th centuries, they too recognized the importance of the area's copper resources. However, the remoteness of the region and its harsh climate meant that serious efforts to extract the copper resources of the Keweenaw did not come until the early 1800s. Initial efforts to mine the mass, or fissure, deposits were not particularly lucrative. It was not until the capital, technology, and human resources were available to reach the deeper conglomerate and amygdaloid lodes that the true potential of the Keweenaw's copper resources would be realized.

The combination of a favorable survey of copper deposits by geologist Douglass Houghton in 1841, and the implementation of the first Treaty of La Pointe in 1843, in which the United States government acquired title and mineral rights from the Ojibwe, touched off "copper fever" in Michigan's Upper Peninsula. Explorers and speculators flocked to the region to stake claims and start digging. Most failed, especially those that had concentrated on easily available and workable mass deposits. Eventually, a few massive operations grew to dominate copper mining on the Peninsula.

One of these was the Calumet and Hecla Mining Company. The origins of the company lie in the discovery of a rich conglomerate lode by surveyor Edwin Hulbert. In 1866, funded by capital from Boston backers, Hulbert formed two companies, the Calumet Mining Company and the Hecla Mining Company, which, despite their separate names, had the same leadership. The boundary between the two was Red Jacket Road, with Calumet north of the road and Hecla to the south. Mining shafts were aligned along the lode with Mine Street paralleling the outcropping of the lode on the surface, and the intersection of Mine Street and Red Jacket Road became the focal point of the company's operations. In 1867, frustrated by the lack of early profits, the Boston backers replaced Hulbert with engineer and natural scientist Alexander Agassiz, who would lead the company into the early twentieth century.

In 1871, the two companies merged to form the Calumet and Hecla Mining Company. By this time, Michigan dominated the copper market in the United States, accounting for 95 percent of production. While the neighboring Quincy Mining Company to the south had been the early leader in copper production and profitability, Calumet and Hecla quickly began catching up, paying its first dividends in 1870 and eclipsing Quincy as the largest producer of copper during the following decade. The company invested heavily in developing a surface plant to support the mining of the lode and processing of the copper once it had been brought to the surface through milling and smelting.

Corporate Paternalism and Building Community at Calumet

When the early mining companies began extracting the copper deposits of the Keweenaw Peninsula on a large industrial scale, they faced the problems of running labor-intensive operations in a region that was remote and relatively inaccessible from the population centers of the United States. The area lacked infrastructure to house and move the people and materials necessary, and had a harsh climate that further exacerbated the problems of transportation and housing. In order to make mining feasible, companies had to build not only mining facilities, but also transportation networks to move the materials and villages to house and support the workers and their families that came to work in the mines. While the copper mining companies of the Upper Peninsula did not build the complete company-owned and run towns that would later be exemplified by places like Pullman, near Chicago, they did to varying degrees provide the town facilities needed to support their operations and attempted to exert some control over the lives of their workers.

Mining companies like Quincy and Calumet and Hecla acquired vast tracts of land during their early exploration of the copper lodes. The Quincy Mining Company platted and sold off much of its land along the shores of Portage Lake to form Hancock, across

from Houghton. While Quincy did build company housing and sponsored some support businesses, in general the company could rely on Houghton and Hancock for overflow housing and community needs such as stores, schools, and churches. At the more remote Calumet and Hecla, the village and the mine developed in closer proximity. While the village of Calumet was nominally independent, the company built many key public facilities in the community, such as the high school and hospital, and donated land and funds to develop and support others. Thus both in practice and in perception,Calumet and Hecla had a stronger role in developing a community at Calumet than the Quincy Mining Company had in Hancock.[3.1] The leaders of both Quincy and Calumet and Hecla favored hiring workers with families rather than bachelors, reasoning that such workers would be more reliable and productive in the long term. To attract families, the companies believed they needed to ensure that their towns had the facilities to support family life.

The Calumet and Hecla Library is characteristic of the type of facility that exemplified corporate paternalism. In addition to providing basic services such as housing, corporate paternalism often extended to attempting to influence and control the moral and cultural lives of the company's workers and their families.

The mines of the Keweenaw attracted a high proportion of immigrants, from the Cornish miners of Great Britain who translated their working knowledge to the early mines of the Keweenaw, to the successive waves of Slovenians, Italians, and Scandinavians who formed the backbone of the labor force in later decades. The company placed a high priority on "Americanizing" these immigrants, particularly through education, and saw a library as a means to achieving this. The workers and their families also wanted to learn to speak, read, and write English, and many brought habits of reading and debating from their home countries.

That the Calumet and Hecla Library was a company endeavor was demonstrated by its location. When Alexander Agassiz first suggested the idea of building a library for Calumet in 1895, he proposed a site on the southeast corner of Red Jacket Road, opposite the company's main office and the company house Agassiz had built for his own use while he was in Calumet. [3.2] The Hecla Mining Company had purchased this tract of land in 1862 from the St. Mary's Mineral Land Company, a subsidiary of the St. Mary's Falls Ship Canal Company, which had purchased the land from the State of Michigan in 1855. Rather than locating the library in the village of Calumet, where other public facilities were located, it was instead in the heart of company territory as were other company facilities and amenities for the community.

Prior to the establishment of the Calumet and Hecla library, there had been libraries in some of the schools, as well as a township library. The year before Agassiz indicated his interest in erecting a public library, the Calumet school district decided to establish a district library that would be open to the public. What is unclear is if the two decisions were related. As Larry Lankton noted in *Cradle to Grave*, even if such institutions benefited their communities,

3.1 The village of Calumet was originally named Red Jacket. Then as now, however, the entire area was referred to as Calumet. For the purposes of this report, the name "Calumet" will be used.

3.2 Letter from Alexander Agassiz to S. B. Whiting, August 21, 1895, Calumet and Hecla Correspondence, Box 101/008.

they also served as a "quiet means of social control."[3.3] A library controlled by the company had authority over the books in it.

While the library was under construction, the company hired a Boston librarian, Bertha Merrill, to select and catalogue the books purchased for the new building. As late as 1912, when, as Lankton suggests, corporate paternalism was already losing a great deal of its force, the Calumet and Hecla librarian consulted with company officials on the books. She had asked then-President Quincy Shaw to find a seemingly innocuous book on woodworking which included recommendations regarding safety. Yet, after consulting with superintendent James MacNaughton, Shaw decided that they would not stock the book unless someone could "look it over carefully" to judge "the wisdom of the conclusions and the attitude in which the book is written."[3.4] Granted, this came just one year before a major strike in the Copper Country, when the company administrators were likely already seeing unrest over issues of worker safety and compensation, but it serves as an illustration of attitudes among company leadership as to the purpose of their public library.

On the more benign end of the spectrum, the librarians themselves seemed to have a somewhat more egalitarian view of their work. In 1907, assistant librarian Anna Fiske presented a paper at the annual meeting of the Michigan Library Association on Calumet. Fiske noted that one of the primary purposes of the library was to educate workers and their families on "what a home should be, judged by American standards" and to that end, the librarians tried to cultivate a home-like atmosphere through the use of plants, flowers and artwork.

Calumet had a large population of foreign immigrants and first-generation children and, while learning English was important, the library also tried to provide reading materials, both books and newspapers, in a variety of languages. Fiske reported that open stacks facilitated the browsing of materials in multiple languages, and librarians often turned to native speakers to help them catalogue the foreign language materials. The librarians also actively reached out to the community, distributing lists of the available books to men at their places of work to let them know what was available. [3.5]

The company also seemed to recognize that heavy-handed corporate paternalism could be counterproductive. A previous attempt to establish a library in Calumet had apparently failed when workers perceived the facility as only for the elite. [3.6] This time, the company offered to run the library jointly with the school district which, as noted above, had recently voted to establish a public district library. However the company, having constructed the new building ostensibly as a public amenity, was unwilling to cede control of operations entirely outside of its oversight. When Agassiz first began discussing the idea with the superintendent, S. B. Whiting, in the summer of 1897, the latter was dubious.

> I presume that you would not be willing to place the new library building in the

3.3 Larry Lankton, *Cradle to Grave: Life, Work, and Death at the Lake Superior Copper Mines* (Oxford University Press, 1993), 174.

3.4 Lankton, *Cradle to Grave,* 173-174.

3.5 Anna J. Fiske, "The Human Interest in Library Work in a Mining District," *Michigan State Library Association Proceedings of the 17th Annual Meeting Held at Detroit, June 6-8, 1907* (Lansing, MI: Wynkoop Hallenbeck Crawford Company State Printers, 1907), 27-36.

3.6 "The New Public Library," *Copper Country Evening News*, August 8, 1896.



Figure 3-2. Main reading room, ca 1911 (source: NPS, Keweenaw NHP, Foster Collection, Lib Card #349),

> hands of the township or district board to have the management or control and you would probably wish to be able to deny to objectionable persons the privileges of the new building. I doubt if under the existing statutes any permanent arrangement can be made to merge the two libraries that would be satisfactory to you because of the uncertainty of the future and position of the district boards.[3.7]

Eventually, the company did come to an agreement with the school district, perhaps because they saw the value of at least appearing to share control of operations with the community. Under the final agreement, the company bore the cost of building and maintaining the library building. The company and the district would share the operation of the library through a library committee with members appointed by both the school district and the company, although the company retained control of the bathhouse in the lower level. The company

3.7 S. B. Whiting to Alexander Agassiz, September 6, 1897, C&H Correspondence Box 158/010.

would appoint and pay the head librarian, while the school district would appoint and pay the assistant librarian. The company and the district would also retain separate ownership of the books they had each contributed. The library would be open to both company employees and residents of the district.[3.8]

An Architectural Gem in Calumet

While Calumet and Hecla built a number of amenities for its workers and the greater Calumet community, the place of the library within the range of facilities is perhaps best assessed by its location and appearance. As has already been mentioned, the library was built at the very heart of the company's administrative nucleus, across Red Jacket Road from both the general office and Agassiz's house. In a community dominated, even more so at the time, by the utilitarian buildings of the company's surface plant as well as modest worker housing and commercial buildings, it stood out. In style and materials, the building was very similar to the general office. Both were built of stone, specifically dark colored basalt, or waste rock low in copper content, that was brought to the surface from underground, a by-product of mining activity. While the material may sound prosaic in character, the individual stones were carefully selected and meticulously set by skilled masons in a "mosaic" pattern highlighted by raised mortar joints and interspersed with lighter colored granite and gneiss field stone. The material was further elevated by the use of brick quoining at the corners and local Jacobsville red sandstone for the sills. The interior was richly detailed with carved wood columns and coffered ceilings, while the second floor reading room was characterized by a high ceiling and an imposing brick fireplace.

The company hired the Boston firm of Shaw and Hunnewell as architects. The use of a Boston firm illustrated the strong connections between Boston and Calumet. Boston investors like Agassiz had provided the capital that enabled the initial exploration and development of the Calumet Conglomerate lode, and the lode increased the wealth of the company and the investors that permitted them to indulge in providing magnificent architecture in Calumet. The continuing relationship between the company's leadership in Boston and its management in Calumet was close and reciprocal, with frequent travel between the two locations. So the selection of a Boston firm to design the library was natural. However, the firm itself had close ties to the company. George Russell Shaw, one of the partners, was the nephew of Quincy Adams Shaw, Sr., Calumet and Hecla's first president. Quincy Adams Shaw, in turn, was the husband of Agassiz's sister, Pauline Agassiz Shaw. George Russell Shaw's brother (and first architectural partner), Robert Gould Shaw, was married to the sister of Henry Hunnewell, the other partner in Shaw and Hunnewell.

Although Shaw and Hunnewell had designed the general office of the Calumet and Hecla Mining Company (now Keweenaw National Historical Park Headquarters), most of their work was concentrated in the Boston area. Among their commissions were the Watertown, Massachusetts Free Library (1884), a women's hospital in Brookline, Massachusetts (1894-95), and two buildings at Harvard, as well as a series of houses in Boston's Back Bay. However, the Town Hall and Library in Wellesley, Massachusetts, is architecturally the most closely related to

3.8 Alexander Agassiz, "Public Library Report," May 7, 1898, Calumet and Hecla Correspondence, Box 210, Folder 24.



Figure 3-3. Wellesley, MA Town Hall and Library (source: Wikimedia Commons).

the Calumet and Hecla Library (figure 3-3). This building is rendered in irregular stone laid in a mosaic pattern, trimmed with darker stone, somewhat reminiscent of the Calumet library, although with the latter, Shaw and Hunnewell reversed the pattern to use dark stone trimmed with a lighter color brick. Stylistically, however, the Calumet and Hecla library is much simpler, with a few aspects of Queen Anne—patterned masonry, single pane double-hung windows, and ornamental woodwork at the gable—applied to a simpler and more rectilinear form.

Later History of the Library

Although the Copper Country of Michigan had been eclipsed in terms of proportion of the country's copper production by mines in the American West even before the company built the Calumet and Hecla Library, copper mining remained profitable and production continued to rise into the early years of the twentieth



Figure 3-4. Children in the children's reading room, ca. 1906 (source: NPS, Keweenaw NHP, Foster Collection Lib Card #151),

century. The population of Calumet likewise continued to increase during this period, and the new library had many patrons in its early years. Among the "best and most enthusiastic" of these were children, and librarians reported that children regularly lined up out the door to check out books and took over the main reading room. Around 1903, the smaller second-floor hall, which was originally programmed as a smoking room and gathering space, was repurposed as a children's reading room (figure 3-4). Whether this was entirely due to the children's enthusiastic patronage of the library, or if there were other factors involved, is unknown. Certainly, Alexander Agassiz had a deep and personal interest in education. Agassiz had graduated from Harvard and was an engineer and natural scientist, a background that served him in good stead in the copper mining industry. He continued to conduct research and publish academic papers throughout his life.

The concept for a children's library may also have been influenced by Alexander Agassiz's sister, Pauline Agassiz Shaw. Shaw was a philanthropist who focused her efforts on assisting the poor, especially children. She founded trade schools and developed a system of kindergartens in the Boston area and opened the nineteenth century equivalent of day care centers for the children of working

women. While research to date has not yielded any definitive evidence of Shaw's involvement in the Calumet and Hecla Library, given her close family ties to the company and her philanthropic work, it is not unreasonable to suggest that she may have taken an interest in the operation of the library and the provision of a children's library within the building.

A series of events in the early twentieth century led to the eventual closure of the Calumet and Hecla Library. Alexander Agassiz died in 1910, and several years later, the copper mining communities of the Keweenaw Peninsula were affected by a long and contentious strike in 1913-1914. Although the industry somewhat recovered during World War I, a combination of reduced demand and increasing costs related to the need to delve ever deeper to extract copper led to further economic problems for companies like Calumet and Hecla. The company purchased additional mines and looked at other ways to diversify their income in the 1920s and 1930s. A generation after the strike, the increased power of the unions and reduced profitability, among other factors, meant the company was unable and unwilling to maintain the degree of corporate paternalism it had in more prosperous years.

Despite the library's continued relevance and patronage, the Calumet and Hecla Mining Company made the decision to close the library in 1943. Aside from the company's need to relieve overcrowding in the general office building, other factors may have contributed to this decision. The company had recently changed management, with longtime superintendent James MacNaughton, who had been handpicked by Alexander Agassiz in 1901, retiring in 1941. The decline of the copper industry in Michigan had reduced profits for the company, and it was in the process of scrapping out much of its surface plant and equpment. Finally, the company was moving away from the corporate paternalism that had characterized earlier decades. The Calumet and Hecla workforce unionized in late 1942 (the last local copper mine to do so), and in the year preceding the successful unionization vote, the company had "strongly implied" that unionization would result in the loss of paternal benefits like low rents and utilites on company housing. In this context, the closure of the library may have been another company response to unionization.[3.9] The company paid to convert space in the high school to accommodate a much reduced collection of books, and remodeled the library into offices. Calumet and Hecla held on for another 25 years, finally ceasing operations in 1968, shortly after it merged with Universal Oil Products (UOP).

Following the closure of mining operations, UOP conceived an ambitious plan to redevelop former Calumet and Hecla properties into a tourist attraction called Coppertown USA, to include a museum, a monument to copper mining, festival plaza, motel, restaurant, and shops. Under this plan, the former C&H Library was rehabilitated to house the administrative offices, library, a reconstructed mining office and other exhibits, and community meeting and conference space. The library was formally opened by Coppertown USA in July 1975, and the program for the grand opening included a presentation by Arthur Thurner, a historian

3.9 See Larry Lankton, *Hollowed Ground: Copper Mining and Community Building on Lake Superior, 1840s-1990s* (Detroit, Michigan: Wayne State University Press, 2010) , 232-234 and Arthur Thuner, *Strangers and Sojourners: A History of Michigan's Keweenaw Peninsula* (Detroit, MI: Wayne State University Press, 1994), 263-264.



Figure 3-5. Detail from historic photograph of Calumet looking south from Superior Stack, 1893 (source: NPS, Keweenaw NHP, Foster Collection Lib Card #031]

who had visited the library as a child, about the history of the library.

Coppertown USA never came to fruition, with its primary accomplishments being the acquisition and rehabilitation of the library, and the creation of the Coppertown USA Mining Museum in the former Calumet and Hecla Carpenter Shop. Lake Superior Land Company, the real estate entity UOP established to manage the former C&H holdings, retained ownership of the former library building until 2001, when it was purchased by the National Park Service as part of the establishment of Keweenaw National Historical Park (KNHP). Like Coppertown USA, KNHP was initiated through local advocacy efforts to preserve and interpret Calumet's copper mining history, with the end goal of economic redevelopment through tourism. The park moved its museum, archives, and historical services to the building. Lake Superior Land Company office space was repurposed into storage and research rooms and offices for NPS staff. It remains in this use today.

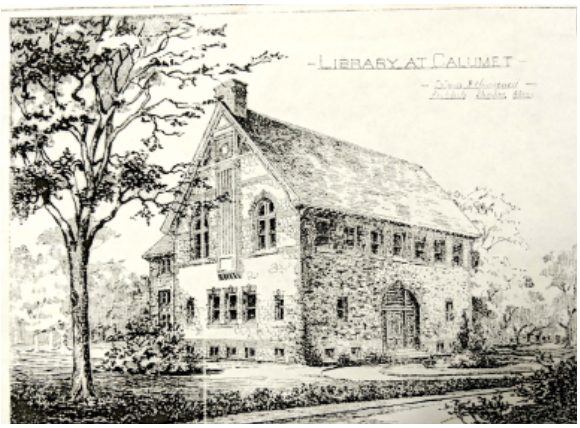


Figure 3-6. Library Rendering, 1896 (source: unattributed newspaper clipping, August 5, 1896).

Building History

Planning and Construction: 1895 to 1898

The first concrete evidence of planning for the Calumet and Hecla Library came in a letter written from Alexander Agassiz to S. B. Whiting, the general manager of the company in Calumet. Agassiz wrote in August of 1895 that he was "having plans worked up for erecting a public library next summer at Calumet on behalf of the company" and asked Whiting what he thought of a location opposite the general office and west of the Congregational Church (figure 3-5).[3.10] Whiting's answer may have been affirmative, as this was the site on which the library was eventually erected. In the 1880s and early 1890s, this area was occupied by several small frame houses that faced Mine Street, with rear yards extending east toward Calumet Avenue (US 41).

Boston architects Shaw and Hunnewell supplied the plans for the library sometime in late 1895 or early 1896. The company broke

3.10 Letter from Alexander Agassiz to S. B. Whiting, August 21, 1895, Calumet and Hecla Correspondence, Box 101/008.

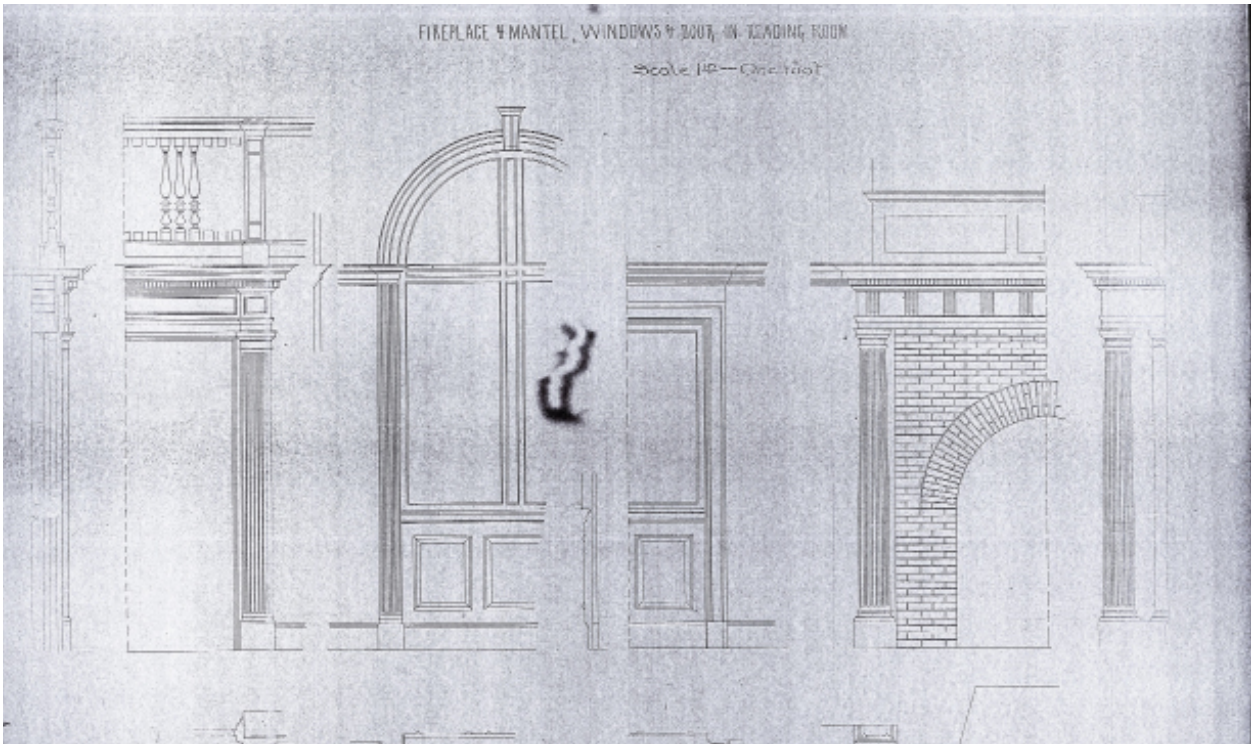


Figure 3-7. Shaw and Hunnewell Detail Drawing, 1896 (source: Keweenaw National Historical Park).

ground on the project in the summer of 1896, with an announcement and description of the project carried in the local newspaper, the *Copper Country Evening News*. The paper described the project as a "public library, reading-room and hall, with baths attached, for the benefit and use of their employees and their wives and families." A general description of the building was included, noting that the "building will be of stone, with brick quoins and of the same style of architecture (which, we understand, is the Mosaic) as the company's office on the other side of the road…"[3.11]

Although ground was broken in June, progress on the foundation was delayed until August because workers had to blast out the rock beneath the surface to create an area large enough to accommodate the building.[3.12] During this period, Whiting continued to correspond with Shaw and Hunnewell regarding some aspects of the project. Hunnewell visited the site in September 1896, where he was given a tour of the mine and taken underground to see the mine workings.[3.13] However, minor changes or refinements of the design were handled by Calumet and Hecla's in-house drafting department, who issued detailed drawings for elements such as the window sash, doors, and columns.[3.14] The company

3.11 "A Philanthropic Move." (unattributed newspaper clipping), June 9, 1896.

3.12 Unattributed newspaper clipping, August 5, 1896.

3.13 Letter from S. B. Whiting to Alexander Agassiz, September 16, 1896, C&H Correspondence, Box 158/100.

3.14 Letter from S. B. Whiting to Shaw and Hunnewell, architects, August 27, 1896, C&H Correspondence, Box 158/008;

was also working on details of the library's fixtures and furnishings, soliciting designs for the electrical fixtures from C. H. McKenney & Co. of Boston, and for a book stack from G. W. & F. Smith Iron Company, also of Boston. McKenney & Co. noted that the fixtures had been designed "expressly for a public library building." [3.15]

The end of the construction season came in late October of 1896. By that time, the library had been completed to the top of the second story window sills, with work proceeding only when the masons were available. [3.16] Work started up again in the spring of 1897, with the roof covered with slates (sourced from the Arvon slate quarry near L'Anse) and the windows installed over the summer. With the exterior completed, the focus of construction activities turned to the interior.[3.17] Marinette, Wisconsin-based Linden and Miller provided the interior wood finishes, and representatives of Calumet and Hecla corresponded with the company during the latter part of 1897 on finish details, such as the fluted pilasters and wainscoting. [3.18] The interior trim was specified as Norway pine, with doors of Southern pine, while the windows were white pine finished with boiled linseed oil and containing double-strength glass. Calumet and Hecla workers made the frames.[3.19]

The completion and opening of the library was anticipated throughout the first half of 1898, but kept being pushed back. A local newspaper reported in January 1898 that completion of the library was expected within a month, and even Alexander Agassiz spoke in a May 1898 report to the Calumet School Board that the building would be opened "in a few weeks." Some of the delays may have been due to changes in the interior designs. For example, in March 1898 the company issued a redesigned plan for the basement level baths which reduced the overall size and number of bathing rooms in the women's side and increased the facilities for the men.

By June, the company was still awaiting the installation of the electric fixtures and furniture. Late August and early September were taken up with last-minute difficulties in installing the book lift (figure 3-8), which was supplied by the Library Bureau, of Chicago, Illinois. Company workers apparently had difficulty in installing the apparatus, and Whiting blamed it on the wrong parts being sent, while the Library Bureau representative reminded Whiting that the contract had not included personnel to install the lift.[3.20]

3.15 To C&H Mining Company from CH McKenney & Co., October 14, 1896, C&H Correspondence, Box 114/118; From GW&F Smith Iron Co., Architectural Iron Work, Boston to Mr JH Lathrop, Chief Clerk, C&H, October 29, 1896, C&H Correspondence, Box 114/018.

3.16 Letter from S. B. Whiting to Alexander Agassiz, October 22, 1896, C&H Correspondence, Box 158/010. The company may have Italian masons, as many masons working for the company were Italian or of Italian heritage, according to company lists of employees by job category.

3.17 S. B. Whiting to Alexander Agassiz, May 18, 1897, C&H Correspondence, Box 158/010; S. B. Whiting to Alexander Agassiz, May 25, 1897, C&H Correspondence, Box 101/015; S. B. Whiting to Alexander Agassiz, June 22, 1897, C&H Correspondence, Box 158/010; S. B. Whiting to Alexander Agassiz, August 20, 1897, C&H Correspondence, Box 158/010.

3.18 Letter from Math Mehrens to Linden and Miller, November 2, 1897, C&H Correspondence, Box 128/010; S. B. Whiting to Linden and Miller, November 4, 1897, C&H Correspondence, Box 158/008.

3.19 "Inside Finishing Material," June 26, 1899, C&H Correspondence, Box 158/103.

3.20 "The New Library," unattributed article, January 22, 1898; Warinen to S. B. Whiting, February 7, 1898, C&H Correspondence, Box 101/015; Letter from George Meleney, August 25, 1898, C&H Correspondence, Box 114/014; Correspondence between S. B. Whiting and George Meleney, Library Bureau, September 1898, C&H Correspondence Box 114/014.

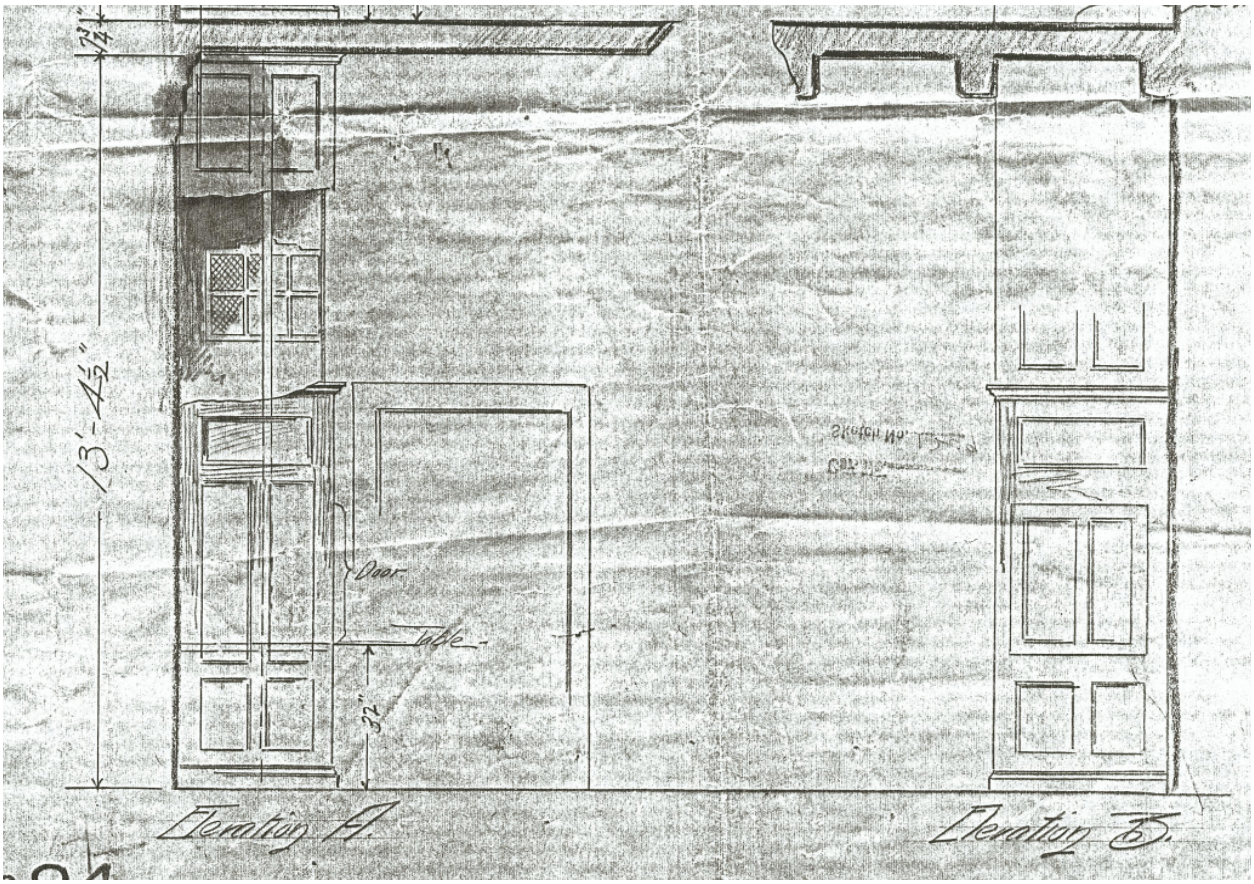


Figure 3-8. Detail of book lift drawing (source: Keweenaw National Historical Park).

The Calumet and Hecla Library finally opened on Saturday, September 17, 1898. This day was devoted to an informal open house for the community to see the new building. Workers and their families were invited to inspect the building, and the Calumet band played music to commemorate the event. The local press highlighted the rich furnishings, including oak and mahogany tables, and noted that the building would have so many electric lights that "a person will be able to see all the books at night as well as in the daytime." According to later reports, about 4,000 people came through the library during the open house.[3.21]

The library opened for full use the following Monday. The approximately 6,000 books were largely supplied by the company. Bertha Merrill, who had selected, purchased, and catalogued the books, was sent to Calumet to oversee the opening and initial months of operation. Although there had been some discussion at the beginning of the year that James James, the librarian of the district library, would have charge of the new library, Marie Grierson was appointed librarian when the building opened. Grierson would remain

3.21 Marie F. Grierson, "Calumet and Hecla Library," *The Mining Congress Journal*, October, 1931, 561-562.



Figure 3-9. Workers in front of the library, 1898 (source: NPS, Keweenaw NHP, Curto Collection, Album 1, #042).

the librarian for over 30 years. The bathing rooms in the basement also opened at the same time, although only 12 of the planned 25 were available at first. News of the opening was carried in the *Library Journal*, the national trade publication for librarians.[3.22]

Although the library was open for business, a few details remained to be completed, including installing a water heater, additional lighting fixtures, and blinds.[3.23] It quickly became apparent that having both library patrons and bathers entering together through the main doors was impractical. In November 1898, the company provided drawings to build a second entrance on the west elevation to give bathers direct access to the stairs to the basement on that side of the building. A new enclosed entry porch was designed and built, and new interior doors provided access from the porch to the stairwell (figure 3-10). In addition, the company requisitioned eight storm sash, likely for the windows in the new entry porch, in December 1898.[3.24]

Library Use and Alterations – 1899-1943

As with any new construction, the Calumet and Hecla Library experienced a shaking out period, where unfinished projects were completed and problems were corrected. In the summer of 1899, the area around the building was landscaped with woodbine and Boston ivy. C&H Boston librarian, Bertha Merrill, sent the plants, which she noted had been ordered through a landscape gardener, to Marie Grierson, with the caveat that she wasn't sure if the ivy would grow in Calumet. She noted that George Flagg (the company's treasurer in Boston) recommended putting the ivy on the most sheltered side of the building (the east side of the stack wing facing Calumet Avenue), but that if it failed, the woodbine would likely do well. Merrill also passed along directions for planting, noting that the landscape gardener had said that the ivy would have a "good deal better chance" of surviving if they were planted close together, as "they like company, as people do." Merrill also expected Grierson to visit her in Boston, indicating again the extent of communication and sharing between the Boston and Calumet branches of the company.[3.25]

Grierson occasionally wrote to company officials to request alterations. In November 1899, she observed that the stack room was very dark in the late afternoon, and asked if it would be convenient to turn the lights on as

3.22 "A Boon to the Community." *Copper Country Evening News*, September 16, 1898; *The Library Journal*, October 1898, 587.

3.23 Ramsey to Merton, September 27, 1898, C&H Correspondence Box 128/010; C&H Cash Ledger, October 1898, 424/007; C&H Cash Ledger, November 1898, 424/007.

3.24 Memorandum from James M.Master to Linden and Miller, dated December 10, 1898, C&H Correspondence, Box 128//010.

3.25 Bertha Merrill to Mrs. Grierson, May 12, 1899, C&H Correspondence Box 101/113.



Figure 3-10. Library north and west elevations after installation of west entry, ca. 1898 (source: NPS, Keweenaw NHP, Curto Collection, Album 14, #042).

early as three o'clock. The following summer, Calumet and Hecla introduced electrical service during the day as well as at night, and the local press noted that it was particularly welcome in the library, where the stack room was so often dark that patrons and staff couldn't see.[3.26]

Reports in the early years of the library suggest that it was increasingly popular. Significant additions to the collection were made during this period, with the collection growing from 6,000 volumes at its opening to over 18,000 by 1903. Some of the most oft-cited additions included foreign periodicals and books, both foreign-language translations of American works and European literature in its native language, and photographic reproductions of works of art. An article in the *Hancock Evening Journal* claimed that for the year 1901, the Calumet and Hecla library was fourth in circulation in the state, behind Detroit, Grand Rapids, and Jackson.[3.27]

3.26 Grierson to Whiting, November 25, 1899, C&H Correspondence, Box 101/013; "C&H Starts a Day Service," unattributed newspaper clipping, August 31, 1900.

3.27 "The C&H Library," *Copper Country Evening News*, May 11, 1899; "Calumet-Hecla Library," *Hancock Evening Journal*, November 26, 1902.



Figure 3-11. East elevation of the library, ca. 1900 (source: NPS, Keweenaw NHP, Foster Collection, Lib Card #399).

Among the "best and most enthusiastic patrons" of the library were children. Librarians reported that it was a regular occurrence for children to line up from the assistant's desk out to the hall and down the storm shed almost to the street. The children were also apparently taking over the reading room, where they enjoyed sitting around the fire.[3.28] This may have resulted in plans to turn the second floor room adjacent to the reading room into a dedicated children's reading room. Photographs dated to 1903 in



Figure 3-12. Library west and north elevations during winter, showing storm shed off main entry, ca. 1906 (source: NPS, Keweenaw NHP, Foster Collection, Lib Card #129).

the librarian's handwriting seem to indicate that the change took place around this time.

Drawings dated 1905 and 1906 detail a number of changes to the building interior. On the first floor, the men's coat room, to the east of the main entrance, was repurposed as a book repair room, while the women's coat room on the opposite side now contained the extensive picture collection. On the second floor, in addition to repurposing the south wing hall to a children's reading room, the curved desk partition in the main block between the adult reading room and the so-called "special room" was removed, and a new case was installed in the special room's southwest corner. At the gallery, new shelving was installed, and the arched opening looking out onto the main reading room was enclosed with wood framing, trim, and divided light windows. Detail drawings also note the addition of "cork carpet" in the children's room and gallery.

Another change documented in these drawings is reconfiguration of the desk in the delivery room. The original (1896)

3.28 "Children Patronize the Library," *Daily Mining Gazette*, undated, but ca. 1903. This was confirmed in oral history interviews with people who as children had visited the library in the 1910s and 1920s; they noted that the fireplace was a treat, especially in the winter.

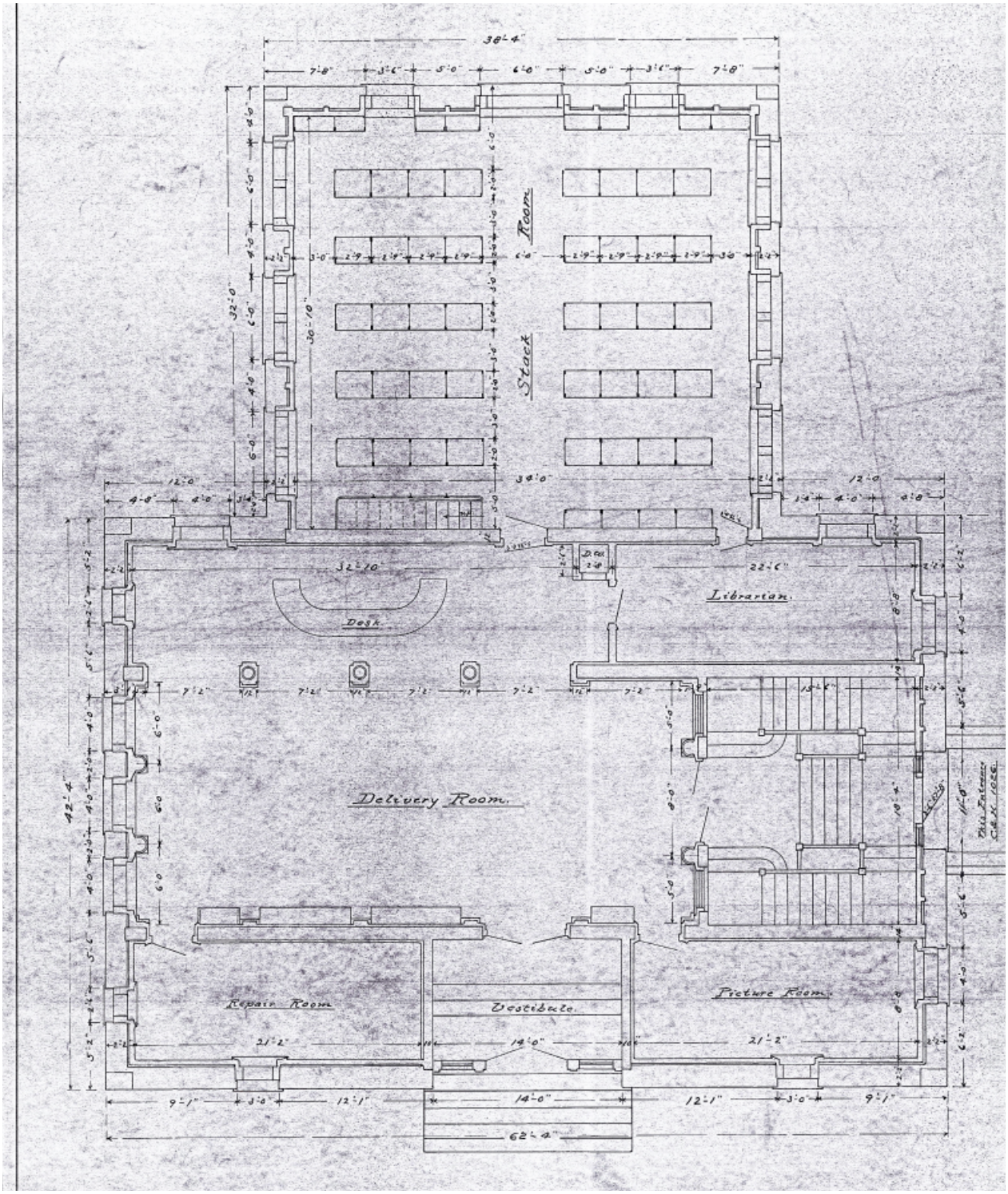


Figure 3-13. First floor alterations, dated 1905 (source: Keweenaw National Historical Park).

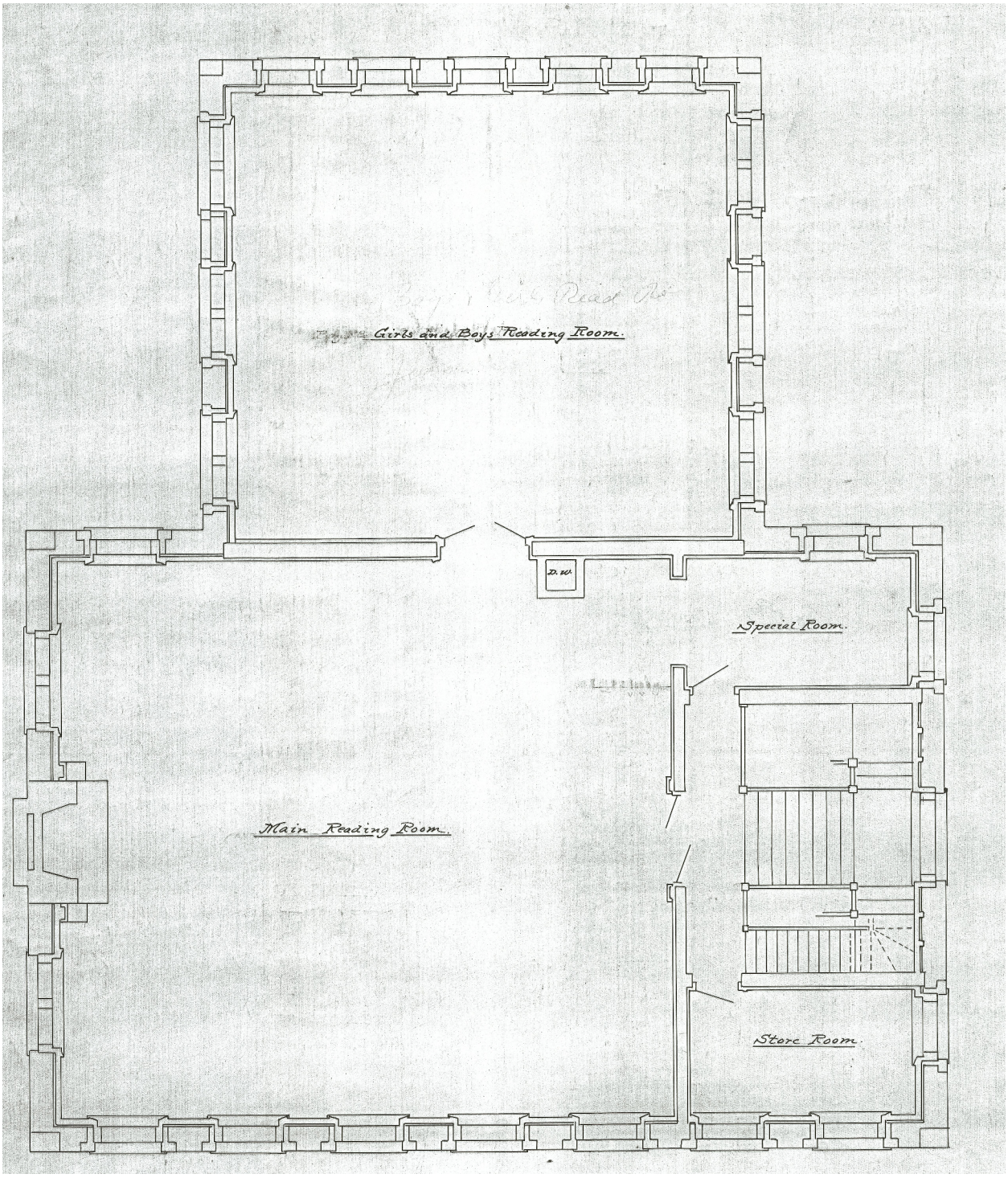


Figure 3-14. Second floor alterations, dated 1905 (source: Keweenaw National Historical Park).



Figure 3-15. Delivery room, dated 1903 (source: NPS, Keweenaw NHP, Foster Collection, Lib Card #091).

drawing for the first floor shows a wall and desk across the southeast end of the delivery room that divided it from the catalogue room and the door to the first floor library stacks. The 1905 drawing (figure 3-13) depicts this wall removed and a semi-circular desk in the catalogue room space (see also figure 3-15). There is some question whether this alteration took place in 1905/1906 or was a change during initial construction in 1896-1898. One article written at the time of the library's opening mentioned that the library had open stacks, which may not have been compatible with the wall/desk as documented on the original drawings. There is also no ghosting of this wall/desk visible in photographs of the period or on the historic woodwork that remains in place today.

The sequence of flooring in the library is also bit uncertain during this period. Some interior photographs clearly show highly varnished wood plank floors in the adult and children's reading rooms, while in others, there appears to be a dull matte covering of some kind, perhaps the referenced cork flooring. One image of the main reading room has wood flooring with a runner of some kind (figure 3-16). On the first floor, photographs of the delivery room after the alterations clearly show the cork or linoleum flooring in place. The dating of the photographs may also



Figure 3-16. Main Reading Room, ca 1905 (source: NPS, Keweenaw NHP, Coppertown Collection).

be inaccurate. In addition to the 1905-1906 alterations to the interior, iron window grilles were installed over the basement windows around 1907.

The next major changes to the library took place in 1911-1912. As early as 1907, the company began planning for the construction of a separate bathhouse. The baths were popular with Calumet residents, particularly in the summer, when some residents visited several times a week to enjoy the cool water.[3.29] In response to a request for information from James MacNaughton, who had replaced S. B. Whiting as superintendent in 1901, Marie Grierson reported that she thought a standalone bathhouse would be in greater demand than the facilities in the library basement. She cited the inadequate water supply and a lack of suitable facilities on the women's side, which had been reduced in favor of more room for the men's baths.[3.30] Two years later, she reiterated that a separate bathhouse would be preferable. This time, she noted in addition that the baths were a "nuisance" to the library and that if the baths

3.29 *Copper Country Evening News*, July 24, 1909.

3.30 Grierson to MacNaughton, February 19, 1907, C&H Correspondence, no box/folder number.



Figure 3-17. Children's Reading Room, ca. 1911 (source: NPS, Keweenaw NHP, Foster Collection, Lib Card #350).

were removed, the library would benefit from the extra space in a remodeled basement.[3.31]

After the company opened a new bathhouse in December 1911, the library was remodeled to capture the basement for library use. The stack room was extended to the basement and connected to the first floor stack room with a stair; the book elevator was also extended to the basement, although it is unclear if it was a "noiseless" lift run by electricity as Grierson had requested. The east end of the basement housed a large book repair room, and a packing room occupied the space between it and the stairs. Along the north wall were storage rooms and a women's toilet and coat room, while a janitor's room was installed in the southwest corner.

At the upper floors, it is unclear which of Grierson's requested changes were implemented. These included installing signals between the floors and telephone

3.31 Grierson to MacNaughton, November 17, 1909, C&H Correspondence, no box/folder number.



Figure 3-18. North elevation showing new entry porch and enlarged windows, ca. 1930 (source: NPS, Keweenaw NHP, Curto Collection, Album 14, #043).

connections between the rooms, a new ventilation system, enlarging the basement windows, and a rest and lunch room for employees on the second floor. Several of her suggestions were implemented, either at this time or in the following years. One of these was to put in larger windows in the "technical room" northeast of the delivery room, likely the book repair room shown on the 1905 drawings. Historic photographs show that both of the first floor window openings flanking the north entrance were enlarged from single units to paired ones sometime between about 1910 and 1930 (figure 3-18).

Grierson had also requested a number of exterior changes. These included changing the front door to open outward, installing an exterior landing (the original door opened directly onto the stairs), and constructing a shelter over the doorway to provide shelter from the elements. Possibly around 1917, the stairs were replaced and a gable roofed hood installed over the door (figure 3-18). [3.32] In 1913, Grierson wrote to MacNaughton that "the re-arranged building is much more convenient than it was before, and we are using all the space," but that "we need more heat in our basement stack." [3.33]

Under Grierson's leadership, the library remained popular with the residents of Calumet. In 1916, the library had over 42,000 volumes, as well as extensive collections of public documents, pictures, clippings,

3.32 "Library – Proposed Changes." Library Folder, 210.
3.33 Grierson to MacNaughton, October 28, 19193, C&H Correspondence, Box 047/485.

photographs, maps, and periodicals. The library even maintained a case of mineral specimens, very appropriate given its connection to the mining company. Librarians counted over 282,000 visits, over 90,000 of those using the reading room.[3.34] After nearly 32 years as head librarian, Marie Grierson retired in July of 1930, succeeded by Geneva Rabey.[3.35]

The Calumet and Hecla Mining Company announced in September 1943 that it would close the library. The company cited overcrowding in the main office, noting the "steady increase in office workers, due to the necessity of conforming to Government regulations and filing countless reports, and due to the rapid expansion of the Company's operations..." The company claimed that the library was the "only available building."[3.36] Indeed, the headquarters building had been overcrowded since a fire in February 1936 destroyed an office building on Mine Street that had housed a number of the company's departments, including the geology department.

The Calumet public school board met to consider the problem of the lack of a public library in the community, and decided to establish a library on the first floor of the east wing of the high school building. While the space would be much smaller and not at all comparable to the facilities offered at the Calumet and Hecla Library, the company did offer to donate most of the library's books that it owned and the movable library equipment to the new space, and also would pay for the necessary alterations in the high school and the cost of moving the books.[3.37] The company did retain some technical books and materials of interest to the company's history, and donated about 2,400 books and bound newspapers to Michigan Technological University.[3.38] Since the new library did not have as much room, teachers and librarians selected the books to be kept from the old library (about 21,000 from a collection that had grown to over 50,000). With the company no longer supporting staff and operating costs, the voters of Calumet approved a three mill tax to fund the relocated library.[3.39]

Office and Later Use: 1944-2000

Remodeling the library for office use took place during the first half of 1944. The program for the building included offices for company president John Petermann and others on the first floor, room for the geological department in the basement, and meeting space on the second floor. In the basement, a large room was created from the former packing and book repair rooms, and two smaller rooms from the book repair room to accommodate the geological laboratory. The former stack area became a large drafting room with three new offices along the south wall. An exterior vault addition was constructed off the center bay of the stack wing's west wall, accessed through a basement-level new door opening on the west facade. A decorative ball and stick partition that had formerly divided the vestibule at the bottom of the stairs was shown to be

3.34 *Calumet and Hecla Semi-Centennial Edition of the Keweenaw Miner*, 1916; Marie F. Grierson, "Calumet and Hecla Library," *The Mining Congress Journal*, October, 1931, 561-562.

3.35 "Offices to Occupy Library Building," [C&H Newsletter], November 1943, 1.

3.36 "Offices to Occupy Library Building," *Calumet and Hecla News and Views*, November 1943, 1.

3.37 "C&H Library to Close; High School will House Books," *Daily Mining Gazette*, October 6, 1943, 6; Public Schools of Calumet, MI, Record of Minutes, October 12, 1943.

3.38 "C&H Gives 2,400 Books, Many Files Newspapers to Tech," *Daily Mining Gazette*, March 20, 1944, 2.

3.39 "Need for Voting Funds for Public Library Stressed," *Daily Mining Gazette*, November 9, 1943, 6.



Figure 3-19. Gallery in use as office space, ca. 1945 (source: NPS, Keweenaw NHP, Foster Collection, Series 2).

removed on the 1944 alteration drawings, but it actually remained in place into the 1960s.

At the first floor, drawings show the former delivery room divided into a lobby, a large office for the president, and a smaller office for the president's stenographer in the area formerly occupied by the library desk. For this purpose, wood-framed walls were constructed between the freestanding columns. While this arrangement does reflect the current layout of this part of the first floor, it is unclear if the president actually occupied this office. Dolores Capello, who worked for Calumet and Hecla and then the Lake Superior Land Company during this period, stated that the president's office was in the far southeast corner of the south wing.

A small coat room was also added on the south wall of the lobby adjacent to the stairs. The library stacks and mezzanine were removed from the stack room and the space adapted for the legal department, research director, and chief geologist, with two offices on each side flanking a central corridor. As part of this work, the center window on the south wall was reconfigured to accommodate the construction of corridor walls. The second floor layout remained much the same, with the main reading room repurposed as meeting space, the children's reading room as a drafting room, and the gallery as an open office (figure 3-19). The cost to remodel



Figure 3-20. North elevation during Coppertown USA use, ca. 1975(source: NPS, Keweenaw NHP, KHVM - ACC KEWE-00180).

the library was just over $24,000, and was completed by September of 1944. [3.40]

The former library remained an office building for Calumet and Hecla for just under 25 years. In 1968, the company ceased mining operations after its merger with Universal Oil Products (UOP). The building then housed the local offices of UOP's real estate branch, the Lake Superior Land Company, which was itself Calumet and Hecla's former land branch. It was around this time that the north half of the double stair was reportedly removed at the basement level to accommodate the installation of a large cast-iron boiler, in order to remove the building from the central steam system, which was shut down.

During the Coppertown USA era, a preservation study was undertaken for the building in 1975 in preparation for its conversion to administrative, library, and exhibit space. This study noted that the original slate roof was still in place, but that the original fixtures were all gone except for those in the gallery. Coppertown USA received a grant from the National Park Service to

3.40 Calumet and Hecla Cost Sheets, letter from Chief Clerk dated September 5, 1944.

restore the library, with additional assistance pledged from UOP.[3.41] The slate roof was likely replaced at this time with an asphalt shingle roof.

NPS Acquisition and Use: 2000-present
Since acquiring the building, the NPS has undertaken a series of projects to restore the building, adapt areas for new, compatible uses, and perform needed maintenance. In 2003, the south wing of the basement was remodeled for storage and workspace for the park's archival collections. The 1944 partition walls were removed and stored, and a compact storage system installed. A mechanical overhaul took place in 2007-2008, encompassing the removal of the heating system boilers, pumps, and controls, plumbing fixtures, non-historic light fixtures and exit lights. New high efficiency boilers and unit heaters were installed, and a dedicated basement mechanical room was created, which also housed a new water heater. On the first floor, a new restroom and cloak room was installed in the northwest corner room. These rooms included new lighting, lockable storage and a drinking fountain.

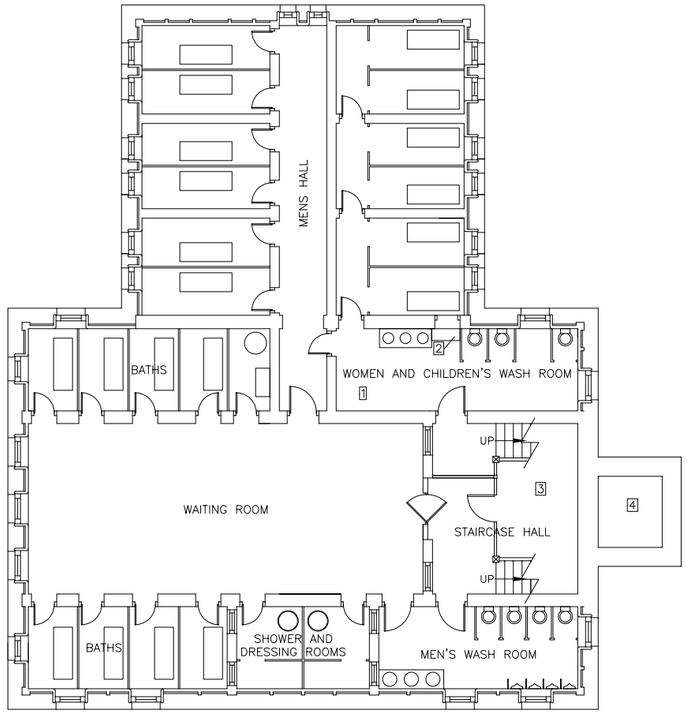
The windows underwent a complete restoration in 2010, including rehabilitating 125 historic wood windows, fabricating additional window sash where the originals were missing, and adding new custom storm windows and hardware. This project was followed in 2012 by replacement of the roof with a new asphalt roof (NPS originally planned to install a slate roof to match the historic roof, but opted for asphalt due to concerns about performance issues of material in the cold climate). The project also included re-roofing the north entrance door hood and the west entrance vestibule, as well as restoring the roof woodwork and trim and painting it to match the original colors. In the same year, the primary first floor spaces were painted. More recent work includes masonry exterior restoration in 2016, encompassing mortar repointing, and masonry and mortar cleaning, as well as the repair of the basement metal window grilles and stair handrails. Some non-contributing cedar trees around the building foundation were removed as part of this project. In 2017, comprehensive electrical upgrades included new electrical service, new distribution wiring, new devices (outlets and switches), and new LED light fixtures and exit lighting throughout.

3.41 "Copper Country History to Come Alive at Coppertown USA," MTU *Lode*, April 9, 1975, 9.

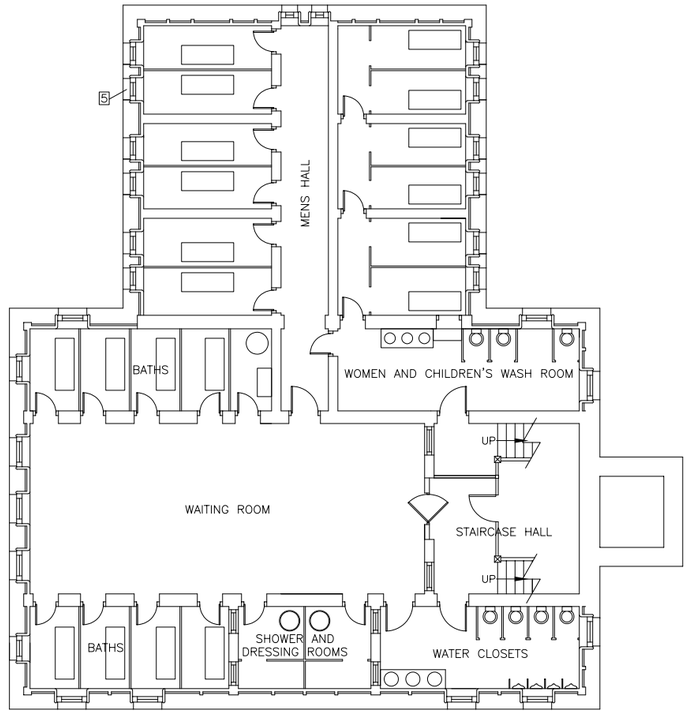
C&H LIBRARY CHRONOLOGY SUMMARY

YEAR	EVENT
1864	Start of Calumet and Hecla Mining Company Period of National Significance
1871	Merger of Calumet and Hecla companies
1896	Start of construction of library
1898	Construction complete, library opened
1898	West vestibule added post-opening
1903	Smoking room converted to children's reading room
1906	Possible Delivery Room reconfiguration
1906	Gallery enclosure
1907	Iron grilles at basement windows
1912	Removal of bath house function
1912	Steel beams added at removed basement masonry walls
1917	(ca.) Roof over entry stair; steps replaced
1917	(ca.) North window enlargement
1923	(Pending) End of C&H Mining Company Period of National Significance
1943	Library closed by C&H
1944	Conversion to office function for C&H
1944	Remodel - stacks removed from south wing
1944	Remodel - four offices in south wing
1944	Remodel - division of Delivery Room
1944	Remodel - partition of basement south wing
1944	Vault addition
1954	Modifications to Room 112
1954	Partition of Rooms 108-110
1968	C&H Mining Co ceased operations
1970s	(ca.) Removal of north run of stair in basement
1975	Office space for LSLC and Coppertown USA
1989	National Historic Landmark nomination
2000	Pre-acquisition Hazmat survey
2002	NPS purchase of structure
2003	Removal of partitions in south basement
2003	Installation of storage system, basement
2007	Fire suppression system added
2008	Mechanical overhaul
2008	Dedicated mechanical room in basement
2008	Restroom/cloakroom on first floor
2010	Window rehabilitation
2012	Attic insulation replacement
2012	Roof replacement
2012	Exterior woodwork restoration and painting
2016	Masonry restoration
2017	Electrical system upgrade

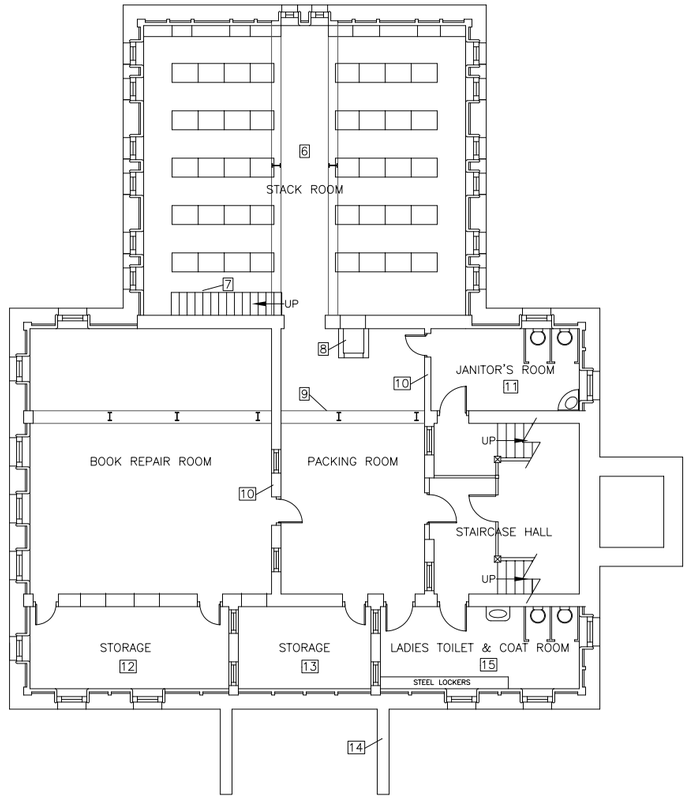
Chronology Drawings



1 CH0.1 C&H PUBLIC LIBRARY – BASEMENT FLOOR PLAN, 1898 AS BUILT
SCALE A



2 CH0.1 C&H PUBLIC LIBRARY – BASEMENT FLOOR PLAN, AS OF 1907
SCALE A



3 CH0.1 C&H PUBLIC LIBRARY – BASEMENT FLOOR PLAN, AS OF 1917
SCALE A

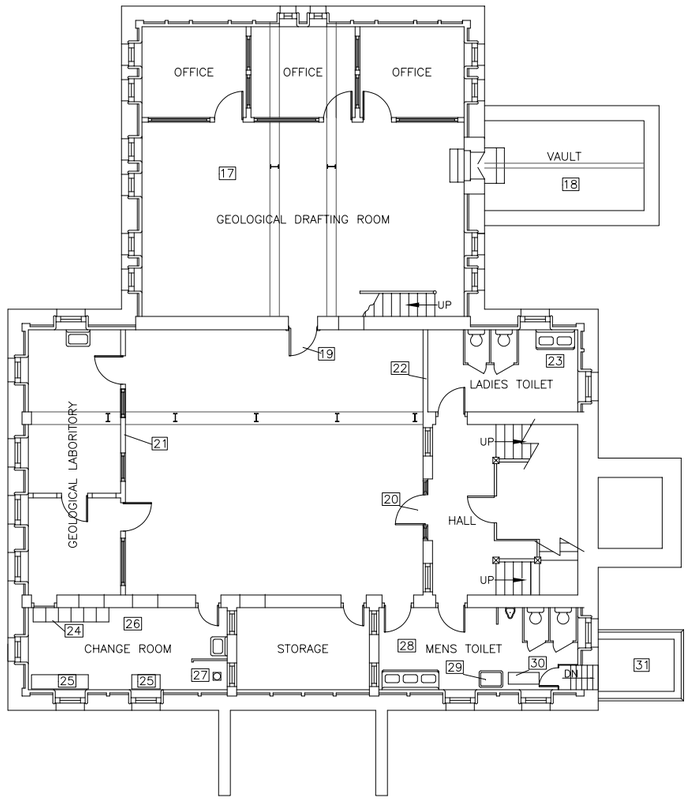
NOTES:

1. Original Shaw & Hunnewell drawings indicate larger women's and children's bathing facilities. Drawings were revised during construction and built as shown.
2. Transformer
3. Storage under stairs
4. Second entrance added for bathhouse access after construction completed. Foundation shown here.
5. Iron grilles added to basement windows
6. Bathhouse removed. Basement repurposed for library functions
7. Stair connecting basement and first floor stack rooms added
8. Dumbwaiter for books extended to basement
9. Wall removed, steel columns and beam added in its place
10. Partition wall added/moved
11. Women and children's washroom repurposed as janitor's room. Fixtures added
12. Men's baths repurposed as a storage room
13. Men's shower and dressing rooms repurposed as a storage room
14. Front entry steps replaced. Footings shown here
15. Men's toilets repurposed as women's toilets. Fixtures moved

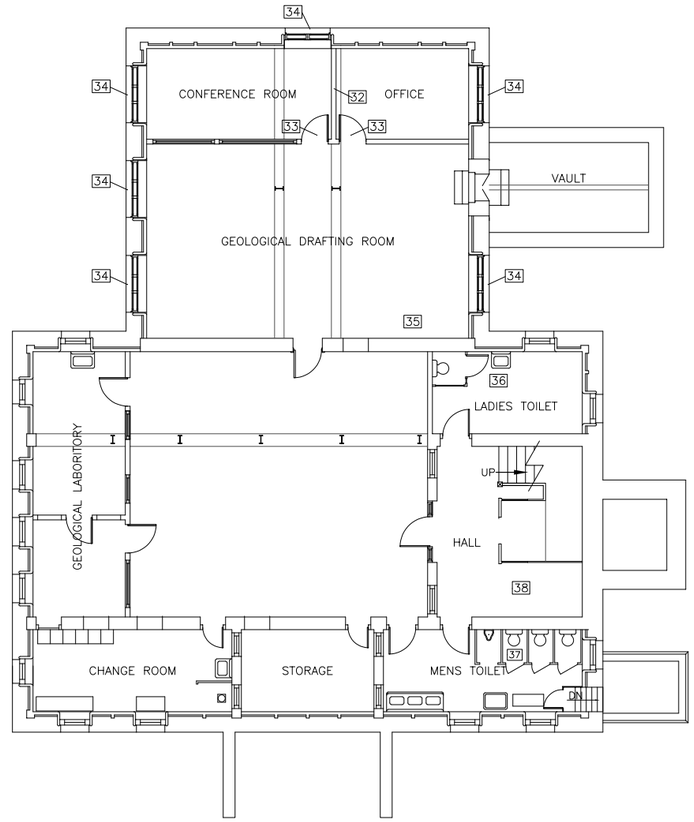
SCALE A 16 0 16 32
SCALE OF FEET

NOT FOR CONSTRUCTION

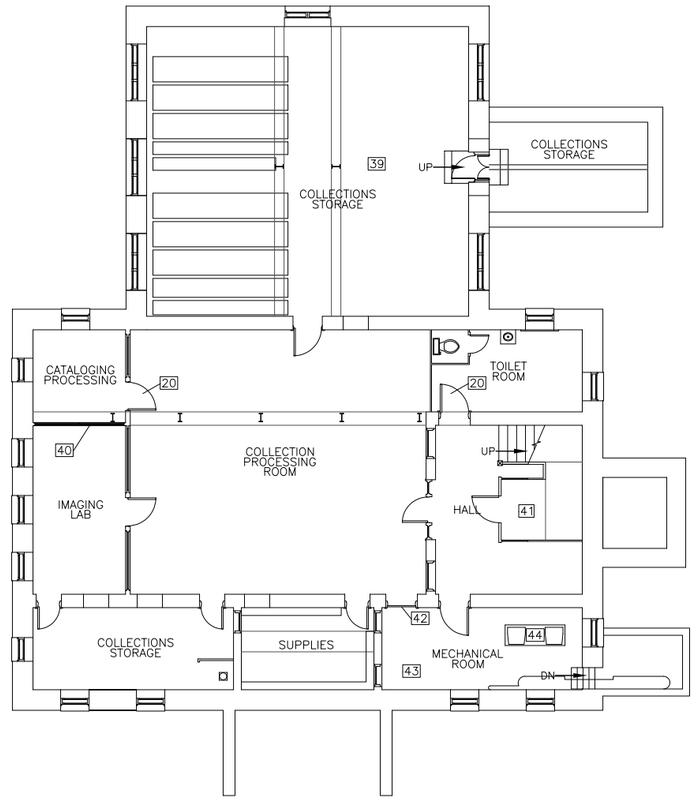
DESIGNED: LHM	SUB SHEET NO.	TITLE OF SHEET	DRAWING NO.
CADD SH	CH0.1	PART 1–CHRONOLOGY PLANS BASEMENT PLANS 1	X XXX
TECH. REVIEW: EMH			PMIS/PKG NO. 237234
DATE: 11/1/2019		CALUMET & HECLA PUBLIC LIBRARY KEWEENAW NATIONAL HISTORICAL PARK	SHEET 1 OF 7



1 CH0.2 C&H PUBLIC LIBRARY – BASEMENT FLOOR PLAN, AS OF 1944
SCALE A



2 CH0.2 C&H PUBLIC LIBRARY – BASEMENT FLOOR PLAN, AS OF 1968
SCALE A



3 CH0.2 C&H PUBLIC LIBRARY – BASEMENT FLOOR PLAN, AS OF 2008
SCALE A

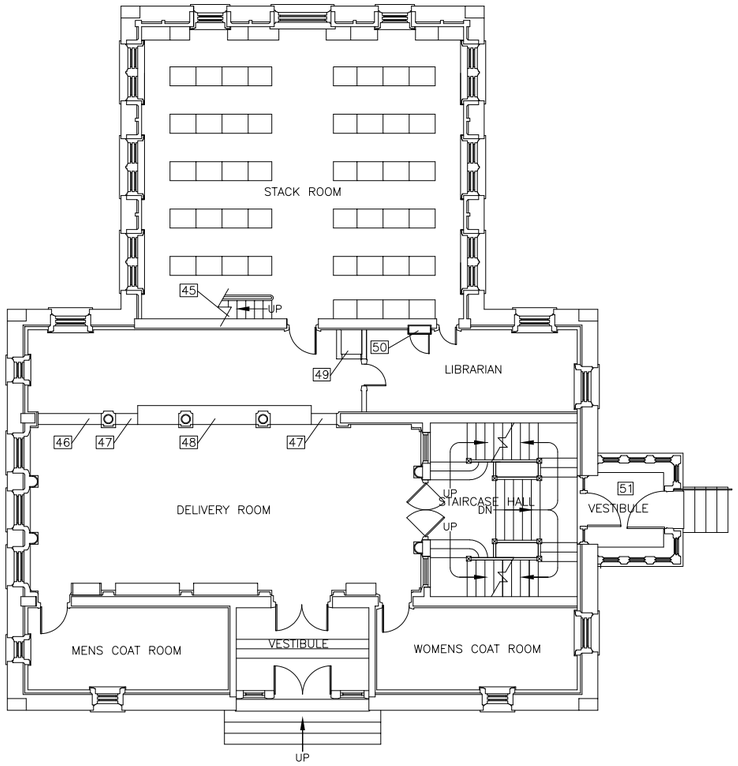
NOTES:

10. Door swing changed.
16. Library closed and converted to office function for Calumet & Hecla.
17. Stacks removed. Partition walls added to create three offices and a geological drafting room.
18. Vault with basement access added.
19. Door added
20. Door swing changed.
21. Partition walls added to create geological laboratory.
22. Door removed.
23. Janitor's closet repurposed as women's toilet. Plumbing fixtures moved.
24. Lockers
25. Bench
26. Storage room repurposed as change room with shower.
27. Shower
28. Women's toilet repurposed as men's toilet.
29. Janitor's sink
30. Hot water tank above
31. Pit for steam heating connection. Unknown construction date
32. Partition walls removed. One partition wall added. Three offices converted to one office and one conference room.
33. Doors relocated.
34. Windows altered.
35. Stair removed.
36. Toilet removed. Remaining toilet moved.
37. Toilet added.
38. North run of stair removed between basement and entry levels, to make room for boiler.
39. South room converted to collections storage. Partition walls removed and high–density storage system installed.
40. Partition wall moved.
41. Under–stair storage dedicated to janitor.
42. Door not operable.
43. Men's toilet repurposed as mechanical room.
44. Boilers installed

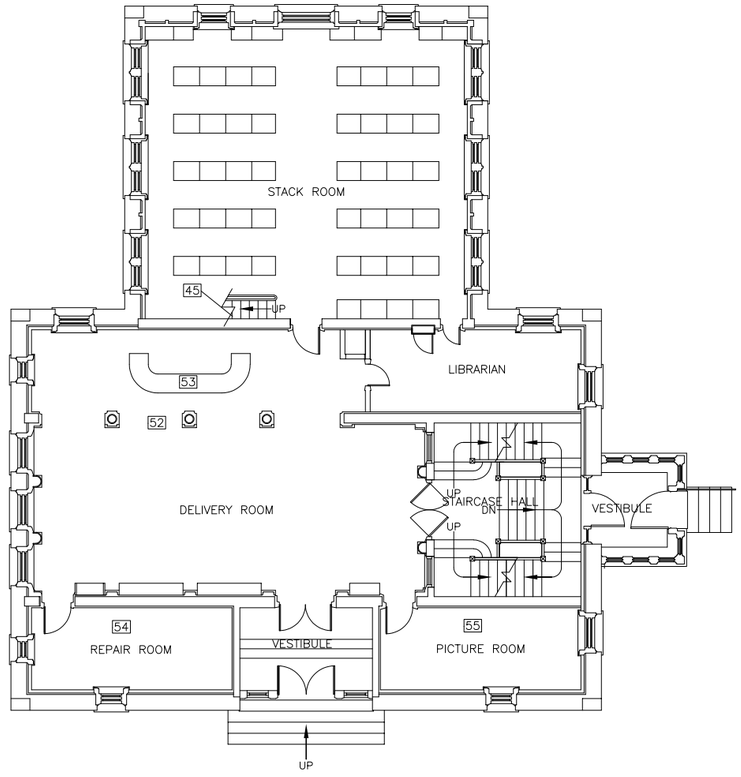
SCALE A 16 0 16 32
SCALE OF FEET

NOT FOR CONSTRUCTION

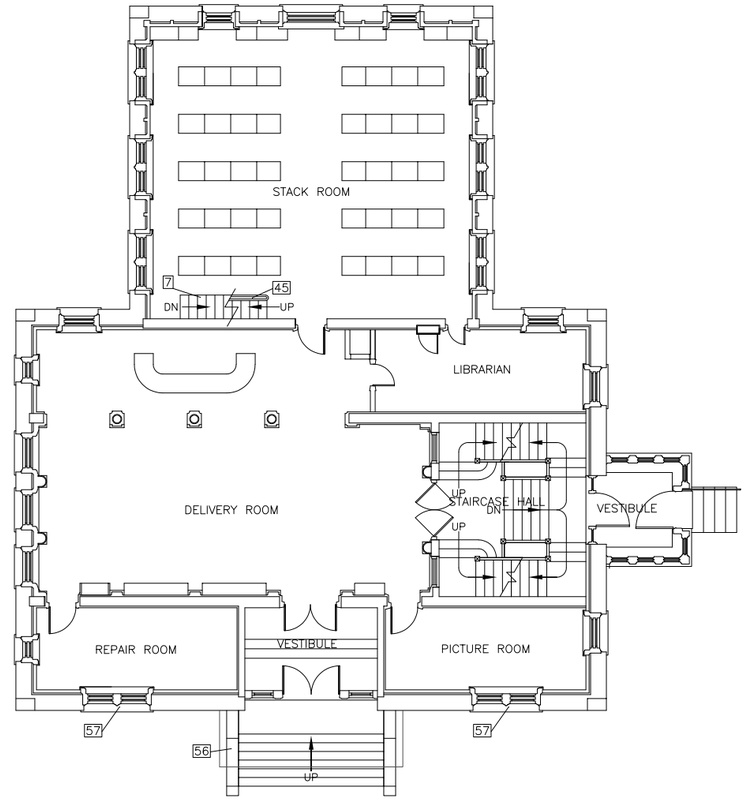
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TECH. REVIEW: EMH		CALUMET & HECLA PUBLIC LIBRARY KEWEENAW NATIONAL HISTORICAL PARK	PMIS/PKG NO. 237234
DATE: 11/1/2019			SHEET 2 OF 7



1 CH1.1 C&H PUBLIC LIBRARY – FIRST FLOOR PLAN, 1898 AS BUILT
SCALE A



2 CH1.1 C&H PUBLIC LIBRARY – FIRST FLOOR PLAN, AS OF 1907
SCALE A



3 CH1.1 C&H PUBLIC LIBRARY – FIRST FLOOR PLAN, AS OF 1917
SCALE A

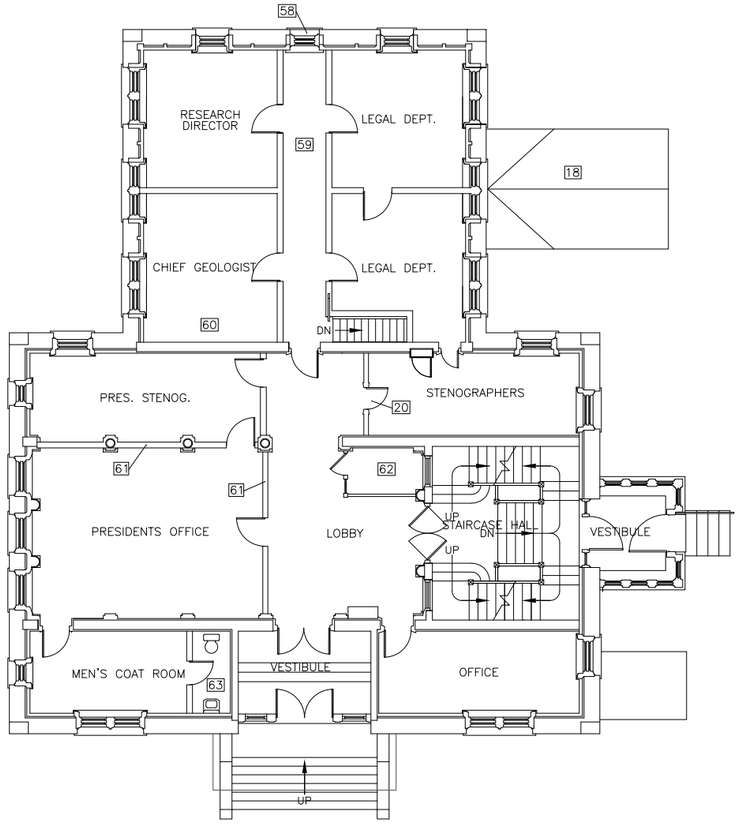
NOTES:

7. Stair connecting basement and first floor stack rooms added
45. Stair to intermediate stack level.
46. Half wall, same height as desk
47. Hinged counter for pass–through
48. Desk
49. Dumbwaiter for books
50. Electrical chase cabinet
51. Second entrance added for bathhouse access after construction completed.
52. Original desk and half–wall removed
53. Semi–circular desk installed
54. Men's coat room repurposed as book repair room
55. Women's coat room repurposed as picture collection room
56. Front entry steps replaced; gable roof added over entry
57. North windows enlarged

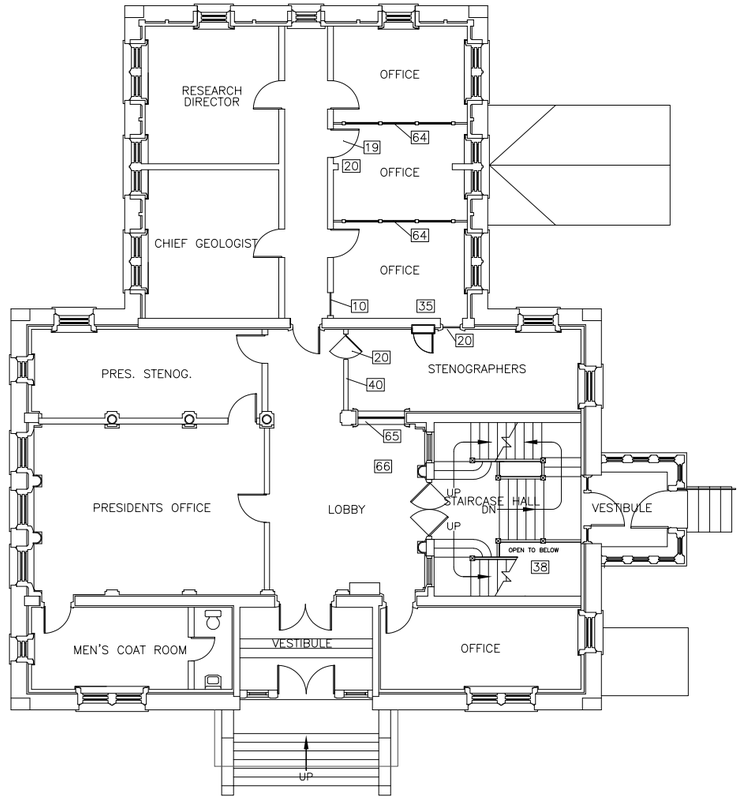
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SCALE OF FEET

NOT FOR CONSTRUCTION

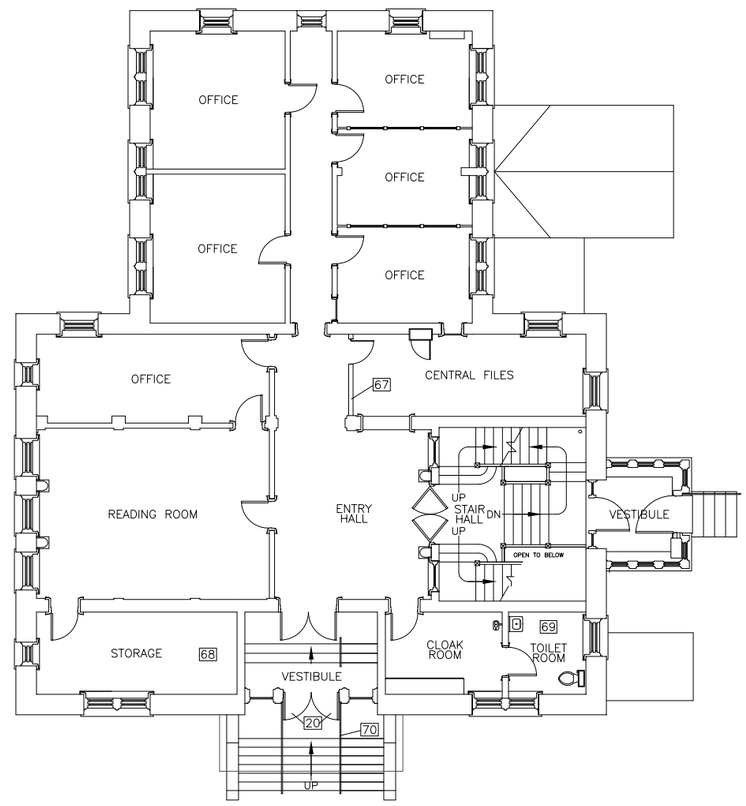
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		CALUMET & HECLA PUBLIC LIBRARY KEWEENAW NATIONAL HISTORICAL PARK	PMIS/PKG NO. 237234
			SHEET 3 OF 7



1 CH1.2 C&H PUBLIC LIBRARY – FIRST FLOOR PLAN, AS OF 1944
SCALE A



2 CH1.2 C&H PUBLIC LIBRARY – FIRST FLOOR PLAN, AS OF 1968
SCALE A



3 CH1.2 C&H PUBLIC LIBRARY – FIRST FLOOR PLAN, AS OF 2008
SCALE A

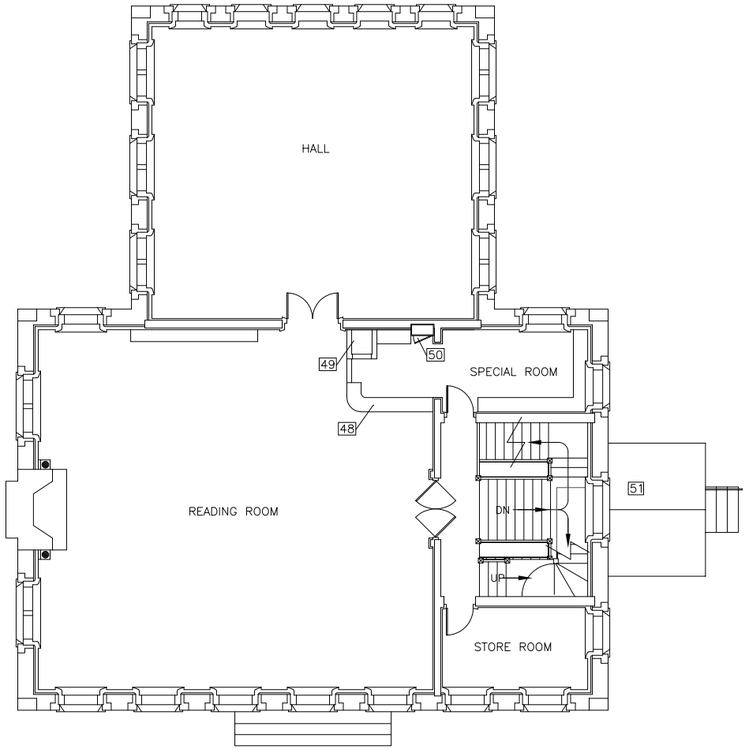
NOTES:

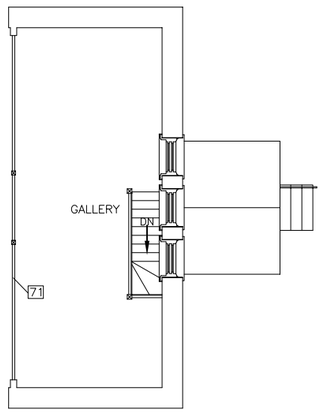
10. Door swing changed.
18. Vault with basement access added
19. Door added
20. Partition wall removed
38. North run of stair removed between basement and entry levels.
58. Window altered
59. Stacks removed; partition walls added to create offices and corridor
60. Intermediate stack level and stairs removed
61. Partition walls added to create president's office and president's stenographer's office
62. Coat room added
63. Men's toilet added
64. Partition walls added to create three offices
65. Receptionist window added
66. Coat room removed
67. Partition wall replaced with half wall
68. Toilet room removed
69. Accessible Toilet room added
70. Stair railings added

SCALE A 16 0 16 32
SCALE OF FEET

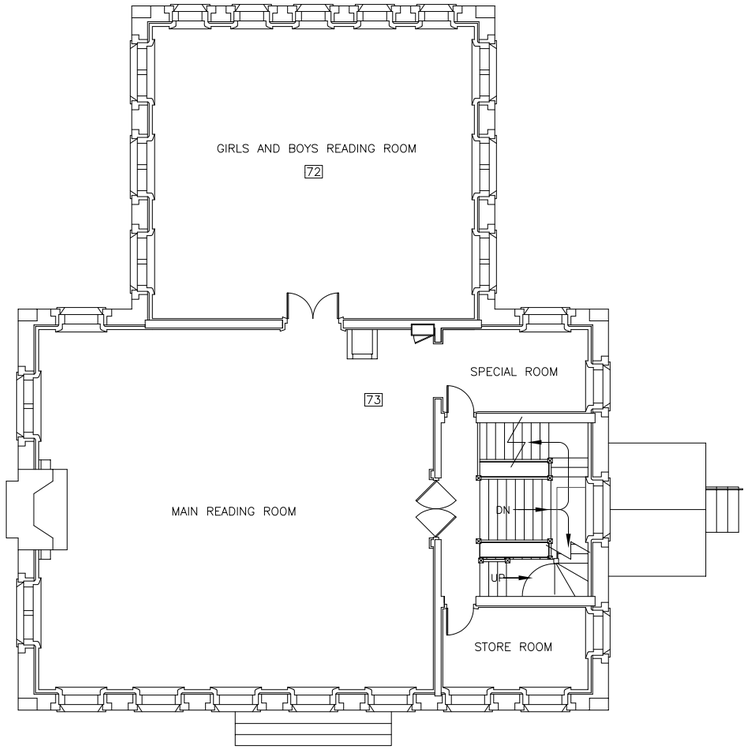
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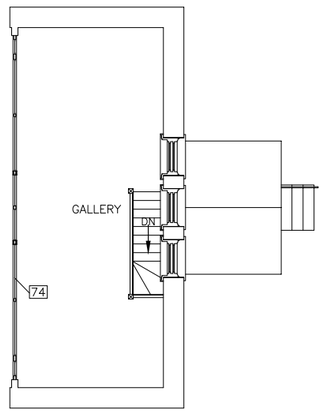
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TECH. REVIEW: EMH		CALUMET & HECLA PUBLIC LIBRARY KEWEENAW NATIONAL HISTORICAL PARK	PMIS/PKG NO. 237234
DATE: 11/1/2019			SHEET 4 OF 7





1 CH2.1 C&H PUBLIC LIBRARY – SECOND FLOOR PLAN, 1898 AS BUILT
SCALE A





2 CH2.1 C&H PUBLIC LIBRARY – SECOND FLOOR PLAN, AS OF 1907
SCALE A

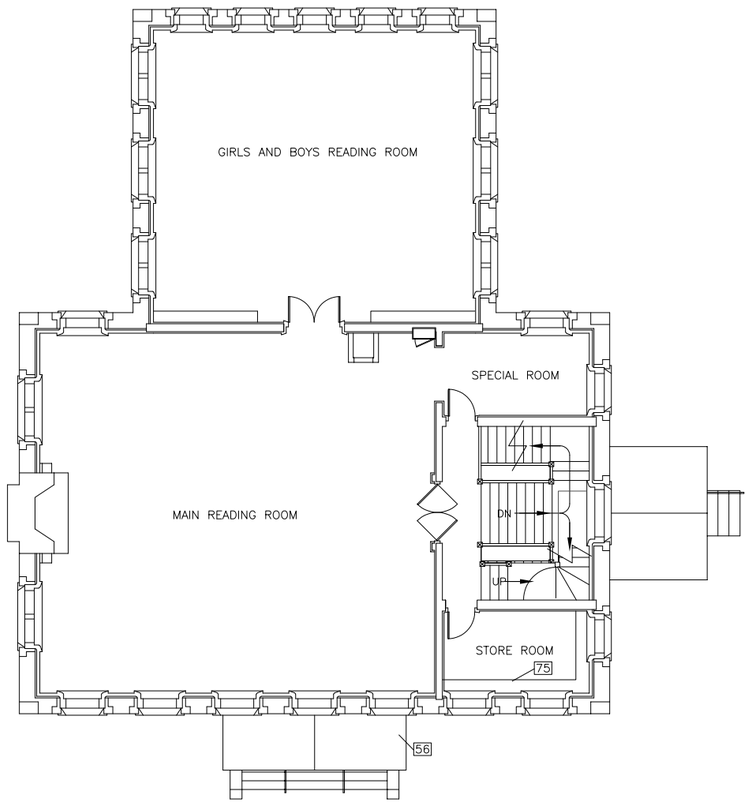
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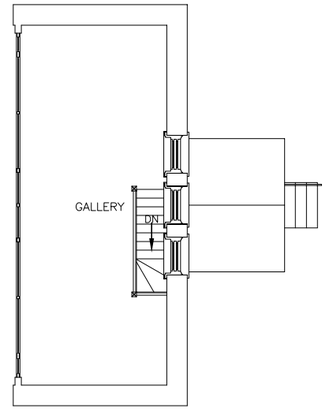
48. Desk
49. Dumbwaiter for books
50. Electrical chase cabinet
51. Second entrance added for bathhouse access after construction completed.
56. Front entry steps replaced; gable roof added over entry
71. Open balustrade
72. Hall repurposed as girls' and boys' reading room
73. Curved desk and partition removed
74. Arched opening infilled with glazing

SCALE A 16 0 16 32
SCALE OF FEET

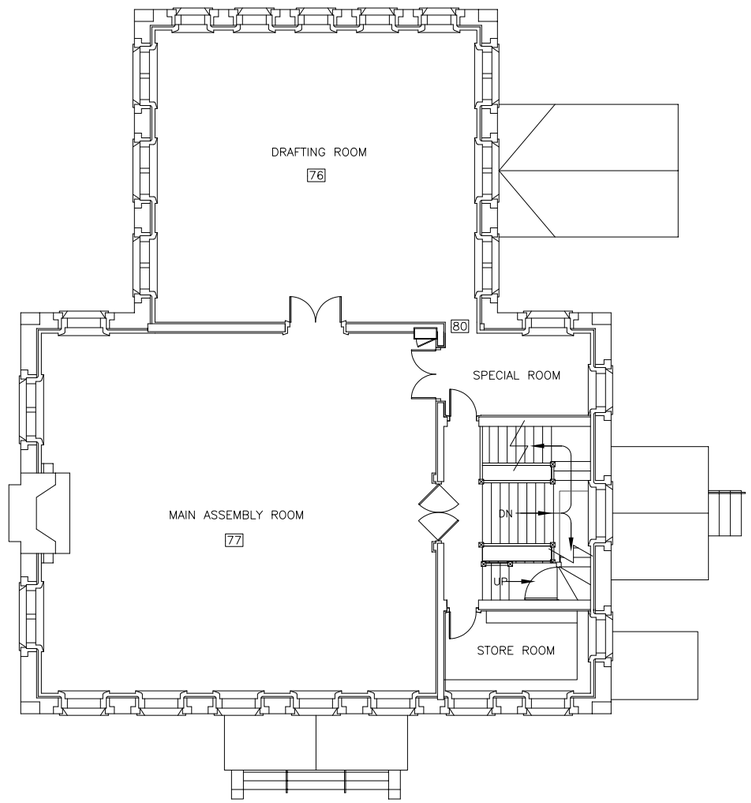
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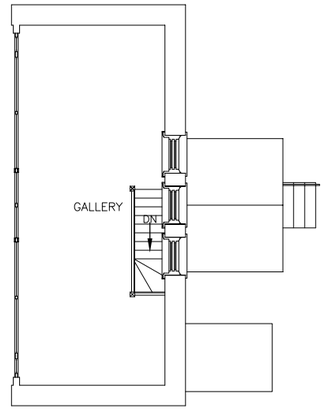
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CADD EV	CH2.1	PART 1–CHRONOLOGY PLANS 2ND FLOOR PLANS 1	X XXX
TECH. REVIEW: EMH		CALUMET & HECLA PUBLIC LIBRARY KEWEENAW NATIONAL HISTORICAL PARK	PMIS/PKG NO. 237234
DATE: 11/1/2019			SHEET 5 OF 7





1 CH2.2 C&H PUBLIC LIBRARY – SECOND FLOOR PLAN, AS OF 1917
SCALE A





2 CH2.2 C&H PUBLIC LIBRARY – SECOND FLOOR PLAN, AS OF 1944
SCALE A

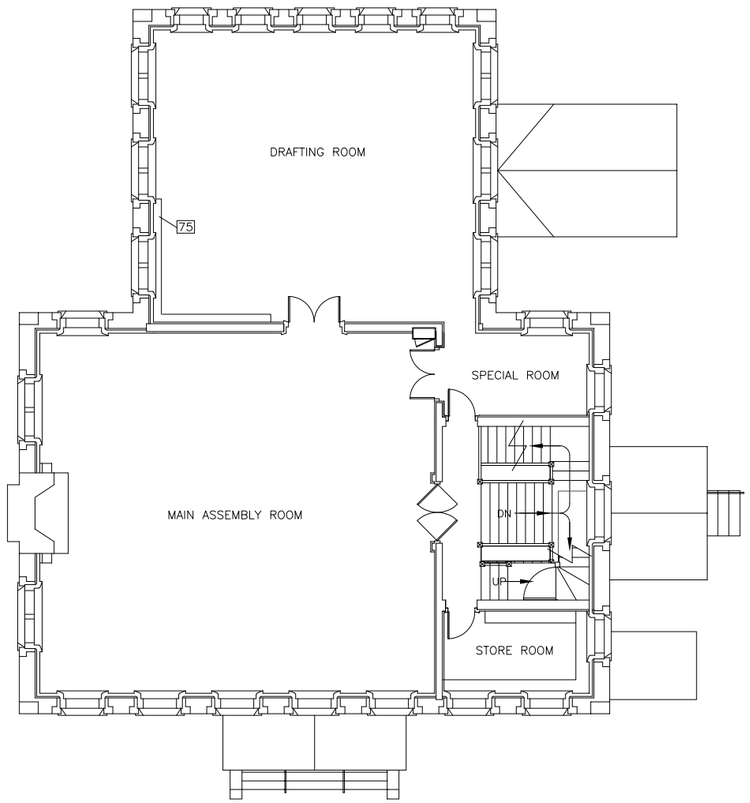
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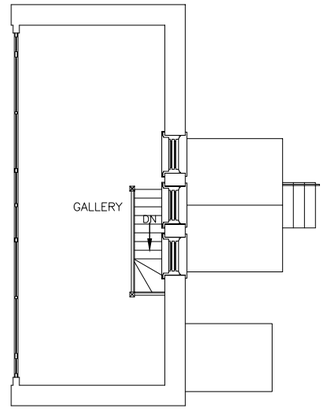
56. Front entry steps replaced; gable roof added over entry
75. Storage shelving – installation date unknown
76. Girls' and boys' reading room repurposed as drafting room
77. Reading room repurposed as main assembly room
80. Doorway added, assumed during 1944 conversion

SCALE A 16 0 16 32
SCALE OF FEET

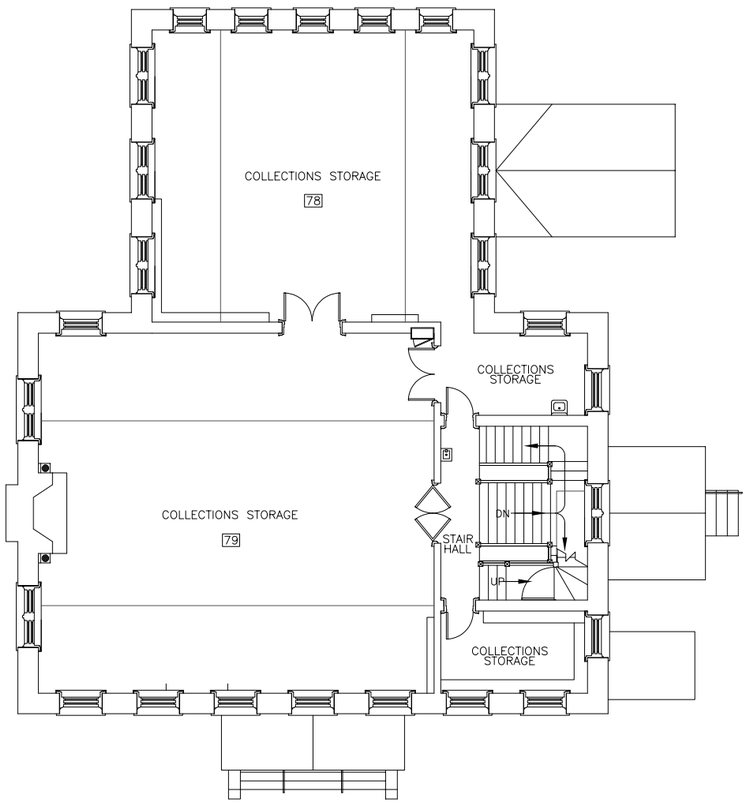
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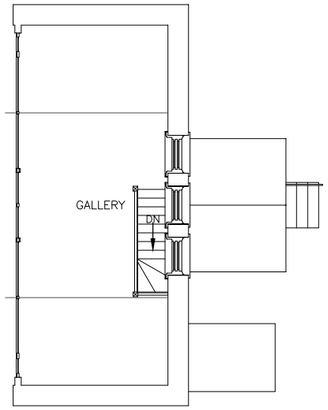
DESIGNED: LHM / CADD SH / TECH. REVIEW: EMH / DATE: 11/1/2019	SUB SHEET NO. CH2.2	TITLE OF SHEET: PART 1–CHRONOLOGY PLANS 2ND FLOOR PLANS 2 — CALUMET & HECLA PUBLIC LIBRARY KEWEENAW NATIONAL HISTORICAL PARK	DRAWING NO. X XXX / PMIS/PKG NO. 237234 / SHEET 6 OF 7





1 CH2.3 C&H PUBLIC LIBRARY – SECOND FLOOR PLAN, AS OF 1968
SCALE A





2 CH2.3 C&H PUBLIC LIBRARY – SECOND FLOOR PLAN, AS OF 2008
SCALE A

NOTES:

75. Storage shelving – installation date unknown
78. Drafting room repurposed as collections storage
79. Main assembly room repurposed as collections storage

SCALE A 16 0 16 32
SCALE OF FEET

NOT FOR CONSTRUCTION

DESIGNED: LHM
CADD EV
TECH. REVIEW: EMH
DATE: 11/1/2019

SUB SHEET NO. CH2.3

TITLE OF SHEET
PART 1–CHRONOLOGY PLANS
2ND FLOOR PLANS 3

CALUMET & HECLA PUBLIC LIBRARY
KEWEENAW NATIONAL HISTORICAL PARK

DRAWING NO. X XXX
PMIS/PKG NO. 237234
SHEET 7 OF 7

4. Existing Conditions and Assessment

Existing Conditions & Assessments - Overview

Existing Conditions

The Existing Conditions section describes the current conditions, by discipline and by component, as observed on site during the October 2018 site visit. Please refer to the existing conditions drawings in Appendix D for graphical depictions

Condition Assessment

Immediately following the Existing Condition, each feature/system is evaluated and assigned an attendant condition rating. The condition rating system is as follows. (Note: Buildings are rated by evaluating the combined condition of all features/systems.)

Good - The feature is intact, structurally sound and performing its intended purpose. The feature needs no repair or rehabilitation, but only routine or preventative maintenance.

Fair - The feature is in fair condition if either of the following conditions is present:

- There are early signs of wear, failure, or deterioration though the feature is generally structurally sound and performing its intended purpose - or -
- There is failure of a portion of the feature.

Poor - The feature is in poor condition if any of the following conditions is present:

- The feature is no longer performing its intended purpose - or -
- Significant elements of the feature are missing - or -
- Deterioration or damage affects more than 25% of the feature - or -
- The feature shows signs of imminent failure or breakdown.

Unknown - Not enough information is available to make an evaluation.

NA - The feature is not present within the building.

Applicable Codes

Code Overview

The following is a master list of building codes and guidelines consulted to inform the condition assessment for all structures by all disciplines:

2018 International Building Code (IBC)

2018 International Existing Building Code (IEBC)

2018 International Fire Code (IFC)

2018 International Mechanical Code (IMC)

2018 International Plumbing Code (IPC)

2018 International Fuel and Gas Code (IFGC)

2018 International Energy Conservation Code (IECC)

ASCE 7-10 Minimum Design Loads for Buildings and Other Structures

National Fire Protection Administration (NFPA) - NFPA 13 and NFPA 13D

Secretary of the Interior's Standards for Rehabilitation of Historic Buildings

Architectural Barriers Act Accessibility Standards (ABAAS)

Character Defining Features

Mass and Form
The overall shape of the building with its t-shaped plan, two distinct wings and steep intersecting gables, is a character defining feature. The west entrance vestibule with gable roof and the gable roof door hood are also character defining.

Exterior materials and features
The majority of the materials and features are original or have been replaced in kind. The stone masonry is particular to the architect as well as the region and may be deemed exemplary. Defining features include:

- Full height masonry walls with a mosaic field of polygonal basalt and granite stones with brick accent bands and quoining
- Beaded mortar joints in stone field
- Only basalt polygonal stones used below lowest brick band (basement level)
- Massive corbeled brick chimney
- Sandstone window sills
- Flat jack brick arches as headers at most window openings;
- Header of second floor and basement windows incorporated into brick band
- Brick arches above arched windows and entry door with multiple extensions into stone field
- Continuation of stone and brick patterns at sidewalls of appendages
- Varying degrees of detail woodwork, to include trusses, in gable ends
- Woodwork cornice, soffit and corbel brackets at all eaves

Openings
The rhythm, symmetry, scale, and size of the window and door openings contribute to the character of the building. Doors are centered on the wall with windows symmetrically arranged at each facade. Wood frame windows are one-over-one double hung. At the south wing, two levels of windows, with wood spandrels between, occupy a single masonry opening. This arrangement, which accommodated a book stack level, conveys the historic use of the structure and is character defining.

Interior materials and features
Room layout and most original finishes on the second floor and third floor gallery level have been retained. Rooms have been re-arranged on the first floor and basement since the period of significance, but many features of remaining walls were retained. Significant features include:

- Coffered ceilings throughout
- Carved wood trusses in main reading room
- Wood balustrade and glazed partition at Gallery wall
- Additional woodwork in main reading room: mantle, arched window grilles, continuous picture rail molding incorporating window headers
- Brick fireplace in main reading room
- Cast iron columns encased in fluted wood trim with wood bases and capitals
- Interior fluted window and door trim throughout
- Interior grand stair including risers, treads, balustrades, newel posts and associated wood trim
- Cast iron floor in south wing as remnant of former stack system
- Six-panel interior wood doors
- Painted plaster walls and ceilings
- Painted interior brick walls in the basement, stairwell and north vestibule
- Beadboard wainscot and cap

Integrity

The Calumet and Hecla Library has retained remarkable integrity of design, materials and feeling on the exterior, with the exceptions of a change in roofing material and the addition of the brick vault on the west elevation. Inside, the second floor has maintained excellent integrity. The first floor has been rearranged and the historic library stacks removed, but much original material remains.

The period of significance for the library is the date of construction (1898) to the early 1920s, pending review of the NHL revision.

Existing Conditions & Assessment - General

General Building Description

The Calumet and Hecla Public Library is a two-story masonry structure with a t-shaped floor plan and an intersecting gable roof. A partial third floor, known as the Gallery, fits within the west end gable of the north block, and the structure has a full basement. A door hood, an enclosed vestibule, and a brick vault have been appended to the structure since its original construction in 1898.

The masonry walls feature a field of polygonal dressed stones surrounded by brick accents and borders. The stones are a mosaic of dressed granite and "poor rock", the local term for basalt that is poor in copper content and thus a common mining waste material. The main roof, once slate, is now clad in asphalt shingles. Windows are often paired; three such pairs are each topped with arched transoms. At the south wing, two levels of windows serve the first floor; an intermediary floor for book stacks has been removed.

The rich interiors feature exposed trusses and beams as well as ornate wood trim and wainscoting against a plaster background. High coffered ceilings and a large fireplace in the second floor reading room set apart this distinctive space.

While the library shares the distinct mosaic stone featured at the Queen Anne style Wellesley Town Hall and Library, the best known work of architects Shaw and Hunnewell, formally it differs considerably. Here, the architects applied a few aspects of Queen Anne--patterned masonry, single pane double-hung windows, and ornamental woodwork at the gable--to a simpler and more rectilinear form.



Figure 4-1. C&H Library east elevation at sunrise (LM 11/2/2018)



Figure 4-2. Library looking southeast across Red Jacket Road (DA 10/29/2018)



Figure 4-3. Library with vault and vestibule as viewed from the southwest (DA 10/29/2018)

Condition: *Good*
The exemplary historic exterior is mostly intact. Recent rehabilitation campaigns have not only served to preserve materials for the future, but also, through attention to detail and craft, to restore the structure to its former glory. The interior layout has been altered since the period of significance, but many defining features, such as the woodwork in the reading rooms, have been well preserved. The library is structurally sound, but decisions about future use must consider the risk of overloading structural systems. The mechanical system, replaced over ten years ago, is in good condition, but provides neither air conditioning nor ventilation. Some plumbing lines are in poor condition, but the recently upgraded electrical system is in good condition. The structure has a full fire suppression system in good condition, but lacks a second egress from the upper floor. The structure lacks universal access to any floor.

Existing Conditions & Assessment - Architecture

Architecture - Roofing - Main Roof

As part of a 2012 exterior restoration, the roofing was replaced. The new roofing consists of black asphalt tab shingles and lead-coated copper flashing on the gabled main roof. The flashing is exposed on the lower 18 inches of the roof eaves and at the valley (Figure 4-4). The ridge has a continuous built-in roof vent along both ridges of the cross gable.

Condition: *Good*
The main roof and its flashings are in generally good condition. The exception is a warp in the west-facing slope of the south wing roof, possibly caused by condensation in



Figure 4-4. Lead-coated copper eave and valley flashing at the gable intersect (DA 10/29/2018)

the attic but not active.

Architecture - Roofing - Appendage Roofs
The door hood over the north entry was sheathed in flat-seamed lead-coated copper during the 2012 roof replacement. The roof is flashed back to the masonry wall with exposed lead-coated copper cap flashing let into a continuous reglet. Kick out flashing prevents rainwater from washing off the roof edge and down the wall (Figure 4-5).


Figure 4-5. Flat seam lead-coated copper roof and wall flashing at door hood (DA 10/29/2018)

The roofing over the west vestibule is the same asphalt shingle as the main roof and has the same exposed eave flashing detail. The flashing at the masonry wall is similar to that described for the north roof (Figure 4-6).


Figure 4-6. West vestibule roof with eave, wall and kickout flashing (DA 10/29/2018)

The shallow gable roof over the vault addition is roofed in asphalt shingles over galvanized flashing. This roof was not included in the 2012 restoration. At the intersection with the wall, the roof form features half an intersecting gable such that two valleys channel water away from the wall. These valleys are flashed with metal flashing. The flashing at the masonry wall is less discernible at it is covered with a black tar-like substance.

Condition: *Good to Fair*
The roofs over the entrances are in good condition with no signs of leaks or damage. The roofing over the vault is in fair condition in part because the flashing is showing signs of rusting at the valleys (Figure 4-7). The condition of the wall connection is difficult to assess due to the nature of the roofing tar used as a sealant, but inspection of the vault interior showed active leaks at this connection.


Figure 4-7. Rusted valley flashing at asphalt vault roof (DA 10/29/2018)

Architecture - Chimney

At the east gable end of the north wing, an exterior brick chimney is centered on the gable. At the east wall, the chimney brick steps out to six wythes of brick and then extends all the way up and through the roof structure. Five vertical recesses one brick deep and wide run most of the length of the chimney (Figure 4-8). Above that and visible behind the wood truss, a pattern of sandstone and basalt ornaments the chimney shaft. Above the roof, the chimney steps outward to a lead-coated copper chimney cap, which was added during the restoration in addition to new step flashing at the roof (Figure 4-9).



Figure 4-8. Brickwork at chimney as viewed from below (DA 10/29/2018)

Condition: *Good*

The exterior masonry of the chimney appears to be in good condition; the interior condition was not assessed.



Figure 4-9. Apron, step flashing and cap at chimney (DA 10/29/2018)

Architecture - Exterior Masonry

Masonry work consists of a field of polygonal dressed stones surrounded by brick accents and borders (Figure 4-10). The stone field itself is a mosaic of tooled basalt poor rock and light gray granite field stones with distinctive extruded mortar joints. At the basement level, only the darker poor rock is employed (Figure 4-11)

Three horizontal bands of brick cross the facades of both wings in a running bond. The lowest band aligns with the head of the basement windows and is seven courses high. A second band, six courses high, runs at the second floor window sill. The third band, also six courses, runs at the head of the upper windows. At the gable ends of the north wing, a fourth band of five courses runs above that, and brick quoining lines the intersection with the roof at the gable. The mortar on the brick is flat struck.



Figure 4-10. General disposition of mosaic stone and brick trim elements (DA 10/29/2018)

Three windows at the gable ends (two on the east facade flanking the chimney and one at the west above the stair) are topped with brick Roman arches. At all rectangular window openings, headers consist of flat-jack brick arches (Figure 4-12). The polygonal stone forms the jambs of all the windows except for those on the second floor of the south wing, which have quoined brick jambs.

Window sills are made from a local red sandstone and tooled to slope out with lugs at both ends. The face of the sill is tooled with a horizontal comb pattern. At the south wing, two stacked windows occupy each of these masonry openings.

At the north facade, there is a shallow arch over the main entry that consists of brick interlaced with granite quoining. The jamb of the entry opening consists of granite quoins, a detail not used anywhere else.

At the south facade of the south wing, the center window at the first floor is narrower than the others and sits in a larger opening. The rest of the opening has been infilled with a recessed wall of newer brick with tooled joints. In the gable, a Roman arch forms the header of semi-circular window looking out from the children's reading room. A single triangular granite piece decorates the top of the gable brickwork.

Condition: *Good to Fair*
The stone masonry is in good condition overall. The field stones, basalt "poor rock"and some granite, have weathered well. A few poor rocks have a dusty bluish-green substance on the surface (Figure 4-13). This substance is likely copper-based salts that have effloresced from the stone over time and do not, on this small scale, pose any cause for alarm.



Figure 4-11. Detail of poor rock at brick quoining; image also shows crack through stone and brick (DA 10/29/2018)



Figure 4-12. Sandstone sills and jack headers within lowest brick band (DA 10/29/2018)

Mortar joints between the polygonal stones have been repointed in some areas with slight variations in color of the mortar, and in other areas without the proper tooling.

The sandstone window sills pose the largest problem. The softer sandstone is eroding or cracking at the lugs, and sometimes spalling at the base of the sill (Figure 4-14). The sills typically show more black environmental staining than the other stone elements.

At the east facade, sills at the basement level of south wing appear to have been three pieces of sandstone. The joints between the pieces have been patched with red colored mortar.

At the eastern corner of the south facade, a crack aligned with the brick quoining has split a poor rock block in two before continuing through the courses of the lower brick band. Further west on the same facade, a large hole in the stone at the base of the wall has been filled in with smaller stones and messy extruded joints. This is the historic location of a ventilation fan for the baths (Figure 4-15).

The brick masonry is in overall fair condition. The bricks show varying levels of cracking, pitting and surface erosion. There is considerable environmental staining on the brick in some areas, but efflorescence or similar evidence of moisture issues is rare. Repointing of the brick has been inconsistently pursued. Some joints have been pointed with clearly incompatible mortars and tooling, while other joints are eroded and cracked.



Figure 4-13. Example of bluish salts at poor rock, south elevation (DA 10/29/2018)



Figure 4-14. Cracked sandstone sill (DA 10/29/2018)



Figure 4-15. Incompatible repointing at former penetration, south elevation(DA 10/29/2018)

Architecture - Exterior Masonry - Appendages

At the north entry stair, poor rock cheek walls with concrete caps bookend a wide concrete stair (Figure 4-16). Two steel pipe handrails extend down on each side of the double entry doors. There is also evidence of a former railing at the center of the steps, as indicated by holes in the face of the concrete risers.



Figure 4-16. North entry cheek wall with light biological growth(DA 10/29/2018)

At the three walls of the west vestibule, a poor rock base is topped with a brick band. The band is aligned with the lowest band of the main building (Figure 4-17). The walls are wood-framed above this point. From the walk, concrete steps lead up to a buff-colored sandstone sill at the exterior door to the vestibule. A steel pipe handrail is mounted on the right side of the steps. A former railing at the center of the steps is indicated by holes in the face of the concrete risers.



Figure 4-17. Poor rock and brick band at west vestibule (DA 10/29/2018)

At the vault extending west from the basement level of the south wing, load-bearing brick follows a common bond pattern with a darker-colored header course. The brick has struck mortar joints. The brick walls sit above a board-formed concrete foundation.

Condition: *Good*

The masonry is in overall good condition on all elements. At the north entry, concrete caps on the cheek walls have been patched and, in places, are spalling. The cap is chipped at the top and all exposed edges. The concrete steps show similar deterioration. At the vault, brick is stained from water runoff from the valley flashing (Figure 4-18). Horizontal separation of an upper course of brick from its mortar bed (most visible on the north facade) is an indication of differential settlement, as described in the structural section of this report.



Figure 4-18. South elevation of brick vault with staining (DA 10/29/2018)

Architecture - Exterior Woodwork

At the prominent east gable end, a verge board consists of beadboard slats oriented perpendicular to the roof slope behind a framework of 1x trim (Figure 4-19). The verge board curves downward as it meets. The bottom edges are supported by large wood corbels at both sides. Near the top of the wood frame is an expressed wood truss that spans across in front of the brick chimney. The bottom chord of the truss is supported by four wood brackets attached back to the brickwork on the wall. The top triangle of the truss is infilled with vertical beadboard. An ogee profile fascia covers the one-foot distance between the roof edge and the verge board.



Figure 4-19. Beadboard at truss and verge board, east elevation (DA 10/29/2018)

At the opposite west gable, these verge board and fascia elements are repeated, but without the truss element (Figure 4-20). At the south gable, the verge board follows the same profile as that on the east, but is flat with no beadboard or framing elements..



Figure 4-20. Simplified verge board and no truss, west gable (DA 10/29/2018)

At all eaves, a wood cornice consists of a fascia in the same ogee profile above a beadboard soffit. The soffit is supported by wood corbel brackets. At the edge of each wall, a wider and deeper corbel connects to the corbel at the gable end.

At the north facade, the shallow masonry front entry arch is infilled with a wood framework hosting doors and windows (Figure 4-21). The frame consists of painted fluted pilasters supporting a transom with cornice molding. The transom consists of three arched windows with quarter-round trim around each window frame. At the far side of two diamond-pattern side lites, with wood inset panels below, narrow pilasters line the opening. All woodwork is painted two tones of dark green.

Condition: *Poor*
The exterior woodwork at the roofs was addressed in the 2012 roof restoration. Generally, cornice, fascia, trim and bracket elements were stripped and painted. At the east gable, the woodwork condition must have been critical as verge board, trim and truss elements were designated for replacement where deteriorated, with an assumption of 60% deterioration. However, extensive verge board replacement was not executed, as discovered in 2016. Wood components that merited replacement were instead retained and repainted, and the poor condition persists today.

Architecture - Exterior Woodwork - Appendages
At the north entry, a wood-framed hood over the entryway consists of wood brackets attached to the brick wall and a wood-framed gable roof structure (Figure 4-21). The hood roof structure has a center beam that is set into the stone at the wall and is supported by a king post truss at the face of the gable. Dimensional wood rafters span from the brackets to the ridge beam. A small ogee cornice covers the top of a wood fascia. The roof sheathing consists of tongue and groove wood decking exposed on the underside. All woodwork is painted two tones of dark green.

At the west vestibule, woodwork consists of wood posts supporting a wood roof with a triangular gable infill (Figure 4-22). The gable infill consists of a wood frame with recessed panels, both rectangular and triangular. The posts have built-up caps; the structure of the roof hangs out in front of those posts. The roof has a smaller ogee cornice board with a flat fascia board below. The beadboard soffit follows the slope of the roof. All woodwork is painted dark green except for the recessed panels and the framing around both windows


Figure 4-21. Wood canopy structure and door assembly at the north entry (DA 10/29/2018)


Figure 4-22. Woodwork at the west vestibule (DA 10/29/2018)

and doors which is painted a lighter green.

Condition: *Good*
The woodwork at the north entry and west vestibule was included in the 2012 restoration and remains in good condition. Wear at the base of the jamb trim of entry doors indicates that routine maintenance is due.

Architecture - Windows
Most windows are of one type: a wood double hung window, one-over-one with no mullions. The configuration of this simple type varies considerably. Each window has two complete sets of double-hung sashes; in effect an interior double-hung window paired with an exterior double-hung window. In addition, the windows have the added protection of an exterior wood storm window.

At the first floor of the north wing, windows 101 through 104, 106, 107, 108, 110, 141, 142 and 145 are of this type in a three-foot by six-foot proportion. Windows 101-104 occur in pairs on either side of the entry (Figure 4-23). These windows were added in 1917; prior to that two smaller windows occupied that space. Windows 105 and 109 are of the same type but of a smaller two-foot by five-foot proportion.

At the second floor of the north wing, windows 206 through 212, 221 and 242, 243 and 205 are smaller than those on the lower floor, about four feet by five. Flanking the fireplace, windows 213 and 214 and then 215 and 216 are slender three-foot by seven-foot with a wood stile between the pair. These windows are topped by arched transoms—each transom is a quarter arch on either side of the central stile. Above the vestibule, windows 201 and 204 follow the same design (Figure 4-24).


Figure 4-23. Paired window W104-105, added circa 1911 (DA 10/29/2018)


Figure 4-24. Paired window with arched transoms at west elevation, W201-204 (RK 10/29/2018)

At the third floor gallery, three windows looking east are of the same type at a three-foot by four proportion.

More windows of this type punctuate the south wing. On the first floor, 2-1/2 feet by 4-1/2 feet double-hung windows are paired with a wood stile, and then repeated above with a wood panel insert between the top and bottom pairs (Figure 4-26). The stack floor ran at this spandrel level previously. Windows 133 through 136 on the west facade are the same windows, but the spandrel has been removed and the lower pair moved upward to accommodate the exterior vault addition. At the south facade, windows are stacked with a wood spandrel but not paired. Windows 125 and 126 are stacked but slimmer and fit within a brick insert that occupies a larger rough opening, a 1944 alteration to accommodate interior rearrangement.

On the second floor of the south wing, windows of the same proportion as those on the lower level are repeated above. Above these windows on the south facade, a semi-circular window sits in the gable. This window consists of one operable pane (a later alteration to accommodate an exhaust fan) with a transom between two arched side-lites.

In the course of the 2010 window rehabilitation project, each double hung window received a new fixed one-over-one storm window to the outside of the operable historic exterior sash. The storms were painted a darker green than the frame elements, and secured to the exterior of the frame with clips. Existing clips were re-used, suggesting storm sash were present historically.



Figure 4-25. Divided glass windows at north entry, W164-168 (RK 10/29/2018)



Figure 4-26. Paired windows with spandrel panels, east elevation of south wing, W115-118 (RK 10/29/2018)

All double-hung windows have a thumb turn latch atop the lower sash. Interior hardware was restored in the window rehabilitation project, which also provided for a new sash cord, sash lock and brass weatherstop for each window.

Windows at the west vestibule and at the north entry door take on an entirely different character. At the vestibule, which was added in the year following the building opening, eight fixed windows with diagonal mullions lend a Tudor feel to that small space. The historic exterior sash at these windows were retained and painted the darker green color. At the north entry, two similar, diagonal-paned fixed windows flank the entry door. Above the door is a composition of three windows under the shallow masonry arch. These windows have perpendicular mullions at a tight interval (Figure 4-25). All the windows in this assembly have a single sash and did not receive storm windows.

Basement windows fall into three different types. Those at the north wing are nearly square, 3'-0 x 2'-8", hopper windows (Figure 4-27). At the south wing, one type consists of a two-lite slide. The second type, fitting in the same 6'-0" x 2'-8" rough opening, consists of three lites in one row, of which the center lite is operational. All the south wing basement windows are covered with insulated panels at the interior.

During the 2010 rehabilitation, basement windows received new storm windows, as well as new hinges and sash locks where needed. Most basement window openings received new security bars mounted to the outside of the new storm windows.

Condition: *Good*
Recently rehabilitated, the windows are


Figure 4-27. Typical basement window at north wing, W019 (RK 10/29/2018)


Figure 4-28. Wear at the south-facing vestibule windows, W143-145 (RK 10/29/2018)


Figure 4-29. Leaf collection at basement window, W016 (RK 10/29/2018)

in good condition. Exterior wood storm windows, where installed, were painted a darker color than the historic window elements. This paint is more readily showing wear in the form of peeling, fading and chipping. The exterior fixed sash of the west vestibule windows, where there are no new storms, are likewise showing wear, particularly on the south side (Figure 4-28).

Window 125 on the south facade had suffered some damage prior to the time of inspection, ostensibly from a window air conditioning unit. The storm window has been removed along with the clips. The base rail of the exposed frame is damaged, and a 2x braces the jamb. A fluid, likely effluent from the unit, stains the window frame and stone sill.
.
At the basement windows, the security grilles are having the unintended affect of trapping leaves and debris. Decomposing leaves threaten moisture issues at both wood and stone sill elements over time. Moreover, water can enter inner cavities of the wall directly through any loose mortar joints in the jamb. A similar issue likely occurs with snow (Figure 4-29).

Architecture - Exterior and Vestibule Doors
Door 101 is a stile and rail wood double door with the right-hand leaf active. Each leaf has one lite with one inset wood panel above and two below (Figure 4-30). An 1898 photograph shows that the original doors did not have lites, though the lites replaced two vertical panels. Hardware on the active leaf is a knob on a metal back plate and an older but not historic deadbolt. The active leaf also has a closer. The inactive leaf has two bolts for securing the door and a brass mail slot just below the lite. The doors are painted on the exterior and stained inside.



Figure 4-30. Entry door 101 at north elevation (LM 10/30/2018)



Figure 4-31. Vestibule door 102 at north elevation (LM 10/30/2018)

Door 102 communicates with the enclosed vestibule. This stile and rail wood door is also double leaf but with the left-hand leaf active (Figure 4-31). Taller than door 101, each leaf has a single lite (formerly a panel) with a wood panel above and below, but then two vertical wood panels below that in a more traditional arrangement. Doors are stained on both sides. Hardware is knob on back plate with a newer deadbolt on the active leaf and a strike plate and two bolts on the inactive leaf. The active leaf also has a closer.

Door 118 is a wide, 42-inch single leaf stile and rail wood door with a single lite in the upper half and two panels below. The metal knobs, back plates and the two hinges appear to be historic while the shiny deadbolt and closer are new (Figure 4-32).

Door 119 is a wide, 48-inch stile and rail wood door with a single lite over two inset wood panels. Brass knobs, back plate, deadbolt and closer are not historic. The door is painted to the exterior and stained inside.

Condition: *Good to fair*
At Door 101, knobs are loose. One bolt is broken, and hinges are rusted (Figure 4-33). Door 102 is heavily worn at the base and newer weatherstripping is already coming undone. The bottom bolt no longer aligns. Door 119 is worn at the threshold, and the stile and rail assembly is loose. Please see the accessibility assessment for further discussion.

Architecture - Interior Doors - 1st Floor
Typical: 103, 105, 106, 108, 109, 110, 111, 112. Most interior doors on the first floor are of the same type and likely date to the reorganization of that floor in 1944 (Figure 4-34). The type is a wood stile and rail door with an etched 1/3-lite above 3 horizontal



Figure 4-32. Doors 118 and 119 at the west vestibule (LM 10/30/2018)


Figure 4-33. Hardware issues at Door 101 (LM 10/30/2018)


Figure 4-34. Typical post-1944 door; D108 shown (LM 10/30/2018)

wood panels. Original hardware includes knobs, plates and three hinges. Several doors have newer deadbolts. The 3'-0" x 7'-0" doors are stained on both sides.

Door 104 and 116. These stile and rail wood doors have no lite and a more traditional six-panel arrangement. They likely predate the 1944 renovation, and are likely the original doors noted in the history section as being constructed of Southern pine (Figure 4-35). The doors have knobs, small back plates and three hinges. They are stained on both sides. Door 120 is a new, 4'-0" door of the same configuration. It has a brass kick plate on either side and accessible lever hardware. Door 117 communicates between the Entry Hall (102) and the Stair Well (114). These tall double doors are wood stile and rail with a 1/3 lite, two horizontal panels and two vertical (Figure 4-36). The doors both swing from two large two-way hinges (Figure 4-37). Other hardware is limited to a brass push plate on either side of each door. Both leaves also have bolts to allow them to be fixed in place. A transom window in a wood frame tops the assembly.

Condition: *Good*
Doors are in good condition.

Architecture - Interior Doors - 2nd Floor
Door 201 (11'-9" x 8'-5") communicates between Collections (201) and the stairwell and matches Door 117 except that there is no transom above. The door also has a newer thumb turn lock. Roller shades have been installed above lites on the Room 201 side.

Door 202 and 205. These 3'-0" x 7'-0" stile and rail wood doors are a variation on the traditional six-panel arrangement with a single clear lite in place of the upper two vertical panels (Figure 4-38). A transom



Figure 4-35. Typical original door; D116 shown (LM 10/30/2018)



Figure 4-36. Door 117 from Entry Hall to stairwell (LM 10/30/2018)



Figure 4-37. Two-way hinges on Door 201 (LM 10/30/2018)

in a wood frame tops each door. The doors have their original knobs, small back plates and three hinges. Door 205 also has a new deadbolt. They are stained on both sides.

Door 203 is a large wood stile and rail double door communicating between Collections and the Reading Room. Each leaf is of the traditional six-panel configuring found elsewhere, but is 8'-6" tall. There are no lites. Hardware includes original knobs and back plates on the active leaf and two bolts on the inactive. The active leaf also has a historic closing device.

Door 204 is also a double stile and rail wood door (5'-8" x 7'-0") topped with a transom. It dates to the 1944 renovation and each leaf has the familiar configuration of a lite over three horizontal panels (Figure 4-39). These lites are divided into three by narrow wood mullions, an effect not seen elsewhere, and painted on one side. Hardware includes original hinges, knobs and back plates on the active leaf and two bolts on the inactive leaf. The transom is operable as a hopper; the latch and chains are intact.

Door 206 is a squat wood and stile door leading to the Gallery. It is 3'-6" wide and only 6'-0" tall. It is thinner than a standard door and has a traditional five panel (four vertical, one horizontal) configuration. The knob has been replaced with an incompatible black knob; there is no back plate. A hook and eye secure the door from the stair side.

Condition: *Good*
Door 201, 202 and 205 are in good condition. Door 204 is in fair condition. A pane is broken on the inactive leaf. Door 206 is in fair condition. There is a hole left from removed hardware above the current knob. The hook and eye configuration is not acceptable from a



Figure 4-38. Door 205 with transom (LM 10/30/2018)



Figure 4-39. Door 204, added in 1944 (LM 10/30/2018)

safe egress perspective.

Architecture - Interior Doors - Basement
Door 001 and 002. These stile and rail wood doors with a grained finish measure 3'-0" x 6'-8" and are a variation on the traditional six-panel arrangement with a single etched lite in place of the upper two panels (Figure 4-40). The lite on 002 is labeled "Men's Rest Room". The doors have their original knobs, small back plates and three hinges. Door 001 also has a new deadbolt.

Door 003, 011 and 012 are wood stile and rail doors, also 3'-0" x 6'-8", with a traditional 6-panel configuration. Door 003 has been fixed shut. Door 011 is painted on one side and grained on the other. Letters on the door say "Ladies' Rest Room". Door 012 is stained both sides. Typical hardware is two hinges and knobs and plates.

Door 004, 005 and 006 are smaller, 2'-4" x 6'-4", wood stile and rail doors with a simple 3 panel configuration. Door 007 and 008, 3'-0" x 6'-10", are wood stile and rail doors with a 2/3 lite and two vertical panels below. The lite is divided into four panes. Doors are painted on both sides, and hardware varies.

Door 009, dating to the 1944 renovations, (3'-0" x 6'-10")is a painted steel door with three strap hinges. Hardware include knobs and plates plus a grip pull on one side and a new deadbolt (Figure 4-41). Door 010 is a narrow (2'-6" x 6'-2") steel vault door leading to the collections storage. It has a historic thumb turn latch that throws four steel bolts. It also has a combination lock, plus three heavy duty hinges. Just beyond, a narrow steel double door with similar latches opens outward.

Door 013, 014 and 015, wood stile and rail doors with three horizontal panels below an



Figure 4-40. Door 001 from the basement stair well (LM 10/30/2018)



Figure 4-41. Door 009 leading to the south wing (LM 10/30/2018)

etched lite, were removed for the installation of the basement compact storage system. The doors have been salvaged according to park staff but were not observed.

Condition: *Varies*
Door 001, 002, 003 and 011 are in poor condition. The lite on Door 001 is loose. There are chips in the wood frame and scuffs along the frame at the door edges. Door 002 has a damaged stile and on the Room 005 side has been covered in paneling (Figure 4-42). Door 003 is no longer operational, and its original hardware has been removed. Door 011 has its original hardware, plus a hook and eye latch on the interior. Door 004 is in good condition but has new hardware. Door 005 has a broken hinge plate and sits inside the room with hardware removed. Door 006 has no hardware. Door 007 is in fair condition with a newer knob and a historic plate. Door 008 has all new hardware. Doors 009 and 010 appear to be in good condition, but lock functionality was not tested.



Figure 4-43. Door 002, damaged, and Door 003, fixed closed (LM 10/30/2018)



Figure 4-42. Room 001 looking west with columns to the right (EH 8/22/2018)

Architecture - Interiors - *001 Processing*
Sheet flooring covers the concrete floor.

The north, west, and south walls are exposed painted brick interior bearing walls with flat jack brick headers at openings. West wall openings accommodate a door with side lites leading from the stairwell and two interior divided windows. The east wall, dating to the 1944 renovation, is a wood frame partition that is mostly glazed with divided fixed interior windows, but otherwise painted beadboard with a wood base. A portion of the west wall south of the column line is a similar partition wall, further described for Room 010. Interior windows and doors are cased in flat wood trim. Five steel columns support a deep box beam running east-west through

the space where an earlier brick bearing wall was removed, circa 1912. These structural elements are painted (Figures 4-43 and 4-44).

The ceiling is open to the floor structure above, wood boards supported by timber beams. All elements are painted.

Condition: *Fair*
Flooring is in fair condition with dents and some separation at the seams. All walls are in fair condition with some separation in the beadboard. The paint on the ceiling elements is worn, particularly at connections, but is in fair condition overall.

Architecture - Interiors - *002 Stair Hall*
The floor is painted concrete.

Walls are exposed, painted brick with no base. At the east wall, three masonry openings host Door 001 with its two side lites and two interior, 6-lite windows. Flat jack arches span the openings. The wood frames of these elements have layered trim and are recessed into the openings. The west, exterior wall hosts door 009 to the west vestibule and its side lites, at the level of the intermediate landing. Just north of the south stair, the head trim remains from the decorative screen that historically separated the stair hall. Ceilings are exposed to structural timber beams and wood planks, which are painted.

The original grand stair from the first floor is intact on only one side to the intermediate landing, the other side having been removed circa 1970 to accommodate a boiler. It consists of 7" risers and 12½" treads. Landings and all stair elements are stained wood. Painted wood tread covers are installed on steps and landings. The wood railing consists of turned wood balusters between 6" x 6" chamfered posts. The posts have beveled



Figure 4-44. Room 001 looking back to Door 001 (KC 10/31/2018)



Figure 4-45. Lower stair from landing at vestibule (KC 10/30/2018)



Figure 4-46. North flight of stair removed (KC 10/30/2018)

wood caps. The top rail, wood in a traditional profile, runs 33 inches above the treads (Figure 4-45). This rail now extends across the landing where the north stair run was removed (Figure 4-46). There is no separate handrail. The wood carriage on the inside of the stair is exposed to the stairwell. The walls below the carriages are covered in beadboard and house a closet with a door and oblique windows with figured glass (Figure 4-47).

Condition: *Fair*
Flooring is in fair condition, showing some chips in the paint. All walls are in fair condition. The painted brick has not been touched up at prior attachments. Stair treads and nosings are heavily worn. Paint on the ceiling elements is in fair condition overall.

Architecture - Interiors - *005, 006, 007 Mechanical and Storage*
Floors are painted concrete.

The north wall for each is the exterior wall; the exposed brick is painted (Figure 4-48). The south wall is an interior brick bearing wall. East and west walls, whether exterior walls or the support walls for the vestibule above, are painted brick. Openings are spanned with jack arches; several previous openings have been filled in. Most basement windows are covered in insulated shades, which, as furnishings, were not addressed.

Ceilings are exposed to structural timber beams and wood planks, which are painted. The sloped ceiling of Room 006 has painted beadboard at the underside of the entry stair.

Condition: *Fair*
Flooring is in fair condition with dents and chipped paint. Walls are in fair condition, except for the top of the north wall of 007, where moisture intrusion (likely from snow



Figure 4-47. Lowest run of stair at basement (KC 10/30/2018)



Figure 4-48. North wall of mechanical room with window (KC 10/30/2018)



Figure 4-49. North and east walls plus ceiling condition in Room 007 (KC 10/30/2018)

build-up at the exterior, see Structural) has resulted in peeling paint (Figure 4-49). Elsewhere, paint is typically degraded near the floor line, particularly in the mechanical room. The paint on the ceiling elements is in fair condition overall.

Architecture - Interiors - *008 and 009 Imaging*
Sheet flooring covers the concrete floors.

At the exterior walls, exposed brick is painted. The basement windows are covered in insulated shades. The west wall of each is the wood frame partition with glazing and beadboard described for Room 001. The common wall, which runs below the steel box beam described earlier, is also a wood-framed beadboard and glazed partition (Figure 4-50).



Figure 4-50. Steel columns and partition wall between Rooms 008 and 009 (KC 10/30/2018)

Ceilings are exposed to structural timber beams and wood planks, which are painted behind an extensive network of exposed conduit and piping.

Condition: *Fair*
Flooring is in poor condition. Portions of the flooring were water damaged and removed. The floor was patched with a polymer leveling patch (Figure 4-51). Walls are in fair condition; locations of some previous attachments have not been patched. The paint on the ceiling elements is in fair condition overall.



Figure 4-51. Floor patching in Room 008 (KC 10/30/2018)

Architecture - Interiors - *010 Restroom*
This restroom is the only room in the basement that has retained its historic function for most of its existence, though layout and finishes have been altered. First a women's restroom, it became a janitor's room and men's restroom until the 1944 renovation. The floor is painted concrete.

The south and west exterior walls each have

a window; as these windows are uncovered, it is possible to observe the sharply sloped sill of the masonry opening. Historic shelves, brackets and soap dispenser remain on the south wall. The north wall is an interior brick bearing wall, painted.

The east wall was added after removal of the bathhouse function in 1911. The wall is a framed and covered in beadboard. The 1911 drawings showing a masonry wall with a door in this location, but whether the wall was ever built is unknown. The beadboard finish is consistent with other 1944 modifications.

Ceilings are exposed to structural timber beams and wood planks, which are painted.

Condition: *Poor*
Flooring is in poor condition; much of the paint has worn off. Walls are also in poor condition, particularly at the base of the exterior walls, where moisture intrusion has resulted in peeling paint (Figure 4-52). Paint is also peeling above the windows, near the bearing points of the floor joists, and within the window openings (Figure 4-53). The paint on the ceiling elements is in fair condition overall.



Figure 4-52. Windows and worn finishes in Room 010 (KC 10/30/2018)



Figure 4-53. Peeling paint at joist bearing, Room 010 (KC 10/30/2018)

Architecture - Interiors - *011 Collections Storage*
The floor is painted concrete. A compact storage system, installed on the east side in 2003, includes a floor track in a raised plywood floor(Figure 4-54). To the west, painted wood steps lead to the vault opening.

The brick walls are painted. Some window openings have been bricked in while others are covered with insulated panels. Where the brick bearing walls have been removed in the center of the room, the 1912 steel beams and columns have been painted.

The ceiling is exposed to the cast iron plates that comprise the structural floor above.

Condition: *Fair*
The floor paint is in poor condition, faded and worn at the west side of the room. The paint on the wood steps to the vault is worn (Figure 4-55). The painted walls are in good condition. Window inserts appear to be easily removed. Paint on the ceiling elements is in good condition.

Architecture - Interiors - *012 Vault*
Concrete steps lead up from a landing at the south wing entrance to the concrete floor of the vault.

At the north, south and west walls 4"x 8" glazed masonry units are exposed. The east wall, which is the exterior wall of the south wing, is parged.

The vault ceiling is the exposed and painted board-formed concrete roof structure, which slopes up to a central beam running east – west (Figure 4-56).

Condition: *Fair*
The concrete floor is in fair condition with a few cracks as well as water staining and efflorescence. The walls are in fair condition except for the east wall, which exhibits water staining and cracking from a leak at the intersection of the vault roof and the main wall and a crack at the junction with ceiling (Figure 4-57). The ceiling itself is in overall fair condition with minor cracks and some water staining.

Architecture - Interiors - *101 Vestibule*
A painted concrete stair with adhesive tread covers and metal nosings runs the full width of the room. The landings at the



Figure 4-54. Installed heavy storage system in Room 011 (KC 10/30/2018)


Figure 4-55. Wear on wood steps to vault (KC 10/30/2018)


Figure 4-56. Glazed wall brick and concrete ceiling in vault (KC 10/30/2018)

top and bottom of the stair are also painted concrete. The central portion of the bottom landing is covered in sheet vinyl, while the upper landing is completely covered in tread cover material. A free-standing painted steel handrail runs to the west of the doors.

Walls are painted brick with no base trim. Brick headers detail the wall at the entry doors, arched at the exterior door and flat at the interior. A small locked door is incised in the east window jamb.

The coffered ceiling is composed of wood beams and painted plaster.

Condition: *Fair*
The stairs and landings are in fair condition. Stair treads are worn and exposed; paint and applied adhesive treads are also worn (Figure 4-58). The sheet vinyl insert at the base of the stair does not match adjacent materials. Risers are scuffed and marred with layers of cracked and oxidized finish. The walls and ceiling are in good condition.

Architecture - Interiors - *102 Entry Hal***l**
The floor is covered in carpet throughout.

Wall treatment on the north and south wall consists of a nine-inch wood base with a quarter round base shoe below vertical wood paneling that extends nine feet above the floor. Above the panels, painted plaster continues to a picture rail below the ceiling coffers. (Figure 4-59). Fluted pilasters with 12-inch bases and simple rectangular capitals are centered on the walls. The east wall was added in 1944, but trim elements were designed to match the original.

On the original west wall, paneling extends up to the ceiling but is interrupted by the door to the stair as well as two interior windows.



Figure 4-57. Leak at vault roof, east wall (KC 10/30/2018)



Figure 4-58. Wear on stair in the entry vestibule, Room 101 (KC 10/30/2018)



Figure 4-59. Plaster above wainscot and at coffered ceiling, Room 102 (KC 10/30/2018)

Semi-engaged fluted columns on rectangular bases reach from floor to ceiling on either side of the door (Figure 4-60). The windows have fluted trim at head and jamb and have a bullnose stool and apron

Doors on the north and east walls have five-inch fluted wood trim at the head and jamb (Figure 4-61). The Shaw and Hunnewell drawings included full size drawings of wood trim profiles, specifying Norway pine for some and white pine for others. The south wall has an unglazed opening cased in fluted trim at head and jamb. This opening was in fact added during a 1954 renovation, but the trim was designed to match the original. The opening has a bullnose stool but no apron.

The coffered ceiling features painted plaster between stained wood beams.

Condition: *Good*
The carpet flooring is in good condition. Condition of the hardwood floors under the carpet is unknown. Walls are in good condition with some scuffs on wood work, mostly at floor level. The ceiling is in good condition.

Architecture - Interiors - *103 Collections Storage*
The floor finish is linoleum.

All walls are finished in painted plaster with a nine-inch wood base and quarter round base shoe that can be considered typical of the original construction. Doors and windows are cased with fluted trim at the head and jamb and have a bullnose stool and apron. All wood is painted dark brown.

The coffered ceiling consists of plaster between exposed stained beams.



Figure 4-60. Wood paneling in Room 102 (KC 10/30/2018)


Figure 4-61. Detail of fluted trim typical at windows and doors (KC 10/30/2018)


Figure 4-62. Crack and penetrations in ceiling of Room 103 (KC 10/30/2018)

Condition: *Fair*
The flooring exhibits some scuff marks and cracks. Walls are in fair condition. There is a crack in the plaster in the eastern bay, not far from some newer pipe penetrations (Figure 4-62). Paint has damaged wood trim finishes.

Architecture - Interiors - *104 Reading Room*
The floor is covered in carpet throughout.

The east, exterior wall has an atypical seven-inch wood base with quarter round shoe and a plaster finish above. Two fluted wood columns (actually Norway pine trim concealing structural cast iron columns) on rectangular bases are engaged in the wall. The columns have simplified Doric capitals. Between the columns, windows are cased with five-inch fluted trim at head and jamb and a bullnose stool and apron (Figure 4-64).

The north, west and south walls have the typical nine-inch wood base and quarter round base shoe and a plaster finish above. Wood picture rail trim runs the perimeter of the room just below the ceiling coffer trim. Shallow wood pilasters occur at room corners and are aligned with ceiling beams (Figure 4-63). Two of these pilasters also appear at the west wall. The west and south walls were added in 1944 as frame walls filling in between the pilasters. Doors on these three walls all have fluted trim.

The coffered ceiling consists of painted plaster between wood beams painted dark brown.

Condition: *Fair*
The carpet flooring is in good condition. Condition of the hardwood floors under the carpet is unknown. The plaster walls are in fair condition with some cracking, particularly at the west wall. Paint has damaged wood


Figure 4-63. Engaged pilasters and coffered ceiling, Room 104 (KC 10/30/2018)


Figure 4-64. Wood column trim, east wall of Room 104 (KC 10/30/2018)

trim finishes. The ceiling is in good condition, but modern fixtures are suspended from the wood coffers.

Architecture - Interiors - *105 Office*
The floor is covered in carpet throughout.

The original east and south walls are finished with plaster and the typical nine-inch wood base. The north and west wall were added in 1944 and the wood trim of the pilasters, seen in Room 104, is not visible here. The cast iron columns have been boxed out and then plastered (Figure 4-65). Windows and doors, however, do have the familiar fluted trim.

The coffered ceiling has plaster between wood beams painted dark brown.

Condition: *Fair*
The carpet flooring is in good condition. Condition of the hardwood floors under the carpet is unknown. The walls are in fair condition with cracking on the south wall and some visible patching. Paint has damaged wood trim finishes. The ceiling is in fair condition with cracks in the plaster and areas of patching. Modern lighting fixtures hang from the wood beams.


Figure 4-65. No wood trim at the pilasters in Room 105 (KC 10/30/2018)

Architecture - Interiors - *106 and 107 Offices*
Flooring is carpet throughout.

The exterior walls have a painted plaster finish with a stained five-inch wood base and a quarter round base shoe. This wood base, typical of walls in the south wing, likely was added after the removal of the stacks in 1944; the original drawings showed no trim in this modern, functional space.

The stacked windows are recessed into the wall. As opposed to the heavy wood trim typical at north wing windows, here the plaster finish of the wall turns into the jamb


Figure 4-66. Window trim condition in Room 106 (KC 10/30/2018)

and terminates at a wood quarter round at the window frame. Similar trim runs at the head of each pair of windows as well along the stile between the pair. Sills are a bullnose stool with a flat apron (Figure 4-66).
The west wall facing the corridor and the partition wall, all stud walls added in 1944, have the same base and a plaster finish. The partition wall intersects the east wall at the stile between a pair of windows.

The high, flat ceilings are finished with painted plaster.

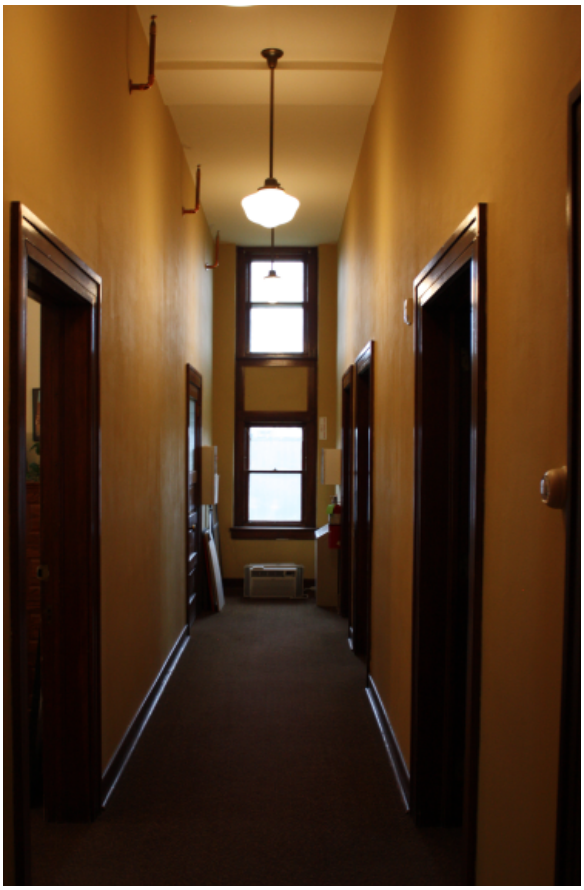
Condition: *Good*
Condition of the flooring under the carpet is unknown. The plaster of the east wall of Room 106 is damaged where it turns into the window jamb. The finishes are in otherwise good condition.

Architecture - Interiors - *108, 109, 110 Offices*
The floor is carpeted.

The exterior walls have a painted plaster finish with a stained five-inch wood base and a quarter round base shoe. The trim condition at the windows is as described for rooms 106 and 107. The spandrel between the window stack is plastered.

The masonry north wall of Room 110 has the same finishes. The east wall facing the corridor was added in 1944 but has the same base and finishes. The newer (ca. 1954) walls that separate the three rooms consist of a half wall with a plaster finish and the same wood base, topped off by a chair rail. Above the chair rail three panels of patterned translucent plastic panels in four-inch wide wood casing stretch to the ceiling. Quarter round trim (smaller than that seen at the windows), lines the wall edges and the ceiling. Edges of the former(1944) partition wall


Figure 4-67. Glazed partition wall and column at window in Room 109 (KC 10/30/2018)


Figure 4-68. Corridor 111 looking south (KC 10/30/2018)

remain in Room 109 (Figure 4-67).

The ceilings are finished with painted plaster.
Condition: *Good*
Condition of the flooring under the carpet is unknown. Other finishes are in good condition, except chipped and worn base trim in Room 109, and stained carpet in Room 110.

Architecture - Interiors - *111 Corridor*
The flooring in the corridor is carpet.

The south, exterior wall has a painted plaster finish with the stained five-inch wood base. The recessed window has stained trim and frames. The east and west walls are 1944 partitions, but have the same base and finish. The north wall has a cased opening but no door. Three torus-shaped holes (now filled with wood) are visible on the south side of the west jamb casings at the typical height for hinges.

The ceilings are finished with painted plaster.

Condition: *Good*
Condition of the flooring under the carpet is unknown. Other finishes are in good condition, except for hairline cracks in the plaster wall at the south end.

Architecture - Interiors - *112 Central Files*
The floor is covered in carpet throughout.

North, south and west walls are covered in painted plaster with the typical original nine-inch wood base. At the south wall, a millwork electrical cabinet is semi-recessed into the wall next to a slender door that has no knobs. On these three walls, a picture rail, three inches high in an ogee profile, runs two feet below the ceiling (Figure 4-69).

The low east wall was added in a 1954



Figure 4-69. Millwork cabinet and ceiling beams in Room 112; the encased beam at the removed wall is visible in the foreground (KC 10/30/2018)

renovation, which removed a full height wall located just west of the original pilaster. The beam at the top of this wall was encased and painted (Figure 4-69). In its stead, the project added this half wall, three feet tall and clad in beadboard below a stained wood cap (Figure 4-70). The wall houses a wood swinging gate. The same project inserted an interior window into the south wall looking to the lobby, replacing a small and higher casement window. The later window is a cased opening only; it and the fixed door are trimmed with the ubiquitous fluted profile of the original.



Figure 4-70. Fluted pilaster and low wall that divide Room 112 from 102 (KC 10/30/2018)

The ceiling is coffered with beams oriented north – south and painted plaster between.

Condition: *Fair*
The carpet flooring is in good condition. Condition of the flooring under the carpet is unknown. The plaster walls are in good condition walls with minor patch areas at base. The finish on the low wall cap is worn. The ceiling is in fair condition with cracks in the plaster and areas of patching, particularly in the northwest corner at a cable penetration. Three modern light fixtures hang from wood beams.

Architecture - Interiors - *113A Cloak Room*
Room 113 was divided into two rooms as part of the 2008 Facility Improvements project, creating a new restroom in the northern half. Flooring in the remaining section is 2¼" wood tongue and groove boards with a lighter stain than that on the walls.



Figure 4-71. Room 113 interrupted by new wall to ABA bathroom (KC 10/30/2018)

The north and south walls have maintained their original finish with the wood base and beadboard wainscot described elsewhere. Above the wainscot, walls are painted plaster to the ceiling. The picture rail runs on these walls as well. There is ghosting of a former sconce at the south wall. The west wall, added

in 2008, has the same wood base, but the beadboard wainscot continues to just above the window head, with painted gypsum board above. The picture rail does not continue to this wall (Figure 4-71). The historic door has the traditional fluted trim while the new door to the restroom has flat trim with an ogee molding. The north window is bisected by the restroom wall but otherwise has retained its fluted trim.

The ceiling is coffered with plaster between beams.

Condition: *Good*
All finishes are in good condition.

Architecture - Interiors - *113B Restroom*
The flooring in the new restroom is new one-inch square white mosaic tile with a gray grout. A marble threshold covers the transition to the wood floor.

The north, west and south walls have maintained the original plaster finish and trim, except that there is no base shoe. A cover plate from a former sconce remains on the south wall, and the ghosting of a built-in cabinet can be seen on the west wall. The 2008 east wall finish matches that of the west wall described above, with the same trim at the door. The bisected window has otherwise maintained its traditional trim.

The ceiling matches that described above.

Condition: *Good*
All finishes are in good condition, with mild water staining noted at the beadboard near the sink and toilet (Figure 4-72).



Figure 4-72. Historic beadboard and trim masterfully retained in new restroom (KC 10/30/2018)



Figure 4-73. East wall at first floor landing (RK 10/30/2018)

Architecture - Interiors - *Stair Hall 114*
The floor, which also serves as the landing for the stair, is wood tongue and groove.

Walls are exposed, painted brick with no base. At the east wall, three masonry openings host Door 117 with its transom above and two interior windows. The brick headers above the opening are flat jack arches. The stained wood frames of these elements are recessed into the opening and trimmed with a small quarter round. The interior windows are 15-lite fixed sash (Figure 4-73).

The ceiling is effectively the underside of the landing above and consists of painted plaster between wood beams.

The grand stair to the second floor is intact on both sides and consists of 7" risers and 12½" treads. Landings and all stair elements are stained wood. (Figure 4-74). Painted wood tread covers are installed on the steps and at the top and intermediate landings. The railing consists of turned wood balusters between 6" x 6" chamfered posts. The posts have beveled wood caps. The top rail, wood in a traditional profile, runs 33 inches above the treads. There is no separate handrail. The wood carriage on the inside of the stair is exposed to the stairwell and turns down toward the base of the stair. The underside of the stair is covered in beadboard (Figure 4-75).

Condition: *Varies*
Stair is in fair condition with wear on the treads, landings and risers (Figure 4-76). Fire suppression and plumbing pipes (painted) run through landings at north and south corners of landings at west wall. The walls and ceiling are in good condition. Please refer to the section "Architecture-Life Safety and Egress" for more on code considerations for the stairwell.



Figure 4-76. Grand stair viewed from the first floor landing (KC 10/30/2018)


Figure 4-74. Beadboard at underside of central stair run (KC 10/30/2018)


Figure 4-75. Typical tread wear at first floor landing (KC 10/30/2018)

Architecture - Interiors - *Vestibule 115*
Room 115 is the west vestibule, which sits about five feet lower than the first floor. The floor is painted concrete.

Walls are exposed, painted brick below a continuous deep wood sill at the windows (Figure 4-77). The sill woodwork includes trim molding that overhangs the brick. Jamb trim at the windows, concealing structural posts, is flat. At the window head, crown molding runs the perimeter of the room. A wood book drop sit above the sill with a metal lock box in the masonry wall below.

The ceiling is wood beadboard.

Condition: *Fair*
The paint on the floor has largely worn off. The paint on the brick is faring better with some scuffs. The ceiling is in good condition.

Architecture - Interiors - *201 Collections Storage (former Main Reading Room)*
Flooring throughout the room is painted cork.

Common to all walls is a nine-inch wood base below a wood beadboard wainscot that terminates in a wood cap at 3'-9" above the floor. Walls are finished in painted plaster above the wainscot and topped with a substantial picture rail molding that aligns with the window heads (Figure 4-78). Between the picture rail and the sloped ceiling, perforated acoustic panels were added and have been painted.

At the windows on north wall, the fluted trim at the header again aligns with the picture rail. At each jamb, five-inch fluted trim extends from the header past the wainscot to the wood base. Below the sills, which align with the top of the wainscot, two wood panels infill the space between the jamb trim.



Figure 4-77. Continuous wood sill above the masonry wall in the west vestibule; the double sash windows above (KC 10/30/2018)



Figure 4-78. Window headers at picture rail with acoustic panels, Room 201 (KC 10/30/2018)



Figure 4-79. West wall of Room 201 with balustrade and glazing (KC 10/30/2018)

The windows that flank the fireplace on the east wall feature an arched wood panel with a decorative wood grille above the window. The spring point of the arch aligns with the picture rail. Below the sill, which aligns with the wainscot, three wood panels extend between the fluted jamb trim.

Above the picture rail molding at the west wall runs the balustrade of the third floor gallery (Figure 4-79). The balustrade consists of closely spaced turned wood balusters with three-inch squared tops and bases. The balusters are topped with a molded wood cap. Wood panels now infill behind the balustrade. Above, a broad arched wood window with built-up trim fills most of the gable end; wedges of glazing infill the remainder. All glass is painted. This wood and glass enclosure was added in 1906.

At the west end of the south wall sits a millwork electrical cabinet with a five-panel door. The lower two panels hinge separately. This cabinet is near the location of the former book lift mentioned in the history section and shown in the original drawings but has no apparent relation to it.

The distinctive fireplace at the center of the east wall has a 8'-5" wide x 8'-9" tall brick surround with arched firebox (Figure 4-80). The wood mantle reads essentially as a full entablature with a stepped cornice lined with dentils above a frieze of triglyphs. Fluted wood columns with simple capitals support the mantle and more wood horizontal paneling sits above, flat against the wall.

All wood trim mentioned is varnished to a high degree of gloss. The ceiling follows the roof gable for about two-thirds its height and then turns flat below the collar ties. The coffered ceiling is composed of exposed



Figure 4-80. Mantle configuration at fireplace, Room 201 (KC 10/30/2018)



Figure 4-81. Animal heads at tie rods at ceiling of Room 201 (KC 10/30/2018)

structural elements plus decorative members. Four perforated acoustic panels were added to each coffer. Built-up wood trusses with tie rods are slightly offset from the ceiling bays. Abstract carved animal heads animate the connection of the painted metal tie rod to the wood buttress of the truss (Figure 4-81).

Condition: *Fair*
The cork floor is in fair condition, exhibiting a few dents and cracks. Near the north wall, the cork is missing, and wood flooring is exposed. The plaster finish and the woodwork are in good condition, with some wear at the window sills. The ceiling is in fair condition with isolated evidence of prior water damage; some acoustic tiles are stained or missing (Figure 4-82).

Architecture - Interiors - *202 Collections (former Girls' and Boys' Reading Room* **)**
Flooring throughout the room is painted cork.

At all walls, a quarter-round wood base runs below a wood beadboard wainscot that terminates in a wood cap at 3'-9" above the floor. Walls are finished in painted plaster above the wainscot. There is no picture rail in this room. The windows are cased with five-inch fluted trim at the head and jambs (Figure 4-83). The jamb trim terminates at the chair rail cap, which also serves as the apron at the window sills. The south wall features a semi-circular window with fluted trim and decorative wood grille high in the gable end. Cover plates for historic sconces are notable on the north wall.

The ceiling follows the roof gable for about two-thirds its height and then turns flat below the steel collar ties (Figure 4-84). Stained wood rafters with ornamental molding run east – west and intersect with larger beams that line the transition from the flat ceiling to



Figure 4-82. Acoustic tiles at the coffered ceiling of Room 201 (KC 10/30/2018)



Figure 4-83. Window trim and sill in Room 202 (KC 10/30/2018)



Figure 4-84. Exposed rafters and collar ties at ceiling of Room 202 (KC 10/30/2018)

the sloped. The ceiling is finished in plaster between the beams.

Condition: *Fair*
The cork floor is generally in fair condition, exhibiting scratched and worn paint, but is critically damaged along a section of the west wall (Figure 4-85). The plaster finish is in fair condition, affected in the northwest corner by water damage that has caused the paint to crack and peel. Cracks are visible in the plaster on the north, south and east walls (Figure 4-86). The woodwork is in fair condition with some crazing of varnish at sills. The wainscot shows considerable wear in the vicinity of the floor damage. The ceiling is in good condition.

Architecture - Interiors - *203 and 205 Collections Storage and Supply Storage (former Special Room and Store Room)*
Flooring is painted cork.

At all walls, a quarter-round wood base runs below a beadboard wainscot that terminates in a wood cap at 3'-9" above the floor. Walls are finished in painted plaster above the wainscot. The windows are cased with five-inch fluted trim at the head and jambs. The jamb trim terminates at the chair rail cap, which also serves as the apron at the window sills. The wainscot trim cap is detailed on the original drawings. Built-in shelving occupies three of the walls of Room 205.

The flat coffered ceilings consist of a plaster finish between wood beams running north – south.

Condition: *Fair*
The black paint on the floor exhibits considerable wear and water damage below the sink (Figure 4-87).


Figure 4-85. Floor damage at west wall of Room 202 (KC 10/30/2018)


Figure 4-86. Cracking in plaster between windows and rafters, south wall of 202 (KC 10/30/2018)


Figure 4-87. Floor damage at sink in Room 203; typical wainscot detail behind (KC 10/30/2018)

Architecture - Interiors - *Stair Hall 204*
The floor, which also serves as the landing for the stair, is wood tongue and groove.

Walls are exposed, painted brick with no base. At doors, simple masonry openings hold wood frames recessed back from face of wall with a quarter round trim. The exception is the squat door to the stair to the gallery, which is tucked tightly into the wood enclosure to the stair to third floor. This enclosure consists of beadboard paneling behind wood structural elements. The base of the stair is clad in beadboard (Figure 4-88).

The window opening on the west wall above the stair consists of a masonry Roman arch over the arched window and an otherwise typical masonry opening. Again, the frame is recessed into the opening and trimmed with a small quarter round. The bullnose wood stool of the sill, however, extends beyond the opening and has an apron that hangs over the brick (Figure 4-88).

The stair to the third floor consists first of a continuation of the main stair on the north side only, up four risers to a wood landing. The landing supports the stair to third floor, which is accessed through the door in the enclosure just described.

The enclosed stair to the Gallery consists of 8-inch wood risers and 10-inch treads, except at the three winder steps just past the door. The treads have vinyl tread covers. Four pipes penetrate one winder tread at the turn of the stair. There are no handrails (Figure 4-89).

The coffered ceiling consists of painted plaster between wood beams



Figure 4-88. Arched window below stair to third floor gallery (KC 10/30/2018)

Condition: *Fair*
The stair to the third floor is in good condition to the landing, then in fair condition past the enclosure. The treads show considerable wear to either side of the tread cover. The top cover is torn and the useful width of the stair is encroached by the pipes. The ceiling is in fair condition with hairline cracks in plaster and peeling paint at southwest corner near plumbing lines.


Figure 4-89. Stair to third floor gallery viewed from the top (KC 10/30/2018)

Architecture - Interiors - *Gallery 301*
The floor is finished with 2¼" wood tongue and groove planks.

The north, south and west walls are anchored with a beadboard wainscot with an eight-inch base and a wood cap at 3'-0" above the floor. Above the wainscot on the north and south walls, a plaster finish covers the short distance to the sloped ceiling. Above the wainscot at the west (exterior) wall, plaster extends to ceiling coffer. The three windows on the west wall sit above the wainscot and are cased at head and jamb with fluted trim and simple bullnose stool and apron.

At the east wall, the beadboard wainscot is taller with a square profile wood cap at 3'-7". Above is the large arched window overlooking the main reading room, added in 1906. The windows have been painted on the gallery side; one is operable. Horizontal boards have been installed across the window to protect the glass (Figure 4-90). Copper fire suppression and painted roof drain pipes are exposed at walls. One historic sconce remains on the west wall, and ghosting of former bookcases is noteworthy on three walls.


Figure 4-90. Gallery glazing with protective boards (KC 10/30/2018)

The coffered wood ceiling is infilled with plaster. One coffer contains an attic hatch. The bases for the original brass three-armed light fixtures remain in some panels, and new

period-style fixtures hang from others.

Condition: *Fair*
The flooring is in fair condition. The finish is scratched, and metal tracks for sliding shelving have been fastened through the floorboards (Figure 4-91). The wood wainscot and trim are in fair condition with some scratches to the wood finish. The wall plaster finish, also in fair condition, exhibits hairline cracks and patching just above the wainscot at both north and south ends. The ceiling is in overall good condition with minor cracking in the plaster panels.



Figure 4-91. Windows at west wall; tracks installed at floor (KC 10/30/2018)

Architecture - Life Safety and Egress
As a National Park Service project, any proposed rehabilitation of the structure is subject to the Denver Service Center workflows. As such, work is governed by the 2018 International Code Council family of codes.

The following general classifications prescribed in the 2018 International Building Code (IBC) have been applied to this study:

Area (within walls): Basement 3244 sq ft, First Floor 3093 sq ft, Second Floor 3252 sq ft. The basement is considered as an occupied space. The third floor gallery is considered a mezzanine for this analysis.

Fire Suppression: This study includes the automatic sprinkler system already installed. Improvements to that system may be required by code as discussed by other disciplines.

Occupancy Classification: Per the 2009 Facility Plan, the structure is to continue to function as the Keweenaw History Center. This function aligns best with the Assembly Group A-3, which includes both libraries and museums. This will be further tested by the proposed alternatives of this work.

Type of Construction: The size of this structure allows it to be considered a Type VB construction, which means that any new walls, floors or partitions would not require a fire rating unless specifically required elsewhere. This conclusion is dependent on the presence of the sprinkler system and the consideration of the third floor gallery as a qualified mezzanine.

The 2018 International Existing Building Code (IEBC) is the primary reference for this work. While there are three paths for compliance under this code, this discussion will assume the work area compliance method. The extent of rehabilitation recommended in this report would qualify as a Level 3 alteration, in which the proposed reconfiguration of space would exceed fifty percent of the building area. Requirements for Level 3 Alterations are covered in Chapter 9 of the IEBC, but that chapter defers to Chapter 8 for most requirements. Chapter 12, Historic Buildings, further refines these provisions. All chapters typically refer extensively to the IBC, indicating which elements of that new building code must be followed to protect life safety and where variances are reasonable due to the confines of the existing space or to preserve the historic character of the structure. Key points are discussed below.

Section 801.3 stipulates that new construction shall comply with the IBC except where indicated otherwise.

Section 802.2 requires a one-hour fire resistance rated enclosure at vertical openings such as that at the grand stairway. Exception 4 reduces to 30 minutes for Group A, but see also 1203.6 below.

Section 805 specifies when stories may have one exit. For A occupancies, a single exit from the first story below the grade plane (i.e. the basement) is allowed but not from the second floor. This means that a second exit or exit access is required from the second story.

As new construction, the stair itself that would provide that exit access would fall under the guidelines of the IBC, section 1011. The stair design herein treats the stair as an *exit access stair,* rather than an *exit stair*. If travel distances were greater, it would have to be an exit stair per section 1006. The advantage to a historic building is that an exit

access stair that communicates between only two stories need not be enclosed (1019).

Per 805.2, doors on the egress path must swing in the direction of exit travel when serving an occupant load greater than 50. As this is an A occupancy, exit doors with latches must be equipped with panic hardware. Section 805.5 discusses requirements for doors and openings into corridors; these do not apply here as the corridors are excepted from rating in the IBC (Table 1020.1).

Per 805 handrails must be provided on at least one side of an existing stair.

Per 809, if the occupant load of a story is increased by more than 20 percent, then plumbing fixture quantities must meet the current code. This could mean that additional facilities should be provided, but this varies with the alternative chosen and will be discussed there.

Chapter 12 allows some useful concessions. Per 1203, elements of the means of egress such as door openings and corridor and stairway width may be less than those specified in the code, when approved by the code official.

Section 1203.5 allows historic interior finishes to be maintained despite flame spread requirements.

Per 1203.7, any one-hour fire-resistant assembly need not be provided where the existing wall and ceiling finish are lath and plaster. Moreover, 1203.6 allows stairway enclosure construction to limit the spread of smoke through use of solid elements and tight doors; the fire resistance rating is not required.

Per 1203.9, grand stairways are excepted from handrail and guard requirements provided they are not structurally dangerous. Section 1203.10 allows the spacing in historic guard rails to be maintained. Missing elements may be replaced in a manner that preserves the historic character of the guard.

Section 1204.7 allows that existing front doors need not open in the direction of egress travel.

Condition: *Poor*
The safe egress of occupants is the most critical item as there is currently only one egress route from the second floor. Otherwise, presence of a fire suppression system greatly enhances occupant safety.

Architecture - Accessibility
As a federally managed structure, this building is subject to the Architectural Barriers Act (ABA) Standards. Section F202.5 of the standards outline specific exceptions to the standards for qualified historic buildings. In short, alterations to qualified buildings must provide at a minimum: one accessible route from a site arrival point to an accessible entrance (F206.2), one accessible public entrance with an accessible route to public elements on that floor (F206.4) and a minimum of one unisex accessible restroom (F213.2). Otherwise, altered elements must comply with the standards. Moreover, the NPS subscribes to the principles of universal design, which strives to go beyond the minimums set by the standards.

Condition: *Poor*
There is currently no accessible route to an accessible entrance nor an accessible route through the building. To complicate matters, neither entrance is at the same level as the first floor. If a primary function such as a reading room is added to the second floor, that floor should be made accessible. One unisex restroom conforming to accessibility standards has been added, but serves only the first floor. Current door knobs and clearance at door openings are examples of items that must be brought into compliance when space is altered.

Existing Conditions & Assessment - Hazardous Materials

Hazardous Materials - Asbestos
Eight materials were tested for asbestos, including cork flooring, plaster, window caulking and carpet adhesives. Plaster samples were collected from original walls and newer (1944) construction.

Condition: *Fair*
Two materials tested were found to contain asbestos. While the carpet adhesive did not contain asbestos, some fibrous material on the adhesive did test positive. These fibers are possibly remnants of pipe insulation, since removed. The second item to test positive was one sample of exterior window caulking. Another sample did not test positive. As all windows received new caulking during the 2010 window restoration, it is possible that affected caulk was applied since. Further testing is appropriate. Please refer to the full report of Environmental Survey Findings in the Appendix for a thorough discussion.

Hazardous Materials - Lead Based Paint
Paint on the first and second floor was not tested as it had been recently applied. Previous (2000) testing found lead in basement and attic paints.

Condition: *Unknown*
It is likely that older layers of paint do contain lead, as previous (2000) tests found lead in basement and attic paints. Further testing is necessary at painted surfaces that will be impacted by the scope of work. Please refer to the full report of Environmental Survey Findings in the Appendix for a thorough discussion.

Existing Conditions & Assessment - Structural

Structural - General System Description

The Calumet & Hecla (C&H) Library is a cross gable structure with the main portion of the structure to the north and a wing to the south (Figure 4-92). The main structure is two stories with a partial third floor gallery while the south wing has two stories. Both wings have full height basement spaces that are occupied. The roof is framed of 2x lumber rafters that are supported by wood purlins framed to timber trusses spanning between interior brick and exterior stone and brick masonry bearing walls. The first, second, and third floor gallery floors are framed in several manners with combinations of steel and lumber floor members. The first floor framing is supplemented with structural steel beams and columns where interior masonry bearing walls were removed in 1912 for programing purposes. Soon after the building was completed, a one story entry vestibule was added to the west elevation in 1898. A one-story vault, added in 1944, protrudes from the west elevation of the south wing and consists of a cast-in-place concrete roof over brick perimeter bearing walls (Figure 4-93).

Where visible, the structural elements and configuration of the building generally conform to the original 1898 drawings by Shaw & Hunnewell, the 1898 vestibule drawings, the 1912 steel shop drawings associated with the bath house renovations in the basement, and the 1944 renovation drawings.



Figure 4-92. Southeast corner of the C&H Library (CBB, 11/01/2018)



Figure 4-93. Exterior of the vault attached to the west elevation of the C&H Library (CBB, 11/01/2018)

Structural - Foundation

The C&H Library is founded on full height foundation walls. Around the perimeter of the structure, the below grade portion of the masonry walls is constructed of a rubble exterior leaf and an interior brick backing wall (Figure 4-94). Beneath the interior bearing lines, the full-height bearing walls are constructed of brick masonry. The type of foundations beneath the steel columns added in 1912 are unknown.



Figure 4-94. Brick foundation walls above grade (CBB, 10/30/2018)

At the 1898 vestibule, the perimeter stone walls extend approximately 3'-0" below grade and do not appear to have a widened footing per the drawings.

Per the 1944 drawings, the one-story vault addition is founded on a 1'-1" thick concrete stem wall that extends below grade. A note on the drawings indicates that unless the construction crews encountered solid rock, the stem wall bears on a 6" thick by 1'-6" wide concrete footing.

Condition: *Good to Fair*

The foundations of the C&H Library are concealed, however they are likely in good condition and performing well. There are no signs of differential settlement such as cracks in the interior finishes or listing floors.

The foundations of the vault are in fair condition. A horizontal crack in the exterior brick masonry wall of the vault indicates that the foundation beneath the exterior wythe of the wall is likely settling differentially from the interior concrete floor slab beneath the interior hollow brick wall. This differential settlement between foundation systems and resulting crack is exacerbated by the fact that the interior wythe of the wall supports the roof. No signs of rust jacking, such as rust staining from corroding internal steel, were

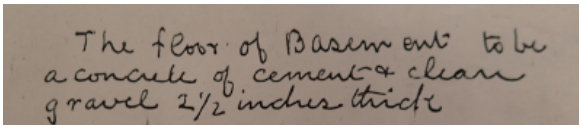


Figure 4-95. Excerpt from the 1887 drawings from the nearby C&H Mine Office describing the ingredients to be used to construct the concrete floor of the basement (LMG, 10/30/2018)

observed near the horizontal crack.

Structural - Floor Framing
The basement floor is concrete slab-on-grade. Originally, the slab was likely 2-½" thick and composed of unreinforced concrete, similar to the C&H Mine Office (Figure 4-95). In the south wing, the compact shelving units that were installed in 2003 are supported on steel rails that are set in a full grout bed on the original concrete slab.

The first floor is framed with two systems: a timber system and a steel system. In the north portion of the structure, the floor is framed with 5-½" x 11-¼" timber joists spaced at approximately 4'-0" on center spanning between the exterior walls and two intermediate bearing lines generally provided by interior brick bearing walls (Figure 4-96). Where one of the original bearing walls was removed in the basement about 1912, 22" deep steel wide flange columns spaced at approximately 8' support a steel box beam created from two 12" channels and several steel plates that picks up the joists.

In the south portion of the structure, the first floor is framed with original steel joists that span between the exterior bearing walls and larger steel beams that were installed in 1912 when the masonry bearing walls were removed (Figure 4-97 & Figure 4-98). These floor framing members are sheathed with the original cast iron floor plates which are visible from the underside in the basement of the south wing. These floor plates are all that remains in situ of the original cast iron and steel library stack structural floor system that supported the Children's Reading Room on the second floor of the south wing. Other components, including examples of the wood shelves and the vertical structural elements, are part of the park's



Figure 4-96. Timber first floor framing of the north portion of the structure (CBB, 11/01/2018)



Figure 4-97. Steel bearing line supporting the first floor framing in the north portion of the structure added in 1912 (CBB, 11/01/2018)



Figure 4-98. Original steel framing supporting the cast iron floor above and larger steel below added in 1912 to remove bearing walls (CBB, 11/01/2018)

museum collection. This structural library stack system with a perimeter shell of stone masonry was just becoming popular at the time of the construction of the C&H Library, with notable buildings such as Gore Hall at Harvard and the Boston Athenaeum utilizing this unique construction technique (Figure 4-99). This application was likely one of the first buildings constructed with this system outside of the east coast and it quickly gained popularity over the following decades. Soon thereafter, these library stack systems were advertised in catalogs produced by companies such as the Snead & Co. Iron Works.



Figure 4-99. 1913 demolition of the cast iron and steel library stack structural skeleton of Gore Hall at Harvard University originally constructed in 1877 (Snead & Co. Iron Works, Library Planning, Bookstacks and Shelving, 1915)

At the time of the observation visit, the second floor was not accessible due to finishes, but both the north and south systems are represented in drawings from different eras. Per the original drawings, the second floor of the north portion of the structure is likely framed with 6x12 timber joists spaced at approximately 4' on center, similar to the first floor. These joists are supported by the exterior walls, the interior brick bearing wall and a series of cast iron columns that are wrapped in finishes.

Per drawings from the 1944 conversion of the structure, the second floor of the south portion of the structure was completely reframed. Originally the floor was supported in part by the cast iron library stacks as described above, but when these were removed, the floor was reframed with 3-¾" x 3-¾" joists at approximately 1'-0" on center spanning between 3" x 7-½" joists spaced at 16" on center. The timber joists are supported on a system of steel beams and columns.

The floor framing of the third floor gallery in the main portion of the structure was not observable at the time of the visit, but according to the original drawings, it is likely

framed with 6x12 joists in a similar layout as the second floor.

The floors of the west entry vestibule and the vault are concrete slabs on grade.

Condition: *Good*
The floor framing of the structure is generally in good condition. There are no signs of deflection or visible deterioration. One item to note; because the building's basement was used as a bath house for many years, it is possible there may be some concealed wood decay where floor joists pocket into bearing walls. Because the interior space was moist and heated during the time this space was used as a bath house while the exterior conditions were sometimes quite cold, the dew point temperature across the wall assembly may have been located within the joist pocket. This excess presence of moisture may have caused decay fungi to flourish, and even if the pocket is not actively moist, any damage that may have occurred during the time the space was used as a bath house would still be internal to these pockets. It is also possible that water may be infiltrating through the exterior walls, especially in the areas where the paint is blistering, and collecting in exterior joist bearing pockets and causing deterioration. There is no specific indication of such damage currently, but since the joist ends are concealed in the walls, it is difficult to determine if the members are deteriorating. If the joist bearings have deteriorated, the members could potentially shear off the wall or the floor could drop incrementally.

Park service staff report that carpenter ants were detected in the building in the early 2000s. At that time, an exterminator treated the perimeter of the building with a boric acid solution and there have been no signs

of carpenter ants or damage since. No signs of damage due to carpenter ant infestation was noted during the design team's visit in October 2018.

Structural - Roof & Ceiling Framing

The cross gable roof is framed with rough sawn 2x12 southern pine rafters spaced at approximately 3'-0 on center. The roofs are pitched at approximately 13 on 12. The rafters are supported at the exterior walls and at the midpoint by rough sawn 4x12 purlins (Figure 4-100). The purlins span between trusses that are spaced at approximately 6'-0" on center. The trusses are framed in the same plane as the rafters, spanning across the space from exterior wall to exterior wall (Figure 4-101). A built-up beam composed of a 4x12 member sandwiched between two 2x12 members forms the top chords of the trusses. The rafter tails at the trusses are tied with 1-½" diameter rod collar ties with two turnbuckles located at the third points. A vertical 1-½" diameter vertical rod connects the rafter tie rod to the peak of the structure. The bottom two thirds of the trusses are visible from the reading rooms on the second floor while the upper third is concealed by the ceiling located at the collar tie level.



Figure 4-100. Typical roof framing of the C&H Library (CBB, 11/01/2018)



Figure 4-101. View of trusses from interior of the Main Reading Room in the north portion of the structure (LMG, 10/30/2018)

Per the drawings, the west gable roof of the entry vestibule is framed with 2" x 8" rafters spaced at 16" on center. At each rafter pair, a 2" x 6" collar tie extends across at the top of wall elevation.

The roof of the one-story vault is framed of a 4-½" thick reinforced concrete slab with a 3-¼ on 12 slope. The slab bears on the interior wythe of the exterior walls and a 10" deep steel beam at the ridge that is supported by the exterior wall of the vault and of the main structure.

Condition: *Good to Fair*

The roof framing is in good condition. There are no signs of global structural issues such as sagging rooflines, and all members have adequate capacity for the structural loads imposed on the structure.

During the site visit, it was noted that the trusses are not centered on the masonry piers between the windows as intended (Figure 4-102). There do not seem to be any ill effects caused by this offset.



Figure 4-102. Several trusses are not centered on the appropriate pier such as in this location in the Main Reading Room (CBB, 11/01/2018)

Although no slack was noticed in the tie rods at the roof trusses at the time of the visit, these rods are integral to the structural stability of the roof and should be maintained taut.

At the intersection of the gable roofs over the main building and the south wing, there is evidence of water intrusion in the past. This evidence includes water staining, but no members visible were yet showing signs of wood deterioration. The source is likely a roof or flashing leak, or build up of condensation. The recent re-roofing project should have abated any flashing related leak, therefore, if moisture is observed to re-occur at this location, it is likely from condensation of humid air migrating into the insulated and unheated attic space.

Near the gable end of the vault, there is evidence of a roof leak through the concrete elements by way of a water stain (Figure 4-103).



Figure 4-103. Water stained concrete from a roof leak in the vault (LMG, 10/30/2018)

Structural - Wall Framing
The exterior walls approximately 24" thick and are constructed of stone masonry on brick back up walls. The stone masonry is laid in a unique polygonal mosaic pattern with red brick water tables at each floor level and red brick corner quoining. Below the lowest water table, the stones are all "poor rock" (local mining waste rock) to provide a uniform color palate. Above the water table, the wall is composed of a mosaic pattern of local field stone and poor rock. The interior walls are approximately 16" thick and constructed of load-bearing brick masonry.

The perimeter stone walls of the entry vestibule to the west transition to brick for approximately the top 1'-0" of the wall. The masonry walls extend up approximately 3'-8" above the floor level where they transition to windows and structural mullions. Timber headers span between the mullions to support the roof.

The walls of the one-story vault are constructed of 13" thick brick masonry on the exterior, with a 1" air gap and an interior exposed 4" wide wythe of hollow brick.

Condition: *Good to Fair*
Generally, the walls of the main structure are in good condition with several items in fair condition. There is some hairline cracking in the interior plaster finishes of the second floor (Figure 4-105 & Figure 4-106). These cracks are likely caused by flexural movement of the walls due to wind forces or thermal expansion and contraction. See the Lateral System description below for further discussion.

Along the north wall of the structure and at the southwest corner of Room 010 in the basement near the exterior grade line, signs



Figure 4-104. Typical exterior wall masonry pattern near a corner (CBB, 11/01/2018)

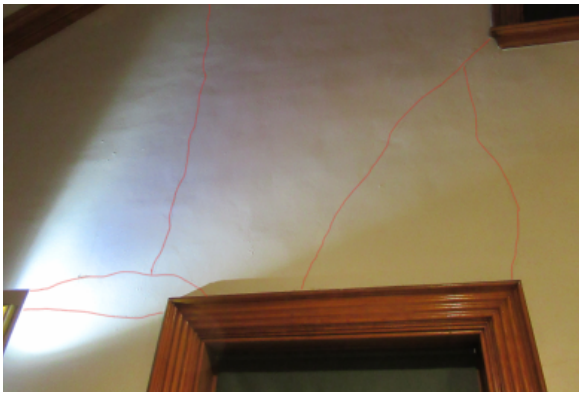


Figure 4-105. Hairline cracks (digitally enhanced in this image) are visible in the gable end walls (CBB, 11/01/2018)

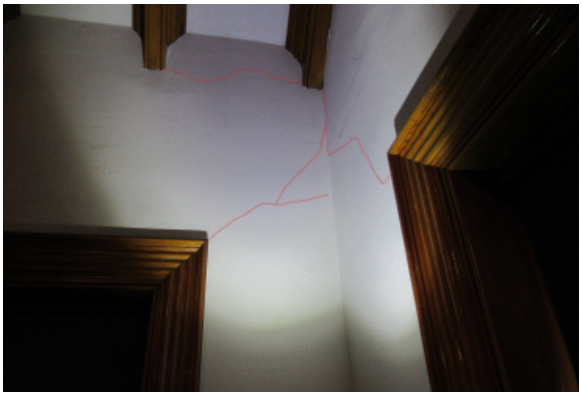


Figure 4-106. Hairline cracks (digitally enhanced in this image) are visible in the gable end walls (CBB, 11/01/2018)

of moisture infiltration through the wall (likely from the melting of built-up of snow in these locations during the winter) including blistering and peeling paint are visible (Figure 4-107).

A significant crack was observed in the brick walls of the one-story vault addition, that is likely related to differential settlement between the interior single wythe brick and the exterior brick walls (Figure 4-108 & 4-109).

Structural - Lateral System

The lateral force resisting system of the C&H library consists of the unreinforced masonry shear walls and foundations walls, as well as the sheathed floor and roof diaphragms of the structure.

Condition: *Good to Fair*

Overall, the lateral force resisting system is in good condition. The wooden floor diaphragms and perimeter masonry shear walls are in good condition laterally and there are no signs of racking or lateral distortion associated with lateral events; the elements are adequately proportioned to resist the low lateral demands on this shear wall structure.

Originally in the south wing of the structure, the upper floors of the integral cast iron and steel library stacks (described in the Floor section above) acted as a diaphragm bracing the perimeter walls. When these were removed in the 1944 renovation, it is unclear if the wood floor that was installed includes any diaphragm connections meaning that the walls may span from the cast iron first floor to the roof diaphragm above. This may be the cause of the hairline cracks above the windows on the gable end wall in the south wing.



Figure 4-107. Paint is blistering and peeling near the top of the basement wall along the north elevation (CBB, 11/01/2018)



Figure 4-108. Horizontal crack in the vault wall likely caused by differential settlement (CBB, 11/01/2018)



Figure 4-109. Horizontal crack in the vault wall likely caused by differential settlement (LMG, 10/30/2018)

Structural - Applicable Codes & Load Requirements

The code references for this assessment include the 2018 International Building Code (IBC), the 2018 International Existing Building Code (IEBC), and ASCE 7-10 Minimum Design Loads for Buildings and Other Structures.

The load requirements for the C&H Library are based on the type of occupancy and geographical location of the building. The required floor live load capacities per ASCE 7-10 for office use is 50 pounds per square foot (psf), for assembly use is 100 psf, and for library stacks is 150 psf. Any of these building uses classify the structure as Risk Category II for standard occupancy. A brief review was completed to compare the design and current code required live load capacities of the floors since the use of the structure has changed over time (see the KEWE HSR Live Load Capacity Chart in Appendix A).

The ground snow load required for the C&H Library per ASCE 7-10 is 90 psf. This ground snow load translates to a flat roof snow load on the structure of 70 psf per ASCE 7-10 when wind exposure and thermal conditions are considered. Given the steep slope of the roof and the texture of the roof surface, a 5% reduction is allowed resulting in a roof snow load of 67 psf.

The ultimate design wind speed at the C&H Library site per ASCE 7-10 Figure 26.5-1A is 115 miles per hour (mph). The equivalent nominal wind speed is 90 mph.

The C&H Library site falls within Seismic Design Category A. The Seismic Design Category is a classification given to a structure that is based on the Risk Category of the building and the severity of the design

earthquake ground motion at the site. The earthquake ground motion properties of the site are catalogued by the United States Geological Survey (USGS). The two mapped acceleration parameters for the site per the USGS are short period (Ss = 0.055 g) and 1 second period (S1 = 0.019 g). Without site specific soil testing, site soil conditions are assumed to comply with Site Class D resulting in a Seismic Design Category for the C&H Library of A. Since the structure falls within Seismic Design Category A, no seismic analysis is necessary per code.

Southern Pine design values were used to evaluate the load capacity of the C&H Library structural members based on a wood sample taken from an original floor joist. The remaining sample was not retained after the analysis. Most of the members had only some sporadically located grade-limiting defects, such as knots, resulting in Select Structural analysis values.

Condition: *Good to Fair*
Most of the floors are adequate for their current uses except for the Reading Rooms on the second floor and the third floor gallery. In the basement of the north portion of the structure, the original slab-on-grade is in good condition with no indications of damage, but it likely cannot accommodate the addition of compact shelving loads without removal or strengthening. If no measures are taken to increase the strength of this slab, the floor could settle differentially and jam the compact shelving tracks. At the south portion of the basement where free standing compact shelving is currently installed, the replaced slab-on-grade appears to be adequate as there are no signs of failure such as settlement or cracking.

The first floor of the south portion of the

structure, which originally housed stacks, is adequate with a calculated capacity of 100 psf for its current use as offices (code required capacity of 50 psf). The first floor of the main portion of the structure is adequate for its current use as offices with a live load capacity of 55 psf, but it does not have additional capacity.

The Reading Rooms on the second floor are currently being used for museum object and artifact storage, which is associated with a higher live load (125 psf) than the calculated capacity of the structure (55 psf at the north and 75 psf at the south) so the members are overstressed. Compact shelving (approximately 300 psf) is currently installed on the third floor gallery above the reading room that has a capacity of 55 psf. These members are overstressed. The two floor systems that have been identified as overstressed are in fair condition because although there have been no visible failures at this point, wood as a material does not perform well under long term heavy loads. Office (50 psf) or a modified Reading Room (only tables and chairs with no stacks) use would be more appropriate for these spaces with their current framing. If it is desired to utilize these spaces for library stacks (150 psf) or assembly use (100 psf), the floor framing systems will need to be strengthened. See the Live Load Capacity chart in the appendix for a clear comparison of the capacity of each floor versus the code required live loads.

The roof framing elements have adequate capacity and are in good condition.

Existing Conditions & Assessment - Mechanical

Mechanical - System

The existing building contains four levels including a basement, first level, second level, and third level. Each level contains occupiable space that is heated via a central heating water system located in the basement. The mechanical system consists of two high efficiency boilers, each a Weil McLain Ultra 310 with a maximum input of 310 MBH and a rated output of 289 MBH. The boilers are 120V/1 phase units. Each boiler has a dedicated primary circulating pump, Taco Model 0014-F1, 120V/1 phase. There are also two (2) heating water secondary pumps that are installed in parallel within the mechanical room. The secondary pumps are set up as the principal pump and the second pump is a redundant pump that must be manually switched over. Each heating secondary water pump is a Grundfos Model UP-43. Figures 4-110, 4-111, 4-112, 4-113 and 4-114.

There are at total of seven (7) heating zones and the control valves are located in the basement mechanical room. Figures 4-115 and 4-116.

The current zones are as follows:

- Zone #1 – North 2nd Floor
- Zone #2 – North Basement
- Zone #3 – South 1st Floor
- Zone #4 – South 2nd Floor
- Zone #5 – North 1st Floor
- Zone #6 – South Basement
- Zone #7 – 3rd Floor



Figure 4-110. Boilers in Mechanical Room. (DMD, 10/30/2018)



Figure 4-111. Typical boiler nameplate. (DMD, 10/30/2018)



Figure 4-112. Boiler primary/circulating pump. (DMD, 10/30/2018)

Heating water lines for each of the zones are routed out of the Mechanical Room. All the heating water lines are copper lines. There is a mixture of insulated and uninsulated lines within the building. The heating water lines within the mechanical room are not insulated. The heating water lines in the basement archives area, 1st floor, 2nd floor, and 3rd floor area are all insulated. The heating water lines routed from the Mechanical Room to the basement Bathroom are not insulated nor are the heating water lines routed in the Bathroom to the Archives area. Figures 4-117 through 4-123.

The heating water lines are routed to various heating water devices including baseboard heaters, unit heaters, and cabinet unit heaters throughout the building. The heating water devices are mostly from an HVAC renovation that occurred in the 1990's while the more recent 2007 HVAC renovation focused on new boilers, pumps, and control valves and only added a few new heating water devices.

Basement:
All the heating devices in the basement are baseboard heaters. Figures 4-124 and 4-125

The Mechanical Room has a single baseboard heater.

The Supplies room has a single baseboard heater.

The Collections Storage has a single baseboard heater and a portable dehumidifier.

The Cataloging Office has a single baseboard heater. This baseboard heater is located behind the file cabinet.

The Imaging Lab has a single baseboard heater.



Figure 4-113. Heating water secondary pump. (DMD, 10/30/2018)



Figure 4-114. On/Off switches for secondary pump operation. (DMD, 10/30/2018)



Figure 4-115. Control panel with zone designation. (DMD, 10/30/2018)

The Collection Processing Room has two baseboard heaters. One of the heaters is located on the south wall under tables and the second baseboard heater is located on the west wall. There is also a portable dehumidifier that is located near the west wall along with a floor fan to help circulate the air within the space. Figures 4-126

The Collections Storage has four (4) baseboard heaters. There is a baseboard heater on the east wall, one on the south wall, and two on the west wall on either side of the Collections Storage Vault. There is a portable dehumidifier located in the center of the room and a floor fan located at the doorway into the Collections Storage Vault.

The Collections Storage Vault contains no heating devices or other sources of heat.

The Toilet Room contains a single baseboard heater on the south wall.

The Hall area located at the base of the stairs contains a single baseboard heater on the west wall. In the northeast corner of the Hall north of the stairs are multiple heating water risers that provide heating water to the upper floors. These lines are exposed in the corner.

The basement is divided into two main control zones as noted on the control panel in the Mechanical Room, the north basement zone and the south basement zone. The areas on the north basement zone include the Supplies Room, Collections Storage, Imaging Lab, Cataloging Office, and the Collection Processing Room. The thermostat for this zone is located in the Collection Processing Room on the west wall south of the doorway into the room. Figure 4-127.



Figure 4-116. Control panel with zone designation. (DMD, 10/30/18)



Figure 4-117. Heating water control valves in Mechanical Room in basement. (DMD, 10/30/2018)



Figure 4-118. General view of Mechanical Room in basement. (DMD, 10/30/2018)

The area on the south basement zone is the Collections Storage and the thermostat is located just inside the Collections Storage room on the north wall east of the door way. The baseboard heater in the Hall does not have a thermostatic control valve and provides heat whenever the heating water system is commanded "on".

The Collections Storage room on the south side of the basement has grade level windows. These windows have been boarded-up from the outside. The interior insulated windows provide heat mitigation for the Collections Storage room as wells as to help mitigate leakage of unfiltered air from entering the room. There are also seasonal security panels at the southwest valley to protect windows from snow and ice damage. Figure 4-128

The Mechanical Room is equipped with an Emergency Power Off (EPO) button on the outside of the room. This device is used to disconnect the power to the boilers in case of emergency from a safe location. Figure 4-129.

First Floor:
The first floor contains a mixture of baseboard heaters, cabinet unit heaters and unit heaters. The heating devices are fed from heating water lines located in the basement and routed up through the floor to the first floor devices.

Vestibule #101 has no heating devices or sources of heat.

The Entry Hall #102 is heated via a cabinet unit heater located on the east wall just inside the double doors from Vestibule #101. There is a historic thermostat located on the east wall north of the doorway into the Reading Room. The historic thermostat is no longer



Figure 4-119. Uninsulated copper heating water lines in Mechanical Room. (DMD, 10/30/2018)



Figure 4-120. Heating water lines in basement northwest corner of Hall. Horizontal lines to basement Bathroom are exposed copper while vertical lines are insulated to upper floors. (DMD, 10/30/2018)



Figure 4-121. Uninsulated copper heating water lines in basement Bathroom located tight to bottom of ceiling. (DMD, 10/30/2018)

functioning and the mercury has been removed, but it has been left in place. Figures 4-130 and 4-131.

Storage #103 is heated via a cabinet unit heater located on the north wall. This room also contained a portable AC unit that was not plugged in. This unit is used in the summer time to provide cooling in this room and the adjacent Reading Room #104. There are also heating water lines that are routed up to the 2nd floor and down to the basement in the northeast corner of the room. Figure 4-132.

Reading Room #104 has a cabinet unit heater that was installed on the east wall during the 2007 HVAC renovation. This room also contains a historic thermostat that is installed on the west wall north of the door into the room. The mercury has been removed from the thermostat. Figure 4-133.

Office #105 is heated via a cabinet unit heater on the south wall under the window. There is a historic thermostat on the west wall north of the doorway. The mercury has been removed from the thermostat. There are heating water pipes up to the 2nd floor and down to the basement on the south wall of the room.

Office #106 is heated via a cabinet unit heater located on the east wall under the window. There is a historic thermostat on the west wall south of the doorway. The mercury has been removed from the thermostat.

Office #107 is heated via a cabinet unit heater on the east wall under the full south window. There is a historic thermostat on the west wall south of the doorway.



Figure 4-122. Insulated copper heating water lines in basement archive area. (DMD, 10/30/2018)



Figure 4-123. Typical insulated copper heating water lines from 1st floor up to 2nd floor. (DMD, 10/30/2018)



Figure 4-124. Typical baseboard heater behind desk/furniture in basement. (DMD, 10/30/2018)

The mercury has been removed from the thermostat.

Office #108 is heated via a cabinet unit heater located in the southwest corner of the room. There is a historic thermostat on the east wall south of the doorway. The mercury has been removed from the thermostat.

Office #109 has a cabinet unit heater located on the west wall.

Office #110 has a cabinet unit heater located on the west wall. There are heating water pipes on the north wall that are routed up to the 2nd floor and down to the basement.

Corridor #111 has a cabinet unit heater at the south end and has a window air conditioning unit that was sitting on the floor. This window air conditioning unit is installed in the window during the summer time. Figure 4-134.

Central Files #112 is heated via a cabinet unit heater on the west wall.

Cloak Room #113 which is now the locker area and Restroom is heated via two (2) baseboard heaters on the north wall. There is one heater in the locker area and the other heater is in the Restroom. The Restroom also is provided with mechanical exhaust through a wall grille mounted high on the east wall. The grille is ducted down in the wall into the basement mechanical room where there is an inline exhaust fan that is ducted out the west window of the mechanical room via a 6" round duct. Figure 4-135.



Figure 4-125. Baseboard heater behind filing cabinet in basement. (DMD, 10/30/2018)



Figure 4-126. Typical portable dehumidifier and floor fan. (DMD, 10/30/2018)



Figure 4-127. Typical wall mounted thermostat. (DMD, 10/30/2018)

Stairwell #114 does not have any heating devices on this level but, is open to the basement below where there is a heating device.

Vestibule #115 does not have any heating devices or sources of heat.

The first floor is divided into two heating zones via the heating control valves located in the basement. The two zones are noted as the first floor north zone and the first floor south zone. The rooms on the first floor north zone include Entry Hall #102, Storage #103, Reading Room #104, Office #105, Central File #112, the locker area of Copy Room #113 and the Restroom area of #113. The thermostat for this zone is located in the Reading Room #104. The rooms on the first floor south zone include Office #106, Office #107, Office #108, Office #109, Office #110, and Corridor #111. The thermostat for this zone is located in Corridor #111 on the north end.

On the exterior of the building on the south side there is an area within the stone work where a round opening has been patched with stone work. This is the previous vent opening from the baths that were removed in 1912. Figure 4-136.

On the exterior west side of the building there is a window that has been removed and in its place is a sheetmetal panel with the venting for the boilers, water heater, inline exhaust fan, and clothes dryer. There is also a remote water meter reading device and a convenience outlet. Figure 4-137.

Second Floor:
The second floor is heated via cabinet unit heaters. The large Collections Storage area which is located at the top of the stairwell of the second floor is heated via two (2) cabinet



Figure 4-128. Example of secured windows at basement (DMD, 10/30/2018)



Figure 4-129. Emergency Power Off (EPO) button location outside the basement Mechanical Room. (DMD, 10/30/2018)



Figure 4-130. Typical floor mounted cabinet unit heater. (DMD, 10/30/2018)

unit heaters. There is one cabinet unit heater located on the north wall and a second cabinet unit heater on the south wall. There is also a large solid fuel fireplace on the east end of the area. There is an exterior cap on the chimney and an insulated panel inserted in the flue, closing it at the bottom. Figures 4-138 and 4-39.

The Collection Storage area on the south side of the building is heated via a cabinet unit heater on the north wall just west of the doorway. There are two (2) heating zones on the floor according to the control panel in the Mechanical Room, the north second floor and the south second floor. The large Collection Storage area in the main section of the building containing (2) cabinet unit heaters is considered the north zone and the Collection Storage area on the south side containing (1) cabinet unit heater is the south zone.

There are also two historic steam radiators that have been abandoned on the floor, one in the Collections Storage in the northwest corner and the Collections Storage area in the southwest corner. Figure 4-140.

There is one (1) floor fan located in the main Collections Storage area in the northeast corner. The Collections Storage area on the south side contains two (2) floor fans, one in the southwest corner and one on the east wall midway between north and south. These floor fans help to circulate air within the spaces and mitigate stagnant air zones. Figure 4-141.

Third Floor:
The third floor is a small floor plate and contains a heating water unit heater located just north of the stairs. Figure 4-142

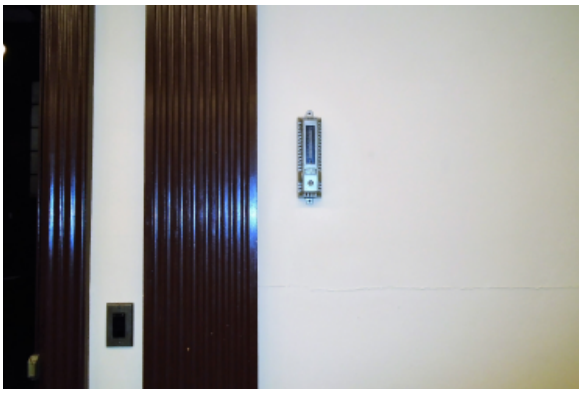


Figure 4-131. Typical historic thermostat abandoned on wall. (DMD, 10/30/2018)



Figure 4-132. Portable air conditioning unit. (DMD, 10/30/2018)



Figure 4-133. Floor mounted cabinet unit heater in Reading Room. (DMD, 10/30/2018)

There is also a dehumidifier, floor fan, and portable air conditioning unit located on the south side of the space. The portable air conditioning unit is used in the summer time to help cool the upper floor. There is also a historic steam radiator that is abandoned on the west wall at the south window. Figure 4-143.

There is a thermostat located on the west wall just north of the unit heater that controls the heating valve for this floor.



Figure 4-134. Window air conditioning unit on floor in hallway. (DMD, 10/30/2018)

Condition: *Fair/Good*

The existing central plant heating system equipment for the building is in good condition and approximately 11 years old. There were some signs of corrosion on the heating water connections to the boilers. The erosion seems to have occurred during the early operation of the boilers and no longer progressing. The boilers are high efficiency and operate on an outside air reset temperature that resets the supply heating water temperature based on how cold it is outside. This is a current control method used in the industry and one regarded as highly energy saving. Boilers are properly vented out the west window of the basement Mechanical Room and have sealed combustion air ducted to them in good condition. The primary and secondary pumps are in good condition. The weak link in the heating system is that the secondary pumps are manually changed over and not automatic. This means that if the running secondary pump fails, personnel have to physically go into the Mechanical Room and flip off the running pump and turn on the backup redundant pump.



Figure 4-135. Inline exhaust fan located in basement Mechanical Room to service 1st floor Restroom. (DMD, 10/30/2018)



Figure 4-136. Stone work infilling hole left by vent from previous baths function of building. (DMD, 10/30/2018)

The cooling system for the building is via portable air conditioners and Through the Wall Air Conditioners (TWAC). The portable units and TWAC units are not large enough to provide cooling throughout the entire building to maintain the space at +/-72°F. The air conditioning units provide spot cooling and with the use of the floor fans provide some relief from summer temperatures.

The humidity control system for the building is via portable dehumidifiers located strategically within the building. Temperature and humidity logs have been provided for analysis that provide measurements from April 2017 to July 2018. These logs are taken from several areas within the building including the basement, 1st floor, 2nd floor, and 3rd floor. The data log information provided has been converted into graphs and included at the end of this report for reference. The data loggers show that temperatures within certain areas are fairly controlled while other areas experience greater swings. The relative humidity levels throughout the building vary from lows in the 20% range up to highs in the 60% range.

Ventilation for the building is provided by operable windows. On the basement level, the windows are not accessible to the Collection Processing Room and the windows in the south Collections Storage have been blocked off. Introducing ventilation into the building needs to carefully take into consideration maintaining temperature and humidity levels. Any time ventilation is introduced from outside, it is required to be treated to heat, cool, and/or dehumidify so that it does not quickly influence the overall climate within the building spaces.



Figure 4-137. Exterior view of panel with multiple vent penetrations, exhaust, water meter reader, and convenience outlet. (DMD, 10/30/2018)



Figure 4-138. Typical cabinet unit heater in 2nd floor Collections Storage. (DMD, 10/30/2018)



Figure 4-139. Large fireplace in large Collections Storage area. (DMD, 10/30/2018)

The 1st floor has operable windows in most of the occupiable rooms. The exception is the Entry Hall #102 which has access to the outside via the two adjoining vestibules and the window at the far south end of Hall #111. The second and third floors have operable windows in all the occupiable rooms providing code compliance for proper ventilation.



Figure 4-141. Typical floor fan to help circulate airflow. (DMD, 10/30/2018)



Figure 4-142. Unit heater on 3rd floor. (DMD, 10/30/2018)



Figure 4-140. Historic radiator behind door in northwest Supplies Storage room. (DMD, 10/30/2018)



Figure 4-143. Abandoned historic radiator. (DMD, 10/30/2018)

Existing Conditions & Assessment - Plumbing

Plumbing - System

The main water line enters the building from the west in the basement Mechanical Room. The water line is a ¾" cold water line with a water meter. The water line is then routed to the plumbing fixtures throughout the building, the water heater in the Mechanical Room, and the boiler for make-up water. The water line to the boiler has a reduced pressure backflow preventer to prevent cross contamination control. Figures 4-144, 4-145, and 4-146



Figure 4-144. Water shut-off valve west of the building at edge of street and curb. (DMD, 10/30/2018



Figure 4-145. Water meter in Mechanical Room. (DMD, 10/30/2018)

The basement level has a natural gas fired instantaneous water heater. The water heater is located on the north wall and the combustion air and flue venting is routed from the water heater out the west window of the basement Mechanical Room. The water heater provides all the domestic hot water to the plumbing fixtures in the building. Figure 4-147.

There are a few plumbing fixtures located in the basement. Within the Mechanical Room there is a washer box connection with water hammer arrestor for a clothes washer. The cold and hot water lines are routed out of the Mechanical Room to the east and south. The lines routed to the east connect to existing lines at the Mechanical Room wall. The water lines continue and supply a utility sink located in the Collections Storage in the northeast corner of the basement and also up to the Restroom on the 1st floor including the water closet, lavatory, and drinking fountain. Figures 4-148 through 4-153.

The cold and hot water lines routed to the south, supply the Restroom on the basement level including a water closet and lavatory.

At the shared wall between the Restroom and Collection Processing Room there are plumbing line stub outs into the Collection Processing Room. The cold water line also feeds up to the first floor to an exterior hose bibb located outside Central Files #112 on the south side. The cold water line continues up to the second floor where a sink is located on the north wall of the southwest Collections Storage. There is also a drinking fountain on the second floor at the top of the stairs that is abandoned. Figures 4-154 through 4-157.

The main waste line for the building is anticipated to exit to the west out of the basement however, a site survey is being conducted to confirm the location of this waste line. The above grade lines that were visible were a combination of cast iron and PVC with a 4" line being the largest line. The waste line is routed from the plumbing fixtures in the building with a main 3" cast iron dropping down in the southwest corner of the basement Restroom and transitioning into a 4" line prior to entering the floor. Figure 4-158.

There is another waste stack in the Mechanical Room on north wall, west of the east window. This line is a PVC line that enters at the slab. Within the Mechanical Room there is a floor sink that collects the condensate drains from the two boilers, the water heater, and the air gap fitting for the make-up water line reduced pressure backflow preventer. Figures 4-159, and 4-160.

On the 3rd level there are two (2) 4" cast iron vent lines up and into the attic above the 3rd floor level. At this point, they connect to be one vent out through the roof. The plumbing fixtures located on the south side of the main stairs are vented through the south vent and



Figure 4-146. Backflow preventer on make-up water line to boiler. (DMD, 10/30/2018)



Figure 4-147. Wall mounted water heater. (DMD, 10/30/2018



Figure 4-148. Washer and Dryer in basement Mechanical Room. (DMD, 10/30/2018)

the plumbing fixtures located on the north side of the main stairs are vented through the north vent. Figure 4-161.

On the east side of the building, there are three (3) pipes that come up through grade near the exterior building walls. It is unknown what systems these pipes serve. Figures 4-162 and 4-163.

There is a natural gas meter located on outside Central Files #112 on the south side. The natural gas line is routed into the basement and provides natural gas to the two boilers and the water heater. There is an abandoned gas line stubbed up out of the ground on the south side of the building. Figures 4-164, 4-165.

Condition: *Fair*
The cold and hot water lines that supply the plumbing fixtures on the north side of the building which include the washer box in the Mechanical Room, the utility sink in the northeast Collections Storage, the drinking fountain on the 1st floor, and the Restroom on the 1st floor were new in 2007 and are in good condition. The cold and hot water lines that supply the plumbing fixtures on the south side of the building are older lines and in poor condition.

The sanitary lines on the north side of the building are newer PVC lines and tie into the main sanitary in the Mechanical Room. The below ground sanitary lines were not observed and their condition is unknown. The sanitary lines on the south side of the building are cast iron lines and in poor condition. The vent lines through the roof are cast iron lines and are in fair condition. Facility personnel noted that there are times when there are sewer odors within the building and the source is not known. The



Figure 4-149. New water lines to existing lines at Mechanical Room wall. (DMD, 10/30/2018



Figure 4-150. Utility sink in northeast Collections Storage in basement. (DMD, 10/30/2018)



Figure 4-151. Water closet in 1st floor Restroom. (DMD, 10/30/2018)

odors typically occur in the winter time and seem to be associated with varying weather conditions. One thought is that the vent openings are becoming iced over and unable to maintain an opening to the atmosphere and this may be causing the odor issue within the building. Additionally, with the baths removed in 1912, it is assumed that there are abandoned waste and water lines under the floor. Further evaluation of the odor source needs to be conducted to verify if this initial idea of the problem is correct and how to go about resolving the odor.

The natural gas line is in good condition and mainly installed in 2007 with the recent boiler renovation project.



Figure 4-152. Lavatory in 1st floor Restroom. (DMD, 10/30/2018)



Figure 4-153. Drinking fountain on 1st floor outside Restroom. (DMD, 10/30/2018)



Figure 4-154. Basement Bathroom lavatory and water closet. (DMD, 10/30/2018)



Figure 4-155. Exterior hose bibb on outside of building. (DMD, 10/30/2018)



Figure 4-156. Sink on 2nd floor in southwest Collection Storage room. (DMD, 10/30/2018)



Figure 4-157. Abandoned drinking fountain on 2nd floor. (DMD, 10/30/2018)



Figure 4-158. Waste line down in basement Restroom exposed in corner. (DMD, 10/30/2018)



Figure 4-159. Waste line down through floor exposed in Mechanical Room. (DMD, 10/30/2018)



Figure 4-160. Floor sink in Mechanical Room with condensate drains from boilers, water heater, and drain from reduced pressure backflow preventer air gap fitting. (DMD, 10/30/2018)



Figure 4-161. Vent through roof on south side of roof ridge line (DMD, 10/30/2018)



Figure 4-164. Gas line abandoned at grade on south side of building (DMD, 10/30/2018)



Figure 4-162. Pipes on east side above grade (DMD, 10/30/2018)



Figure 4-165. Natural gas meter on exterior of building. (DMD, 10/30/2018)



Figure 4-163. Pipes on east side south corner (DMD, 10/30/2018)

Existing Conditions & Assessment - Fire Suppression

Fire Suppression - System

The main fire protection line enters from the west into the basement Mechanical Room and is protected with a double check backflow preventer. Within the mechanical room, the fire line is split into a wet fire sprinkler system and a dry fire sprinkler system. The majority of the building is protected by the wet fire sprinkler system while the attic space and both unheated vestibules are protected by the dry fire sprinkler system. Both the wet and dry systems were installed in 2007. All fire protection piping outside of the Mechanical Room is copper piping, including the lines in the attic, and routed exposed. The dry fire sprinkler system is supported via an air compressor to keep the dry pipes pressurized. The air compressor is located in the Mechanical Room on the north wall. The wet and dry systems are fully monitored and recently tested in July of 2018. The water pressure observed at the pressure gauges was +/- 40 psi which is what is noted on the test tags from the July 2018 testing. The air pressure on the dry system was reading +/-37 psi. Figures 4-166 through 4-175.

Located in the basement in the Collections Storage on the south wall is a fire test drain location. Figure 4-176.



Figure 4-166. Fire Protection backflow preventer. (DMD, 10/30/2018)



Figure 4-167. Fire Protection valves in basement Mechanical room.



Figure 4-168. Wet Sprinkler Valve and with noted areas served. (DMD, 10/30/2018)

Condition: *Good*

The fire protection system was installed in 2007 and is in good condition. The water alarm valves have test tags that have been filled out on a regular basis. The fire alarm control panel is in good condition and shows no signs of rust or deterioration. The air compressor for the dry pipe system is in good condition. The fire sprinkler heads and fire lines are in good condition and no sign of leaks were noted.

Review of the fire protection shop drawings and correspondence that occurred between AHJC (Authority Having Jurisdiction) and the engineer note that systems complied with requirements for the building. However, the water pressure in the area is subject to change with additional construction in the area and should be reviewed in depth during future renovations.

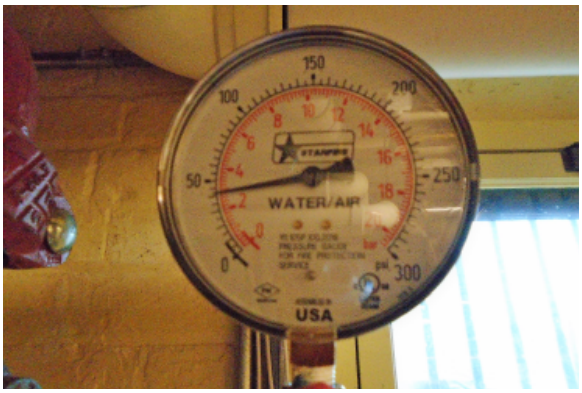


Figure 4-169. Wet Sprinkler line pressure gauge. (DMD, 10/30/2018)



Figure 4-170. Wet Sprinkler line annual testing documentation. (DMD, 10/30/2018)



Figure 4-171. Dry Sprinkler Valve and noted area served. (DMD, 10/30/2018)



Figure 4-172. Dry Sprinkler line annual testing documentation. (DMD, 10/30/2018)



Figure 4-173. Dry Sprinkler system air compressor in Mechanical Room. (DMD, 10/30/2018)



Figure 4-174. Typical exposed copper fire sprinkler lines within the building. (DMD, 10/30/2018)



Figure 4-175. Copper dry pipe sprinkler system in attic. (DMD, 10/30/2018)



Figure 4-176. Wet fire protection test drain in basement south Collections Storage. (DMD, 10/30/2018)

Existing Conditions & Assessment - Electrical



Figure 4-177. New MDP in excellent condition (SJH, 10/30/18)

Electrical - Electrical Service and Panels

The existing electrical service for the building is 208/120v, 3-phase. The utility transformer serving the building is a pole mounted 3 phase unit located on Mine Street. The service runs underground to the utility meter and then into the basement electrical room. This transformer feeds into an 800-amp rated Main Distribution Panel (MDP) located in the main electrical room on the basement level. The MDP has a main circuit breaker and has integral Surge Protection Device (SPD). Although the rating of the main circuit breaker is 800A, the current trip setting is at 400A. The installed service conductors and main circuit breaker are sized to allow the breaker to be adjusted to the full 800A trip setting if needed.

There are three electrical panels, one located on each level. Panel LB serves the basement and exterior lighting, Panel L1 Serves the first floor, and Panel L2 serves the second floor and third floor area. Panel L1 and Panel L2 are concealed with custom millwork and the doors comply with the National Electrical Code required clearances.

Condition *Good (Electrical upgrade 2016/2017)*

Based upon an understanding of an overall building square footage of approximately 9,000 sf, the 400A electrical service leads to an overall 14 watts/sf value for the building which is adequate for this type of facility. Note that if the circuit breaker is adjusted to 800A, then 28 watts/sf is available.

The existing electrical service was upgraded in 2016/2017 and is in good condition. The single entrance/exit from the room opens

in the direction of egress, however NEC also requires panic hardware if the equipment is rated 800A. The three subpanels located throughout the building have adequate clearances.

All panelboards are in good condition, and panel directories are provided.



Figure 4-178. Panel L1 (SJH, 10/30/18)

Electrical - Electrical Distribution System
Receptacles for general power / convenience use are adequate for the use. In general, grounding receptacles are installed, and GFCI protected receptacles are located were required by code, such as in restrooms. Multioutlet power strips are used at desks but do not present a trip hazard.

Condition: Good (Electrical upgrade 2016/2017)
Wiring and conduits are concealed. EMT conduit is used throughout the basement areas and are run high and tight to the ceiling. There are no open junction boxes and no code violations were evident.

There are some exposed cables on the basement lobby area near the ceiling that are visible, but do not present a hazard or violation.



Figure 4-179. Centralized inverter located in basement (SJH, 10/30/18)

Electrical - Lighting, Emergency Lighting, and Exit Signs
Exterior building mounted lighting is limited to a surface mounted egress fixture at both exits. They are controlled via timeclock. Light levels are not known at time of report.

There are two pedestrian light poles located at the main entrance, controlled via timeclock and photocell.

All interior fixtures were replaced with LED during the 2016/2017 renovation. The

basement level has LED strip and LED globe lights. All lighting is controlled via occupancy sensors with manual on/off wall controls. First floor level has LED direct/indirect and LED pendent lights. The lobby and stair lighting is controlled via wall switches. The offices have dimmer switches and controlled via occupancy sensors. Second floor level stair pendants provide the lighting in the lobby area. The collections/storage areas use dimmable LED track lights, controlled via wall switch. The two smaller collection/ storage areas use LED pendants controlled via occupancy with manual on/off wall switches. The third floor uses LED pendant fixtures controlled via dimming switch on the stairs. Emergency and exit lights are provided.

Egress lighting for common egress paths, exits, restrooms, reading room, and electrical room are powered from an inverter located in the electrical room.

<u>Condition:</u> Good (Electrical upgrade 2016/2017)
It was noted that the pedestrian pole to the north of the entrance was hit by a snowplow, causing an obvious crack at the pole base.

All operational fixtures throughout the interior of the building are in like new condition and appear to have been replaced in the recent building renovation. There are fixtures found throughout the building which are no longer in use but appear to have been left installed for historic purposes.

From discussions and observations, lighting levels in the offices, and storage area are adequate. The lobby and stairway lighting levels in general appear to have lower lighting levels than preferred making reading of visitor pamphlets difficult.



Figure 4-180. Light fixtures at Attic Level (SJH, 10/30/18)

Electrical - Fire Protection & Detection System
The building is fully sprinklered and has detection and notification that was added/replaced in the 2016/2017 renovations. There are fire alarm horns and strobes located throughout the facility, and manual pull stations can be found at egress doors and are also located within the corridors. The fire alarm control panel is located in the basement electrical room.



Figure 4-181. Fire sprinkler and alarm equipment located in Basement (SJH, 10/30/18)

Condition: *Good*
Spacing of horns and strobes appears compliant with current code requirements.

Electrical - Tele/Data Communications System
The main server rack and telephone distribution equipment are located in the basement and appear to be in good working order.

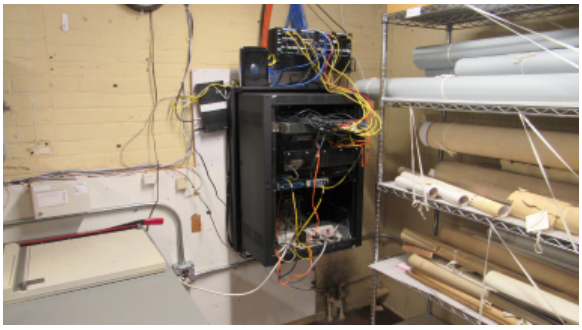


Figure 4-182. Main server rack located in Basement (SJH, 10/30/18)

Condition: *Good*
Phone/data equipment cabling as well as fire alarm cabling, is concealed in most locations. CAT5 cabling/outlets are extended to locations at a few desks using surface wiremold products. Areas of the basement have low voltage cabling routed freely but in general all cables are tied together and routed in a clean manner.

Electrical - Lightning Protection System
The building does not have a lightning protection system.

Existing Conditions & Assessment - Site

Site - General Description

Calumet & Hecla Company built the Calumet & Hecla Public Library in 1898 to serve as a public library and bathhouse for employees. The 1.23-acre parcel is owned and maintained as the Keweenaw History Center by the National Park Service. A non-extant church, First Congregational Church, occupied the southeastern portion of the site during the period of significance. The Calumet Historic District, a National Historic Landmark (NHL), is listed in the National Register of Historic Places (NRHP) with the Calumet & Hecla Public Library as a contributing feature.

Contributing Features[1.1]
- C&H Library†
- Building Context/Relationship to Roads
- Front Entrance (Red Jacket Road) Walkway and Steps*
- Side Entrance (Mine Street) Walkway†
- Red Jacket Road Concrete Walk and Curb Alignment+
- Sidewalks (Along Calumet Avenue and Along Mine Street)†
- Deciduous Trees along Calumet Avenue, Red Jacket Road, and Mine Street*+
- Arborvitae Trees between library and Asphalt Parking Lot*
- Mown Lawn*
- Mine Street*+

Non-Contributing
- Calumet Entrance Sign
- Keweenaw History Center Entrance Sign
- Front Entrance Handrail
- Alexander Agassiz Statue†*
- Street Signs, Waysides and Directional Signs†*+
- Float Copper Interpretive Panel†
- Float Copper Sample†
- Light Poles, Power Poles and Overhead Utility Lines in Rights-of-Way†*+
- Asphalt Parking Lot†
- NPS Interpretive Panel – Rights-of-Way†
- Green Light Poles with Acorn Fixtures*
- Two (2) Light Fixtures at Front Entranc Pedestrian lights are reconstructions based on historic photographs. Lights are non-contributing but compatible with the landscape's historic character.

Site - Site Design

Calumet & Hecla Public Library is located near the Calumet conglomerate lode and associated mining buildings and structures. Visual connections with the mining structures include views to Calumet & Hecla General Office Building, Agassiz House, and Calumet & Hecla Warehouse Number One. Street trees historically framed views to the library and lined adjacent streets. The setting is altered by the absence of the historic First Congregational Church to the east and Armory to the southwest. An asphalt parking lot, visible from the library, occupies the historic church site.

The area immediately surrounding the library consists of open lawn, oak street trees, and a row of mature arborvitae trees. Arborvitae extend perpendicular to Mine Street and Red Jacket Road. Historically arborvitae separated land uses and defined property boundaries. Arborvitae today partially buffer views from the building to the asphalt parking lot

1.1 *Quinn Evans Architects. "Calumet Unit Historic Landscape Cultural Landscape Report and Environmental Assessment." 2013.

†National Park Service. "Calumet & Hecla Library Cultural Landscapes Inventory." 2005.

+Feature within Houghton County rights-of-way

Feature in this document typically use 2013 CLR names except for instances where the 2005 CLI or site visits provided more detailed description.

on the east and Calumet Electronics to the southwest. Historically concrete sidewalks and non-extant rounded post and rail fences along Red Jacket Road and Mine Street separated the front lawn from the public road. Concrete walkways connect attached perimeter sidewalks to the front and side entrances. Concrete steps lead to both entrances.

The building and its setting were modified by the addition of a red brick vault in the 1940s. The vault extends from the west wall of the building's south wing.

Condition: *Good*
Calumet & Hecla Public Library's historic spatial organization and site design remain. The library retains its proximity to the Calumet conglomerate lode and associated mining buildings and structures constructed before 1930. The setting is altered by removal of street trees along Calumet Avenue, Red Jacket Road and Mine Street, removal of Virginia creeper from the rear facade, and absence of historic adjacent structures—First Congregational Church and the Armory.

The site is in good condition. Slopes drain away from the building. Mine Street stormwater drainage flows to an inlet located southwest of the site with a low point at the designated on-street accessible parking space.

Walkways are mostly in good condition. The front entrance walkway, Red Jacket Road sidewalk, and portions of the Mine Street sidewalk were largely replaced in 2001. The side entrance walkway and portions of the attached Mine Street sidewalk south are likely original. Mine Street sidewalk is in poor condition south of its intersection with the side entrance walkway. Curbing does not exist along the majority of Mine Street

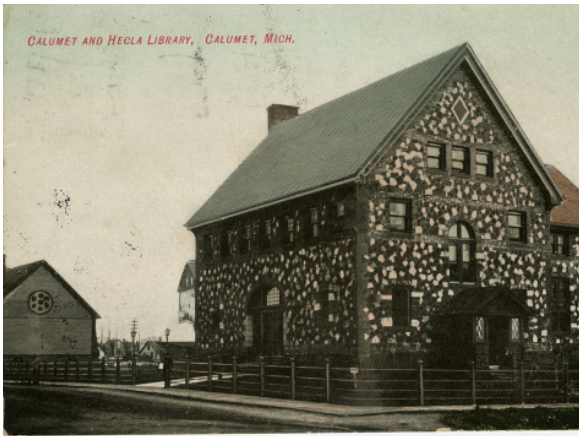


Figure 4-183. Calumet & Hecla Library and the non-extant First Congregational Church, 1907. (KNHP Archives)

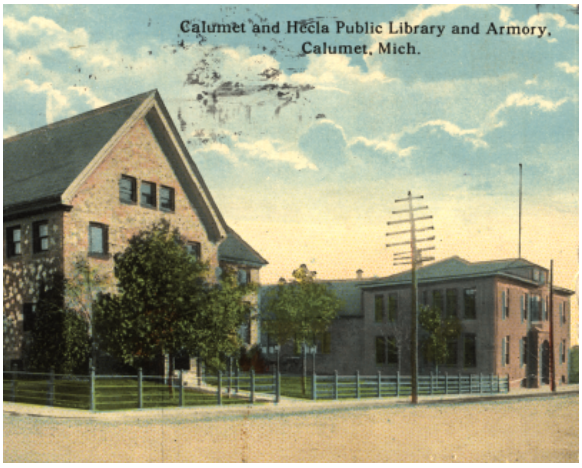


Figure 4-184. Calumet & Hecla Library and the non-extant Armory, 1907. (KNHP Archives)

and the sidewalk is flush with the adjacent roadway. The sidewalk is cracked, upheaved, and covered in sediment. Stormwater flow along this segment results in periodic pooling of water and subsequent damage to the sidewalk and sediment deposits.

Site - Small Scale Features

Pedestrian lights at the library's front entrance are non-contributing but are compatible with the landscape's historic character. . The lights are replicas based on historic photos. They replace non-extant features and are similar in location, character, and scale to light fixtures present in 1906. The statue of Alexander Agassiz, Calumet & Hecla Mining Company's long-time president, dates to the period of significance but is non-contributing due to its relocation after the historic period. The statue was relocated from its historic location in nearby Agassiz Park in 1974.

Non-contributing contemporary small scale features include a Keweenaw National Historic Park sign, float copper sample, float copper interpretive panel, light poles, and vehicular wayfinding and regulatory signage along Calumet Avenue; a Keweenaw History Center sign, pedestrian lighting, and vehicular wayfinding and regulatory signage along Red Jacket Road; vehicular regulatory signage and utility poles and overhead lines along Mine Street.

Non-extant post and rail fences along Mine Street and Red Jacket Road appear in historic photos. The fences delineated the boundary between the library and public right-of-way.

Condition: *Good*

Small scale features are in good condition. Contemporary entrance signs and panels are non-contributing but assist with visitor



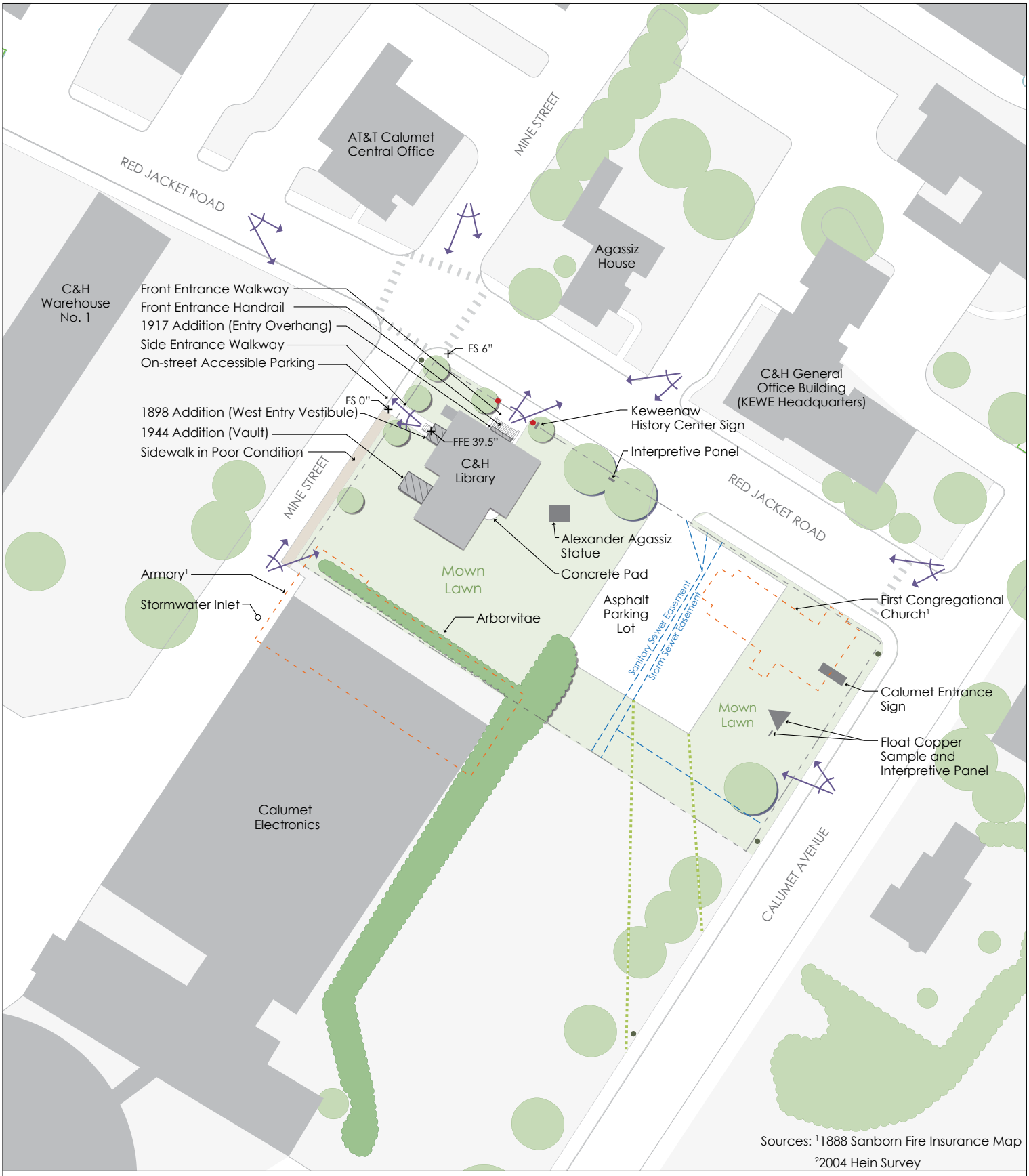
Figure 4-185. Calumet & Hecla Library small scale features, 1898. (KNHP Archives)



Figure 4-186. Calumet & Hecla Library small scale features, 2018. (Mundus Bishop, 2018)



Figure 4-187. Float Copper Exhibit. (Mundus Bishop, 2018)



Sources: [1]1888 Sanborn Fire Insurance Map
[2]2004 Hein Survey

Legend

- C&H Library Boundary
- Mown Lawn
- Deciduous Tree
- Arborvitae
- Front Entrance Light Fixtures[2]
- Power Pole[2]
- Social Trail
- Non-Extant Structure from Period of Significance[1]
- Utility Easement[2]
- Prominent Views to/ from C&H Library
- FFE Finish Floor Elevation
- FS Finish Surface
- Building/Structure

SCALE OF FEET
80 0 80 160
N

DESIGNED: TB CADD KR TECH REVIEW: TB DATE: 11/1/2019	SUB SHEET NO. L1.0	TITLE OF SHEET PART 1 - EXISTING CONDITION SITE CALUMET & HECLA PUBLIC LIBRARY KEWEENAW NATIONAL HISTORIC PARK	DRAWING NO. X / XXX PMIS/PKG NO. 237234 SHEET ___ OF X

orientation and interpretation of copper mining.

Site - Vegetation

Calumet & Hecla Library's setting is primarily low mown lawn surrounding the building. A mature row of arborvitaes divides and partially buffers views from the building to the asphalt parking lot on the east and Calumet Electronics to the southwest. Oak trees line Mine Street, Red Jacket Road, and Calumet Avenue.

Landscape stabilization projects implemented since the early 2000s included removal of dead or overgrown and non-contributing vegetation including vines, shrubs and trees. Historic photos indicate non-extant Virginia Creeper growing on all building facades.

Condition: *Good*

The vegetation patterns of mown lawn, street trees and arborvitae as a hedge remain similar to the period of significance. The majority of trees and vines from the period of significance no longer remain. The lawn is mostly in good condition. Social paths extend from the asphalt parking lot southeast to Calumet Avenue and deteriorate lawn condition. Oak street trees intermittently line Calumet Avenue, Red Jacket Road, and Mine Street. Street trees appear more consistent in spacing, density, form, and size in historic photos.



Figure 4-188. Calumet & Hecla Library open lawn and oak street trees, 2018. (Mundus Bishop, 2018)



Figure 4-189. Calumet & Hecla Library open lawn and street trees, 1909. (KNHP Archives)

Part 2: Treatment and Use Overview

Treatment Overview

Treatments

Presented after the Existing Conditions and Condition Assessment, the treatment section presents recommendations for the repair, protection and stewardship of the Calumet & Hecla Public Library. Treatment recommendations are founded on review of historic documentation, assessment of existing conditions, current and proposed building use, and application of the Secretary of the Interior's Standards as they apply to the treatment of historic buildings.

Unique or diagnostic historic material being salvaged (permanently removed and not reinstalled) from the structure should be submitted to the park for consideration for the museum collection.

Part 2 Organization

This overview begins with an explanation of the Treatment Priority rating system used throughout Part 2. After this overview follows a discussion of treatment recommendations for each of the elements described and assessed in Part 1, again arranged by discipline. A table on the next page summarizes higher priority tasks.

Following these treatment recommendations, the preferred alternative, selected during a team workshop in June 2019, is portrayed graphically.

Treatment Priorities

Treatment priorities are classified as one of three options:

- Critical
- Serious
- Minor

A Critical Deficiency of a feature or elements exists where:

- There is advanced deterioration that has resulted in failure of the building feature or element or will result in its failure if not corrected within 2 years, and/or;
- There is accelerated deterioration of adjacent or related building materials as a result of the feature or element's deficiency, and/or;
- There is a threat to the health and safety of the user.

A Serious Deficiency of a feature or element exists where:

- There is deterioration that if not corrected within 2 to 5 years will result in the failure of the building feature or element, and/or;
- A threat to the health and/or safety of the user may occur within 2 to 5 years if the deterioration is not corrected, and/or;
- There is deterioration of adjacent or related building materials and/or systems as a result of the deficiency of the feature or element.

A Minor Deficiency of a feature or element exists where:

- Standard preventative maintenance practices and building conservation methods have not been followed, and/or;
- There is a reduced life expectancy of affected or related building materials and/or systems, and/or;
- There is a condition with long-term impact beyond 5 years.

Matrix of Critical and Serious Tasks

Discipline	System	Issue	Rating
Architecture	Stair	Create new egress stair	Critical
Electrical	Lightning Protection	Evaluate need for new system	Critical
Hazmat	Asbestos	Abate asbestos and pipe insulation	Critical
Hazmat	Lead Paint	Work involving interior paint under OSHA protocol	Critical
Architecture	Elevator	Provide elevator for accessibility	Critical
Site	ABAAS	Provide exterior accessible route	Critical
Architecture	Exterior masonry	Repair and repoint masonry; replace steps	Serious
Architecture	Exterior doors	Rehabilitate doors, provide ABA and egress hardware	Serious
Architecture	Interior finishes	Remove wall paint in Room 007	Serious
Mechanical	HVAC system	Provide new VRF system and controls	Serious
Mechanical	Humidity Control	Provide new dehumidifiers in basement	Serious
Plumbing	Plumbing system	Various pump and pipe upgrades	Serious
Site	General	Rehabilitate site and landscape features	Serious

5. Treatment Recommendations

Treatment - Architecture

Architecture - Roofing System
Priority: *Minor*
No work is recommended at the main roof or at the entry roofs. At the vault, the flashing condition at the masonry wall should be more thoroughly inspected and readdressed. The use of a lead-coated copper cap flashing let into a continuous reglet, over base wall flashing in a detail similar to that used in like conditions during the rehabilitation project is recommended. Add kickout flashing to the base of the valley flashing to reduce staining of the brick below the valley. Fill cracks in the concrete vault roof and at roof-wall intersection per Structural.

At the mechanical cellar access at the northeast corner, conditions require further exploration. Study replacement of the existing wood curb with a concrete curb in conjunction with the landscape drainage improvements there. Consider new roof sheathing, asphaltic or asphalt shingle roofing and flashing tight to the curb.

Architecture - Chimney
Priority: *Minor*
No work is recommended for the chimney.

Architecture - Exterior Masonry
Priority: *Serious*
At stone and brick joints, remove all incompatible mortar and repoint with compatible mortar. Compatible mortar must historic mortar in strength, composition, color and texture, and must be applied and tooled in a manner consistent with the historic joint appearance. Where the extruded “grapevine” effect has deteriorated, remove the extruded mortar layer, repoint underlying mortar and then retool joint using a compatible extruding mortar. Anticipate that 40% of wall area will require repointing, much of this within the brick components.

Several sandstone sills (9) are cracked or eroded at the lugs. Most can be repaired with a restoration mortar; estimate that 25% will require Dutchman repairs at the lugs. At sills with deteriorated stone spalling off the bottom of the sill, provide mortar repair. At the crack at the south elevation that runs through both poor rock and bricks, fill cracks with repair mortars chemically and physically compatible with each element to prevent moisture intrusion. Remove miscellaneous wood plugs, nails and metal inserts that remain in all brick and stone façade elements. Patch holes with a compatible repair mortar. At the vault, repoint the separated bed joint with a compatible mortar and monitor per structural recommendations.

No large-scale cleaning of the masonry is recommended. The materials that show environmental (carbon-based) staining are the red sandstone sills and the red brick. Smaller areas of black environmental staining can be addressed with the use of a tested masonry cleaner that is specially formulated for use on these substances. Neither is vulnerable to acid, so in theory acid-based cleaners should work well, but the ferrous (iron) content of the sandstone can result in bleaching in the presence of some cleaners. Similarly, the effect of a cleaner for the brick needs to be evaluated for its effect on the mortar, which is likely calcareous and sensitive to acid. Test on small sections and select the least aggressive method. Heavy brushing and any more aggressive mechanical means, such as any type of blasting, is not recommended. Such techniques erode the surfaces of softer stones and will break the delicate vining technique at the polygonal mortar joints.

Biological growth was not observed to an extent to justify the application of biocides at this time.

Architecture - Exterior Woodwork
Priority: *Serious*
The verge boards at the east and west gables have deteriorated, and interim epoxy repairs are no longer adequate. Anticipate 75% replacement.

At the decorative truss at the east gable, , install lead-coated copper cap flashing along the top of the truss.

Otherwise, the exterior woodwork has recently been restored and requires only routine maintenance.

Architecture - Windows
Priority: *Minor*
Windows were rehabilitated in 2011 and require no further work beyond the following. Exterior wood storm windows have been installed on all exterior windows and were painted a darker color than the historic window elements. This paint is more readily showing wear in the form of peeling, fading and chipping. Scrape, sand and patch these elements and repaint. Repaint other storm windows as a part of routine maintenance.

At Window 125, replace or provide Dutchman repair at the deteriorated wood rails, frame and sill. Reinstall the storm window. Clean effluent from wood sill and stone elements.

Grounds maintenance procedures should clearly address the regular removal of leaves and snow inside the security grilles of the basement windows.

Architecture - Exterior Doors
Priority: *Serious*
Remove Doors 101, 102, 118 and 119 for rehabilitation.

At Doors 101 and 102, square up wood stiles and rails, sand doors and refinish. Remove and salvage existing glazing. Provide new tempered glass and new glazing compound. Remove, clean and oil existing hinges; replace missing hinge ball pins. Remove and salvage other hardware. Provide new but compatible thumb latch hardware at exterior. Provide new panic bar and closer.

At Door 118, remove and salvage existing glazing. Provide new tempered glass and new glazing compound. Provide ABAAS compliant hardware. Provide new panic bar and closer.

At Door 119, adjust head and jamb framing to reverse swing of doors. Remove and salvage existing glazing. Provide new tempered glass and new glazing compound. Remove other hardware. Provide ABAAS compliant hardware. Provide new panic bar and closer.

Architecture - Interior Doors
Priority: *Minor*
At the first-floor interior doors (11), touch up stain at wood elements. Provide new glazing compound at lites where deteriorated. Clean and oil existing hinges and hardware.

At the second-floor interior doors (6), touch up stain at wood elements. Provide new glazing compound at lites where deteriorated. Clean and oil existing hinges and hardware, to include transom hardware where applicable (5).

At the functioning basement interior wood doors (7), patch chipped wood and touch up paint or stain. Provide new glazing compound

at lites where deteriorated. Clean and oil existing hinges and hardware. At Door 002, reverse swing and provide panic hardware to comply with NEC requirements. Reverse swing of door 011.

Provide new wood 3-0 door at Room 010. Provide ABAAS compliant lever hardware.

At door 112 provide new ABAAS-compliant lever hardware.

Remove and salvage Door 204 and transom, leaving casing and trim.

Remove and salvage Door 205 and associated trim. Anticipate providing a vertical smoke curtain at rough opening if required by AHJ. Basis of design: SmokeGuard Model 2100.

Provide new wood 3-0 door for Room 205B, match Door 113B. Provide ABAAS compliant lever hardware.

Architecture - Interior Construction
Priority: *Serious*
In main stairwell, cut opening (28 sf) in south masonry wall to access elevator

In basement Room 010, create opening in existing east stud wall for new 3-0 door.

At the west wall of Room 102, replace the opaque glazing at the two interior windows and six door lites with clear vision glass.

At Rooms 102, 104 and 105, demolish framed partitions where indicated; maintain structural columns and associated woodwork trim. Salvage gate and all wood trim.

In Room 202, cut opening in floor for new stair (108 sf); see also Structural

In Rooms 108, 109 and 110, remove and salvage glazed partition walls.

Provide 6-in cmu hoistway from basement through 3rd floor gallery (1165 sf). Provide furring and gypsum board finish at exposed cmu of hoistway (522 sf).

Provide a 2-hr fire rated ceiling assembly (steel stud and Type X gyp, 46 sf) at top of hoistway

Between Rooms 108 and Room 110, infill wall with double 2x4 wood stud and gypsum board construction at previous location (150 sf) returning to two-office configuration.

In Room 205, construct new partition wall, 2x6 wood stud (10 lf) with gypsum board each side (200 sf).

In Room 113B, provide allowance for fur out of east wall behind sink to provide plumbing chase if needed (4lf of 2x4 wall, 44 sq ft of gypsum board)

Architecture - Stairs
Priority: *Critical*
Repair cracks in finish plaster at walls and ceilings and repaint.

Reconstruct lowest north section of stair to match historic at south side, seven wood treads and landing. Reconstruct railing.

Retain southern run of stair in situ but extend landing (30 sf) over the lowest run of stair and provide new wood guardrail at edge of landing

In Room 110, provide new steel stair to 2nd floor with wood treads and landings: vertical rise 14 ft, anticipate 24 risers and three landings, steel guardrails with wood handrails

Architecture - Elevator
Priority: *Critical*
Demolish ceiling and floor structure (3 @ 46 sf each) at hoistway opening, see also Structural

Create elevator pit; demolish floor slab (46 sf), excavate five foot depth; see also Structural

Provide a 4-stop, dual opening, 2000 or 2100 lb, 100-150 fps hydraulic MRL elevator (Basis of Design: Kone Monospace 500, ThyssenKrupp Endura)

Architecture - Interior Finishes - General
Priority: *Minor*
Repair cracks in finish plaster at walls and ceilings and repaint.

Refinish all wood window sills.

At the grand stair (including stair to Gallery), remove tread covers, sand and refinish treads, nosings and landings. Provide new slip-resistant tread covers at all treads. Provide a new ABAAS-compliant wood handrail, mounted on the brick wall on the outside of applicable stair runs.

Architecture - Interior Finishes - Additional Basement
Priority: *Minor*
At Rooms 005, 006 and 007, provide a 4-inch rubber base at room perimeter. At Rooms 008 and 009, provide this base at masonry walls.

At north wall of Room 007, remove paint where peeling and deteriorated. Leave this area exposed to dry to the interior, or provide a highly breathable paint.

In Room 010, prior to installation of elevator hoistway, remove paint from brick walls and replace any deteriorated brick; repoint. Do not repaint.

At east wall of Room 010, replace in kind wood bead board finish on both sides of wall (80 sf).

Architecture - Interior Finishes - Additional First Floor
Priority: *Minor*
At Room 101, remove any applied flooring. Strip and repaint concrete steps. Apply new slip-resistant tread covers at treads. Provide a walk off mat, 3 ft x 7 ft minimum, inside the door.

In Rooms 102, 104, 105 and 112, remove carpet and repair and refinish wood floors following demolition activities; anticipate 10% repair.

At Rooms 102, 104 and 105 following demolition of later partitions, recreate trim at columns where missing.

In Rooms 103, 104 and 105 historic trim has been covered in dark brown paint and stain. On walls to remain, strip all trim and refinish to match historic. In Rooms 104 and 105, coordinate this work with reconstruction of the trim at the columns.

In Rooms 106 through 111 comprising the south wing, verify condition of flooring beneath carpet. Provide allowance for removal of all carpet, to be replaced with new carpet.

At Room 108, repair plaster wall finish and trim where partition was removed. Provide wood baseboard (13 lf) at new north wall to match existing.

At Room 110, repair plaster wall finish and

trim where partition was removed. Provide wood baseboard (13 lf) at new south wall to match existing.

At Room 112, repair plaster and pilaster trim at removed half wall.

In Room 115, clean and touch-up paint on brick walls. Refinish interior woodwork at the sill and jambs of windows.

Architecture - Interior Finishes - Additional Second Floor and Gallery
Priority: *Minor*
At Room 201, repair, patch and refinish cork flooring. Carefully remove all 12x12 acoustic tiles in coffered ceiling and restore original plaster finish between coffers.

At Room 202, repair, patch and refinish cork flooring. Refinish wainscot where water stained; anticipate entire north wall.

In Room 202, provide 42" metal guardrail, to match that at stair, around stair opening and extending as shown (40 lf). with gate.

In Room 301, remove shelving and metal tracks. Sand and refinish wood floor.

Architecture - Interior Finishes - New Restroom/ Cloak Room
Priority: *Minor*
For new wall finish, provide beadboard wainscot, baseboard and cap each side (22 lf) to match existing, 48" AFF

Provide ABAAS compliant grab bars at toilet (fixture re: Plumbing) and typical accessories: paper towel, toilet paper and soap dispensers

Architecture - Interior Finishes - Furnishings
Priority: *Minor*
In Room 105, provide a reproduction circulation desk of finish-grade solid wood millwork construction., 18 ft long, 2 ft deep, 3 ft high

In Room 202, provide (5) custom reproduction wood trestle tables, and (20) commercially available wood period reproduction chairs. Provide 11 lf of 5-ft high and 30 lf of 3-ft high custom wood bookcases.

In new cloak room 205A, provide three two-tier wood lockers, 12" x 20", wood base and spacers.

Provide wood blinds for all first and second floor double-hung windows.

Treatment- Hazardous Materials

Hazardous Materials - Asbestos
Priority: *Critical*
Further abatement of former pipe insulation associated with the heating system is likely required. Refer to full report of Environmental Survey Findings in the Appendix.

Hazardous Materials - Lead Based Paint
Priority: *Serious*
Per the report of Environmental Survey Findings, early layers of all painted surfaces should be deemed lead -containing unless further sampling is completed. All work that will impact these surfaces will require OSHA trained workers and associated safety programs and protective equipment.

Treatment- Structural

Structural - Foundation
Priority: *Minor*
Monitor the cracks in the vault foundations by installing a crack gauge monitor. If the settlement at the vault is active, the foundations may require underpinning with concrete elements. If the settlement is not active, no further action is necessary. See the Wall Framing section for further discussion

There are two options for the elevators pit. If a traditional pit (4' to 5' deep) is required, the exterior foundation walls will need to be underpinned with new concrete footings that extend to the same elevation as the base of the pit structure (at least 4' to 5' below the existing foundation walls). Exact dimensions will need to be confirmed prior to decision. If the elevator can be constructed with no pit or a minimal pit (approximately 1' deep), the exterior foundation walls will not need to be underpinned. Exact dimensions will need to be confirmed prior to decision. The possibility of a pitless (or minimal pit) elevator will need to be discussed with a manufacturer representative (refer to the Architectural section).

Structural - Floor Framing
Priority: *Minor*
The floor framing is adequate if storage is kept to the basement and the first floor of the south portion of the building. All other areas are adequate for office loading. If it is desired to use any other space for storage or assembly use, the floor framing will need to be strengthened or the live load capacity will need to be visibly posted in the space.

If the compact shelving is to be replaced with a different compact system or if it is desired to add more compact shelving in the north part of the basement, an exploratory opening should be made through the slab to determine the thickness and reinforcing of the existing slab. This will allow for a structural engineer to determine if there is sufficient capacity for the system.

Investigate several representative timber first floor joist ends embedded in the brick walls by temporarily removing several bricks near a joist bearing. If the joist ends do not display any deterioration, no remediation is necessary. If deterioration is discovered, bolster the bearing condition by adding an angle ledger at the face of the wall.

Overframe the existing stair in Room 114 with wood framing to form the extended landing. Stiffen the existing stair stringer with a steel angle.

Demo the existing floor framing that interferes with the new elevator hoistway, only removing entire bays of framing. Infill frame between existing joists and new hoistway walls with wood framing members.

Demo the existing floor framing that interferes with the new egress stair in the south wing, only removing entire bays of framing. Strengthen the existing joists on the north and south extents of the floor opening with a multiply LVL beam or a steel channel sister. Re-frame the portion of the floor to remain to the east of the stair opening with dimensional lumber joists. Demo an area of ceiling finishes near the existing steel wide-flange beam that spans east-west to determine the dimensional properties of the beam in order to verify it has the structural capacity for the change in load distribution. If it does have enough capacity, no work is required. If there is not enough capacity, the steel beam will need to be strengthened with

additional steel elements or replaced with a larger steel beam *(include cost for this item, note as contingency*).

Although no damage caused by carpenter ants was discovered, if an infestation were to occur and the insects attacked the wooden structural members of the building (such as the floor framing), the members could become weaker and eventually fail. Periodic treatments to prevent carpenter ant infestations should continue.

Structural - Roof & Ceiling Framing
Priority: *Minor*
Monitor the attic space for condensation and/or leaks periodically (especially during rain events and through the winter when ice dams accumulate). If moisture is an ongoing issue, remediate the leak or condensation issue at the intersection of the gable roofs to stop water intrusion and prevent future deterioration of the wood roof framing members.

As routine maintenance, monitor the tie rods of the trusses at the roof throughout the structure. If any slack is noticed, tighten the rods at the turnbuckles.

Fix roofing at the vault to stop water intrusion through the roof per architectural recommendations. Inject the crack in the concrete roof with a flexible epoxy sealant to prevent further water intrusion.

Structural - Wall Framing
Priority: *Minor*
At the leaks along the tops of the brick basement walls along the north wall just east of the main entrance and at the southwest corner of Room 010, shovel snow away from this area (and the perimeter of the structure in general) to prevent a build up of snow in this area. Remove the affected paint and apply a breathable coating that would allow moisture to escape on the inside of the structure if water does infiltrate the wall and/or locally waterproof this area with blindside waterproofing.

At the open mortar joint in the vault wall caused by differential settlement, repoint the joint and monitor. If the settlement is not active, no further action is necessary. If the settlement is active, the foundations may require underpinning.

At the new opening in the south brick masonry wall of room 114 for access to the new elevator, provide a lintel composed of two steel angles.

Provide a 6” thick CMU hoistway reinforced with #5 bars at 24” from the basement through the 3rd floor gallery. Provide a concrete strip footing at the base of the walls.

Structural - Lateral System
Priority: *Minor*
Verify or provide positive connections (by way of pre-manufactured ties, clips, or other connections) between the second floor diaphragm and the walls in the south portion of the structure. This will require removal of the floorboards near the perimeter walls.

At the west wall of the new egress stair in the south wing where the floor framing is to be removed, provide a steel tube girt anchored to the wall to prevent the wall from bending and/or bowing out of plane.

Treatment- Mechanical

Mechanical - System
Priority: *Serious*
The mechanical treatments outlined below provide thermal comfort cooling on the 1st, 2nd, and 3rd floors, and provide cooling for storage areas on the basement level. The mechanical system proposed for the building to add cooling is a Variable Refrigerant Flow (VRF) system. Please see Appendix A for a complete discussion of why this type of system was proposed.

The outdoor condensing units will be cooling only units and able to provide cooling to multiple indoor units at the same time. The location of the outdoor units will be coordinated with the landscape architect on the southwest corner of the building and the location and type of indoor cooling units will be coordinated with the architect. The indoor cooling units have the option of being wall mounted or floor mounted and can be a mix of unit types to address the needs of the specific room.

Mechanical - Heating and Cooling
Priority: *Serious*
Provide a cooling only Variable Refrigerant Flow (VRF) system for all floors of the building. Locate four (4) condensing units outside on the southwest of the building, coordinate with architectural landscape. Route refrigerant lines from condensing units into the basement. Coordination of refrigerant lines entering the building and routing through the building with the architect will be required. Route refrigerant lines in basement to basement air conditioning units and up to air conditioning units on the 1st, 2nd , and 3rd floors. Coordinate locations of refrigerant lines with architect to each air conditioning unit.

Provide the following air conditioning units for the building:

Basement:
#001 – Collection Processing – three (3) 0.5 nominal ton units
#002 – Hall – no cooling
#003 – Janitorial – no cooling
#004 – Crawl space – no cooling
#005 – Mechanical room – no cooling
#006 – Supplies – one (1) 0.5 nominal ton unit
#007 – Collections Storage – one (1) 0.5 nominal ton unit
#008 – Imaging Lab – one (1) 0.5 nominal ton unit
#009 – Cataloging Office – one (1) 0.5 nominal ton unit
#010 – Elevator – no cooling
#011 – Collections Storage – two (2) 1.0 nominal ton units
#012 – Collections Storage – one (1) 0.5 nominal ton unit

1st Floor:
#101 – Vestibule – no cooling
#102/104/105/112 – Entry Hall, Reading Room, Office, Central Files – four (4) 0.75 ton nominal units
#103 – Storage – one (1) 0.5 nominal ton unit
#106 – Office – one (1) 0.75 nominal ton unit
#107 – Office – one (1) 0.75 nominal ton unit
#108 - Office-– One (1) 0.50 nominal ton unit.
#110 – Stair-– one (1) 0.50 nominal ton unit
#111 – Hall – no cooling
#113 – Cloak Room/Restroom – no cooling
#114 – Stairwell – no cooling
#115 – Vestibule – no cooling

2nd Floor:
#201 – Collections Storage – four (4) 1.5 nominal ton units
#202 – Collections Storage – three (3) 1.0 nominal ton units
#203 – no cooling
#204 – Stairwell – no cooling
#205 – New restroom – one (1) 0.5 nominal ton unit

3rd Floor:
Gallery - two (2) 1.0 nominal ton units

Reroute heating water piping in the basement to accommodate new elevator. Piping consists of four (4) heating water supply and return lines varying in size from 3/4" to 1-1/2".

In basement restroom, remove baseboard heater along the wall including heating water piping and controls.

Relocate cabinet unit heater on 1st floor into new vestibule for elevator.

The new stairway to the 2nd floor requires the relocation of one cabinet unit heater and piping and the removal of one cabinet unit heater and piping on the 1st floor.

Remove and return to owner, three (3) historic thermostats being removed on the 1st floor due to removal of walls.

Relocate one (1) thermostat in #104.

Provide one (1) new cabinet unit heater in new restroom with new piping and controls.

Mechanical - Humidity Control
Priority: *Serious*
Humidity control within the collections is important, as well as maintaining good airflow movement in the larger rooms to avoid stratification. Provide a new dehumidifier similar to Honeywell DH70PW with digital display, pumped condensate, and frost control in the following locations:

#001 – Collections Processing
#007 – Collections Storage
#011 – Collections Storage
3rd Floor Gallery

For maintaining airflow within the space, provide destratification fan similar to Airius Q-50-EC in the following locations:

#001 – Collections Processing – (2) fans
#011 – Collections Storage – (2) fans
#201 – Collections Storage – (2) fans
#202 – Collections Storage – (2) fans
3rd Floor Gallery – (1) fan

Mechanical - Ventilation
Priority: *Minor*
Ventilation air is provided via natural ventilation for all areas not used for collections storage via operable openings to the outside with windows and doors. Collection storage rooms are not provided with ventilation; however, these rooms are maintained for temperature and humidity and introducing ventilation air would be a detriment to maintaining the climate within the rooms.

Provide new exhaust fan for new restroom on 2nd floor.

Provide new transfer fan with thermostat operation for elevator equipment/controls.

Treatment- Plumbing

Plumbing - System
Priority: *N/A*
New elevator
- Remove existing water closet and lavatory in Toilet Room #010. Existing main water, vent, and waste lines to remain. Coordinate with new elevator to maintain 3" vent and 4" waste in corner of toilet room #010.
- Remove water line and drain line that feed lavatory on 2nd floor in Room #203 to accommodate new elevator.
- Provide elevator sump pump system with oil alarm as required. Sump pump shall be capable of 50 gpm flow and routed to the sanitary system.
- The existing sanitary waste line should be scoped to determine condition.

ABAAS restroom in Room 205
- Provide new restroom with water closet and lavatory on the 2nd floor. Provide with cold water, hot water, waste, and vent connections and connect to existing mains.

Treatment- Fire Suppression

Fire Suppression - System
Priority: *Minor*
The existing fire suppression systems are to remain.

Treatment - Electrical

Electrical - Service and Panels
Priority: *Minor*
The existing Main Distribution Panelboard was replaced in 2016/2017 and is in good condition. No improvements are recommended at this time.

Elevator: If an elevator is added, the existing electrical service can accommodate the optional elevator without upgrades.

A new mechanical system will be added to the building to provide cooling via a Variable Refrigerant Flow (VRF) system. There will be (4) condensing units location on the south side of the building (location TBD) that feed into air conditioning units on the inside of the building. See below for locations of all AC units:

Basement:
- Collection Processing #001 – (3) 0.5 ton units
- Supplies #006 – (1) 0.5 ton unit
- Collections Storage #007 – (1) 0.5 ton unit
- Imaging Lab #008 – (1) 0.5 ton unit
- Cataloging Office #009 – (1) 0.5 ton unit
- Collections Storage #011 – (2) 1.0 ton units
- Collections Storage #012 – (1) 0.5 ton unit

1st Floor
- Entry Hall, Reading Room, Office, Central Files – (4) 0.75 ton units
- Storage #103 – (1) 0.5 ton unit
- Office #106 – (1) 0.75 ton unit
- Office #107 – (1) 0.75 ton unit
- Office #109 – (1) 0.5 ton unit
- Office #110 – (1) 0.5 ton unit

2nd Floor
- Collections Storage #201 – (4) 1.5 ton

units
- Collections Storage #202 – (3) 1.0 ton units
- New Restroom – (1) 0.5 ton unit

3rd Floor
- Gallery – (2) 1.0 ton units

New humidifiers will be provided in Collections Processing #001, Collections Storage #007 and #011, and for the 3rd floor Gallery. Destratification fans will be provided in Collections Processing #001 (2-fans), Collections Storage #011, #201, & #202 (2-fans each), and the 3rd Floor Gallery (1-fan).

Refer to the Mechanical HSR Report for more information.

Modification to existing branch circuits as well as the addition of new branch circuits will be required due to the addition of the elevator, egress stair, and ABAAS restroom. Please see below for a list of requirements:
- Provide (1) new electrical connection to elevator motor.
- Provide (1) new electrical connection to elevator cab lights.
- Provide (1) new GFCI receptacle and (1) LED strip light in elevator pit.
- Provide (1) tele/data connection to elevator controller.
- Provide (1) new GFCI receptacle in new ABAAS restroom (2nd Floor Room 205B).
- Relocate/remove receptacles and all associated circuiting in Room 108 and Room 110 where exit stair is being added.
- Relocate/remove receptacles and all associated circuiting in Room 010, 112, and 203 where new elevator is being added.

Electrical - Distribution System
Priority: *Minor*
The existing distribution was replaced in 2016/2017 and is in good condition. No improvements are recommended at this time.

Electrical - Lighting, Emergency Lighting, and Exit Signs
Priority: *Minor*
Lighting was replaced with energy efficient LED and automatic controls in 2016/2017 and is in good condition.

The exterior pedestrian scale light pole shall be replaced/repaired.



Figure 5-1. Damaged pedestrian pole SJH 10/30/18

Lobby area lighting: The lobby area lighting levels are lower than IEC recommendations for similar areas where displays and pamphlets are used by the public. Anticipate new, period specific lighting fixtures to be provided in Circulation 102, Desk 105, and Lobby 112 to increase lighting levels.

Upper floor lighting: Depending of the use of the building it is anticipated the track lighting in the upper floors will be replaced with lighting selected and designed for the use of the space. Anticipate new, period specific lighting fixtures to be provided in Reading

Rooms 201 and 202.

See below for a list of specific areas which require modification due to the addition of the elevator, egress stair, and ABAAS restroom.

- Provide (1) LED downlight in new Cloak Room (2nd Floor Room 205A).
- Provide (1) LED vanity light and (1) LED downlight in new ABAAS restroom (2nd Floor Room 205B).
- Provide (1) occupancy sensor wall switch in new ABAAS restroom (2nd Floor Room 205B) and one in new Cloak Room (2nd Floor Room 205A).
- Relocate/remove lighting controls and light fixture locations in Room 108 and Room 110 where exit stair is being added.
- Relocate/remove lighting controls and light fixture locations in Room 010, 112, and 203 where new elevator is being added.
- Remove existing lighting controls for Rooms 102, 104, and 105 where walls are being removed. Re-circuit all fixtures in this open area to be controlled together.

Electrical - Fire Alarm & Detection System
Priority: *Minor*
The fire alarm system was installed in 2016/2017 and is in good condition. Recommend continuing to perform annual fire alarm testing as required.

Electrical - Tele/Data Communications System
Priority: *Minor*
The tele/data communications system is in good condition and cables are being managed properly. This equipment is located within the collections processing room which is a violation of the NPS museum policy. Moving the network switch to a non-museum space shall be considered.

Electrical - Lightning Protection System
Priority: *Critical*
It is recommended a lightning protection study be performed to determine if a lightning protection system is required.

Treatment - Site

The Calumet & Hecla Public Library site retains the historic character of the period of significance. This includes the setting in open lawn, and relationships to the Calumet conglomerate lode and associated Calumet & Hecla mining buildings.

The recommended treatment for Calumet & Hecla Public Library is to rehabilitate the site to ensure preservation of the library cultural landscape and to provide an ABAAS route to the building by modifications to the existing walkways and structure. Site treatment guidance is consistent with the HSR scope of work and provides more detailed recommendations than provided in the 2013 Calumet Unit Historic Landscape Cultural Landscape Report and Environmental Assessment.

Site - General Description+

Priority: *Serious*

The library will be rehabilitated to repair contributing features and provide an ABAAS compliant route.

The following actions describe site rehabilitation for Calumet & Hecla Public Library.

- Preserve views to Calumet & Hecla General Office Building, Agassiz House, and Calumet & Hecla Warehouse Number One.*
- Install post and rail fences along Red Jacket Road and Mine Street. Follow historic alignment.*
- Relocate Alexander Agassiz statue to original site in Agassiz Park. Restore with lawn.*
- Relocate float copper exhibit to Coppertown. Restore with lawn.*
- Remove asphalt parking lot. Restore with lawn.
- Replace sidewalks along Mine Street and install six (6)-inch curb. Establish positive drainage to stormwater inlet.[1.1]*
- Maintain arborvitae southwest of the library as a visual buffer.
- Preserve historic patterns of open lawn and street trees surrounding the building.
- Preserve existing trees. Perform pruning and thinning to maintain tree form and health. Replace mature trees along Red Jacket Road and Mine Street when they become hazards or die.
- Verify footprint of non-extant Congregational Church. Use a simple paving material, such as brick or stone, to outline the footprint of the building on the ground*
- Locate and screen ground mounted condensers to the south of the vault. Screen utilities with a low-profile metal louvered fence, horizontal in form.

1.1 Actions within the public rights-of-way require Houghton County coordination and approval.

* Recommendation from 2013 Calumet Unit Historic Landscape Cultural Landscape Report and Environmental Assessment. Implementation of CLR recommendations require further study at the park level, coordination with park partners, and environmental compliance.

\+ Archaeological research prior to design and installation of site rehabilitation actions is recommended.

Site - ABAAS

Priority: *Critical*

Improvements to the existing pedestrian and vehicular system will provide an ABAAS route into Calumet & Hecla Public Library.

The finished floor elevation at the front entrance (Red Jacket Road) is approximately 38.5 inches higher than existing grade. The finished floor elevation at the side entrance (Mine Street) is approximately 39.5 inches higher than existing grade, prohibiting ABAAS access at either entrance without modifications. Walkways do not meet ABAAS slope and landing requirements. Existing handrails at both entrances are not ABAAS compliant.

Improvements to the front entrance needed for an ABAAS route would greatly diminish the integrity of the historic structure and cultural landscape. The recommended ABAAS route is to the side entrance to avoid alternations to the primary façade. This respects the established scale, form, and arrangement of the library.

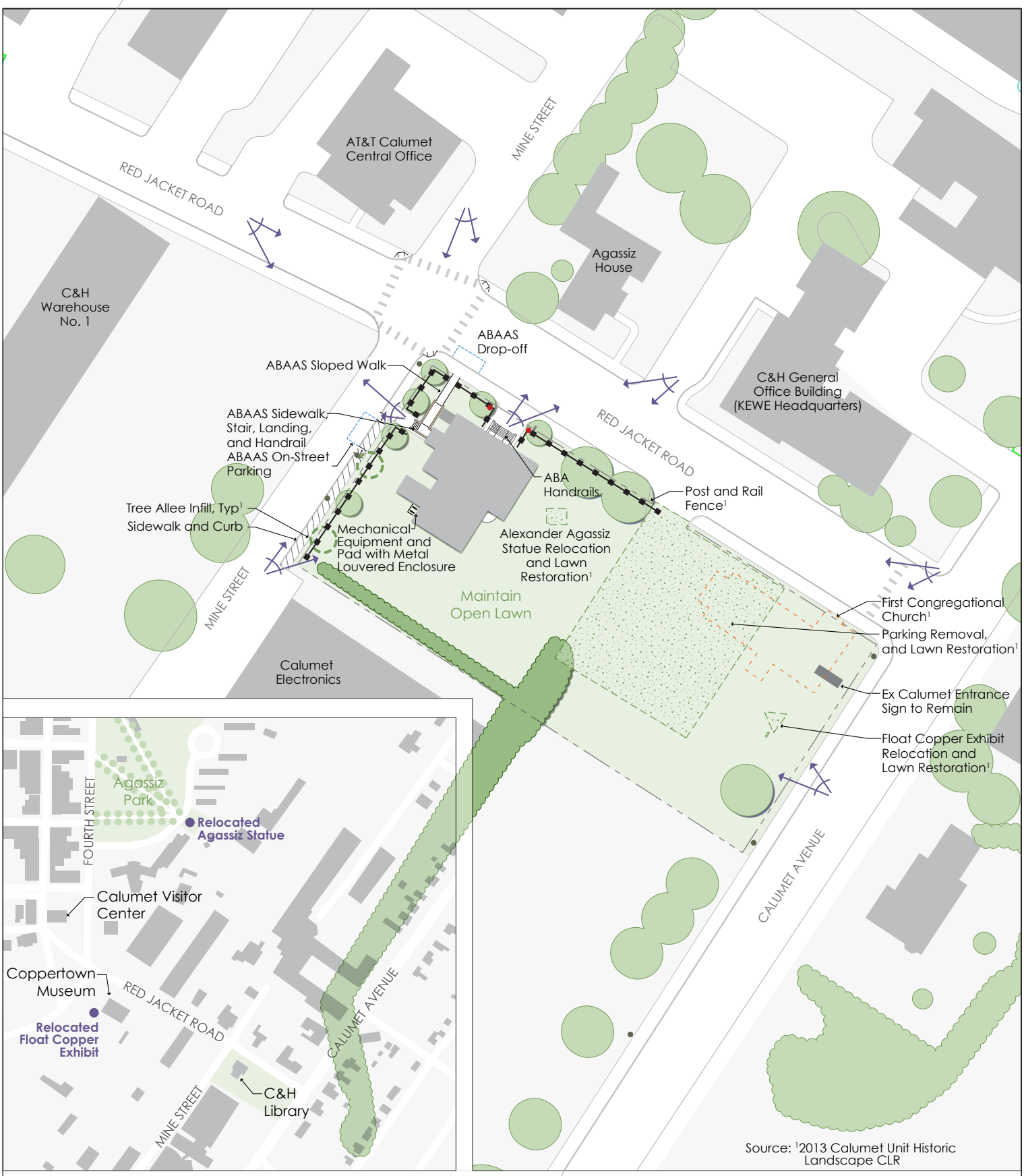
The following actions describe ABAAS parking and access into the existing library side entrance.

- Provide ABAAS routes from the designated on-street parking space along Mine Street and the drop-off along Red Jacket Road to the library, with an accessible ramp at the side entrance.

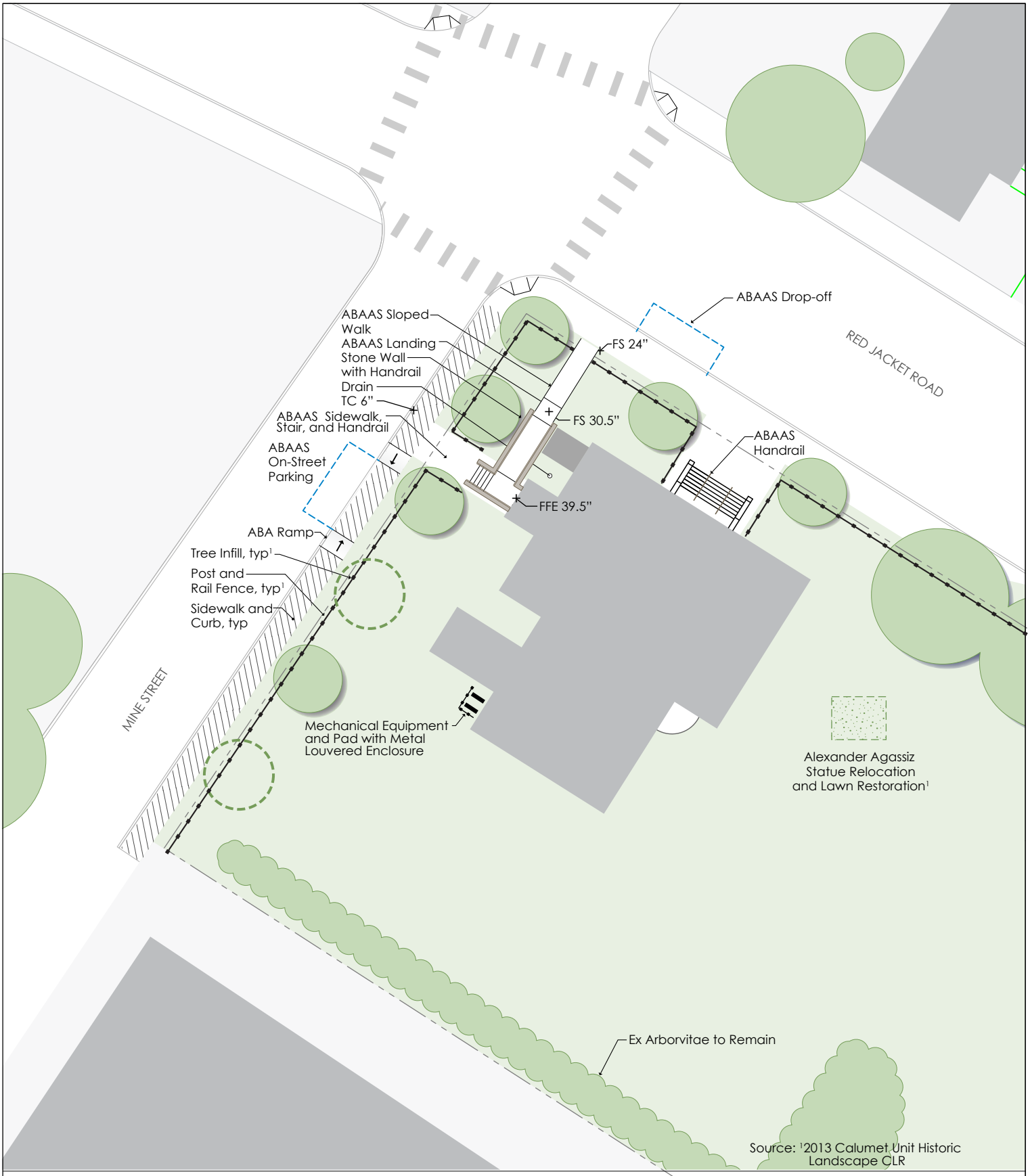
- Provide an ABAAS route to the building's existing side entrance. Establish a six (6)-foot wide concrete paved sidewalk from the Red Jacket Road sidewalk to the entrance. Provide an earthen sloped walk along the existing site topography that transitions to a sloped walk with a low, simple stone cheek wall and painted steel handrails. Locate cheek walls behind the primary facade's setback from Red Jacket Road to minimize intrusion on the site. New stone cheek wall should be compatible but not mimic historic structure. Set slope walk away from the building with an area for drainage between it and the building. Establish an inlet and underground drainage system to divert stormwater away from the building. Seed or sod adjacent landscape to match the surrounding mown lawn.

- Reconstruct the side entrance walkway, stairs, and handrails to meet current ABAAS requirements and provide direct access from the side entrance to the Mine Street sidewalk.

Preferred Alternative Drawings



DESIGNED: TB	SUB SHEET NO.	TITLE OF SHEET	DRAWING NO.
CADD KR	L1.1	PART 2 - TREATMENT AND USE PREFERRED ALTENATIVE SITE	X XXX
TECH REVIEW: TB		CALUMET & HECLA PUBLIC LIBRARY	PMIS/PKG NO. 237234
DATE: 11/1/2019		KEWEENAW NATIONAL HISTORIC PARK	SHEET 1 OF 6



Legend

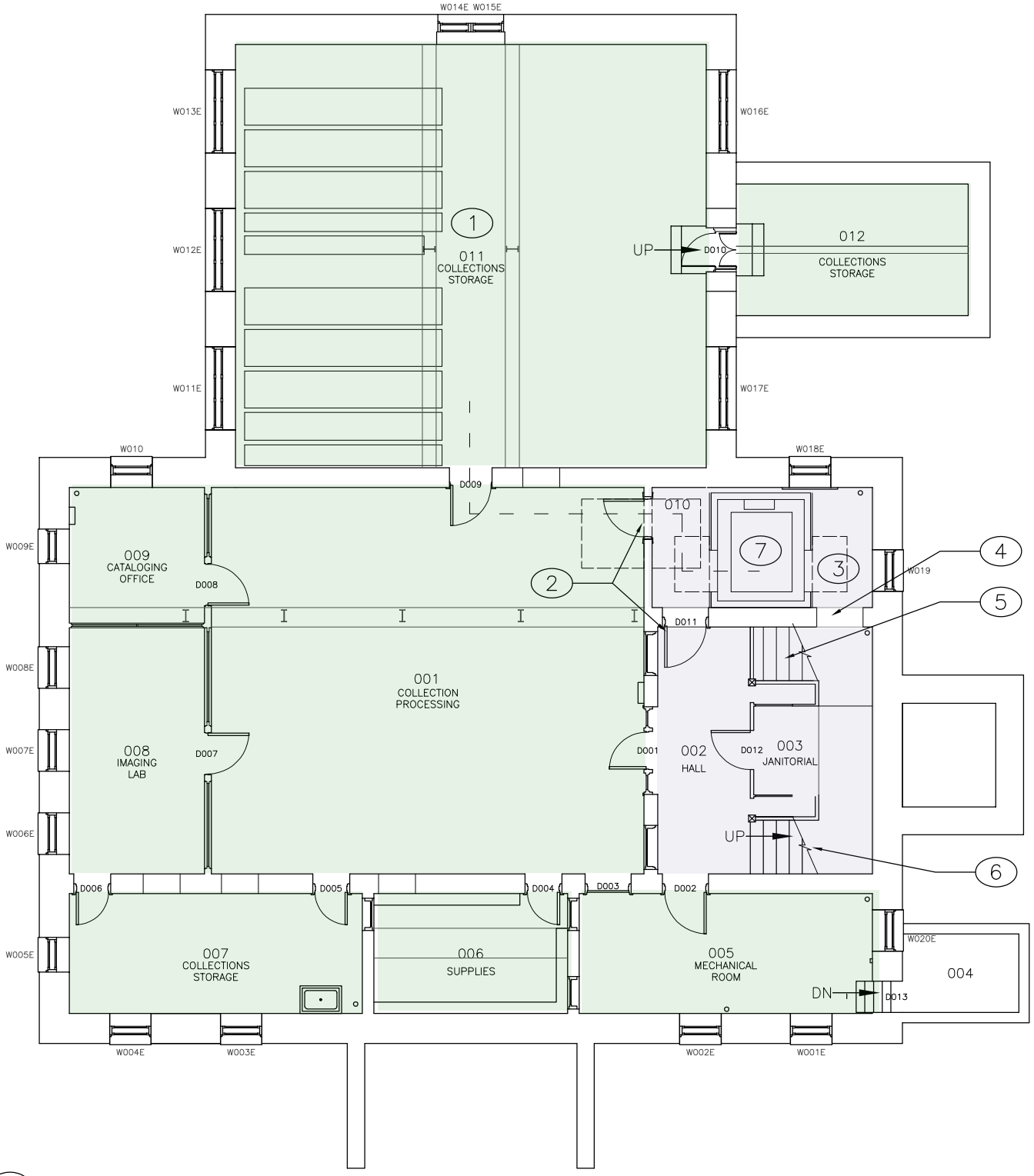
- Post and Rail Fence
- Wall
- Handrail
- Tree Infill
- Lawn Restoration
- Sidewalk and Curb Replacement
- C&H Library Boundary
- Mown Lawn
- Deciduous Tree
- Arborvitae
- FFE Finish Floor Elevation
- FS Finish Surface
- Building/Structure

SCALE OF FEET: 30 0 30 60

N

DESIGNED: TB DRAWN: KR TECH REVIEW: TB DATE: 11/1/2019	SUB SHEET NO. L1.2	TITLE OF SHEET PART 2 - TREATMENT SITE CALUMET & HECLA PUBLIC LIBRARY KEWEENAW NATIONAL HISTORIC PARK	DRAWING NO. X XXX PMIS/PKG NO. 237234 SHEET 2 OF 6

PUBLIC–INTERPRETIVE
KNHP STAFF USE
– – ACCESSIBLE ROUTE
––– ABAAS CLEARANCES



(#) KEYNOTES:

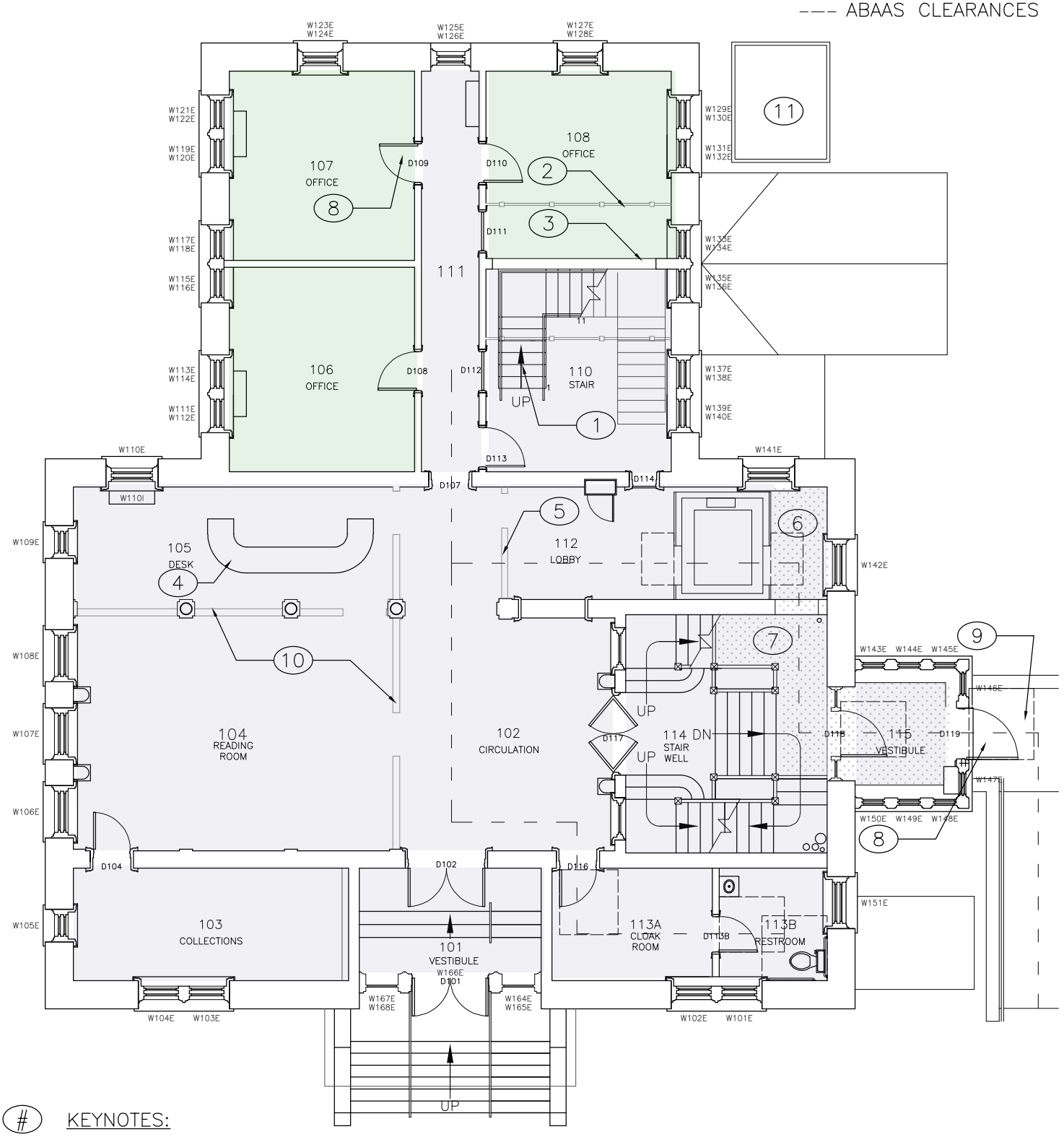
1. ARCHIVE STORAGE IN ROOM 011
2. ADD NEW DOOR AND REVERSE SWING OF DOOR 011
3. ENTRY LEVEL ELEVATOR ACCESS – NEW FLOOR AT +5'–4.5"
4. NEW OPENING IN MASONRY WALL
5. STAIR LANDING EXTEND OVER HISTORIC STAIR; NEW GUARDRAIL
6. SOUTH STAIR RECONSTRUCTED
7. 4–STOP ELEVATOR

4 0 4 8 12
SCALE OF FEET

DESIGNED: LHM CADD SH TECH. REVIEW: EMH DATE: 11/1/2019	SUB SHEET NO. A1.0	TITLE OF SHEET PART 2–TREATMENT AND USE PREFERRED ALTERNATIVE BASEMENT CALUMET & HECLA PUBLIC LIBRARY KEWEENAW NATIONAL HISTORICAL PARK	DRAWING NO. X XXX PMIS/PKG NO. 237234 SHEET 3 OF 6

1/14/19 16:42 RACHELKOLESKI R23 N:\AA PROJECTS\2018\2018590 NPS KEWE HSR (MB)\BIM\ACAD\ARCH\A1.1 – CH – FIRST FLOOR PLAN.DWG XREFS: ..\BASES\XA–QUINCYTITLEBLOCK.DWG; ..\BASES\XA CHTITLEBLOCK.DWG; ..\BASES\XA–CH.DWG;

PUBLIC–INTERPRETIVE
KNHP STAFF USE
– – ACCESSIBLE ROUTE
––– ABAAS CLEARANCES



(#) KEYNOTES:

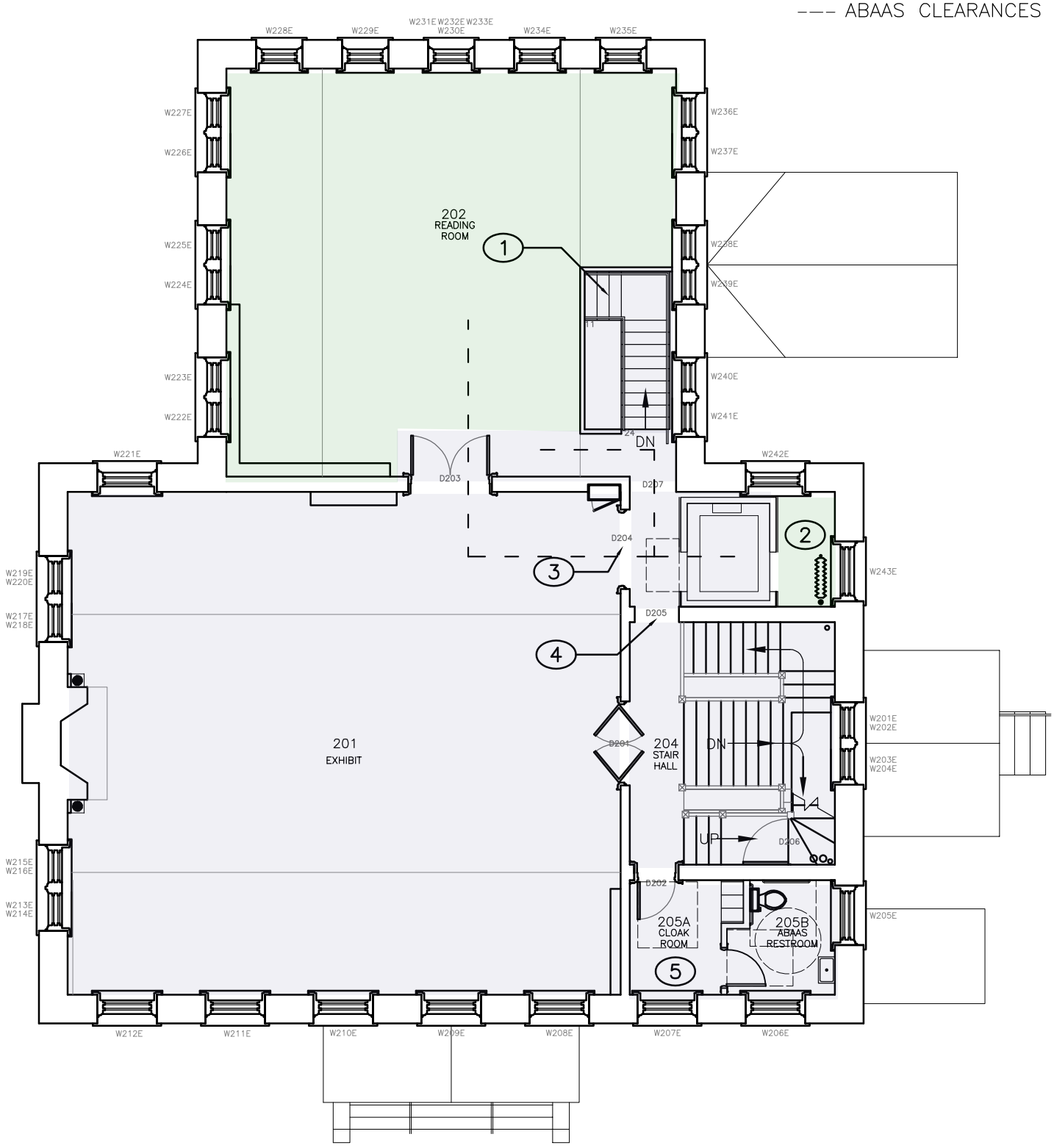
1. NEW EGRESS STAIR FROM 2ND FLOOR
2. DEMOLISH 1954 PARTITIONS
3. NEW WALL TO RESTORE 1944 LAYOUT
4. RESTORE CIRCULATION DESK
5. DEMOLISH 1954 HALF WALL
6. NEW LANDING AT –3'–10" BELOW
7. EXTENDED LANDING AT ENTRY LEVEL
8. REVERSE DOOR SWING
9. NEW LANDING AND RAMP
10. DEMOLISH WALLS; RESTORE COLUMNS
11. NEW MECHANICAL ENCLOSURE

4 0 4 8 12
SCALE OF FEET

DESIGNED: LHM DRAWN: SH TECH. REVIEW: EMH DATE: 11/1/2019	SUB SHEET NO. A1.1	TITLE OF SHEET PART 2–TREATMENT AND USE PREFERRED ALTERNATIVE 1ST FLOOR CALUMET & HECLA PUBLIC LIBRARY KEWEENAW NATIONAL HISTORICAL PARK	DRAWING NO. X / XXX PMIS/PKG NO. 237234 SHEET 4 OF 6

1/14/19 16:42 RACHELKOLESKI R23 N:\AA PROJECTS\2018\2018590 NPS KEWE HSR (MB)\BIM\ACAD\ARCH\A1.1 – CH – FIRST FLOOR PLAN.DWG XREFS: ..\BASES\XA–QUINCYTITLEBLOCK.DWG; ..\BASES\XA CHTITLEBLOCK.DWG; ..\BASES\XA–CH.DWG;

PUBLIC–INTERPRETIVE
KNHP STAFF USE
– – ACCESSIBLE ROUTE
––– ABAAS CLEARANCES



(#) KEYNOTES:

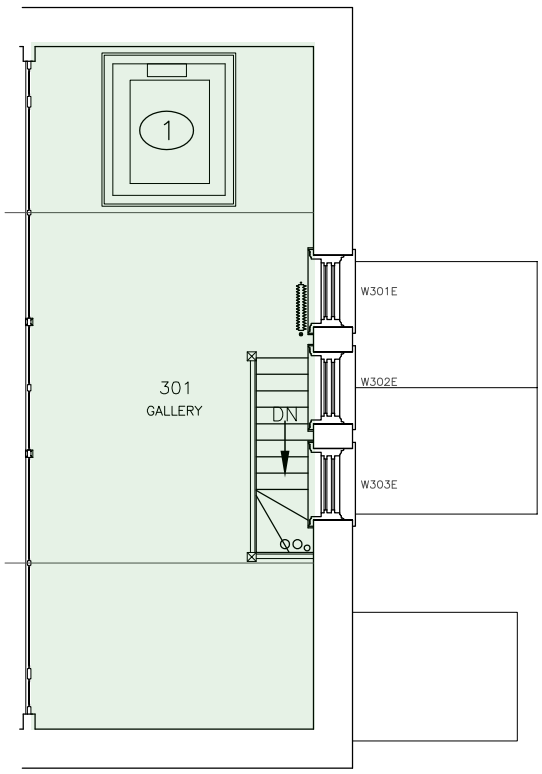
1. FLOOR OPENING WITH EGRESS STAIR TO 1ST FLOOR; GUARDRAIL SURROUND
2. STAFF ACCESS ONLY THIS SIDE
3. REMOVE AND SALVAGE DOOR
4. REMOVE DOOR, PROVIDE SMOKE CURTAIN
5. NEW CLOAK ROOM AND ABAAS RESTROOM

4 0 4 8 12
SCALE OF FEET

DESIGNED: LHM CADD: SH TECH. REVIEW: EMH DATE: 11/1/2019	SUB SHEET NO. A1.2	TITLE OF SHEET PART 2–TREATMENT AND USE PREFERRED ALTERNATIVE 2ND FLOOR CALUMET & HECLA PUBLIC LIBRARY KEWEENAW NATIONAL HISTORICAL PARK	DRAWING NO. X XXX PMIS/PKG NO. 237234 SHEET 5 OF 6

1/14/19 16:42 RACHELKOLESKI R23 N:\AA PROJECTS\2018\2018590 NPS KEWE HSR (MB)\BIM\ACAD\ARCH\A1.1 – CH – FIRST FLOOR PLAN.DWG XREFS: ..\BASES\XA–QUINCYTITLEBLOCK.DWG; ..\BASES\XA CHTITLEBLOCK.DWG; ..\BASES\XA–CH.DWG;

PUBLIC–INTERPRETIVE
KNHP STAFF USE
– – ACCESSIBLE ROUTE
––– ABAAS CLEARANCES



(#) KEYNOTES:

1. SHAFT PENETRATES FLOOR BUT NO ELEVATOR ACCESS IN GALLERY

4 0 4 8 12
SCALE OF FEET

DESIGNED: LHM CADD: SH TECH. REVIEW: EMH DATE: 11/1/2019	SUB SHEET NO. A1.3	TITLE OF SHEET PART 2–TREATMENT AND USE PREFERRED ALTERNATIVE GALLERY CALUMET & HECLA PUBLIC LIBRARY KEWEENAW NATIONAL HISTORICAL PARK	DRAWING NO. X XXX PMIS/PKG NO. 237234 SHEET 6 OF 6

1/14/19 16:42 RACHELKOLESKI R23 N:\AA PROJECTS\2018\2018590 NPS KEWE HSR (MB)\BIM\ACAD\ARCH\A1.1 – CH – FIRST FLOOR PLAN.DWG XREFS: ..\BASES\XA–QUINCYTITLEBLOCK.DWG; ..\BASES\XA CHTITLEBLOCK.DWG; ..\BASES\XA–CH.DWG;

Appendix

Appendix A - Engineering Supplements

Appendix B - Bibliography

Appendix C - Historic Drawings

Appendix D - Existing Condition Drawings

Appendix E - Hazardous Materials Report

Appendix F - Image Permanence Institute Report

Appendix G - Condensed VA/CBA Workshop Notes

Appendix H - Cost Estimate

Appendix A. Engineering Supplements

1. Mechanical System Selection Memo

2.Structural Live Load Chart

3. Wood Species Identification Report

Mechanical Systems Selection Memo

Project: NPS KEWE Calumet & Hecla (C&H) Mining Company Public Library

Date: August 2019

As part of the Historic Structures Report, a recommendation on the type of mechanical system to consider for installation within the C&H Library is summarized in this memo. The purpose of this memo is to put forth a recommendation based on the site observation, discussions with the facility operators of the building, the users of the building, recommendations from the museum environmental specialist, and architectural impacts to the envelope materials of the building.

A site visit was conducted on October 30, 2018. During this site visit meetings were conducted with Park staff as to the operation of the facility, review of mechanical systems currently used within the Park, and several hours reviewing the existing mechanical system within the building and space for mechanical system equipment.

The existing mechanical system is a new heating only hydronic system with boilers in the basement, hydronic baseboards, and fan coil units located throughout the building. The only source of mechanical cooling is via through the wall air conditioning units which are installed during the summer in the operable windows and removed at the end of the cooling season. There are also portable dehumidification units located within the building to mitigate the humidity in critical areas.

The mechanical systems considered for the building focused on providing cooling only since the heating system is new and operating well. The mechanical cooling systems considered were the following;

- Air Handling Unit (AHU) with variable flow and terminal units (VAV System)
- Geothermal with heat pumps
- Fan Coil Units with cooling only coils – DX and chilled water
- Variable Refrigerant Flow (VRF) system

The above systems were considered over several factors and put into a matrix to determine a recommendation to move forward within the Histroric Strucures Report.

On the following page is the matrix along with scoring for the different options. The Importance Factor is based on the opinion of the mechanical engineer following the site visit and subsequent meetings. The higher the Importance Factor (6) is viewed as the most important with a (1) being the least important when compared to the other factors.

C&H Public Library Mechanical System Matrix						
HVAC SYSTEM	Impact to exterior	Energy Efficiency	Impact to interiors	Noise	Ease of maintenance	First Cost
Importance Factor	3	6	1	2	4	5
AHU with VAV's	Greatest - equipment	Good	Greatest – ductwork/soffits	Interior – low Exterior – high	Moderate	Average ($$)
Geothermal	Least - no visible exterior equip. However, goe-field required	Greatest – however, based high on elec costs operating costs are high	Moderate – routing of piping and minimal ductwork	Interior – moderate Exterior – none	Most complex system – Greatest level of maintenance needed	High ($$$)
Fan Coil Units	Moderate - Multiple smaller units or one large unit	Least efficient	Moderate – routing of piping and minimal ductwork	Interior – moderate Exterior – moderate to high	Easiest – but multiple units	Low ($)
VRF	Moderate - Two units	Good	Least – piping with units in space	Interior – moderate Exterior - moderate	Moderate	Average to High ($$+)

The Air Handling Unit with VAV (Variable Air Volume) terminal units poses challenges with space to locate the main air handling unit inside the building, space for ductwork routing, and locating a large heat rejection piece of equipment outside. The heat rejection could be either a DX condensing unit or a chiller. The site is open on all sides and locating this piece of equipment would be challenging. In addition, the larger DX and chiller units are quite noisy and disruptive to the outdoor experience. With the space challenges, ductwork routing challenges, and large outdoor equipment requirement, this option was viewed as a very low viable option.

The Geothermal system scores were rather high on several factors including impact to the exterior and the exterior noise. The geothermal system has no outdoor visible equipment as the geofield is installed either as a borefield or horizontal loop field. A geothermal system has multiple configuration options once interior to the building including use as a VRF (Variable Refrigerant Flow) system. However, a geothermal system is most effective when it is operating as a cooling source as well as a heating source. Since the system would only be utilized as a cooling source, this decreases the return on investment with the typically lower operating costs. Discussions with the Park and local reviews of electrical costs also decrease the viability of this option. Electrical energy costs ore high in the area and the rate of payback with lower energy costs are diminished taking longer to pay back the initial construction costs. Due to the anticipated higher operating costs and complexity of maintanance, this system was dismissed as viable.

The Fan Coil Unit system is similar to the VRF system. The two main differences are that the fan coil units are connected to individual outdoor condensing units resulting in more outdoor units to locate on the site and maintain. Also, the fan coil units offer a floor mounted console option, but not a wall mounted option. Units mounted high would need to be ducted and contained in a soffit. For these reasons, the Fan Coil Unit was not as viable as the VRF system.

Three Sixty Engineering, Inc. recommends the VRF system for the C&H Public Library. The outdoor condensing units can serve multiple indoor units, therefore, decreasing the outdoor equipment to two units. The VRF system has options for floor mounted and wall mounted units requiring no ductwork. The VRF system uses technology at the compressors to increase and decrease capacities to conserve energy. In addition, the facility staff is familiar with the VRF system as there is one currently installed at the headquarters building.

KEWE C&H Library Live Load Capacities

75% HSR - 2019 - JVA, Inc.

Area	Controlling Element of Structural System	Material	Current			Time of Installation		
			Current Use	Calculated Live Load Capacity (psf)	Code Required Live Load Capacity (psf)[A]	Historic Use	Date of Installation	Code Required Live Load Capacity (psf)
Basement - South	Concrete Slab-on-Grade	Concrete (reinforcing unknown)	Archival Storage & Compact Shelving	Unknown	125	Bath House	1899	150[E,G]
Basement - North	Unreinforced Concrete Slab-on-Grade	Concrete	Archival Storage & Offices	Unknown	125	Bath House	1899	150[E,G]
1st Floor - South	I15x42 Steel Beams	Steel - F_y = 60 ksi & F_b = 16 ksi[B]	Offices	100	50	Stacks	1912	150[E,H]
1st Floor - North	5 1/2" x 11 1/4" Timber Joists	Southern Pine, Select Structural[C]	Offices	55	50	Delivery Room, Librarian, & Catalogue	1899	100[E,J]
2nd Floor - South	3" x 7 1/2" Timber Joists	Southern Pine, Select Structural[D]	Archival Storage	75	125	Office	1944	50[F]
2nd Floor - North	5 1/2" x 11 1/4" Timber Joists	Southern Pine, Select Structural[D]	Archival Storage	55	125	Reading Room	1899	150[E,G]
3rd Floor Gallery	5 1/2" x 11 1/4" Timber Joists	Southern Pine, Select Structural[D]	Archival Storage	55	125	Reading Room	1899	150[E,G]

A: 2018 International Building Code (IBC)

B: Material extrapolated from date of construction using *AISC Iron and Steel Beams, 1873-1952* published in 1953 and edited by Herbert Ferris

C: Sample taken from first floor joist

D: Material extrapolated from sample taken from similar member elsewhere in the building

E: "Digest of the statutes and of the ordinances relating to the construction, maintenance, and inspection of buildings in the City of Boston" 1895 (Building designed by a Boston firm)

F: "Minimum Live Loads Allowable for Use in Design of Buildings" Report of Building Code Committee, Bureau of Standards, 1925

G: Considered a public use for the purposes of this study

H: Considered a warehouse use for the purposes of this study

J: Considered an office use for the purposes of this study

December 16, 2018

Ms. Christine Britton, P.E.
JVA, Incorporated
1319 Spruce Street, Boulder, CO 80302

RE: Wood species identification of one sample from JVA Job No. 19463

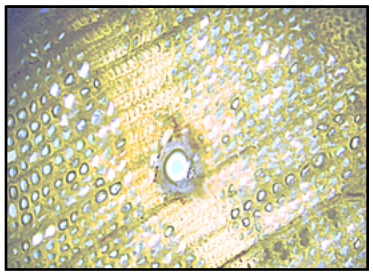
Ms. Britton:

One wood sample from the C & H Library, a library & archive , Calumet, Michigan, was sent to Wood Identification and Consultation Services for species identification. Identifying wood species makes it possible to identify compatible material for repairs and can aid in historic interpretation of construction or repair campaigns.

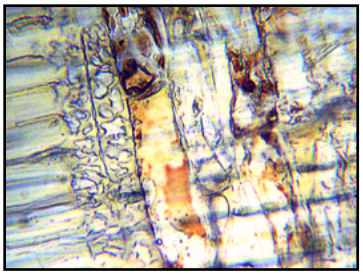
The sample was assessed for macroscopic characteristics that aid in species identification. Thin sections of the sample were also examined at 40x to 1000x magnification with a light microscope to identify cellular features that allow for species differentiation. The sample was identified as follows:

Sample No.	Description	Member Dimensions	Species
1	original first floor joist	5-1/2" x 11-1/4"	Southern yellow pine (*Pinus* spp.)

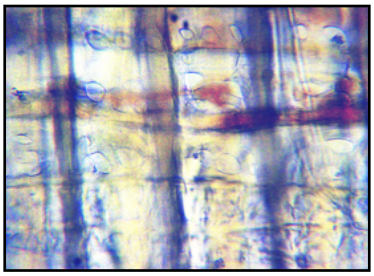
Microscopic characteristics used in identification:



Resin Canal in Cross Section



Dentate Ray Tracheids



Pinoid Cross Field Pitting

Microscopic features for two hard pine species groups, western yellow pine and southern yellow pine, are identical. A determination of southern yellow pine was based on the geographic location of the sample's origin, and macroscopic features including very dense bands of latewood. By comparison, the latewood bands of western yellow pine, when viewed in cross section are not as dense nor as visually distinct.

For determining approximate design values, the southern pine species group is appropriate to use.

If you have any questions regarding the species identification, or if I can be of any additional assistance, please do not hesitate to contact me.

Best regards,



Kimberly Dugan
Wood Specialist
(720) 518-6057
kdugan.preservation@gmail.com

Appendix B - Bibliography

Archival Collections

Michigan Technological University

Calumet and Hecla Mining Companies Collection, MS-002.
Correspondence, Annual Reports, Ledgers, Photographs, and other miscellaneous records.

Keweenaw National Historical Park

Photograph Collections, Keweenaw History Center.

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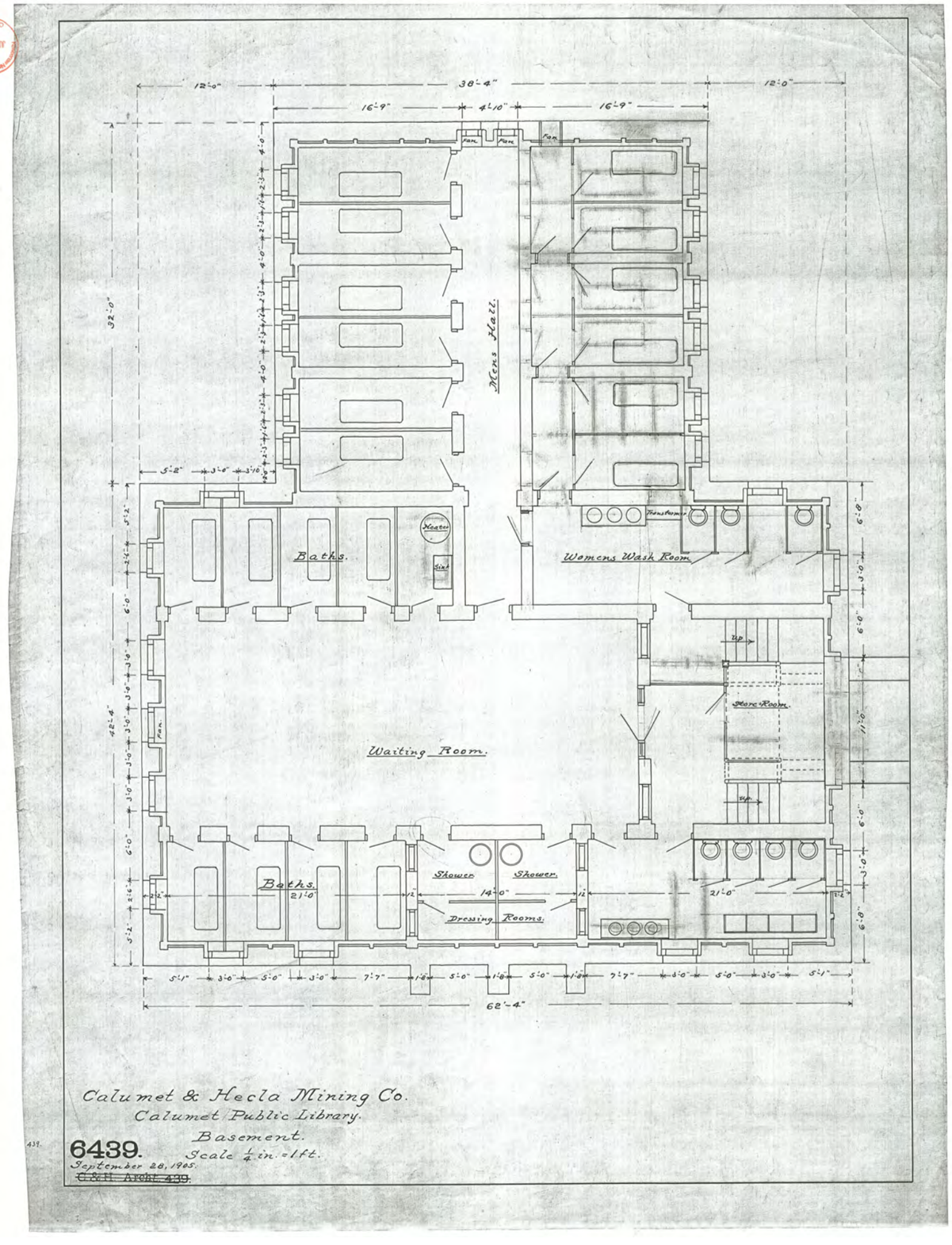
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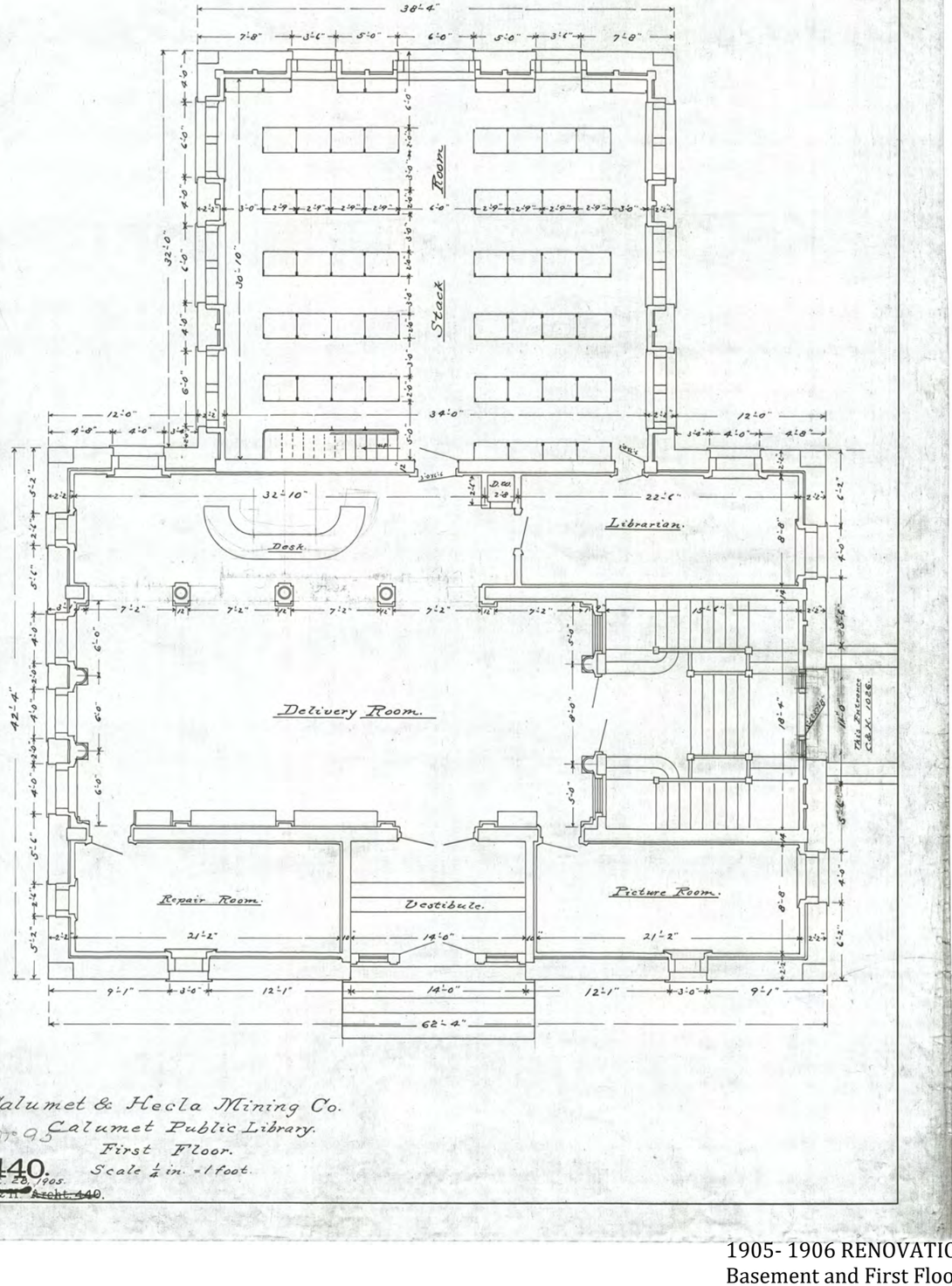
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Appendix C. Historic Drawings

AR 21 2005



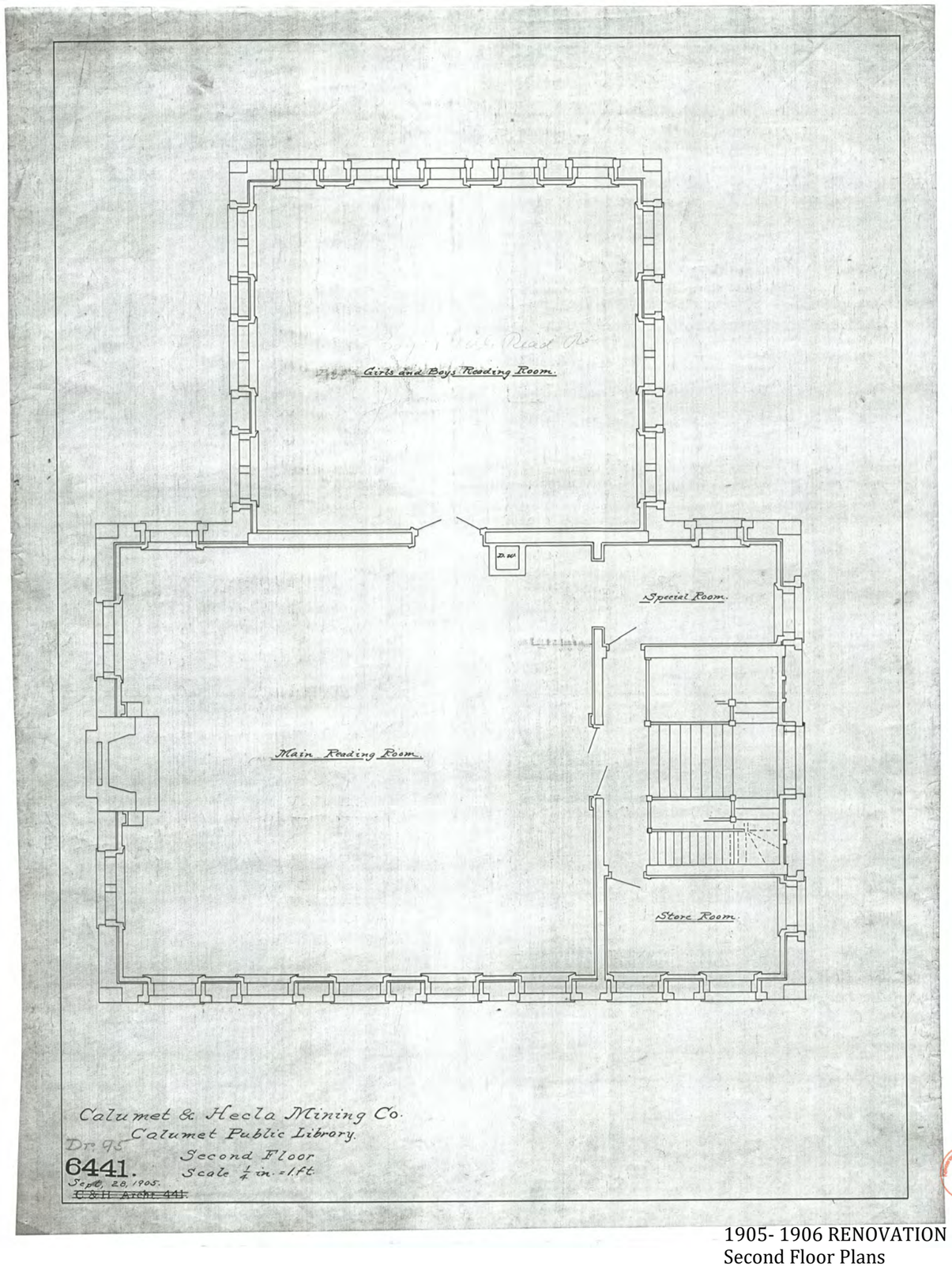
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Calumet Public Library.
Basement.
6439. Scale ¼ in. = 1 ft.
September 28, 1905.
~~C. & H. Archt. 439.~~



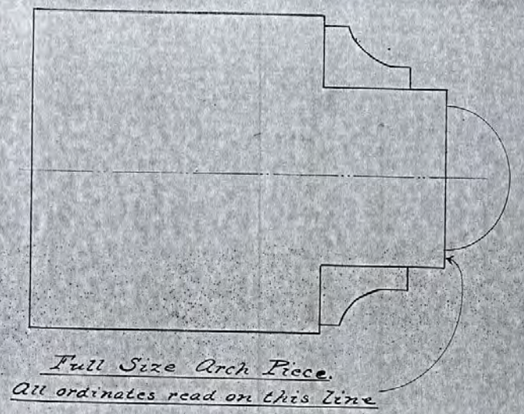
Calumet & Hecla Mining Co.
D-95 Calumet Public Library.
First Floor.
6440. Scale ¼ in. = 1 foot.
Sept. 28, 1905.
~~C. & H. Archt. 440.~~

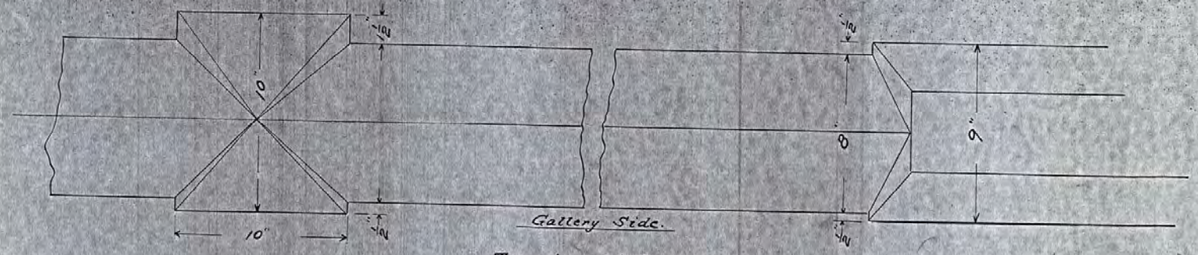
JUL 21 2005

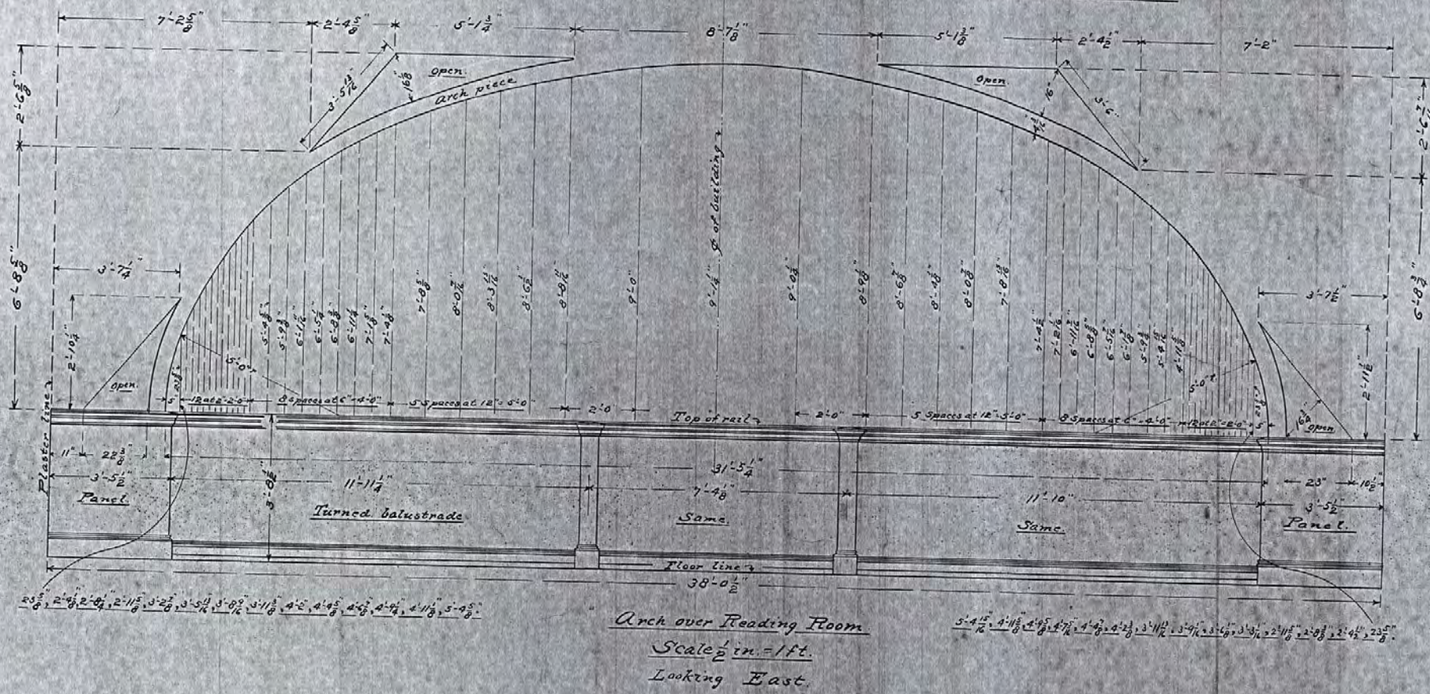
1905- 1906 RENOVATION
Basement and First Floor Plans



1905- 1906 RENOVATION
Second Floor Plans







Calumet & Hecla Mining Co.
Library.
Gallery Arch.
Various Scales.
November 4, 1902.
C. & H. Arch't. 342.

6342

APPROVED
DEC 15 1906
J. MacMAHON
C M

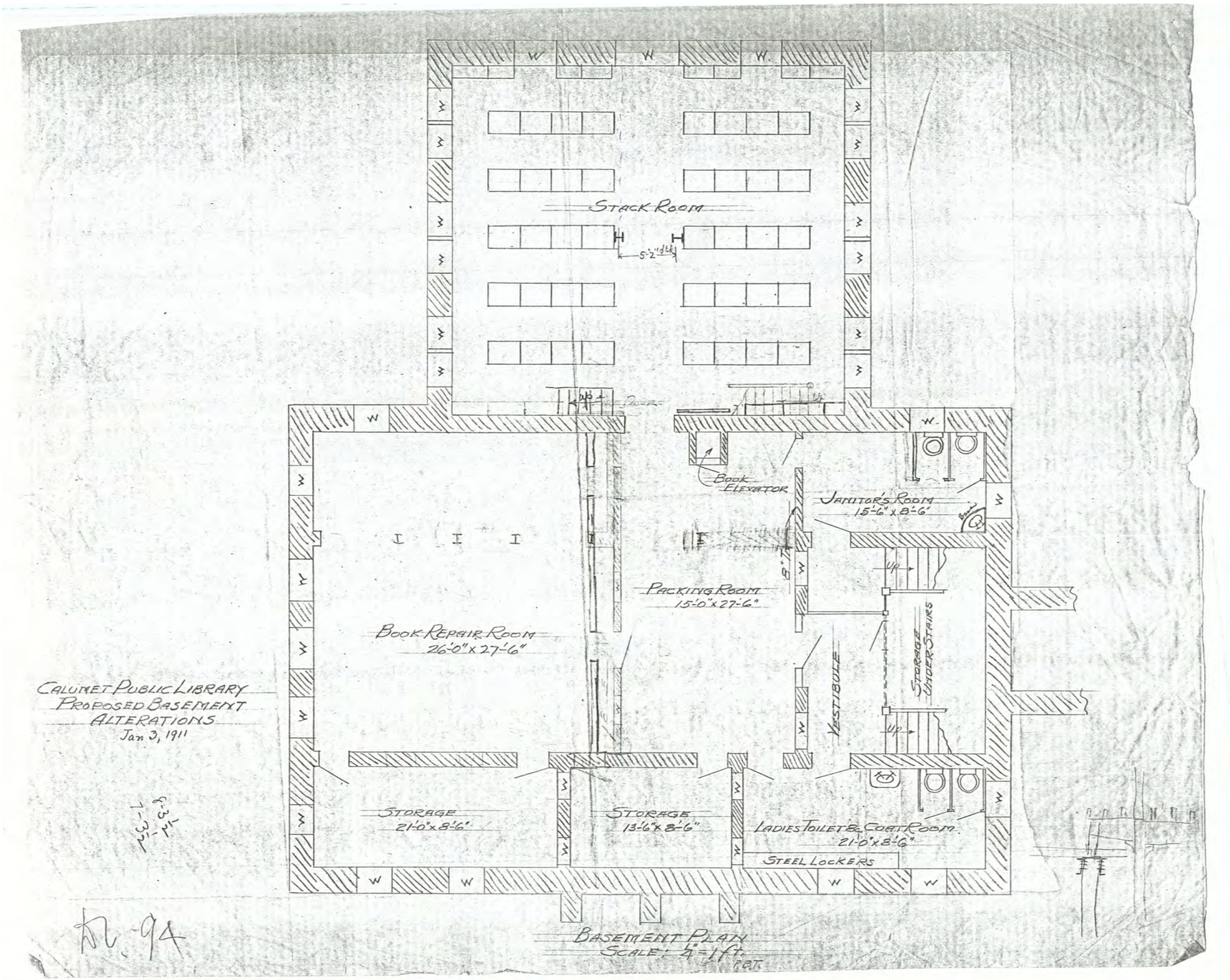
Drawing 95 # 6342

FROM THE COLLECTION OF THE
MICHIGAN TECHNOLOGICAL UNIVERSITY
ARCHIVES & COPPER COUNTRY
HISTORICAL COLLECTIONS

DIGITIZED BY MICHIGAN TECHNOLOGICAL UNIVERSITY
WITH GRANT FUNDS FROM THE INSTITUTE OF MUSEUM AND LIBRARY SERVICES
THE KEWEENAW ARCHIVES & COPPER COUNTRY HISTORICAL COLLECTIONS

CREDIT LINE: MICHIGAN TECHNOLOGICAL UNIVERSITY ARCHIVES AND COPPER COUNTRY HISTORICAL COLLECTIONS

1906 GALLERY ARCH
Detail Drawings

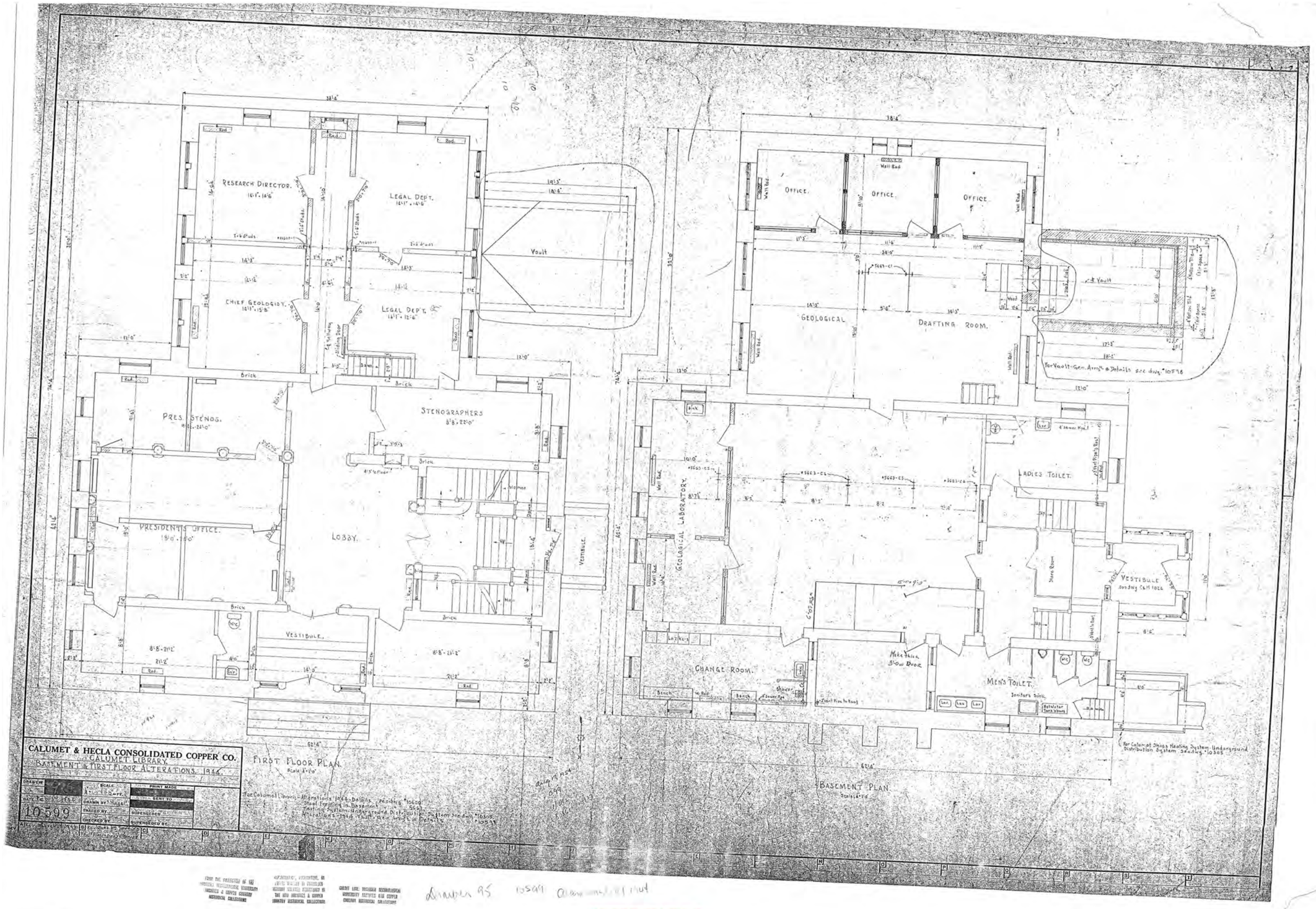


FROM THE COLLECTION OF THE MICHIGAN TECHNOLOGICAL UNIVERSITY ARCHIVES & COPPER COUNTRY HISTORICAL COLLECTIONS

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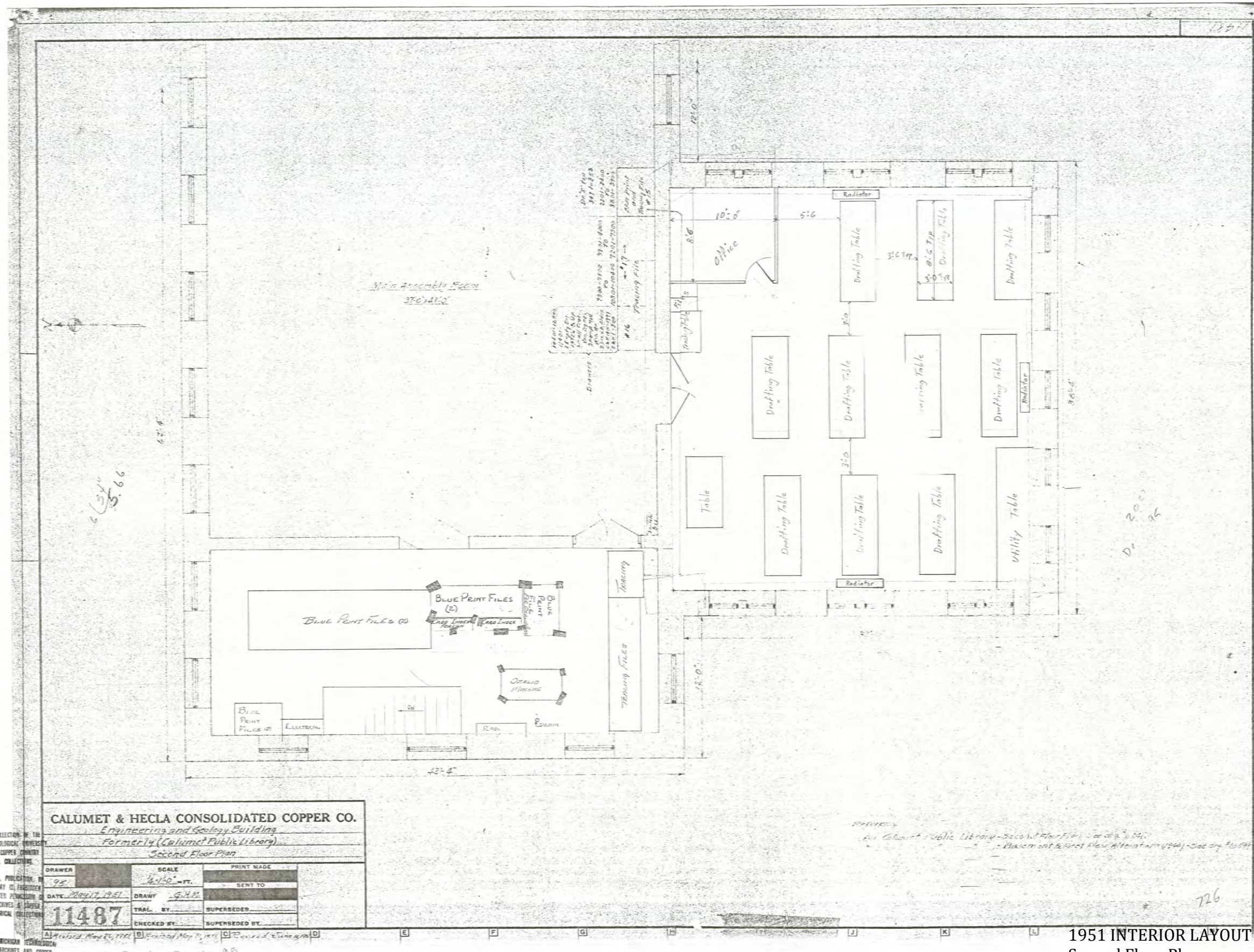
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1912 BATH HOUSE REMOVAL
Basement Floor Plan



C & H LIBRARY BASEMENT & FIRST FLOOR ALTERATIONS, 1944 (NORTH TO RIGHT)

1944 OFFICE CONVERSION
First and Second Floor Plans



CALUMET & HECLA CONSOLIDATED COPPER CO.

Engineering and Geology Building

Formerly (Calumet Public Library)

Second Floor Plan

DRAWER 95		SCALE 1/4"=1'-0"	PRINT MADE
DATE May 17, 1951		DRAWN G.H.B.	SENT TO
11487		TRAC. BY	SUPERSEDES
		CHECKED BY	SUPERSEDED BY

A Revised May 24, 1951 B Revised May 31, 1951 C Revised June 4, 1951 D E F G H J K L

C + H Drawings Drawer 95

Formerly
Fir Calumet Public Library - Second Floor Plan - as of 5-31-51
- Reading Room & Stack Floor Alterations (1956) - See any Blueprint

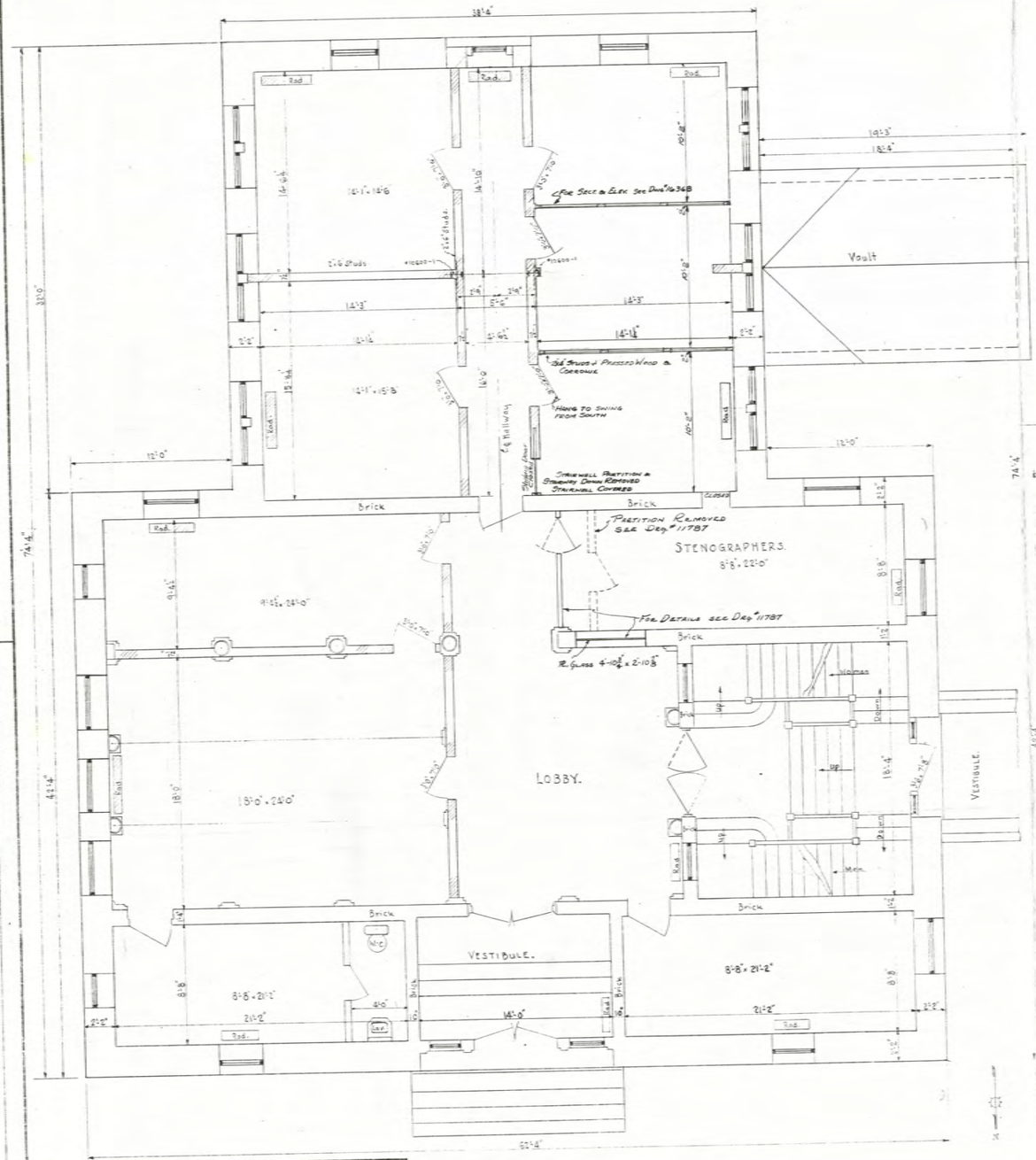
726

FROM THE COLLECTIONS OF THE MICHIGAN TECHNOLOGICAL UNIVERSITY ARCHIVES & COPPER COUNTRY HISTORICAL COLLECTIONS

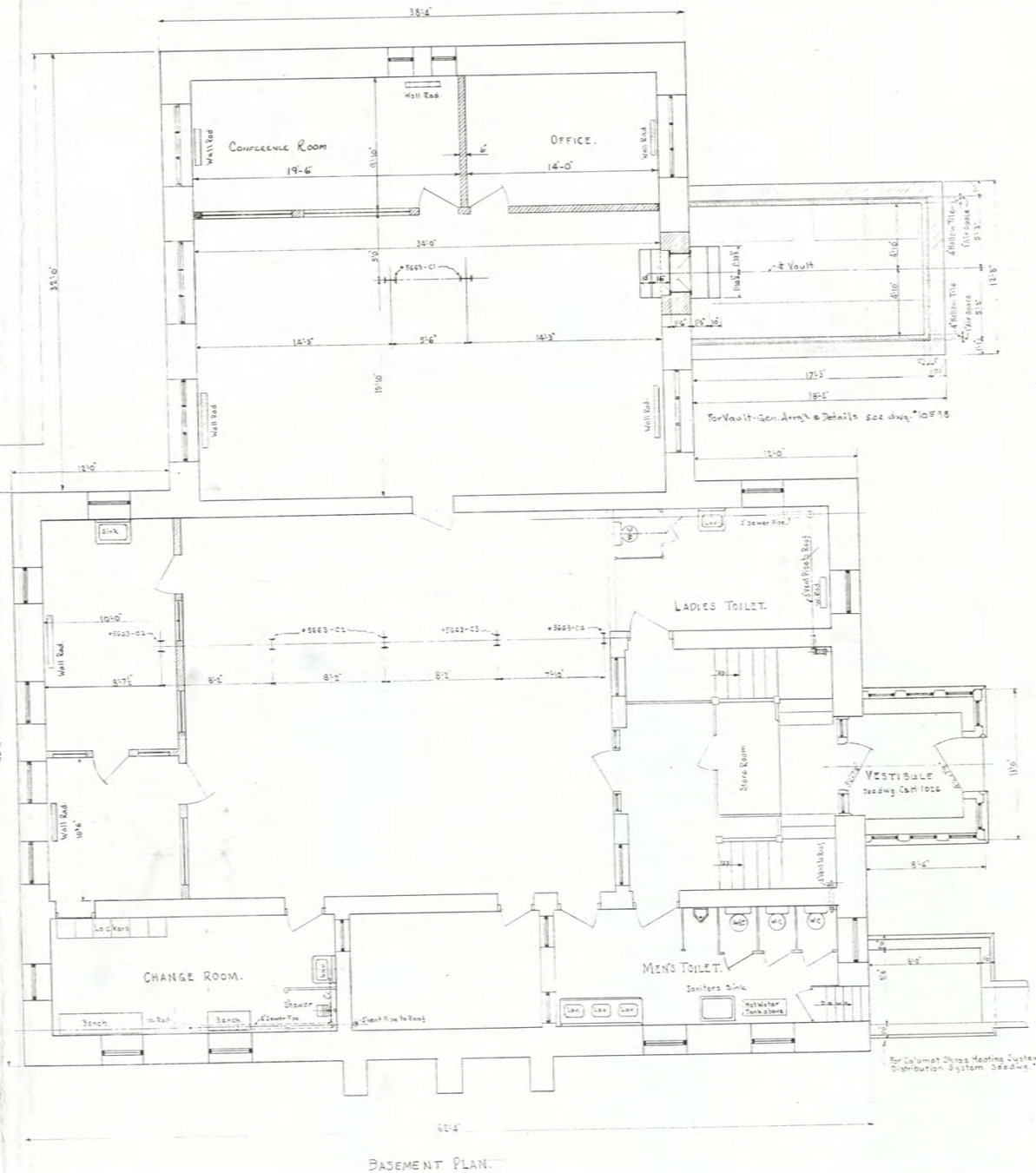
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CREDIT LINE: MICHIGAN TECHNOLOGICAL UNIVERSITY ARCHIVES AND COPPER COUNTRY HISTORICAL COLLECTIONS

1951 INTERIOR LAYOUT
Second Floor Plan



FIRST FLOOR PLAN.
Scale: 1/8"-1'0"



BASEMENT PLAN.
Scale: 1/8"-1'0"

For Calumet Library - Alterations 1948 - Details see dwg. "10600
" " " Steel Framing in Basement " " 5563
" " " Heating System - Underground Distribution System see dwg. "10305.
" " " Alterations - 1948 - Vault - Gen. Arrgt. & Details " " 10598

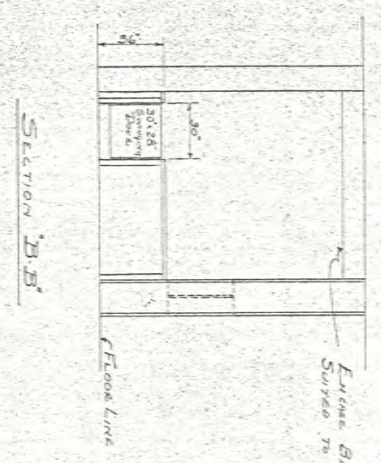
For Calumet Steam Heating System - Underground Distribution System see dwg. "10305

CALUMET & HECLA CONSOLIDATED COPPER CO.
CALUMET LIBRARY.
BASEMENT & FIRST FLOOR ALTERATIONS. 1954.

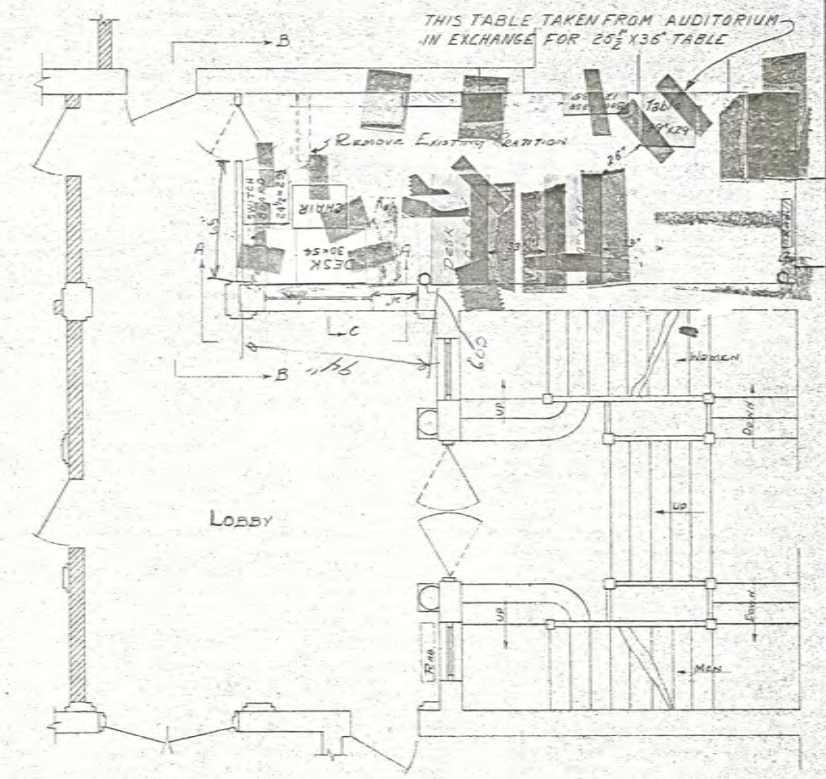
DRAWER 95	SCALE 1/8" = 1'0" WHEN 60" MAX.	PRINT MADE
DATE Feb. 3rd 1954	DRAWN BY H. Nagel	SENT TO
10599	TRACED BY	SUPERSEDES
	CHECKED BY	SUPERSEDED BY

Rev. March 4 '54 [A] Rev. June 15 '54 [B] Rev. Oct. 11 '54 [C] Rev. Oct. 1954 J.R.K. [D] Engineering Office Revised Nov. 23 1954 W.E.H.

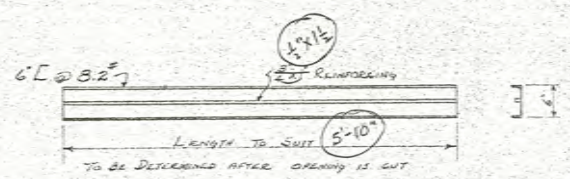
1954 INTERIOR MODIFICATIONS
Basement and First Floor Plans



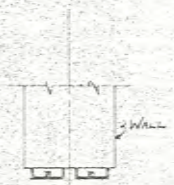
SECTION 'B-B'



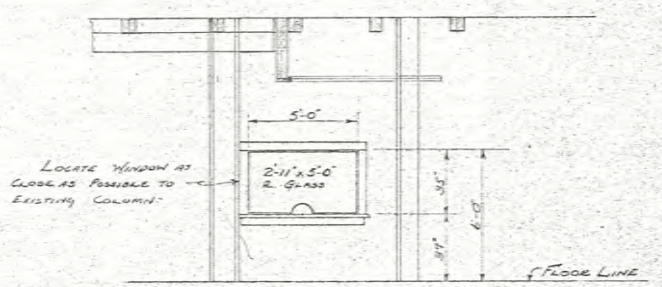
PLAN



Window Lintel
2 Req.



Section C-C
Showing Lintel in Place



Section "A-A"

CALUMET & HECLA, INC.			
Engineering & Geology Bldg			
Second Floor			
Window for Receptionist in South Wall of Secretary's Room			
DRAWER 95	SCALE ¼"=1'-0" FT.	PRINT MADE	NOV 15 1954
DATE Nov 2, 1954	DRAWN BY WEW	SENT TO	OFFICE
11787	TRACED BY	SUPERSEDES	
	CHECKED BY	SUPERSEDED BY	

A B C D E F G H I J K L M N

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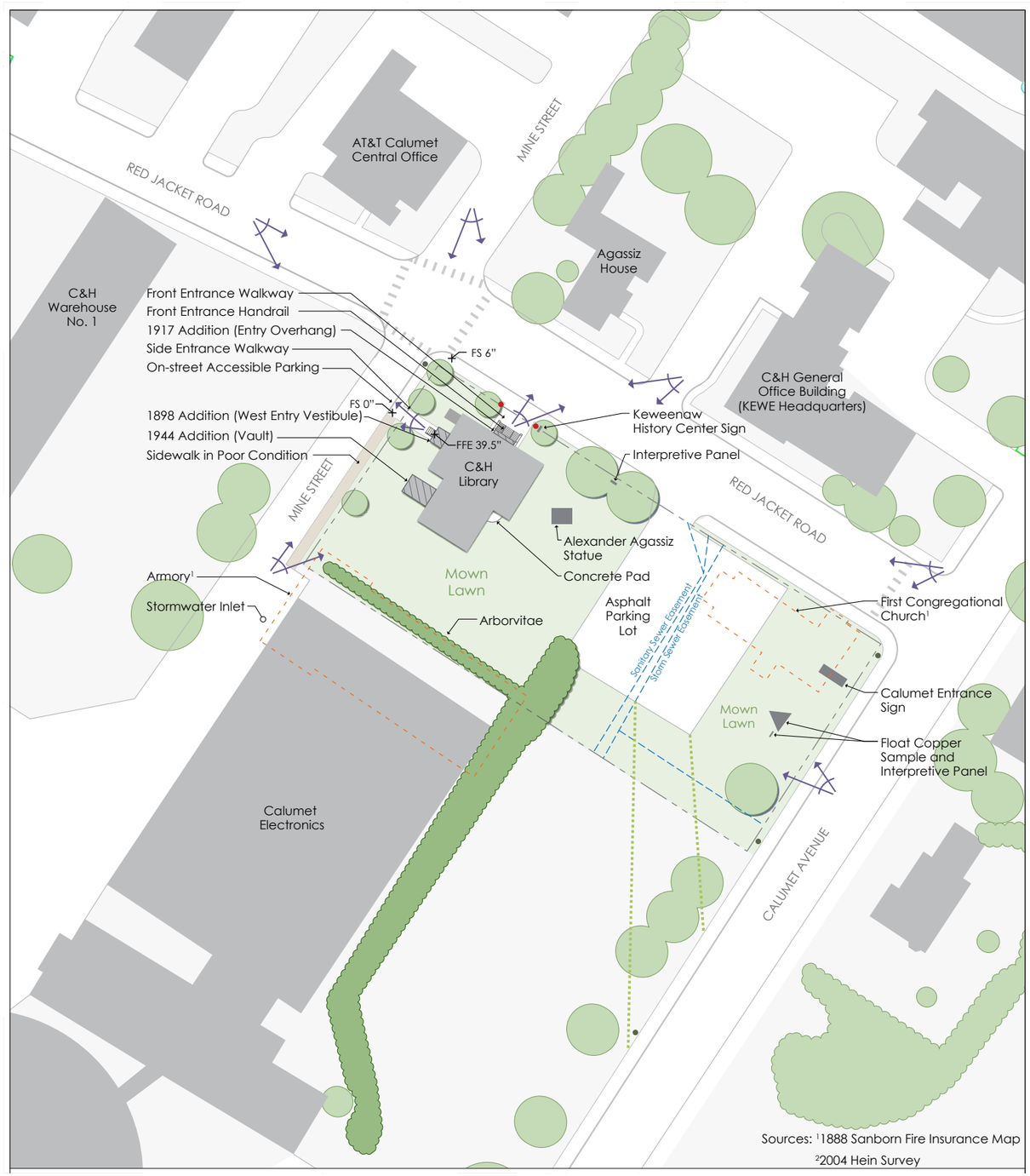
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CREDIT LINE: MICHIGAN TECHNOLOGICAL UNIVERSITY ARCHIVES AND COPPER COUNTRY HISTORICAL COLLECTION

Drawer 95 # 11787

1954 INTERIOR MODIFICATIONS
Partial First Floor Plan

Appendix D. Existing Conditions Drawings



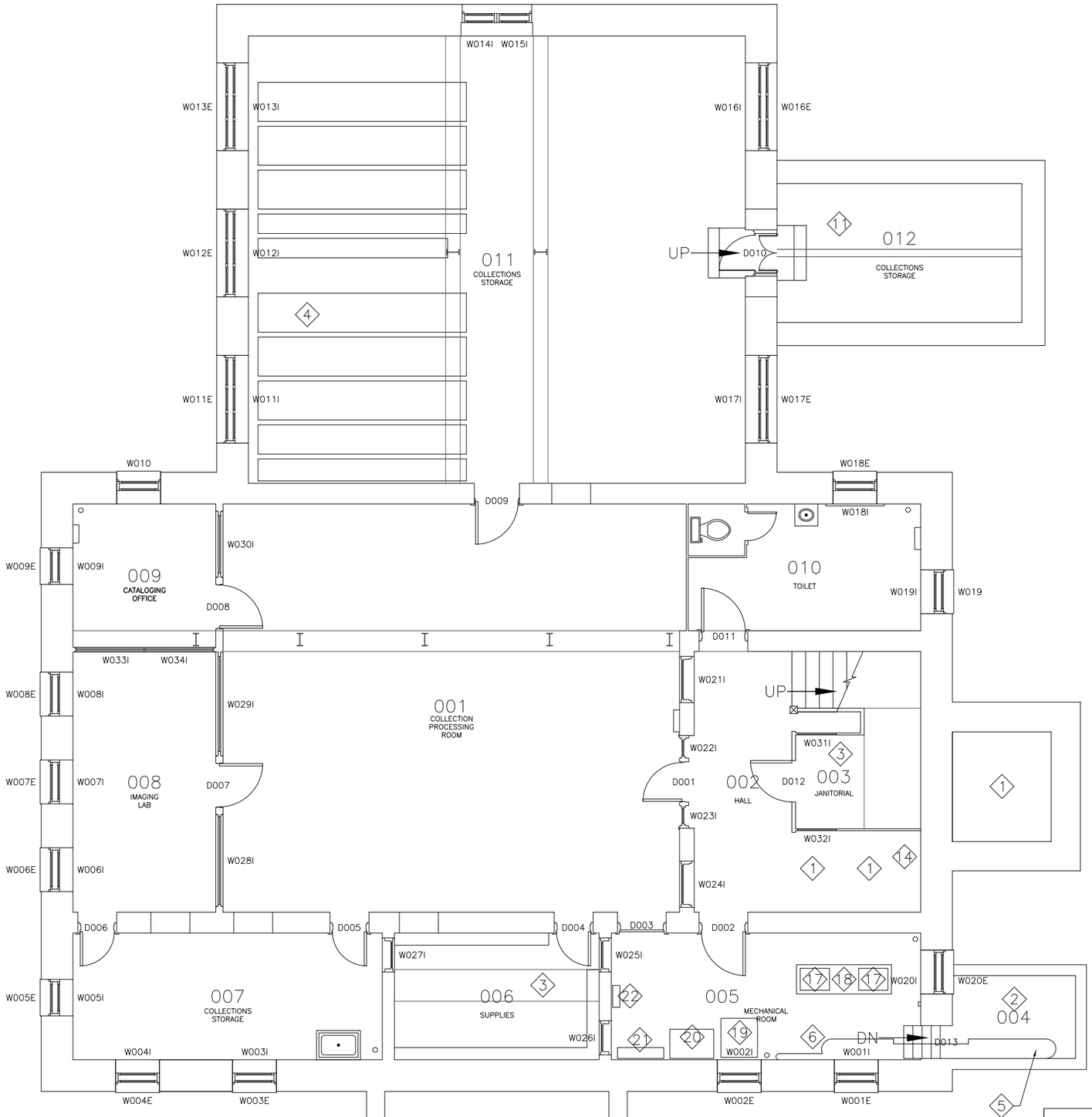
Legend

- C&H Library Boundary
- Mown Lawn
- Deciduous Tree
- Arborvitae
- Front Entrance Light Fixtures[2]
- Power Pole[2]
- Social Trail
- Non-Extant Structure from Period of Significance[1]
- Utility Easement[2]
- Prominent Views to/ from C&H Library
- FFE Finish Floor Elevation
- FS Finish Surface
- Building/Structure

SCALE OF FEET
80 0 80 160
N

NOT FOR CONSTRUCTION

DESIGNED: TB	SUB SHEET NO. L0.0	TITLE OF SHEET: PART 1–EXISTING CONDITIONS SITE PLAN	DRAWING NO. X XXX
CADD KR		CALUMET & HECLA PUBLIC LIBRARY KEWEENAW NATIONAL HISTORICAL PARK	PMIS/PKG NO. 237234
TECH. REVIEW: TB			SHEET 1 OF 8
DATE: 11/1/2019			



NOTES:
1. HEATING SYSTEM BOILERS
2. PIT FOR ORIGINAL STEAM HEATING SYSTEM CONNECTION
3. SLOPED CEILING UNDER STAIR
4. COMPACTABLE MUSEUM STORAGE SHELVING
5. FIRE SUPPRESSION BACKFLOW PREVENTOR
6. FIRE SUPPRESSION VALVES AND EQUIPMENT
11. VAULT
12. FOOTING FOR WEST ENTRY PORCH
13. FOOTING FOR NORTH ENTRY STAIR WING WALLS
14. GAS METER
17. NEW BOILERS
18 CONCRETE PAD
19. WASHER AND DRYER
20. NEW CENTRALIZED POWER CONVERTER
21. NEW MAIN DISTRIBUTION PANEL
22. NEW ELECTRICAL PANEL

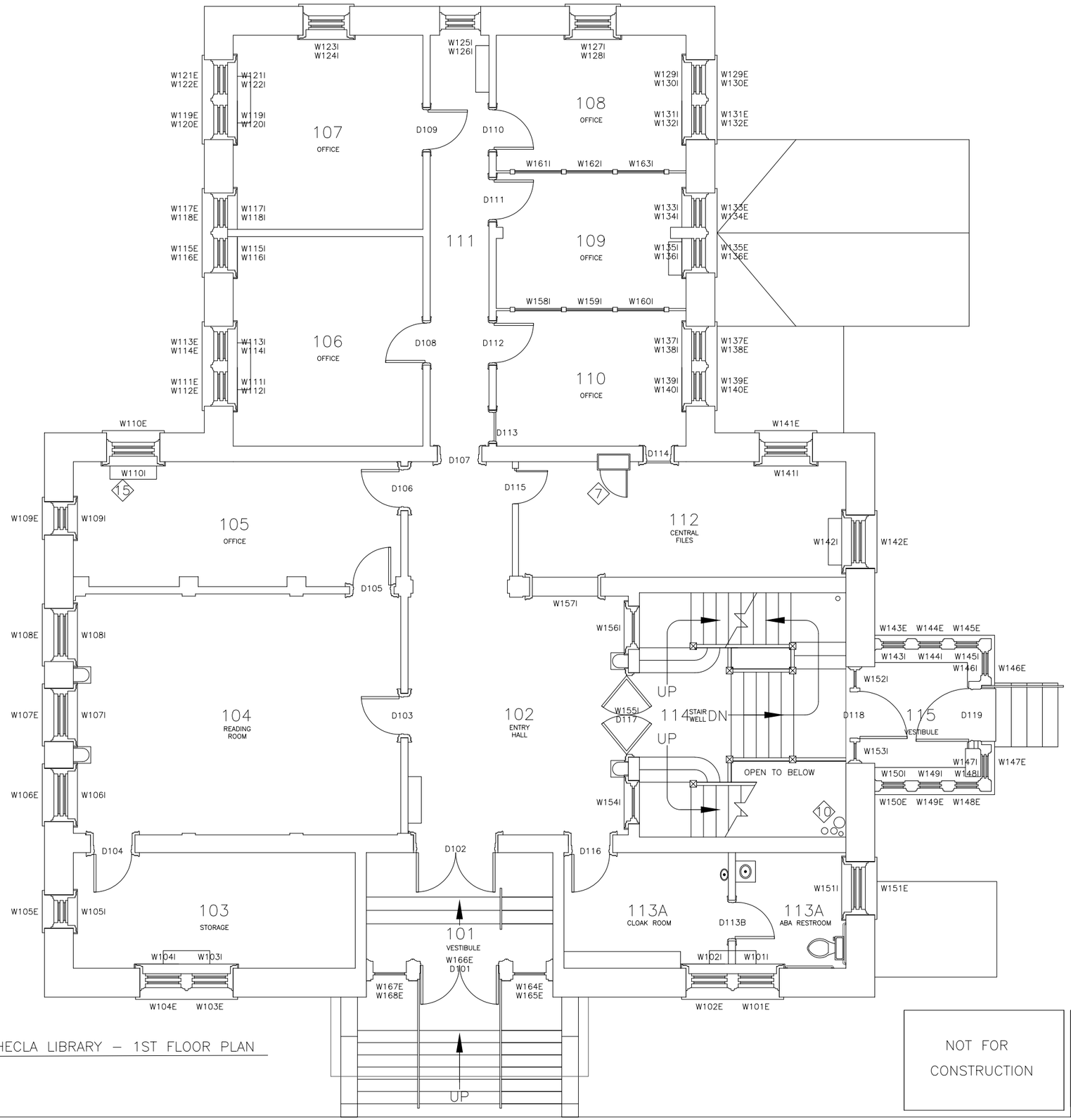
SCALE A 4 0 4 8
SCALE OF FEET

1 / A1.0 CALUMET & HECLA LIBRARY – BASEMENT PLAN
SCALE A

NOT FOR CONSTRUCTION

DESIGNED: LHM DRAWN: SH TECH. REVIEW: EMH DATE: 11/1/2019	SUB SHEET NO. A1.0	TITLE OF SHEET PART 1–EXISTING CONDITIONS BASEMENT FLOOR PLAN CALUMET & HECLA PUBLIC LIBRARY KEWEENAW NATIONAL HISTORICAL PARK	DRAWING NO. X XXX PMIS/PKG NO. 237234 SHEET 2 OF 8

NOTES:
7. ELECTRICAL CHASE CABINET
10. FIRE SUPPRESSION RISERS
15. UNIT HEATER (TYP.)



SCALE A 4 0 4 8
SCALE OF FEET

1 / A1.1 CALUMET & HECLA LIBRARY – 1ST FLOOR PLAN
SCALE A

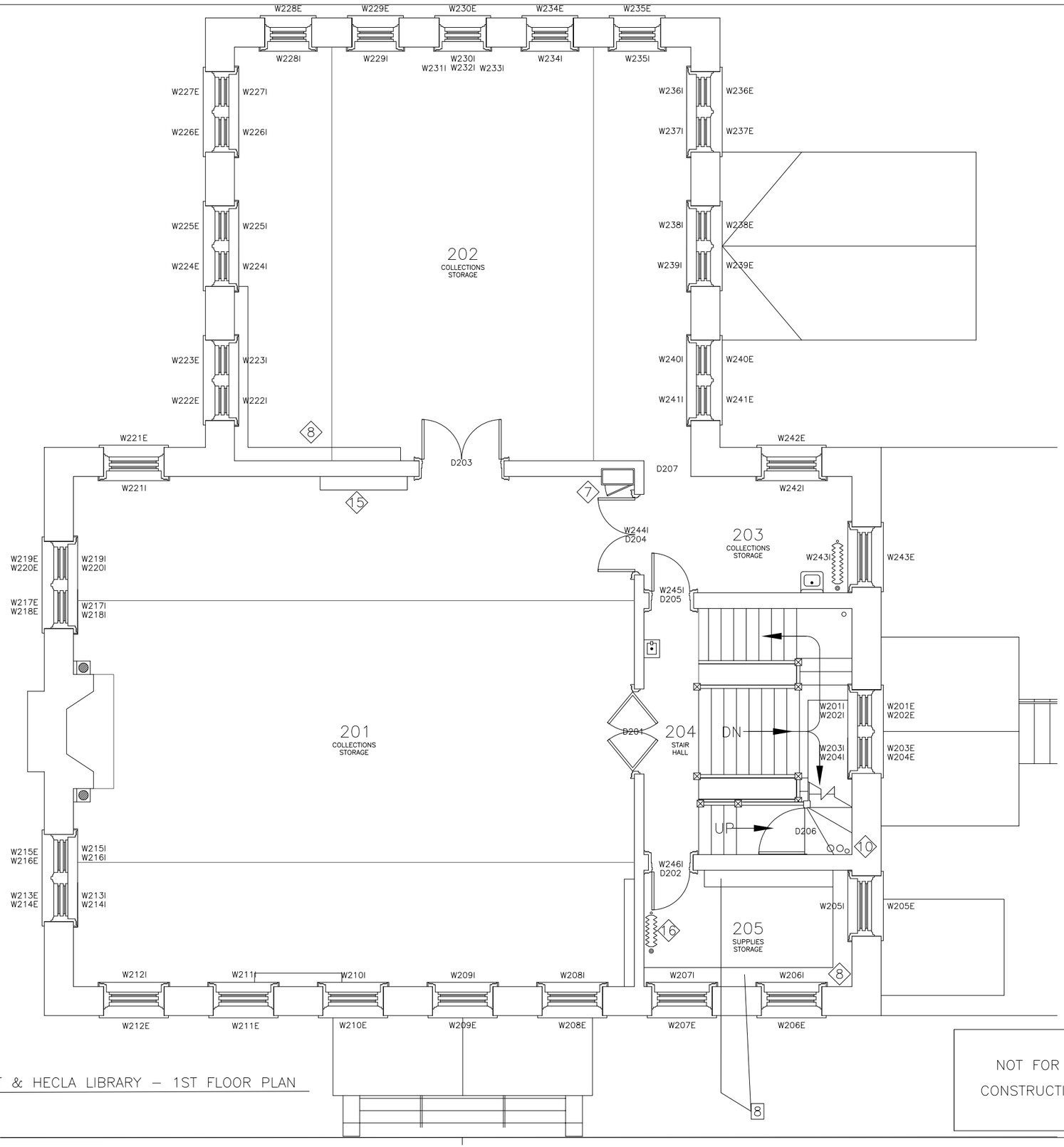
NOT FOR CONSTRUCTION

DESIGNED: LHM	SUB SHEET NO. A1.1	TITLE OF SHEET: PART 1–EXISTING CONDITIONS 1ST FLOOR PLAN	DRAWING NO. X / XXX
CADD: SH		CALUMET & HECLA PUBLIC LIBRARY KEWEENAW NATIONAL HISTORICAL PARK	PMIS/PKG NO. 237234
TECH. REVIEW: EMH			SHEET 3 OF 8
DATE: 11/1/2019			

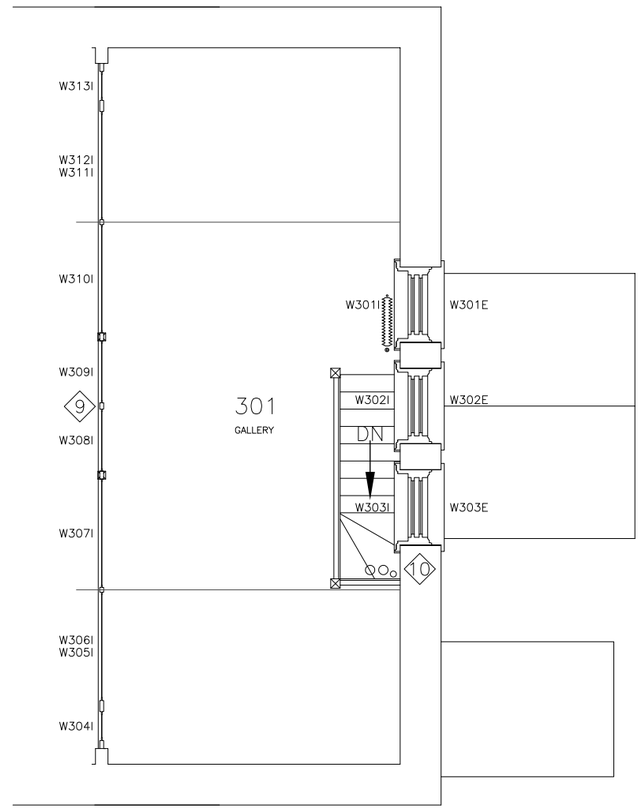
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4/30/19 00:10 SUSIESCOMP R22 N:\AA PROJECTS\2018\2018590 NPS KEWE HSR (MB)\BIM\ACAD\ARCH\C&H EX FLOOR PLANS.DWG XREFS: N:\AA PROJECTS\2018\2018590 NPS KEWE HSR (MB)\BIM\ACAD\BASES\XA CHTITLEBLOCK.DWG;

NOTES:
7. ELECTRICAL CHASE CABINET
8. WOOD SHELVING
9. BALUSTRADE AND GLAZING ENCLOSURE
10. FIRE SUPPRESSION RISERS
15. UNIT HEATER (TYP.)
16. FIN–TUBE RADIATOR (TYP.)



1 / A1.2 CALUMET & HECLA LIBRARY – 1ST FLOOR PLAN
SCALE A



2 / A1.1 CALUMET & HECLA LIBRARY – GALLERY PLAN

SCALE A 4 0 4 8
SCALE OF FEET

NOT FOR CONSTRUCTION

DESIGNED: LHM	SUB SHEET NO. A1.2	TITLE OF SHEET: PART 1–EXISTING CONDITIONS UPPER FLOOR PLANS	DRAWING NO. X XXX
DRAWN: SH		CALUMET & HECLA PUBLIC LIBRARY KEWEENAW NATIONAL HISTORICAL PARK	PMIS/PKG NO. 237234
TECH. REVIEW: EMH			SHEET 4 OF 8
DATE: 11/1/2019			



SCALE A 4 0 4 8
SCALE OF FEET

1 A2.0 CALUMET & HECLA LIBRARY – NORTH ELEVATION
SCALE A

NOT FOR CONSTRUCTION

DESIGNED: LHM	SUB SHEET NO.	TITLE OF SHEET	DRAWING NO.
CADD SH	A2.0	PART 1–EXISTING CONDITIONS NORTH ELEVATION	X XXX
TECH. REVIEW: EMH			PMIS/PKG NO. 237234
DATE: 11/1/2019		CALUMET & HECLA PUBLIC LIBRARY KEWEENAW NATIONAL HISTORICAL PARK	SHEET 5 OF 8

4/30/19 00:08 SUSIESCOMP R22 N:\AA PROJECTS\2018\2018590 NPS KEWE HSR (MB)\BIM\ACAD\ARCH\C&H\C&H EX ELEVATIONS.DWG XREFS: ..\..\BASES\XA CHITTLEBLOCK.DWG;

GALLERY
123'-3 1/2"

SECOND FLOOR
113'-7 1/2"

FIRST FLOOR
100'-0"

BASEMENT
90'-9 1/2"

W227E W226E W225E W224E W223E W222E W219E W217E W215E W213E W220E W218E W216E W214E

W121E W119E W117E W115E W113E W111E W122E W120E W118E W116E W114E W112E W109E W108E W107E W106E W105E

W013E W012E W011E W009E W008E W007E W006E W005E

SCALE A 4 0 4 8
SCALE OF FEET

1 / A2.1 CALUMET & HECLA LIBRARY – EAST ELEVATION
SCALE A

NOT FOR CONSTRUCTION

DESIGNED: LHM	SUB SHEET NO.	TITLE OF SHEET	DRAWING NO.
CADD SH	A2.1	PART 1–EXISTING CONDITIONS EAST ELEVATION	X / XXX
TECH. REVIEW: EMH		CALUMET & HECLA PUBLIC LIBRARY KEWEENAW NATIONAL HISTORICAL PARK	PMIS/PKG NO. 237234
DATE: 11/1/2019			SHEET 6 OF 8



SCALE A 4 0 4 8
SCALE OF FEET

1 / A2.2 CALUMET & HECLA LIBRARY – SOUTH ELEVATION
SCALE A

NOT FOR CONSTRUCTION

DESIGNED: LHM	SUB SHEET NO.	TITLE OF SHEET	DRAWING NO.
CADD SH	A2.2	PART 1–EXISTING CONDITIONS SOUTH ELEVATION	X XXX
TECH. REVIEW: EMH		CALUMET & HECLA PUBLIC LIBRARY KEWEENAW NATIONAL HISTORICAL PARK	PMIS/PKG NO. 237234
DATE: 11/1/2019			SHEET 7 OF 8

4/30/19 00:08 SUSIESCOMP R22 N:\AA PROJECTS\2018\2018590 NPS KEWE HSR (MB)\BIM\ACAD\ARCH\C&H EX ELEVATIONS.DWG XREFS: ..\..\BASES\XA CHITTLEBLOCK.DWG;



SCALE A 4 0 4 8
SCALE OF FEET

1 / A2.3 CALUMET & HECLA LIBRARY – WEST ELEVATION
SCALE A

NOT FOR CONSTRUCTION

DESIGNED: LHM CADD SH TECH. REVIEW: EMH DATE: 11/1/2019	SUB SHEET NO. A2.3	TITLE OF SHEET PART 1–EXISTING CONDITIONS WEST ELEVATION CALUMET & HECLA PUBLIC LIBRARY KEWEENAW NATIONAL HISTORICAL PARK	DRAWING NO. X XXX PMIS/PKG NO. 237234 SHEET 8 OF 8

4/30/19 00:08 SUSIESCOMP R22 N:\AA PROJECTS\2018\2018590 NPS KEWE HSR (MB)\BIM\ACAD\ARCH\C&H\C&H EX ELEVATIONS.DWG XREFS: ..\..\BASES\VA CHITTLEBLOCK.DWG;

Appendix E - Environmental Survey Findings

December 12, 2018

Ms. Laine McLaughlin
Anderson Hallas Architects, PC
715 14th Street
Golden, Colorado 80401
lainemclaughlin@andarch.com

Subject: **Environmental Survey Findings - Calumet and Hecla Library, 101 Red Jacket Road, Calumet, Michigan 44913 – Keweenaw National Historical Park. Landmark Project No. 18088.001.001.**

Dear Ms. McLaughlin:

Landmark Environmental, Inc. (Landmark) has completed an environmental survey for asbestos-containing material (ACM), lead-containing paint (LCP)/lead-based paint (LBP), and biological hazards at the Calumet and Hecla Library located within Keweenaw National Historical Park at 101 Red Jacket Road, Calumet, Michigan 44913 (the Site). This survey was performed in support of the historic structures report (HSR) that Anderson Hallas Architects, PC is preparing.

Scope of Work

Landmark's Industrial Hygienist and United States (U.S.) Environmental Protection Agency (EPA) Asbestos Hazard Emergency Response Act (AHERA) and Michigan Certified Asbestos Building Inspector reviewed historical information from the Site and surveyed the Site for ACM, LCP/LBP, and biological hazards. Fieldwork was performed on October 30, 2018.

Asbestos-Containing Materials Survey

Landmark reviewed the Environmental Report dated December 14, 2000 from the U.P. Engineers & Architects, Inc. (UPEA) which contained information about asbestos within the structure. Plaster sampling was conducted by UPEA in 2000. Analytical results indicated that none of the samples contained asbestos. Plaster samples were only collected from the attic and assumed to be the same material on the other floors. This survey indicated that previous abatement had been performed on piping insulation associated with radiant heating.

Landmark was also advised that vermiculite insulation was formerly used in the attic. Triangle Environmental Service Center, Inc, collected six samples of the vermiculite insulation in 2011. Analytical results indicated this material does not contain asbestos. The vermiculite insulation has

since been removed and replaced with a blown-in cellulose insulation. Landmark spot-checked areas beneath the new insulation and did not observe any remnant vermiculite insulation. The vermiculite insulation may have sloughed into the wall cavities and may still exist behind walls. If walls are to be impacted by renovation or demolition activities it is recommended that wall cavities be investigated for remnant vermiculite insulation, and if present, sampled to verify historic findings.

Sampling of suspect ACM at the Site was performed in accordance with EPA AHERA and U.S. Occupational Safety and Health Administration (OSHA) Chapter 29 Code of Federal Regulations (CFR) 1926.1101 requirements as well as generally accepted industry standards. This screening level survey was performed to gain preliminary information related to asbestos abatement costs for various treatment within the structure as part of the HSR process. Additional sampling may be required prior to a scheduled renovation or demolition of components of the structure.

Landmark collected additional samples of the plaster from other floors to verify the UPEA sampling results. Landmark additionally collected samples from carpet adhesive, ceiling tile, adhesive, hard resinous flooring patch in the basement, sheet flooring adhesives, and exterior window frame caulk.

The bulk suspect ACM samples were submitted to Reservoirs Environmental, Inc. (REI), located in Denver, Colorado. REI is a National Voluntary Laboratory Accreditation Program accredited laboratory, which is also accredited by the American Industrial Hygiene Association. The samples were analyzed using Polarized Light Microscopy to determine asbestos type and percent. A copy of the analytical report is included in Attachment A.

Asbestos Regulatory Criteria

Applicable asbestos regulations define ACM as material containing greater than one percent asbestos by weight, volume or surface area, and distinguishes between friable and non-friable forms of ACM. Friable ACMs can be crumbled or reduced to powder by hand pressure when dry, while non-friable materials cannot. Regulations stipulate that if any one sample of a homogenous material contains greater than one percent asbestos, the entire homogenous area is considered asbestos-containing.

Asbestos Survey Findings

Landmark collected fourteen (14) bulk samples from eight (8) different homogenous areas identified while performing the survey. Two of the materials were found to contain asbestos and are discussed below.

Information related to the asbestos survey is included in Attachment A. This data package includes a summary table, an ACM inspection form for all sampled materials including photographs, a figure of the locations of the samples and confirmed ACM, and the laboratory results.

Identified ACMs

1. CA01* – The tan adhesive associated with purple, gold, and tan carpets does not contain asbestos; however, some white fibrous material was found on the adhesive in sample 2 of the carpet adhesive taken from the northwest corner of room 112. Landmark believes that white fibrous material is associated with former pipe insulation located on the radiant heating system. This condition may exist under the carpet in other areas as well.

2. WC01 – One of the two samples of caulking collected around exterior window frames contained 12% chrysotile. Landmark was unable to visually distinguish between the two window caulking materials at the time of the inspection. All windows should be assumed to have asbestos-containing window caulking unless further investigation of the window caulking is performed.

Lead-Containing Paint and Lead-Based Paint Survey

UPEA collected swab samples in 2000 and identified LBP in the attic and basement. Swab samples did not identify LBP on the 2nd floor and no samples were collected from the first floor due to the fact it was freshly painted. Swab samples only identify lead in the surface paint and cannot identify lead in other layers of paint below the surface.

LCP/LBP Regulatory Criteria

LBP is defined as paint containing 0.5 percent lead by weight or 1.0 milligram per square centimeter (mg/cm^2) by both the EPA and Department of Housing and Urban Development (HUD). LCP is paint containing any detectable concentrations of lead.

The EPA and HUD regulate LBP abatement activities in target housing and child occupied facilities. The EPA also developed a program for renovation activities in child-occupied / target housing and child-care facilities called the Lead Renovation, Repair, and Paint Rule. This rule requires that firms performing renovation, repair, and painting projects that disturb lead-based paint in homes, child care facilities and pre-schools built before 1978 have their firm certified by the EPA (or an EPA authorized state), use certified renovators who are trained by EPA-approved training providers, and follow lead-safe work practices. The surveyed building is not considered a child-occupied facility; therefore, these rules do not apply.

The OSHA lead in construction standard 29 CFR 1926.62 addresses requirements for sites where the employer has reason to believe that any employee may be exposed to lead in excess of OSHA's action level of 30 micrograms per cubic meter (30 µg/m3) of air over an 8-hour time weighted average. The OSHA standard applies to all construction activities that may impact LCP (any detectable lead).

LCP/LBP Findings

Landmark did not collect any paint chip samples due to the good condition of painted surfaces on the first and second floor in order to protect the integrity of the painted surfaces. Once the renovation scope of work has been identified, additional sampling can be performed of the areas that will be directly impacted. Due to the paint history in other areas of the building (the attic and basement both contain LBP) it is likely that layers of LCP or LBP exist under the surface layers of paint on the first and second floor.

Observations of Biological Hazards

Landmark conducted limited observations for biological hazards during the Site walk through. The Site is currently active, operating as office space. There were no observations of any evidence of rodent infestations, water intrusion, or mold growth. If rodents are encountered, it is recommended that the National Park Service's Hantavirus Worker Protection Guidelines (Attachment B) be followed.

Conclusions and Recommendations

Materials that were sampled and confirmed to contain asbestos will require abatement prior to renovation if the renovation will impact them. Materials that were sampled, analyzed, and confirmed not to contain asbestos may also require additional sampling to meet minimum sample requirements. This was a screening level survey only and did not meet typical sample minimums for some materials. This survey also did not include all suspect materials or destructive testing. There may be additional materials that require sampling prior to renovation activities. Inspection activities were limited to the main structure at the Site.

Renovation activities that will impact LBP/LCP will require OSHA trained workers and safety programs. Personal protective equipment will be required to handle these materials until a negative exposure assessment is completed that shows work activities do not result in exposures above the OSHA permissible exposure limit. Additionally, an appropriate waste management plan should be developed for the disposal of these materials. LBP/LCP in good condition that will not be impacted by renovation activities can be left in the building.

Biological hazards were not observed during the Site survey; however, these conditions can change over time. It is recommended that the Hantavirus Guidelines, included in Attachment C, be followed by personnel who encounter areas of rodent habitation/nesting and/or localized accumulations of feces. These workers must be trained on applicable National Park Service Guidance, related hazards, and exposure prevention.

Limitations

It should be noted that no destructive investigation of wall cavities or below grade structures was performed. In the event of demolition or renovation of these areas, asbestos could be discovered that was not identified during this investigation. Additionally, as this was a screening level survey to support high-level decision making regarding the costs of potential abatement during potential renovations projects, not all suspect materials were sampled, and material sample minimums were not achieved in all cases. Additional sampling will be required before demolition or renovations activities occur.

Landmark performed this asbestos, lead paint, and biological hazard survey in a manner consistent with the level of care and expertise exercised by members of the asbestos, lead paint, and biological hazard inspection and assessment profession. Landmark does not imply or guarantee that every suspect ACM, LCP/LBP, or biological hazard on or in the building has been identified or sampled. Conditions described are accounts at the time of the survey and biological hazard conditions can vary over time.

Landmark appreciates the opportunity to provide our services on this important project. Please feel free to contact us if you have any questions or if we can provide any additional assistance.

Respectfully,

Landmark Environmental, Inc.



Brandy Howard, CIH, CSP
Project Manager

Attachment A – Asbestos Data
Attachment B – National Park Service – Hantavirus Risk Reduction – Worker Protection

Attachment A

ASBESTOS DATA

LANDMARK ENVIRONMENTAL INC.
7881 Shaffer Parkway
Littleton, Colorado 80127 ♦ 720-283-8974 ♦ Fax: 720-283-8666

ASBESTOS BULK SAMPLE LOCATION LOG			
PROJECT NAME:	NPS MWR_KEWE_Historical Structures Rpts	**LANDMARK PROJECT NUMBER:**	18088.001.001
LOCATION:	C&H Library	**INSPECTOR:**	Don Milner
CLIENT:	Mundus Bishop	**DATE:**	10/30/2018

Sample ID	Homogenous Material Description	Sample Description	Sample Location	Friability Type	Material Type	Material Condition	Approximate Quantity	Laboratory Analytical Results (RES 421883-1)
C&H-CA01-01	Carpet Adhesive	Tan brittle thin layer of carpet adhesive associated with gold tan and purple carpet	Room 104, NE corner	Type II, Non-Friable	Misc.	Good	N/A	None Detected
C&H-CA01-02	**Carpet Adhesive**	**Tan brittle thin layer of carpet adhesive associated with gold tan and purple carpet**	**Room 112, NW corner**	**Type II, Non-Friable**	**Misc.**	**Good**		**10% Chrysotile & 15% Amosite - white fibrous material None Detected - adhesive**
C&H-CTA01-01	Ceiling Tile Adhesive	Brown hard brittle ceiling tile adhesive associated with 1' x 1' pressed wood tile	Room 203, loose stack of ceiling tile at N wall	Type II, Non-Friable	Misc.	Good	N/A	None Detected
C&H-PL01-01	Plaster	White skim coat over gray granular plaster associated with original construction	Room 205, S wall, W side of entry	Friable	Surfacing	Good	N/A	None Detected
C&H-PL01-02	Plaster	White skim coat over gray granular plaster associated with original construction	Room 107, W wall, N side of entry behind light switch	Friable	Surfacing	Good	N/A	None Detected
C&H-PL01-03	Plaster	White skim coat over gray granular plaster associated with original construction	Room 201, S side of center entry for W	Friable	Surfacing	Good	N/A	None Detected
C&H-PL02-01	Plaster	White skim coat over gray granular plaster associated with post original plaster walls	Room 105, W wall, behind historic thermostat	Friable	Surfacing	Good	N/A	None Detected
C&H-PL02-02	Plaster	White skim coat over gray granular plaster associated with post original plaster walls	Room 105, at 2nd column from E, E side	Friable	Surfacing	Good	N/A	None Detected
C&H-PM01-01	Patching Material	Tan hard resinous patching material over sheet flooring	Room 009, near E wall approximate center	Type II, Non-Friable	Misc.	Good	N/A	None Detected
C&H-SFA01-01	Sheet Flooring	Tan hard sheet flooring associated with mesh cloth backing	Room 009, NW corner	Type II, Non-Friable	Misc.	Good	N/A	None Detected
C&H-SFA02-01	Sheet Flooring	Green cork sheet flooring associated with mesh cloth and paper underlayment	Room 011, E wall, damaged area adjacent to radiator	Type II, Non-Friable	Misc.	Fair	N/A	None Detected

Sample ID	Homogenous Material Description	Sample Description	Sample Location	Friability Type	Material Type	Material Condition	Approximate Quantity	Laboratory Analytical Results (RES 421883-1)
C&H-SFA02-02	Sheet Flooring	Green cork sheet flooring associated with mesh cloth and paper underlayment	Room 205, E wall, damaged area at S side of radiator	Type II, Non-Friable	Misc.	Fair	N/A	None Detected
C&H-WC01-01	**Window Caulking**	**Gray semi-pliable window caulk associated with window frames**	**Exterior, W side of bldg., S side of 1st lower window from S**	Type II, Non-Friable	Misc.	Good		**12% Chrysotile**
C&H-WC01-02	Window Caulking	Gray semi-pliable window caulk associated with window frames	Exterior, E side of bldg., N side of 3rd lower window from S	Type II, Non-Friable	Misc.	Good	N/A	None Detected

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Littleton, Colorado 80127 ♦ 720-283-8974 ♦ Fax: 720-283-8666

Homogeneous Area Building Inspection Form

Client: **Mundus Bishop**	Project: **NPS KEWE**	Date: **10-30-18**
		Inspector(s): **Don Milner**

Homogeneous Material Description:			**Photo**
Carpet Adhesive			
Material Code:	**Material Sequence:**	**Size:**	
CA	01		
Color:	**Pattern / Texture:**	**Associated Materials:**	
Tan	Brittle, thin layer	Gold, tan, purple carpet	
Quantity (SF/LF/EA):	**Material Type:**	**Friable:**	
	M	II	
Condition:	**Disturbance Potential:**	**Assessment Category:**	
G	L	N/A	
Material Notes:			
Sample 02 contaminated what appears to be thermal system insulation debris possibly from past abatement activities			

Sample Number:	Room #	Sample Location Description:	Analytical Results:
C&H-CA01-01	104	NE corner	None Detected
C&H-CA01-02	112	NW corner	10% Chrysotile & 15% Amosite - white fibrous material None Detected - adhesive

Homogeneous Material Description:			**Photo**
Ceiling Tile Adhesive			
Material Code:	**Material Sequence:**	**Size:**	
CTA	01		
Color:	**Pattern / Texture:**	**Associated Materials:**	
Brown	Hard, brittle	1' x 1' pressed wood tile	
Quantity (SF/LF/EA):	**Material Type:**	**Friable:**	
	M	II	
Condition:	**Disturbance Potential:**	**Assessment Category:**	
G	L	N/A	
Material Notes:			

Sample Number:	Room #	Sample Location Description:	Analytical Results:
C&H-CTA01-01	203	Loose stack of ceiling tile at N wall	None Detected

Material Type:
- Surfacing (S)
- Texturing (T)
- Miscellaneous (M)

Friability:
- Friable (F)
- Type I Non-Friable (I)
- Type II Non-Friable (II)

Condition:
- Good (G)
- Fair (F)
- Poor (P)

Disturbance Potential:
- Low (L)
- Moderate (M)
- High (H)

Assessment Categories:
1. Damaged or significantly damaged TSI ACM
2. Damaged friable surfacing ACM
3. Significantly damaged friable surfacing ACM
4. Damaged or significantly damaged friable miscellaneous ACM
5. ACBM with potential for damage
6. ACBM with potential for significant damage
7. Any remaining friable ACBM of friable suspected ACBM

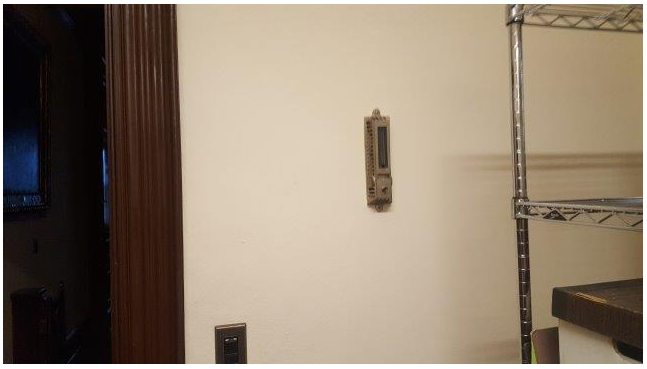
LANDMARK ENVIRONMENTAL INC.
7881 Shaffer Parkway
Littleton, Colorado 80127 ♦ 720-283-8974 ♦ Fax: 720-283-8666

Homogeneous Area Building Inspection Form

Client: **Mundus Bishop**	Project: **NPS KEWE**	Date: **10-30-18**
		Inspector(s): **Don Milner**

Homogeneous Material Description:			**Photo**
Plaster			
Material Code:	**Material Sequence:**	**Size:**	
PL	01		
Color:	**Pattern / Texture:**	**Associated Materials:**	
White	White skim coat over gray granular plaster	Original construction	
Quantity (SF/LF/EA):	**Material Type:**	**Friable:**	
	S	F	
Condition:	**Disturbance Potential:**	**Assessment Category:**	
G	M	5	
Material Notes:			

Sample Number:	Room #	Sample Location Description:	Analytical Results:
C&H PL01-01	205	S wall, W side of entry	None Detected
C&H PL01-02	107	W wall, N side of entry behind light switch	None Detected
C&H PL01-03	201	W wall, S side of center entry for W	None Detected

Homogeneous Material Description:			**Photo**
Plaster			
Material Code:	**Material Sequence:**	**Size:**	
PL	02		
Color:	**Pattern / Texture:**	**Associated Materials:**	
White	Skim coat over gray granular plaster	Post original plaster walls	
Quantity (SF/LF/EA):	**Material Type:**	**Friable:**	
	S	F	
Condition:	**Disturbance Potential:**	**Assessment Category:**	
G	M	5	
Material Notes:			

Sample Number:	Room #	Sample Location Description:	Analytical Results:
C&H-PL02-01	105	W wall, behind historic thermostat	None Detected
C&H-PL02-02	105	N wall, at 2nd column from E, E side	None Detected

Material Type:
- Surfacing (S)
- Texturing (T)
- Miscellaneous (M)

Friability:
- Friable (F)
- Type I Non-Friable (I)
- Type II Non-Friable (II)

Condition:
- Good (G)
- Fair (F)
- Poor (P)

Disturbance Potential:
- Low (L)
- Moderate (M)
- High (H)

Assessment Categories:
1. Damaged or significantly damaged TSI ACM
2. Damaged friable surfacing ACM
3. Significantly damaged friable surfacing ACM
4. Damaged or significantly damaged friable miscellaneous ACM
5. ACBM with potential for damage
6. ACBM with potential for significant damage
7. Any remaining friable ACBM of friable suspected ACBM

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Homogeneous Area Building Inspection Form

Client: **Mundus Bishop**	Project: **NPS KEWE**	Date: **10-30-18**
		Inspector(s): **Don Milner**

Homogeneous Material Description:			**Photo**
Patching Material			
Material Code:	**Material Sequence:**	**Size:**	
PM	01		
Color:	**Pattern / Texture:**	**Associated Materials:**	
Tan	Hard, resinous	Over sheet flooring	
Quantity (SF/LF/EA):	**Material Type:**	**Friable:**	
	M	II	
Condition:	**Disturbance Potential:**	**Assessment Category:**	
G	M	N/A	
Material Notes:			
Isolated around perimeter of floor in basement SE office (009)			

Sample Number:	**Room #**	**Sample Location Description:**	**Analytical Results:**
C&H-PM01-01	009	Near E wall approximate center	None Detected

Homogeneous Material Description:			**Photo**
Sheet Flooring			
Material Code:	**Material Sequence:**	**Size:**	
SFA	01		
Color:	**Pattern / Texture:**	**Associated Materials:**	
Tan	Hard	Mesh cloth backing	
Quantity (SF/LF/EA):	**Material Type:**	**Friable:**	
	M	II	
Condition:	**Disturbance Potential:**	**Assessment Category:**	
G	M	N/A	
Material Notes:			

Sample Number:	**Room #:**	**Sample Location Description**	**Analytical Results:**
C&H SFA01-01	009	NW corner	None Detected

Material Type:
- Surfacing (S)
- Texturing (T)
- Miscellaneous (M)

Friability:
- Friable (F)
- Type I Non-Friable (I)
- Type II Non-Friable (II)

Condition:
- Good (G)
- Fair (F)
- Poor (P)

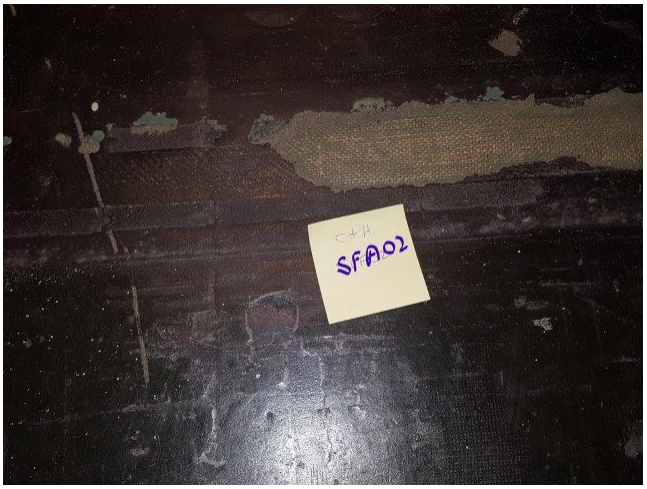
Disturbance Potential:
- Low (L)
- Moderate (M)
- High (H)

Assessment Categories:
1. Damaged or significantly damaged TSI ACM
2. Damaged friable surfacing ACM
3. Significantly damaged friable surfacing ACM
4. Damaged or significantly damaged friable miscellaneous ACM
5. ACBM with potential for damage
6. ACBM with potential for significant damage
7. Any remaining friable ACBM of friable suspected ACBM

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Homogeneous Area Building Inspection Form

Client: **Mundus Bishop**	Project: **NPS KEWE**	Date: **10-30-18**
		Inspector(s): **Don Milner**

Homogeneous Material Description:			**Photo**
Sheet Flooring			
Material Code:	**Material Sequence:**	**Size:**	
SFA	02		
Color:	**Pattern / Texture:**	**Associated Materials:**	
Green	Cork	Mesh cloth and paper underlayment	
Quantity (SF/LF/EA):	**Material Type:**	**Friable:**	
	M	II	
Condition:	**Disturbance Potential:**	**Assessment Category:**	
F	M	N/A	
Material Notes:			
Painted black			

Sample Number:	Room #	Sample Location Description:	Analytical Results:
C&H-SFA02-01	011	E wall, damaged area adjacent to radiator	None Detected
C&H-SFA02-02	205	E wall, damaged area at S side of radiator	None Detected

Homogeneous Material Description:			**Photo**
Window Caulk			
Material Code:	**Material Sequence:**	**Size:**	
WC	01		
Color:	**Pattern / Texture:**	**Associated Materials:**	
Gray	Semi-pliable	Window frames	
Quantity (SF/LF/EA):	**Material Type:**	**Friable:**	
	M	II	
Condition:	**Disturbance Potential:**	**Assessment Category:**	
G	L	N/A	
Material Notes:			

Sample Number:	Room #	Sample Location Description:	Analytical Results:
C&H-WC01-01	Ext.	W side of bldg., S side of 1st lower window from S	12% Chrysotile
C&H WC01-02	Ext.	E side of bldg., N side of 3rd lower window from S	None Detected

Material Type:
- Surfacing (S)
- Texturing (T)
- Miscellaneous (M)

Friability:
- Friable (F)
- Type I Non-Friable (I)
- Type II Non-Friable (II)

Condition:
- Good (G)
- Fair (F)
- Poor (P)

Disturbance Potential:
- Low (L)
- Moderate (M)
- High (H)

Assessment Categories:
1. Damaged or significantly damaged TSI ACM
2. Damaged friable surfacing ACM
3. Significantly damaged friable surfacing ACM
4. Damaged or significantly damaged friable miscellaneous ACM
5. ACBM with potential for damage
6. ACBM with potential for significant damage
7. Any remaining friable ACBM of friable suspected ACBM

Reservoirs Environmental, Inc.

November 13, 2018

Subcontract Number: **NA**
Laboratory Report: **RES 421883-1**
Project # / P.O. # **18088.001.001**
Project Description: **KEWE C&H Library**

Brandy Howard
Landmark Environmental, Inc.
7881 Shaffer Parkway
Littleton CO 80217

Dear Customer,

Reservoirs Environmental, Inc. is an analytical laboratory accredited for the analysis of Industrial Hygiene and Environmental matrices by the National Voluntary Laboratory Accreditation Program (NVLAP), Lab Code 101896-0 for Transmission Electron Microscopy (TEM) and Polarized Light Microscopy (PLM) analysis and the American Industrial Hygiene Association (AIHA), Lab ID 101533 - Accreditation Certificate #480 for Phase Contrast Microscopy (PCM) analysis. This laboratory is currently proficient in both Proficiency Testing and PAT programs respectively.

Reservoirs Environmental, Inc. has analyzed the following samples for asbestos content as per your request. The analysis has been completed in general accordance with the appropriate methodology as stated in the attached analysis table. The results have been submitted to your office.

RES 421883-1 is the job number assigned to this study. This report is considered highly confidential and the sole property of the customer. Reservoirs Environmental, Inc. will not discuss any part of this study with personnel other than those of the client. The results described in this report only apply to the samples analyzed. This report must not be used to claim endorsement of products or analytical results by NVLAP or any agency of the U.S. Government. This report shall not be reproduced except in full, without written approval from Reservoirs Environmental, Inc. Samples will be disposed of after sixty days unless longer storage is requested. If you have any questions about this report, please feel free to call 303-964-1986.

Sincerely,

Brett S. Colbert for

Jeanne Spencer
President

RESERVOIRS ENVIRONMENTAL INC.

NVLAP Lab Code 101896-0

TABLE: PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number: **RES 421883-1**
Client: **Landmark Environmental, Inc.**
Client Project Number / P.O.: **18088.001.001**
Client Project Description: **KEWE C&H Library**
Date Samples Received: **November 06, 2018**
Method: **EPA 600/R-93/116 - Short Report, Bulk**
Turnaround: **Standard**
Date Samples Analyzed: **November 12, 2018 - November 13, 2018**

ND=None Detected
TR=Trace, <1% Visual Estimate
Trem/Act=Tremolite/Actinolite

Client Sample Number	Lab ID Number	LAYER	Physical Description	Sub Part (%)	Asbestos Content: Mineral	Asbestos Content: Visual Estimate (%)	Non Asbestos Fibrous Components (%)	Non-Fibrous Components (%)
C&H-CA01-01	EM 2197295	A	Tan adhesive	100		**ND**	0	100
C&H-CA01-02	EM 2197296	A	White fibrous material	1	**Chrysotile**	**10**	0	75
					Amosite	**15**		
		B	Light tan adhesive	99		**ND**	0	100
C&H-CTA01-01	EM 2197297	A	Tan fibrous material	10		**ND**	95	5
		B	Green resinous material	10		**ND**	0	100
		C	Brown adhesive	80		**ND**	0	100
C&H-PL01-01	EM 2197298	A	Tan compound	8		**ND**	0	100
		B	Bluish white/multi-colored paint	12		**ND**	0	100
		C	White granular plaster	80		**ND**	TR	100
C&H-PL01-02	EM 2197299	A	Tan compound	6		**ND**	0	100
		B	Bluish white/multi-colored paint	9		**ND**	0	100
		C	White granular plaster	20		**ND**	TR	100
		D	White compound w/ white paint	65		**ND**	0	100

TEM Analysis recommended for organically bound material (i.e. floor tile) if PLM results are <1%.

RESERVOIRS ENVIRONMENTAL INC.

NVLAP Lab Code 101896-0

TABLE: PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number: **RES 421883-1**
Client: **Landmark Environmental, Inc.**
Client Project Number / P.O.: **18088.001.001**
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Turnaround: **Standard**
Date Samples Analyzed: **November 12, 2018 - November 13, 2018**

ND=None Detected
TR=Trace, <1% Visual Estimate
Trem/Act=Tremolite/Actinolite

Client Sample Number	Lab ID Number	LAYER	Physical Description	Sub Part (%)	Asbestos Content: Mineral	Asbestos Content: Visual Estimate (%)	Non Asbestos Fibrous Components (%)	Non-Fibrous Components (%)
C&H-PL01-03	EM 2197300	A	Tan compound	8		**ND**	0	100
		B	White/multi-colored paint	12		**ND**	0	100
		C	White granular plaster	35		**ND**	TR	100
		D	White plaster	45		**ND**	0	100
C&H-PL02-01	EM 2197301	A	Tan paint	6		**ND**	0	100
		B	Tan granular material	29		**ND**	0	100
		C	White granular plaster w/ off white paint	65		**ND**	0	100
C&H-PL02-02	EM 2197302	A	Tan/multi-colored paint	15		**ND**	0	100
		B	White granular plaster	85		**ND**	0	100
C&H-PM01-01	EM 2197303	A	Beige resinous material	100		**ND**	0	100
C&H-SFA01-01	EM 2197304	A	Tan fibrous woven material	15		**ND**	90	10
		B	Brown flooring	85		**ND**	25	75
C&H-SFA02-01	EM 2197305	A	Tan fibrous material	6		**ND**	90	10
		B	Green/tan cork flooring	94		**ND**	3	97

TEM Analysis recommended for organically bound material (i.e. floor tile) if PLM results are <1%.

RESERVOIRS ENVIRONMENTAL INC.

NVLAP Lab Code 101896-0

TABLE: PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number: **RES 421883-1**
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ND=None Detected
TR=Trace, <1% Visual Estimate
Trem/Act=Tremolite/Actinolite

Client Sample Number	Lab ID Number	LAYER	Physical Description	Sub Part (%)	Asbestos Content: Mineral	Asbestos Content: Visual Estimate (%)	Non Asbestos Fibrous Components (%)	Non-Fibrous Components (%)
C&H-SFA02-02	EM 2197306	A	Tan fibrous woven material	10		**ND**	90	10
		B	Gray fibrous material	25		**ND**	85	15
		C	Green/tan cork flooring	65		**ND**	3	97
C&H-WC01-01	EM 2197307	A	Tan glazing w/ gray paint	100	**Chrysotile**	**12**	0	88
C&H-WC01-02	EM 2197308	A	Gray resinous material	4		**ND**	0	100
		B	Gray granular cementitious material	96		**ND**	0	100

TEM Analysis recommended for organically bound material (i.e. floor tile) if PLM results are <1%.

Landon Spells
Analyst

Michael Scales
Data QA

Due Date:_____
Due Time:_____

RES 421883

REI LAB Reservoirs Environmental, Inc.

Pager : 303-509-2098

INVOICE TO: (IF DIFFERENT)

Company:	Landmark Environmental, Inc.
Address:	7881 Shaffer Parkway Littleton, CO 80127

Company:	Same
Address:	

CONTACT INFORMATION:

Contact:	Brandy Howard
Phone:	720-3601509
Fax:	
Cell/pager:	720-878-6475

Contact:	Don Milner
Phone:	720-360-1514
Fax:	
Cell/pager:	303-205-8831

Project Number and/or P.O. #: 18088.001.001
Project Description/Location: KEWE C&H Library

Final Data Deliverable Email Address: bhoward@landmarkenviro.com
dmilner@landmarkenviro.com jduffy@landmarkenviro.com

ASBESTOS LABORATORY HOURS: Weekdays: 7am - 7pm

PLM / PCM / TEM ____ RUSH (Same Day) ___ PRIORITY (Next Day) X STANDARD
(Rush PCM = 2hr, TEM = 6hr.)

CHEMISTRY LABORATORY HOURS: Weekdays: 8am - 5pm

Metal(s) / Dust ___ RUSH ___ 24 hr. ___3-5 Day
RCRA 8 / Metals & Welding Fume Scan / TCLP ___ RUSH ___ 5 day ___10 day
Organics ___ 24 hr. ___ 3 day ___5 Day

****Prior notification is required for RUSH turnarounds.****

MICROBIOLOGY LABORATORY HOURS: Weekdays: 9am - 6pm

E.coli O157:H7, Coliforms, S.aureus ___ 24 hr. ___2 Day ___3-5 Day
Salmonella, Listeria, E.coli, APC, Y & M ___ 48 Hr. ___3-5 Day
Mold ___ RUSH ___24 Hr ___48 Hr ___3 Day ___5 Day

****Turnaround times establish a laboratory priority, subject to laboratory volume and are not guaranteed. Additional fees apply for afterhours, weekends and holidays.****

REQUESTED ANALYSIS

Client sample ID number (Sample ID's must be unique)	PLM - Short report, Long report, Point	TEM - AHERA, Level II, 7402, ISO, +/-, Semi-quant, Micro-Quant,	PCM - 7400A, 7400B, OSHA	DUST - Total, Respirable	METALS - Analyte(s)	ORGANICS - METH	MICROBIOLOGY: Salmonella: +/-	MICROBIOLOGY: E.coli O157:H7: +/-	MICROBIOLOGY: Listeria: +/-	MICROBIOLOGY: Aerobic Plate Count: +/- or Quantification	MICROBIOLOGY: E.coli: +/- or Quantification	MICROBIOLOGY: Coliforms: +/- or Quantification	MICROBIOLOGY: S.aureus: +/- or Quantification	MICROBIOLOGY: Y & M: +/- or Quantification	MICROBIOLOGY: Mold: +/-, Identification, Quantification	SAMPLER'S INITIALS OR OTHER NOTES	Sample Volume (L) / Area	Matrix Code	# Containers	Date Collected mm/dd/yy	Time Collected hh/mm a/p	EM Number (Laboratory Use Only)
1 C&H-CA01-01	X																				2197295
2 C&H-CA01-02	X																				96
3 C&H-CTA01-01	X																				97
4 C&H-PL01-01	X																				98
5 C&H-PL01-02	X																				99
6 C&H-PL01-03	X																				300
7 C&H-PL02-01	X																				01
8 C&H-PL02-02	X																				02
9 C&H-PM01-01	X																				03
10 C&H-SFA01-01	X																				04

VALID MATRIX CODES

Air = A	Bulk = B
Dust = D	Paint = P
Soil = S	Wipe = W
Swab = SW	F = Food
Drinking Water = DW	Waste Water = WW
O = Other	

****ASTM E1792 approved wipe media only****

LAB NOTES:

Number of samples received: 14 (Additional samples shall be listed on attached long form.)

NOTE: REI will analyze incoming samples based upon information received and will not be responsible for errors or omissions in calculations resulting from the inaccuracy of original data. By signing client/company representative agrees that submission of the following samples for requested analysis as indicated on this Chain of Custody shall constitute an analytical services agreement with payment terms of NET 30 days, failure to comply with payment terms may result in a 1.5% monthly interest surcharge.

Relinquished By: Don Mlr Date/Time: 11-5-18 12:20

Sample Condition: On Ice Yes / No Sealed Yes / No Intact Yes / No
Temp. (F°) _____

Laboratory Use Only
Received By: Molly Cooper Date/Time: 11-5-18 1255p Carrier: Hand

Results:	Contact	Phone	Email	Fax	Date	Time	Initials	Contact	Phone	Email	Fax	Date	Time	Initials
	Contact	Phone	Email	Fax	Date	Time	Initials	Contact	Phone	Email	Fax	Date	Time	Initials

Reservoirs Environmental, Inc.

RES Job # 421883

Page 2 of 2

Submitted by: **Landmark Environmental, Inc**

	Client sample ID number (Sample ID's must be unique)	PLM - Short report, Long report, Point Count	TEM - AHERA, Level II, 7402, ISO, +/-, Quant, Semi-quant, Micro-vac, ISO-Indirect Preps	PCM - 7400A, 7400B, OSHA	DUST - Total, Respirable	METALS - Analyte(s) RCRA 8, TCLP, Welding Fume, Metals Scan	ORGANICS - METH	MICROBIOLOGY: Salmonella: +/-	MICROBIOLOGY: E.coli O157:H7: +/-	MICROBIOLOGY: Listeria: +/-	MICROBIOLOGY: Aerobic Plate Count: +/- or Quantification	MICROBIOLOGY: E.coli: +/- or Quantification	MICROBIOLOGY: Coliforms: +/- or Quantification	MICROBIOLOGY: S.aureus: +/- or Quantification	MICROBIOLOGY: Y & M: +/- or Quantification	MICROBIOLOGY: Mold: +/- or Quantification	OTHER -	Sample Volume (L) / Area	Matrix Code	# Containers	Date Collected mm/dd/yy	Time Collected hh/mm a/p	EM Number (Laboratory Use Only)
11	C&H-SFA02-01	X																				2197305
12	C&H-SFA02-02	X																				06
13	C&H-WC01-01	X																				07
14	C&H-WC01-02	X																				08
15																						
16																						
17																						
18																						
19																						
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40																						
41																						

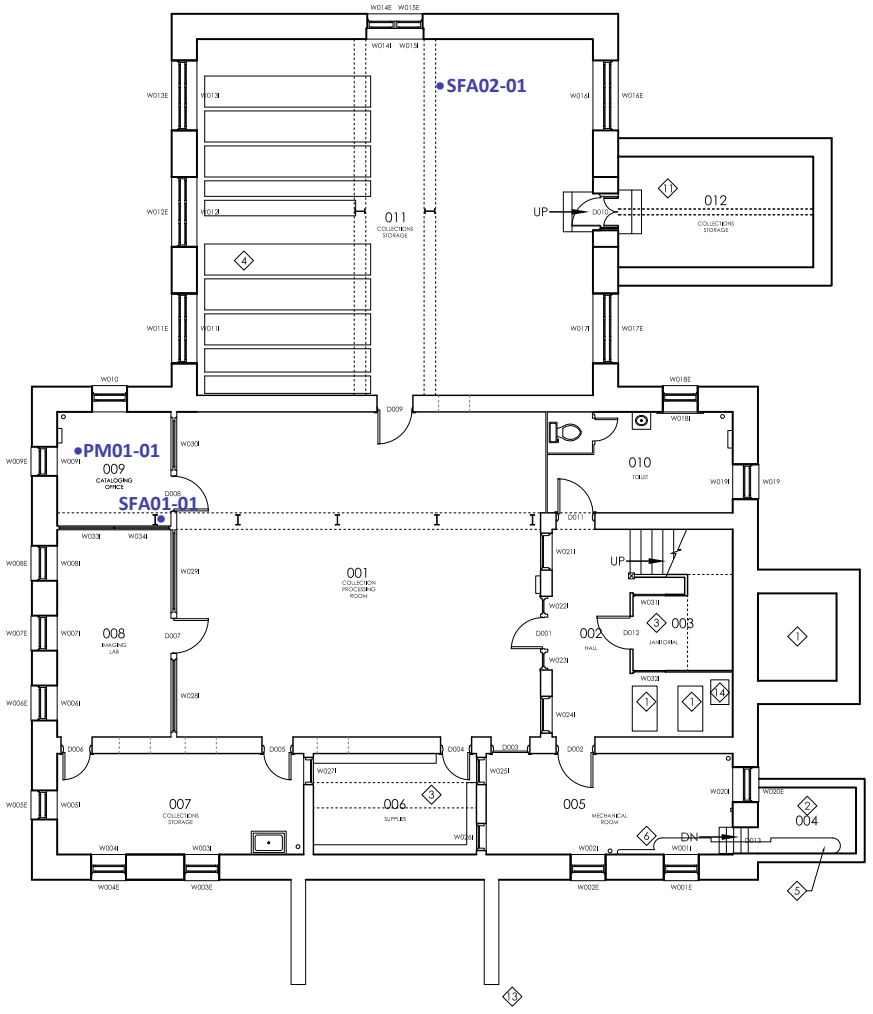
VALID MATRIX CODES

Air = A	Bulk = B
Dust = D	Paint = P
Soil = S	Wipe = W
Swab = SW	F = Food
Drinking Water = DW	Waste Water = WW
O = Other	

ASTM E1792 approved wipe media only

LAB NOTES:

7-2011_version 1



Key

- Current Non-Detect ACM Samples
- Current ACM Samples

PLAN NORTH

BASEMENT

SCALE 3/32" = 1'

0 5 10 20 FEET

KEWEENAW NATIONAL HISTORICAL P•A•R•K

C&H LIBRARY

24947 RED JACKET RD.
CALUMET, MICHIGAN
49913

NOTES:
1. Heating system boilers
2. Pit for original steam heating system connection
3. Sloped ceiling under stair
4. Compactable museum storage shelving
5. Fire suppression backflow preventor
6. Fire suppression valves and equipment
11. Vault
12. Footing for West entry porch
13. Footing for North entry stair wing walls
14. Gas meter

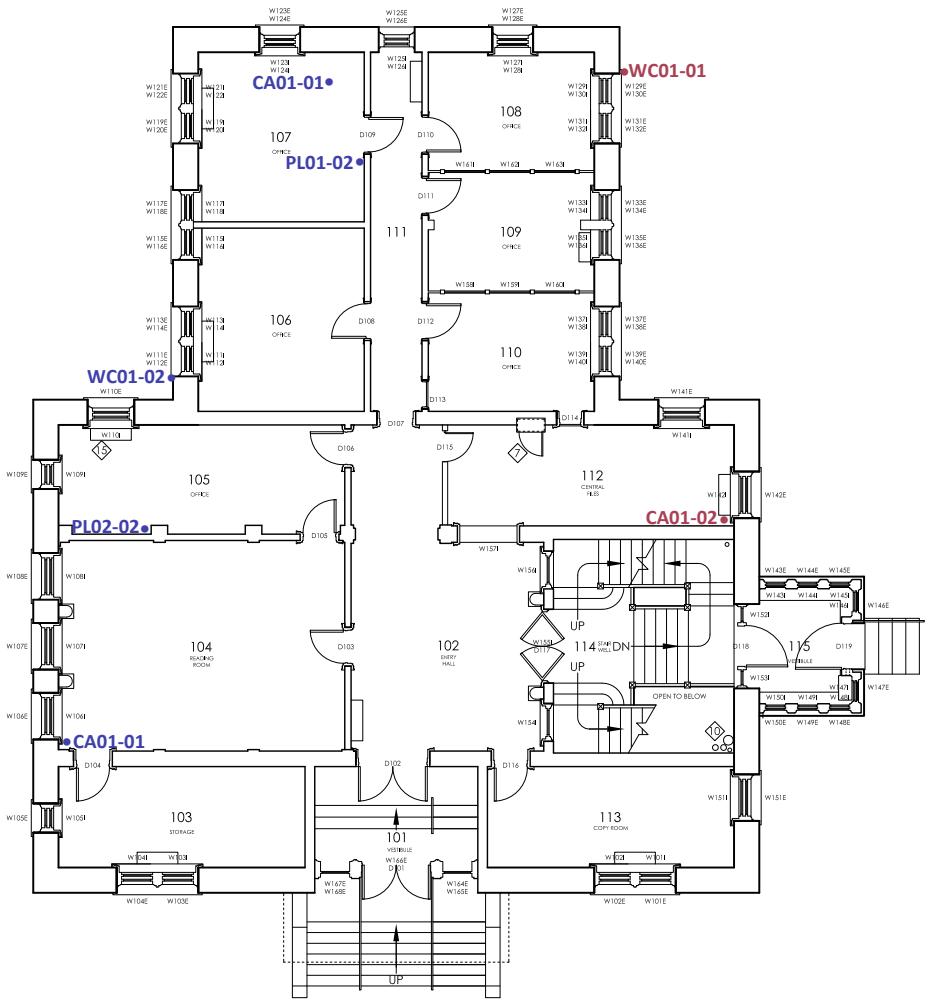
BASEMENT PLAN

EXISTING CONDITIONS

DRAWN BY: Q. PETERSON	DATE: 08/2004
REVISED BY: B. THOMPSON	DATE: 08/2005
REVISED BY: J. M. NORTON	DATE: 08/2006
REVISED BY: J. M. NORTON	DATE: 05/2007
CHECKED BY:	DATE: /

SHEET NO. A - 2

SHEET 3 OF 29



PLAN NORTH

FIRST FLOOR PLAN

SCALE 3/32" = 1'

0 5 10 20 FEET

KEWEENAW NATIONAL HISTORICAL P•A•R•K

C&H LIBRARY

24947 RED JACKET RD.
CALUMET, MICHIGAN
49913

NOTES:
7. Electrical chase cabinet
10. Fire suppression risers
15. Unit heater (typ.)

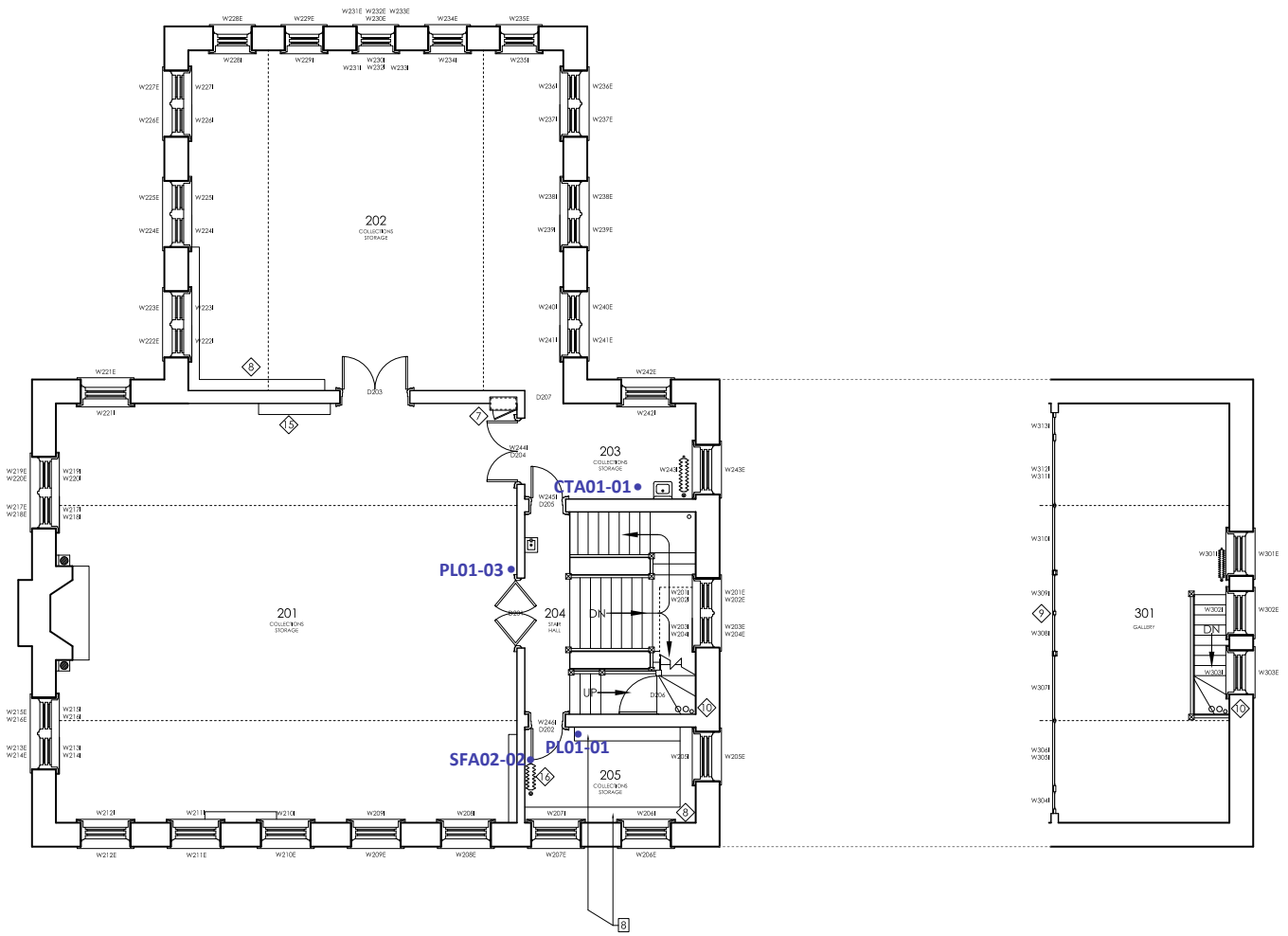
FIRST FLOOR PLAN

EXISTING CONDITIONS

DRAWN BY: Q. PETERSON	DATE: 08/2004
REVISED BY: B. THOMPSON	DATE: 08/2005
REVISED BY: J. M. NORTON	DATE: 08/2006
REVISED BY: J. M. NORTON	DATE: 05/2007
CHECKED BY:	DATE: /

SHEET NO. A - 3

SHEET 4 OF 29



PLAN NORTH

SECOND FLOOR PLAN

3/32" = 1'

SCALE 0 5 10 20 FEET

THIRD FLOOR GALLERY

3/32" = 1'

KEWEENAW NATIONAL HISTORICAL P•A•R•K

C&H LIBRARY

24947 RED JACKET RD.
CALUMET, MICHIGAN
49913

NOTES:
7. Electrical chase cabinet
8. Wood shelving
9. Balustrade and glazing enclosure
10. Fire suppression risers
15. Unit heater (typ.)
16. Fin-tube radiator (typ.)

SECOND & THIRD FLOOR PLANS

EXISTING CONDITIONS

DRAWN BY: Q. PETERSON	DATE: 08/2004
REVISED BY: B. THOMPSON	DATE: 08/2005
REVISED BY: J. M. NORTON	DATE: 08/2006
REVISED BY: J. M. NORTON	DATE: 05/2007
CHECKED BY:	DATE: /

SHEET NO. A - 4

SHEET 5 OF 29

Attachment B

NATIONAL PARK SERVICE – HANTAVIRUS RISK REDUCTION – WORKER PROTECTION

National Park Service
U.S. Department of the Interior

Hantavirus Risk Reduction

Worker Protection

Updated December 2013

Hantavirus Risk Reduction

Worker Protection

Updated December 2013

Office of Public Health
1201 Eye Street NW
Room 52
Washington, DC 20005

Wildlife Health Branch, Biological Resource Management Division
1201 Oakridge Drive
Suite 200
Fort Collins, CO 80525

Integrated Pest Management Program, Biological Resource Management Division
1201 Oakridge Drive
Suite 200
Fort Collins, CO 80525

The following National Park Service contributors helped revise this document: Bruce Badzik, Integrated Pest Management Coordinator & Biologist, Golden Gate National Recreation Area; Dr. Danielle Buttke, DVM, PhD, MPH, DACVPH, One Health Coordinator, Biological Resource Management Division/Wildlife Health Branch and Office of Public Health; Myron Chase, Integrated Pest Management Coordinator –Biologist, Intermountain Regional Office IPM Coordinator; Carol DiSalvo, Servicewide Integrated Pest Management Coordinator, Biological Resource Management Division; and Ciro Monaco, Biological Technician, Servicewide Integrated Pest Management Program.

December 2013

U.S. Department of the Interior
National Park Service
Office of Public Health
Washington, DC
Natural Resource Stewardship and Science
Fort Collins, Colorado

This report received formal peer review by subject-matter experts who were not directly involved in the collection, analysis, or reporting of the data, and whose background and expertise put them on par technically and scientifically with the authors of the information.

Views, statements, findings, conclusions, recommendations, and data in this report do not necessarily reflect views and policies of the National Park Service, U.S. Department of the Interior. Mention of trade names or commercial products does not constitute endorsement or recommendation for use by the U.S. Government.

NPS, December 2013

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Precautions 1

Precautions for Workers Frequently Exposed to Rodents 1

Precautions for Workers Having Potential Contact with Rodents 2

Cleanup 2

Cleanup of Rodent Urine, Droppings, and Contaminated Surfaces 2

Cleanup of Dead Rodents and Rodent Nests 3

Disinfecting Solutions 4

Cleaning Shed and Other Buildings 4

Recommendations for Cleaning Homes or Buildings with Heavy Rodent Infestations 4

Special Considerations for Historic Structures or Structures with Dirt Floors 5

Contacts 6

Introduction

This document summarizes the updated recommendations from the Centers for Disease Control and Prevention (CDC) for hantavirus risk reduction for workers. The information is adapted from the Morbidity and Mortality Weekly Report, July 26, 2002; Vol. 51; No. RR09.

Precautions

Precautions for Workers Frequently Exposed to Rodents

Persons who frequently handle or are exposed to wild rodents are probably at higher risk for hantavirus infection than the general public because of the frequency of their exposures. Such persons include, but are not limited to: wildlife specialists; maintenance workers; employees involved in rodent management; concessions managers; some custodial staff; and building and fire inspectors. Therefore, enhanced precautions are warranted to protect them against hantavirus infection, as described below.

- Workers in potentially high-risk settings should be informed by their employers about hantavirus transmission and symptoms of infection, and be given detailed guidance and training on prevention measures. Determining the level of risk for HPS in each work setting is the responsibility of the park. The Regional Public Health Consultant and Safety Officer may be contacted for assistance, if necessary.

- Workers who develop a febrile or respiratory illness within 7 weeks of the last potential exposure should immediately seek medical attention and inform the attending physician of the potential occupational risk of hantavirus infection.

- When removing rodents from traps, handling rodents, or cleaning heavily infested areas, workers should wear either a NIOSH-approved half-face or full-face, tight-seal, negative-pressure respirator or a positive pressure PAPR (powered air-purifying respirator), both options must be equipped with P-100 or N-100 filters. Employees must be in compliance with NPS Director’s Order #50B and Reference Manual #50B for respiratory protection. Requirements include medical clearance and annual training and fit testing for each approved respirator type. Any individual wearing a respirator must be clean shaven.

- Workers should wear rubber, latex, vinyl, or nitrile gloves when cleaning or working in rodent infested areas, handling rodents or handling traps containing rodents. Before removing the gloves, wash gloved hands in a disinfectant or chlorine solution and then wash bare hands in soap and water.

- Mammalogists or wildlife biologists who handle wild rodents for research or management purposes should refer to the published safety guidelines available on CDC's website, All About Hantavirus (http://www.cdc.gov/ncidod/dvrd/spb/mnpages/rodentmanual.htm).

Precautions for Workers Having Potential Contact with Rodents

Persons who work in occupations with unpredictable or incidental contact with rodents or their nesting sites should follow general risk reduction recommendations and seek guidance from their safety manager or the Office of Public Health. Examples of such occupations include: archaeologists; natural resource specialists; utility operators; curators; and certain construction workers. Workers in these jobs may have to enter buildings and crawl spaces, or might otherwise be exposed to sites or materials that are potentially rodent-infested. Recommendations for such circumstances must be made on a case-by-case basis after the specific working environment has been assessed. The Regional Public Health Consultant or the Safety Officer may be consulted as needed to assist in the assessment. Determining the level of risk present and implementing appropriate protective measures is the responsibility of the park.

Areas with evidence of rodent activity (e.g., dead rodents, nests, and droppings) should be thoroughly cleaned to reduce the likelihood of exposure to hantavirus-infected materials. Cleanup procedures must be performed in a manner that limits the potential for dirt or dust from contaminated surfaces to become airborne. Recommendations are listed in this report for cleaning up (1) rodent urine and droppings, and surfaces potentially contaminated by rodents; and (2) dead rodents and rodent nests.

Cleanup

Cleanup of Rodent Urine, Droppings, and Contaminated Surfaces

- During cleaning, wear rubber, latex, vinyl, or nitrile gloves.
- Spray rodent urine and droppings with an EPA registered disinfectant or chlorine solution until thoroughly soaked. (See Cleanup of Dead Rodents and Rodent Nests below.) Allow disinfectant-soaked area to sit for at least 10 minutes before proceeding.
- To avoid generating potentially infectious aerosols, do not sweep rodent urine, droppings, or contaminated surfaces until they have been disinfected (soaked with disinfectant for at least 10 minutes).
- Use a paper towel to absorb the urine and disinfectant and pick up the droppings. Place the paper towel in the garbage.
- After the rodent droppings and urine have been removed, disinfect items and underlying surfaces that might have been contaminated by rodents or their urine and droppings.
    - Mop floors with a disinfectant or chlorine solution. Allow to sit for 10 minutes before rinsing.

- o Disinfect countertops, cabinets, drawers, and other durable surfaces with a disinfectant or chlorine solution. Allow disinfectant to sit on surface for 10 minutes before wiping down.
- o Spray dirt floors with a disinfectant or chlorine solution.
- o Disinfect carpets with a disinfectant or with a commercial-grade steam cleaner or shampoo.
- o Steam-clean or shampoo rugs and upholstered furniture.
- o Launder potentially contaminated bedding and clothing with hot water and detergent. Use rubber, latex, vinyl, or nitrile gloves when handling contaminated laundry. Machine-dry laundry on a high setting or hang it to air dry in the sun.
- o Leave books, papers, and other items that cannot be cleaned with a liquid disinfectant or thrown away, outdoors in the sunlight for several hours, or in an indoor area free of rodents for approximately 3 weeks before cleanup. After that time, the virus should no longer be infectious. However, to further reduce risk, wear rubber, latex, vinyl, or nitrile gloves and wipe the items with a cloth moistened with disinfectant.
- o Before removing the gloves, wash gloved hands in a disinfectant or chlorine solution and then wash bare hands in soap and water.

Cleanup of Dead Rodents and Rodent Nests

- Wear rubber, latex, vinyl, or nitrile gloves.
- In the western United States, use insect repellent (containing DEET) on clothing, socks, and arms to reduce the risk of fleabites that might transmit plague, tularemia, or other diseases.
- Spray dead rodents and rodent nests with a disinfectant or a 10% chlorine solution, soaking them thoroughly. Wait 10 minutes before disturbing to ensure inactivation of the virus.
- Place the dead rodent or nest in a plastic bag, or remove the dead rodent from the trap and place it in a plastic bag. When cleanup is complete (or when the bag is full), seal the bag, place it into a second plastic bag, and seal the second bag. Dispose of the material in the double bag discarding it in a covered trash can that is regularly emptied.
- Clean up the surrounding area and area that was underneath the rodent as described in "Cleanup of Rodent Urine and Droppings and Contaminated Surfaces."

Disinfecting Solutions

Two types of disinfecting solutions are recommended to clean up rodent materials.

1. General-Purpose Household Disinfectant: These can be used for light infestations (ie, rodent droppings present, evidence of chewing, but no extensive nesting or droppings). Prepare according to the label, if not prediluted. Almost any agent commercially available in the United States is sufficient as long as the label states that it is a "disinfectant" and it has an EPA registration number on the label. Effective agents include those based on phenols, quaternary ammonium compounds, and hypochlorite solutions at a 1:100 or greater concentration.

2. Hypochlorite Solution: A 10% chlorine solution, freshly prepared by mixing 1½ cups of household bleach in 1 gallon of water (or a 1:10 solution) can be used in place of a commercial disinfectant and should be used for heavily infested areas (ie, several rodent nests with extensive droppings present). When using chlorine solution, avoid spilling the mixture on clothing or other items that might be damaged by bleach. Wear rubber, latex, vinyl, or nitrile gloves when preparing and using chlorine solutions. Chlorine solutions should be prepared fresh daily.

Cleaning Shed and Other Buildings

Before cleaning closed sheds and other outbuildings, ventilate the building by opening doors and windows for at least 30 minutes. Use cross ventilation if possible. Be sure that you do not stir up any dust when entering to open windows and leave the area during the airing-out period. This airing helps to remove infectious primary aerosols that might be created by hantavirus-infected rodents. In substantially dirty or dusty environments, additional protective clothing or equipment may be worn. Such equipment includes coveralls (disposable when possible) and safety glasses or goggles, in addition to rubber, latex, vinyl, or nitrile gloves. For recommendations regarding precautions for cleanup of outbuildings with heavy rodent infestations, see below.

Recommendations for Cleaning Homes or Buildings with Heavy Rodent Infestations

Special precautions are indicated for cleaning homes or buildings with heavy rodent infestations. A rodent infestation is considered heavy if piles of feces or numerous nests or dead rodents are observed. Persons cleaning these homes or buildings should contact their Safety Officer or Public Health Consultant. These precautions also can apply to vacant dwellings that have attracted rodents while unoccupied and to dwellings and other structures that have been occupied by persons with

confirmed hantavirus infection. Workers who are either hired specifically to perform the cleanup or asked to do so as part of their work activities should receive a thorough orientation about hantavirus transmission and disease symptoms and should be trained to perform the required activities safely.

- If the building has been closed and unoccupied for a long period (weeks or months), ventilate the building by opening doors and windows for at least 30 minutes before beginning any work. The ventilation helps to remove aerosolized virus inside the structure. Use cross ventilation if possible. Leave the area during the airing-out period.

- Persons involved in the cleanup should wear coveralls (disposable, if possible); rubber boots or disposable shoe covers; rubber, latex, vinyl, or nitrile gloves; protective goggles; and a respirator with appropriate clearance, annual fit-testing, and approvals as detailed in "Precautions for Workers Frequently Exposed to Rodents."

- Personal protective gear should be decontaminated or safely disposed of upon removal at the end of the day. If the coveralls are not disposable, they should be laundered on site. If no laundry facilities are available, the coveralls should be immersed in liquid disinfectant until they can be washed.

- Wash hands thoroughly after personal protective equipment is removed.

- Unless burned on site, all potentially infectious waste material from cleanup operations should be double-bagged in durable plastic bags and then discarded in a covered trash can that is regularly emptied. Contact the local or state health department concerning other appropriate disposal methods.

- Persons involved in the cleanup who develop a febrile or respiratory illness within seven weeks of the last potential exposure should immediately seek medical attention and inform the attending physician of the potential occupational risk of hantavirus infection.

Special Considerations for Historic Structures or Structures with Dirt Floors

- Consult cultural resources staff before beginning any work in historic structures.

- Some disinfectants, such a 10% or greater bleach solutions or repeat use of other disinfectants, can change the color of an organic surface (such as wood, cloth, etc). If this is a concern for a historic structure, disinfectants such as household disinfectants or isopropyl/ethyl alcohol might be more appropriate.

- Dirt floors should be treated as other hard surfaces, with extra care taken not to stir up dust. Thoroughly wet the area and adjacent area with disinfectant, allow the disinfectant to sit for at least 10 minutes, and use a wetted paper towel to clean up the droppings or material.

Contacts

Integrated Pest Management (IPM) – 202-513-7183

Public Health – 202-513-7217

Risk Management – 202-513-7214

Wildlife Health – 970-267-2118

The Department of the Interior protects and manages the nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its special responsibilities to American Indians, Alaska Natives, and affiliated Island Communities.

NPS, December 2013

National Park Service
U.S. Department of the Interior

Office of Public Health
1201 Eye Street NW, Room 52
Washington, DC 20005

Natural Resource Stewardship and Science
1201 Oakridge Drive, Suite 150
Fort Collins, CO 80525

www.nature.nps.gov

Appendix F - Image Permanence Institute Report

Environmental Planning for Archival Storage at Calumet Library, Keweenaw National Historic Park Mundus Bishop/ Anderson Hallas Architects, PC

March-April 2019



Image Permanence Institute
Kelly Krish, Preventive Conservation Specialist

Image Permanence Institute ▪ Rochester Institute of Technology ▪ 70 Lomb Memorial Drive ▪ Rochester, New York 14623
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Appendix 1- IPI's Preservation Metrics

EXECUTIVE SUMMARY

Project Overview

In November 2018, Mundus Bishop/Anderson Hallas Architects, PC contracted with the Image Permanence Institute (IPI) at Rochester Institute of Technology to provide advice regarding sustainable environmental management for the preservation of the collections in the Calumet Library at the Keweenaw National Historic Park. This will inform the Historic Structures Report to be prepared by Anderson Hallas Architects, as well as other strategic planning at the site.

The goals of the project were:

- analyze the preservation quality of current environmental conditions,
- and provide recommendations for short and long-term options to improve preservation and energy-efficient operation, while considering the historic nature of the building envelope.

This report summarizes an evaluation based on documentation review and a one-day site visit by IPI Preventive Conservation Specialist, Kelly Krish. The documentation reviewed included facility improvements reports and proposed use floor plans, as well as temperature and relative humidity data that staff had collected throughout the building using 11 HOBO dataloggers. Data from these covering April 2017 through January 2019 was uploaded to IPI's environmental analysis software eClimateNotebook for evaluation. During the site visit, the consultant met in-person and remotely with administrative and project staff at both the beginning and end of the site visit, and walked through all collection spaces in the Calumet Library.

Summary of findings

Based on the documentation review and site visit, the following key issues were identified:

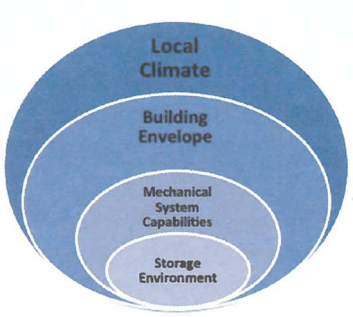
- The basement collections space currently has the best preservation condition of any room in the building, but, despite an impressive level of staff commitment to environmental management, long-term preservation quality conditions are still not achievable, given the mechanical system's lack of ability to cool or dehumidify.
- Adding the capacity to the mechanical system would require accompanying changes to the building envelope and surrounding space that are either too invasive (adding a vapor barrier to the room walls) or impractical (box-in-box design around room constraints).
- Use of the warehouse for long-term storage should therefore be maximized. However, some collections will have to remain on-site for researchers so conditions in the Calumet Library's storage space should be improved to the degree that this is possible through the use of landscaping and exploration of options at the conclusion of the envelope study. Other location options within the building for collections storage where a "box-in-box" construction might be feasible could also be considered, in conjunction with the current space planning study.

Further details on the findings and subsequent recommendations are found in this report, which represents the final deliverable from IPI to Mundus Bishop/Anderson Hallas Architects, PC in fulfillment of the consulting agreement. We greatly appreciate the opportunity to work with the project staff.

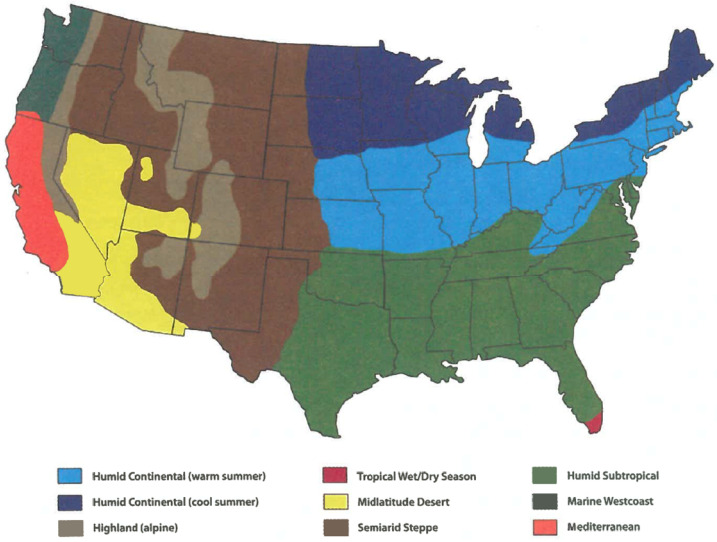
Kelly Krish, Preventive Conservation Specialist
Image Permanence Institute
April 2019

Establishment of Goals

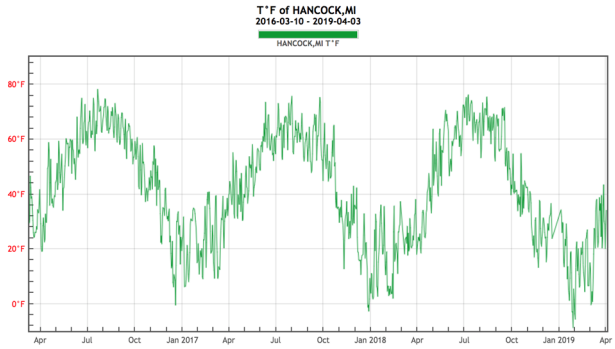
Recommendations for preservation conditions depend on what can be achieved given the local climate, the institution's goals, the building, the mechanical systems, and the collection's needs.

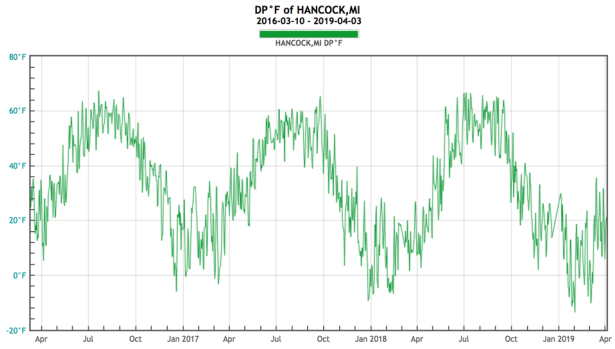


Local climate



The red star on the map of the United States indicates the location of Keweenaw National Historic Park within the "humid continental" climate zone. This is in agreement with local outside weather data, shown on the graphs below, both of which indicate that, while summer will be cooler than in other parts of the country (graph on left of temperature), humidity will be an issue (graph on the right of dew point).



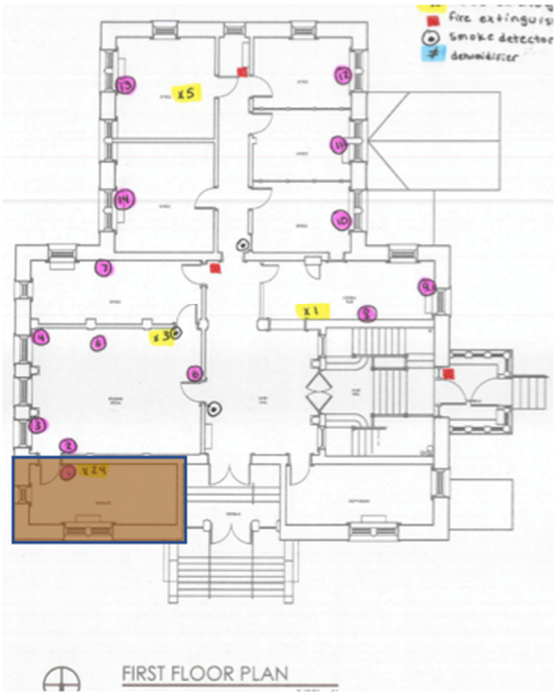


From a preservation perspective, the main challenge will be effective dehumidification during the summer, and, to a lesser extent, maintaining lower temperatures during the summer and preventing low relative humidity in the winter.

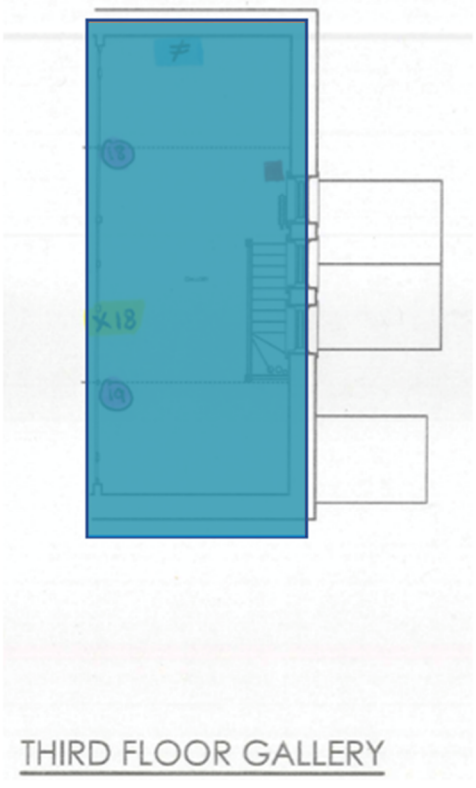
Institutional considerations

The following floor plans indicate current permanent collections storage spaces for Calumet Library, highlighted in red, brown, and blue; however, only the red highlighted space is planned to remain collections storage.









Since there is also a current project to completely renovate the Park's warehouse across the street, it is anticipated that within four years, the objects collections within Calumet Library will be moved and archival material will become the primary focus in the Library building.

This means that the brown highlighted areas on the first and second floor will no longer contain collections. Furthermore, moving the objects out of the basement storage space (highlighted red) will open up space for the archival material currently located on the third floor (highlighted blue) to be relocated. This is desirable as the third floor makes materials difficult to access and the floor would likely need to be reinforced if it were to continue to bear the weight load of the archives. This then removes the third floor blue highlighted area from consideration as well, leaving only the red highlighted space to continue as storage for archival material.

It is important to note though that the maintenance of this or a similar space for on-site storage of archival material is critical in order for the building to continue to function for researchers. Additionally, while the warehouse is located in close proximity, it is not always desirable or practical to transport vulnerable or frequently accessed materials across a parking lot that is often subject to extreme weather conditions.

Building and mechanical system

While the installation of a dedicated mechanical system and other changes to improve the preservation quality of the on-site storage space are options, consideration of the historic significance of the building is imperative. This means that alterations that significantly impact the building envelope- such as installation of a vapor barrier to the walls, extensive ductwork, or the creation of conditions that would drive moisture through the structure- are not appropriate.

There are also concerns about any changes to the outside appearance that are not historically accurate. However, in this case, it may be important to weigh the costs of limited, controlled vegetative growth over the collections space with the costs of deterioration of the collection. This will be discussed in further detail in Recommendations.

Collection needs

Role of environment

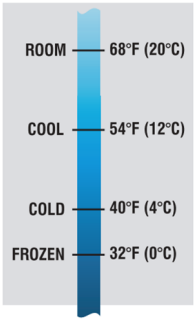
In order to ensure the preservation of archival materials, a quality environment needs to be provided, focused on avoiding high temperatures and controlling relative humidity. Higher temperatures accelerate the rate of chemical deterioration in organic materials in the collection (including the paper and photographic materials), causing color change and embrittlement. Lower temperatures generally slow degradation rates, aiding in preservation.

Inappropriate relative humidity (RH) can cause damage to collections in the following ways:

- High RH encourages mold germination, increased insect activity, metal corrosion, bleeding of colorants, and expansion of materials, as well as reinforcing the effects of other forms of deterioration.
- Low RH can cause materials to become desiccated and physically shrink.

These are approximate guidelines for general collections with a variety of materials. Fluctuations in RH beyond what a material has previously experienced can lead to cracking or separation of layers, particularly if the object is composed of multiple materials that respond to moisture changes differently.

The following chart, from IPI's Media Storage Quick Reference (MSQR), gives a snapshot of recommended conditions for various media formats, highlighting the commonality of colder temperatures (along with a controlled relative humidity).



Storage Conditions	Glass Plates	Nitrate	Acetate		Polyester		Photo Prints		Ink Jet Prints	Magnetic Tape		CDs DVDs
			B&W	Color	B&W	Color	B&W	Color		Acetate	Polyester	
ROOM	Fair	No	No	No	Good	No	Good	No	Fair	No	No	Fair
COOL	Good	No	No	No	Good	No	Good	No	Fair	Fair	Good	Good
COLD	Very Good	Good	Good	Good	Very Good	Good	Very Good	Good	Good	Good	Good	Good
FROZEN	Very Good	Very Good	Very Good	Very Good	Very Good	Very Good	Very Good	Very Good	Very Good	Good	Good	No

Dew point, a measure of the absolute amount of water in the air, determines what the relative humidity will be at a given temperature. Dew point can be changed by humidifying or dehumidifying the air; the extent to which the mechanical system is capable of doing so, will determine the relative humidity in the spaces. The lower the dew point a system can achieve, the more moisture it is capable of removing in the summer, resulting in a lower relative humidity.

Impact of environment

There are four ways in which the environment can cause damage to collections: chemical decay/natural aging, mechanical damage, mold germination, and metal corrosion.

As the relative humidity levels rarely exceed 50%RH in the main storage space and exceed 60%RH only for brief periods of time in the vault space off the main storage space, the risks of mold germination and metal corrosion remain largely below the critical threshold. There is still the possibility for microclimates to exist- especially in the vault space where air circulation is a noted issue and the relative humidity is higher than in the rest of the space- so these risks should not be entirely dismissed but, at current conditions, such damage has not been noted.

In this instance, mechanical damage is also considered a lower risk. This type of damage often comes from objects experiencing extreme levels of relative humidity to which they have not been exposed to in the past. Given the purpose of the institution, most of the objects in the collection were collected locally and so have been exposed to these conditions in the past.

Therefore, the main impact of the environment will be through chemical decay/natural aging, primarily due to high temperatures but also influenced by periods of high relative humidity. The effects of these environmental conditions can be taken into account using IPI's time-weighed preservation index (TWPI), which measures how these affect the rate of deterioration of organic materials. It provides a relative means of comparing preservation quality between existing preservation environments, as well as to proposed changes. The lower the TWPI, the faster materials will deteriorate, so the goal is to increase the TWPI relative to the starting point at the beginning of the project.

DESCRIPTION

Mechanical system

BOILER UNIT
Location: basement, northeast corner
Layout: boiler system
Zone served: entire building

The current mechanical system is only capable of providing heat, with secondary perimeter cabinet units providing supplemental heating. To achieve any other controls, staff utilize additional components:

- wall air-conditioning units to achieve localized cooling
- stand-alone dehumidifiers to lower relative humidity
    - these operate from May to October on a constant basis
    - staff are responsible for emptying the water collected from dehumidification
        - timing must be maximized to account for weekends, with emptying occurring just before departure at the start of the weekend and upon return
- fans to promote air movement, thus reducing the formation of microclimates

Archives space

The basement contains paper, photographs (both black and white, and color), leather-bound books, and blueprints within the compact shelving. Materials on the third floor (which could be moved into the basement space) are currently stored in archival boxes on open shelving, and include paper, photographs (primarily black and white, but some color), acetate and polyester film and negatives, transparencies, and magnetic media. Many of these materials are known to be sensitive to environmental conditions.

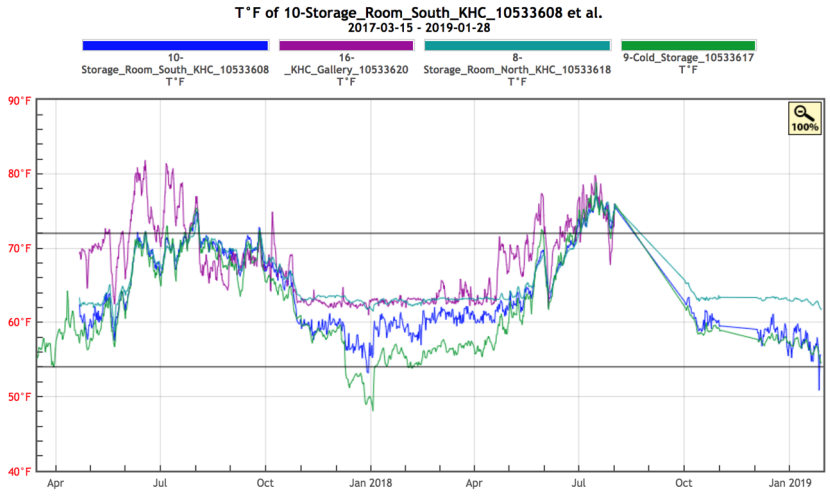
Other aspects of preventive conservation are well-addressed. A Wei-T'o Book Dryer and Insect Exterminator instrument is used to process incoming collections to prevent the introduction of pests, and an IPM reference collection is maintained on-site to compare with pest collected from sticky traps dispersed throughout the building. Lights are kept off when staff are not actively present, and most materials are boxed and/or stored in compact shelving to minimize light exposure. Water-related incidents have not been noted in the collections storage space, and the only water damage noted in the building is on the exterior wall of the basement bathrooms. Intrusion detection has not been addressed though, and it would be beneficial to add a system to do so in order to mitigate this risk.

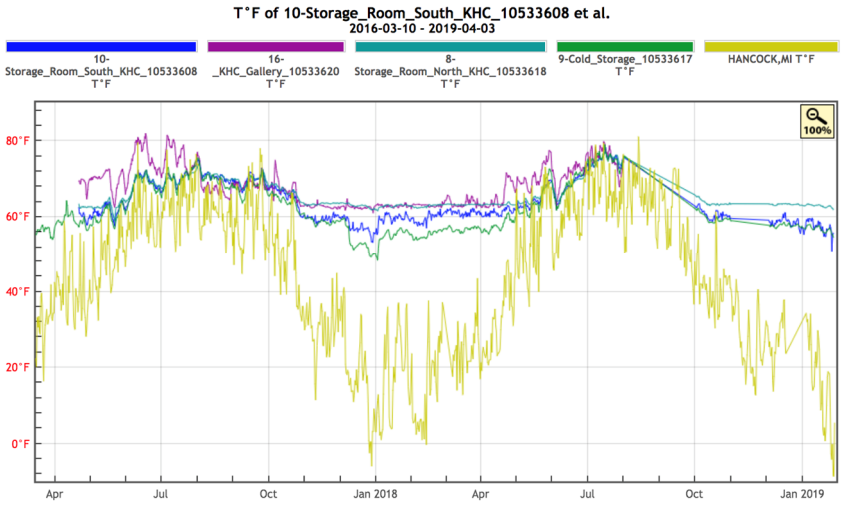
ASSESSMENT

The following assessment is based on data from April 2017 through January 2019. While there were 11 HOBO dataloggers deployed throughout the building, for the reasons described above, only those in the main storage area (Storage_Room_South, Storage_Room_North and Cold-Storage) are examined in detail below, since this is the primary space under consideration for continuing collections storage. The third floor archives space (KHC Gallery) and outdoor weather for the area are also included as points of comparison.

Identified conditions

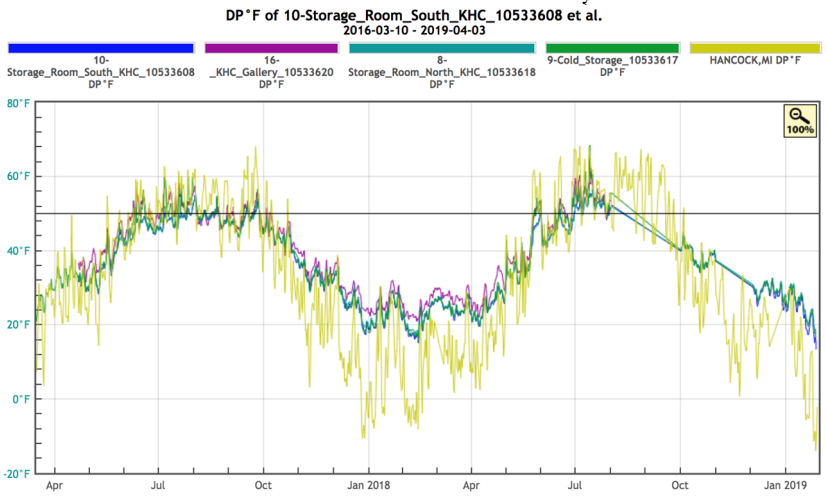
- TWPIs in the basement storage room and vault are 69-73. Aside from the current Textile Storage room (which is also in this range), these are the best conditions currently registered throughout the whole building. As a point of comparison, the archival storage on the third floor has a TWPI of 55, so moving the materials into the basement represents a 24% increase in the expected time before noticeable deterioration occurs.
- However, these are still not the low temperatures that promote long-term preservation, as was seen in the previous chart from the MSQR. Temperature data below is marked to show what would represent "cool" storage at 54°F (still not ideal, as temperatures should be closer to "cold" at 40°F) and human occupancy conditions at 72°F.
    - Temperatures exceed 72°F when outside weather conditions do in the summer. While this is not often (7-11% of the time), the current mechanical system has no ability to counter it, as cooling is only provided by wall A/C units, none of which are present in the basement. A/C units should not be installed in the basement though, as cooler temperatures without dehumidification will push the relative humidity higher, introducing additional risks.



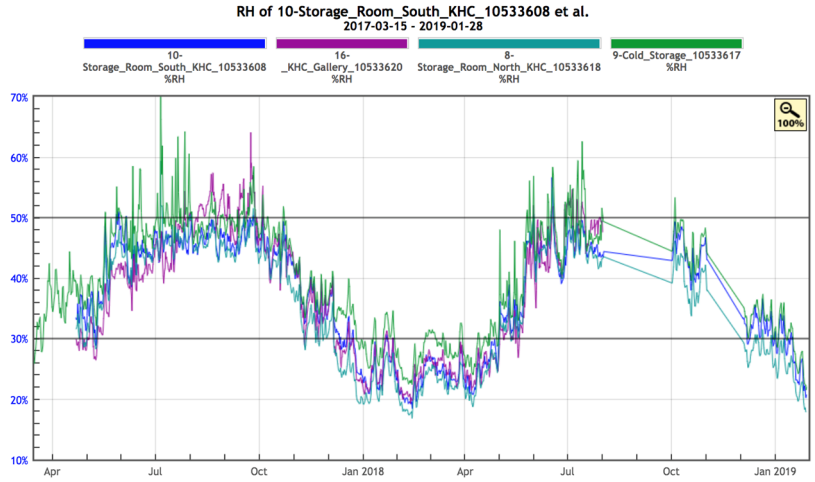


- The temperatures were reported by staff to have increased since the removal of trees from the nearby landscaping for reasons of historic accuracy. Such passive means of mitigating the high temperatures was likely the most efficient way to do so.

- Since the mechanical system has no ability to humidify or dehumidify, the interior spaces closely follow the outside dew point.
  - At an approximately 50°F dew point and 72°F temperature, relative humidity is 47%; even if the current system had cooling capabilities, it would not be advisable as lowering the temperature to even 65°F would result in 60%RH, entering the risk for mold germination and other forms of damage.
  - Dehumidification would have to be present alongside cooling in order to lower the temperature and still maintain a safe relative humidity.



- As discussed previously, the relative humidity levels do not currently indicate a risk, but they are at the higher limit of what would be considered safe.
  - Staff efforts to employ dehumidifiers and fans, while certainly representing an admirable level of commitment, is not a desirable situation since it introduces the potential for water to overflow in collections spaces as condensate pans from dehumidifiers fill, it does not allow for flexibility of staff absences, and is not as effective as dehumidifying within a system, especially as the units will have to constantly work against any incursions of air from other, unconditioned spaces and outside.



- The feasibility of adding components to the mechanical system is questionable.
    - Many of these changes would have to be accompanied by extensive changes to the building envelope in order to effectively distribute air and prevent damage to the structure.
    - Refrigerant systems would require a condenser to be installed outside the building, compromising the historic nature of the landscape.
    - A chilled water or other system would be able to achieve a lower dew point, but would require piping.
    - Adding a desiccant or other form of dehumidification would bring up issues with moisture movement through the building envelope.

Summary

To support long-term preservation for the storage of archival materials, temperatures should be lower, especially by eliminating the higher temperatures and, ideally, high relative humidity in the summer. Neither of these goals can be accomplished with the current mechanical system, as it does not allow for cooling or dehumidification; this is instead achieved by wall A/C units, standalone dehumidifiers, and fans, which also do not have the ability to meet desired conditions. However, adding the ability to cool and dehumidify to the mechanical system would require accompanying changes to the building envelope, discussed in further detail in the subsequent section.

BUILDING ENVELOPE

While building envelope issues can more appropriately and thoroughly be addressed by other project team members, for the purposes of this report, it was important to include the following notes:

- The building envelope is historic and was not designed with a vapor barrier, meaning that creating relative humidity levels inside a space that are significantly different from those outside the building has the potential to result in moisture movement through the walls. This is undesirable as it can result in:
    - damage to the structure, as the water pulls components from the envelope (this is seen in the form of efflorescence on bricks);
    - condensation forming within the walls, allowing for corrosion of interior structural and piping elements and the potential for mold germination;
    - and a loss of efficiency, as the mechanical system must continually compensate for the load/loss from the outside.
- One way this has been handled at other institutions is to construct a standalone structure within the room, referred to as a "box-in-box" design. This could be constructed with its own insulation and vapor barrier, set back from the building walls, which would mean it would not directly impact the historic envelope, and an air space between the two structures would serve as a buffer zone, so that the mechanical system serving the interior structure would not have to work as hard to maintain conditions. However, the current storage space does not have much excess ceiling height and there are columns that appear to be structural spaced throughout the room, all of which would present a challenge for the design of a well-sealed box with adequate space to house the collection.

RECOMMENDATIONS

Given the limitations of the historic building envelope, the following two options should be considered:

- Currently the best environmental conditions are in the existing basement collections storage space, which also has compact shelving already installed and, with the relocation of objects to the warehouse, will have the capacity to hold the remaining archival materials from other spaces in the building, primarily from the third floor.

  Since some collections will have to remain on-site in order to be able to continue to serve researchers, this space could continue to function as a collections storage space. Efforts should be made to maximize environmental conditions there to the extent possible without adversely affecting the existing building envelope.

  - Reinstituting some form of landscaping or other acceptable means of keeping heat off of this one portion of the building should be considered, as it will help to minimize the temperature gains seen in the summer. Landscaping should be done in such a way that it does not lead to water retention or pests close to the building.

  - Options for minimal dehumidification should be explored at the conclusion of the envelope study when the dew point capabilities of the building envelope have been established. While not ideal in terms of demands on staff and the introduction of additional risks to the space, if it is determined that limited dehumidification can be performed, the use of dehumidifiers and fans within the space may be appropriate for the brief periods of time that relative humidity levels exceed 50% in the summer.

  Since the warehouse renovation offers the greatest opportunity for creating a dedicated preservation environment, long-term storage in it should be maximized to the degree that this can be balanced with access concerns. For environmentally sensitive materials and those that are not regularly accessed, a program of digitization and rehousing in more appropriate locations within the warehouse can be used for long-term preservation.

- The other option would be to consider, in collaboration with the space planning study, additional location options for the collections storage where a "box-in-box" construction might be feasible. Only Option 4 of the existing proposals involves the majority of the 1st floor, which may be desirable, especially given the proximity to the Reading Room.

- Intrusion detection for the building should be added for the safety and protection of the structure, staff and visitors, and collections.

Appendix 1 – IPI Metrics

Natural Aging

Measures:

The rate of "natural aging" as determined by the rate of spontaneous chemical change in organic materials.

- TWPI integrates the T and RH values as they change over time into a single estimate of the cumulative effects of the envrionment on the rate of chemical decay.
- TWPI is helpful as a quantitative comparison of the preservation quality of different storage locations or environments.

Applies to:

All Organic Materials (paper, textiles, plastics, dyes, leather, fur, etc).

TWPI Metric	Interpretation
TWPI > 75	GOOD
45 < TWPI ≤ 75	OK
TWPI ≤ 45	RISK

Metal Corrosion

Measures:

The effect of the environment on metal corrosion. The % EMC max represents the maximum amount of moisture that was present in hygroscopic collection materials. Because metallic corrosion is dependent on available moisture, the % EMC gives us an idea whether or not metallic objects (mainly ferrous metals) would corrode in such an environment.

Applies to:

Metals or materials with metal components.

Corrosion Metric	Interpretation
Max EMC ≤ 7.0	GOOD
7.1 ≤ Max EMC ≤ 10.5	OK
Max EMC > 10.5	RISK

Mold Risk

Measures:

The risk for growth of the xerophilic mold species on collection objects or in collection areas.

Applies to:

All organic materials (paper, textiles, plastics, dyes, leather, fur) or inorganic materials with organic films.

Mold Risk Metric	Interpretation
MRF ≤ 0.5	GOOD
MRF > 0.5	RISK

Note: There is no "OK" rating for mold risk. At a MRF of 0.5, conditions are appropriate for germination of spores. By alerting RISK of mold growth at germination, the user is aware of the potential of mold growth before any visible or vegetative mold will appear. This allows for time to react and prevent formation of vegetative mold.

Mechanical Damage

Measures:

Three aspects of moisture content that promote mechanical or physical damage:

1. Max % EMC: Is it too damp? Will paper curl? Will emulsions soften? Will wood warp?
2. Min % EMC: Is it too dry? Will paper become brittle? Will emulsions crack?
3. % DC: How great are the fluctuations between the most damp and the most dry? Has expansion and contraction - from absorption/de-sorption of water - put physical stress on the collection materials?

Applies to:

All organic materials (paper, textiles, plastics, dyes, leather, fur) or inorganic materials with organic films.

Mechanical Damage Metrics	Interpretation
Min EMC ≥ 5% AND Max EMC ≤ 12.5% AND %DC ≤ 0.5%	GOOD
Min EMC ≥ 5% AND Max EMC ≤ 12.5% AND 0.5% < %DC ≤ 1.5%	OK
Min EMC < 5% OR Max EMC > 12.5% OR %DC > 1.5%	RISK

Appendix G - Condensed VA/CBA Workshop Notes

PREFACE

On June 4th and 5th, 2019 concerned parties gathered for a Condensed Value Analysis/Choosing by Advantages ("Condensed VA/CBA") workshop to choose preferred alternatives among those presented in the 75% draft of the HSR.

Participants included:
Wyndeth Davis, Superintendent, NPS KEWE
John Rosemurgy, Historical Architect, NPS KEWE
Brian Hoduski, Chief of Museum and Archival Services, NPS KEWE
Jeremiah Mason, Archivist, NPS KEWE
Jo Holt, Historian, NPS KEWE
Steve DeLong, Landscape Architect, NPSKEWE
Chris St. Martin, Facility Manager, NPS KEWE
Kathleen Hanter, I&E Program Manager, NPS KEWE
Robert McKay, Historic Architect, Michigan SHPO
Elizabeth Hallas, Principal, Anderson Hallas Architects (Facilitator)
Laine McLaughlin, Project Architect, Anderson Hallas Architects

The condensed VA/CBA process took the participants through the following steps

1. In the Information phase, participants reviewed background information such as character defining features and then identified stakeholders
2. Next, in the Evaluation phase, the team reviewed NPS principles and factors and attached criteria to each factor that would be useful in evaluating the alternatives.
3. Choosing By Advantages is one option for evaluation within the VA process. For each factor, the team evaluated the alternative as to its relative advantage in that regard, assigning a weight to each of 0 to 100.
4. Weights were summed for each alternative to arrive at an advantage rating. This rating was compared to the estimated cost for the alternative to produce an advantage to cost ratio. The alternative with the most advantage was considered the preferred alternative.
5. Reconsideration. As only three alternatives were developed and priced, there is often some bundling of design options in each alternative. Some aspects of an alternative are thus interchangeable. The reconsideration process allows participants to incorporate other design options so long as the overall weighting is not deemed to be at risk. The participants also offered other design ideas that the discussion of the alternative brought to light--for example, security implications of a presented egress route.

During this session, this problem of bundled design options caused concern among many participants, who felt it skewed the results. Options for accessibility were bundled together with the options for egress stair location. Some participants would have preferred that these options be evaluated independently. Despite this concern, it was generally agreed to proceed with the alternatives as prepared.

The workshop was considered "condensed" because the Functional Analysis and Creativity phases, in which the alternatives are framed, developed and priced, occurred prior to the workshop. Also, a formal VA report was not included in the deliverables.

Keweenaw National Historic Park
Calumet & Hecla Library & Quincy Mine Office HSRs
VALUE ANALYSIS/CBA LITE – JUNE 4 & 5, 2019





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KEWE / C&H LIBRARY AND QUINCY MINE OFFICE HSR VA/CBA LITE

AGENDA – TUESDAY JUNE 4, 2019

9:00 **INTRODUCTIONS AND KICKOFF**

9:15 **GENERAL INFORMATION**
- Review Agenda/Describe Intent
- Rules of Engagement
- Parking Lot

9:30 **PERIOD OF SIGNIFICANCE DISCUSSIONS**
- Quincy District/Building
- Calumet & Hecla District/Building

9:45 **REVIEW PROJECT GOALS(SOW)**
- Accessibility and Egress
- Building Program

10:00 **BREAK**

10:15 **C&H LIBRARY VA/CBA LITE: STAKEHOLDERS**

10:30 **PRESENT C&H LIBRARY DESIGN ALTERNATIVES**
- 1 – Vestibule Entry
- 2 – Basement Entry
- 3 – Vault Entry

11:30-12:15 **LUNCH BREAK**

12:15 **EVALUATION - CHOOSING BY ADVANTAGE**
- Review NPS Principles, Factors and Subfactors
- List Attributes of Each Alternative
- Score Advantages

2:45 **BREAK**

3:15 **CBA CONCLUDE VA - C&H LIBRARY**
Insert Scores Into Importance/Cost Graph
- Finalize Scores & Costs into Importance Graph
- Identify Apparent "Preferred Alternative"

4:00 **ADJOURN**

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VALUE ANALYSIS PROCESS - OVERVIEW



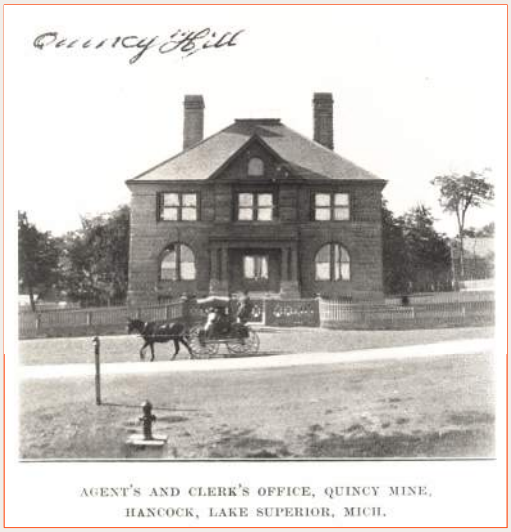
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RULES OF ENGAGEMENT

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PERIOD OF SIGNIFICANCE– QUINCY



AGENT'S AND CLERK'S OFFICE, QUINCY MINE, HANCOCK, LAKE SUPERIOR, MICH.

Quincy Mining Company Historic District

National Historic Landmark, ca. 1989
Period of Significance: 1846-1931

Revised Nomination, 2017 (pending approval)
Period of Significance: 1856-1920

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PERIOD OF SIGNIFICANCE– CALUMET & HECLA



Calumet Historic District

Initial NRHP Listing, 1974
National Historic Landmark, 1989

Period of Significance: 1864-1930

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PROJECT GOALS





STATEMENT OF WORK:

Alternatives for treatment that address...
- Universal access
- Life safety
- Program and use
- Structural - improvement of deficient systems
- MEP- replacement or introduction of new systems

...in context of impact on historic materials and historic character

SITE VISIT CLARIFICATIONS

Building Specific, such as:
- Elevator in all alternatives, QMO
- Archival role for Library
- Unguided interpretation, both

Led to:
- Validation of facility plan
- Archival consultant

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PROJECT GOALS: 2009 FACILITY PLAN AND CBA

C&H
- Proposed Building Use
  - Current: museum services
    Proposed: interpretive (corporate paternalism)
- 2009 CBA- Alternative 2
- Highlights
  - Museum storage and processing
  - Reconstruction of Delivery Room
  - Use of reading rooms
  - Gallery storage

QMO
- Proposed Building Use
  - Current: historic leasing
  - Proposed: interpretive (business of mining)
- 2009 CBA- Alternative 2
- Highlights
  - Interpretive use of front offices
  - Leased space of rear offices
  - Interpretive use of one office on 2nd floor

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PROJECT GOALS: NOV 2018 FACILITY USE DISCUSSION

C&H

- Confirmed: museum services with *strong* interpretive component
- Basement: public viewing of processing space
- Delivery Room reconstruction
- South wing office partitions
- Flexible use of main reading room
- Children's reading room as a controlled but viewable space?
- Concept of secure zones
- Partnerships

QMO

- Confirmed: leased offices with interpretive component
- KNHP/Quincy welcome point?
- 1st floor: leased office plus interpretive
- 2nd floor: leased, maybe interpretive
- Self-guided interpretation
- Interpretive vignettes
- Concept of secure zones
- Partnerships

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C&H LIBRARY HSR VA/CBA LITE



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STAKEHOLDERS

STAKEHOLDERS	INTERESTS
Park visitors	Historic building and setting, curiosity, interest in historic use, connect with heritage and family stories, education of school groups, meeting space
Visiting scholars	Park collections, reference desk, walk-in service (to discuss), wifi connection, cloak room
Museum services staff	Secure office space, processing space, archives, general storage, housekeeping storage, fireproof files, digitalization, security
Maintenance staff	Reduce maintenance, consolidation, snow removal considerations, custodial equipment, water access
KEWE Interpretive	Setting and landscape, ability to go in, lead groups, connect to historic uses, oral histories
Educators	Access to resources, 26 students typical, bus parking, restroom count, web ex, remote learning
SHPO	Maintain historic fabric vs function and public use, no adverse effect goal, archeological sensitivity, cultural landscape integrity
NPS Midwest Region	Deferred maintenance, sustainable operations, multi-park archives, justifiable expenses, visitor experience, cultural resource
Park Manager	Income generating opportunities, micro-lease potential, small event space

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DESIGN ALTERNATIVES



COMMON TO ALL

- Recommended treatments for historic fabric
- Air conditioning via a VRF system
- Dehumidification for archival storage
- Restoration of 1st floor Delivery Room
- Accessible restroom on 2nd floor
- Certain code compliance matters

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VA ALTERNATIVES



ALTERNATIVE VARIABLES

- Exterior accessible route from parking to entry
- Accessible entry
- Elevator and hoistway
- Interior accessible route
- Egress solution
- Public use of basement
- South wing office arrangement

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TREATMENT ALTERNATIVES



ALTERNATIVE 1
- Entrance through vestibule

ALTERNATIVE 2
- Entrance through basement

ALTERNATIVE 3
- Entrance through vault

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ALTERNATIVE #1 – ENTRANCE THROUGH VESTIBULE

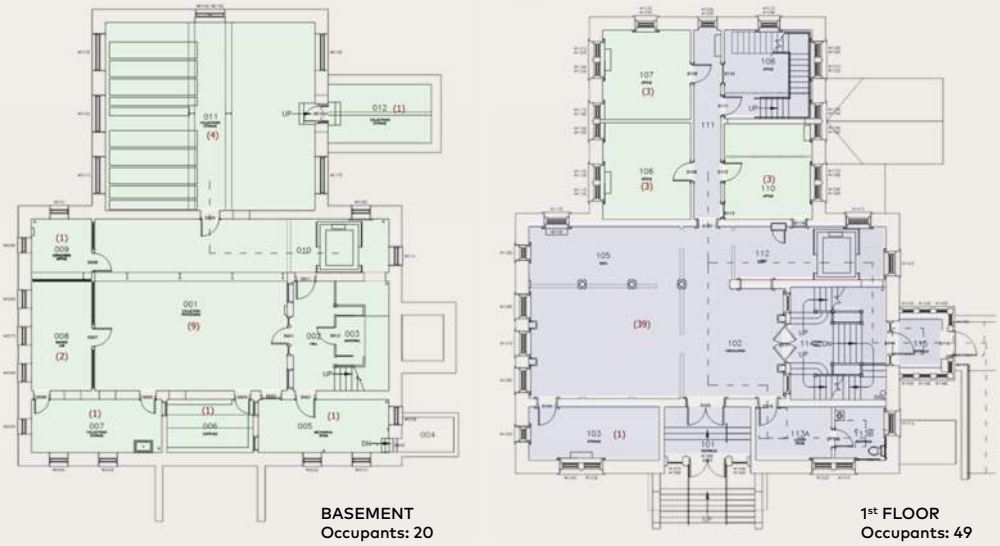


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ALTERNATIVE #1 – ENTRANCE THROUGH VESTIBULE

☐ PUBLIC – INTERPRETIVE
☐ KNHP STAFF USE



BASEMENT
Occupants: 20

1st FLOOR
Occupants: 49

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ALTERNATIVE #1 – ENTRANCE THROUGH VESTIBULE

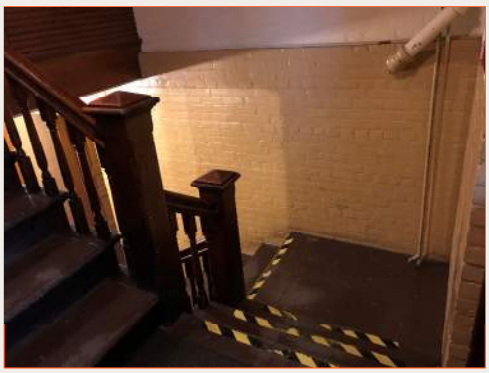




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ALTERNATIVE #1 – ENTRANCE THROUGH VESTIBULE



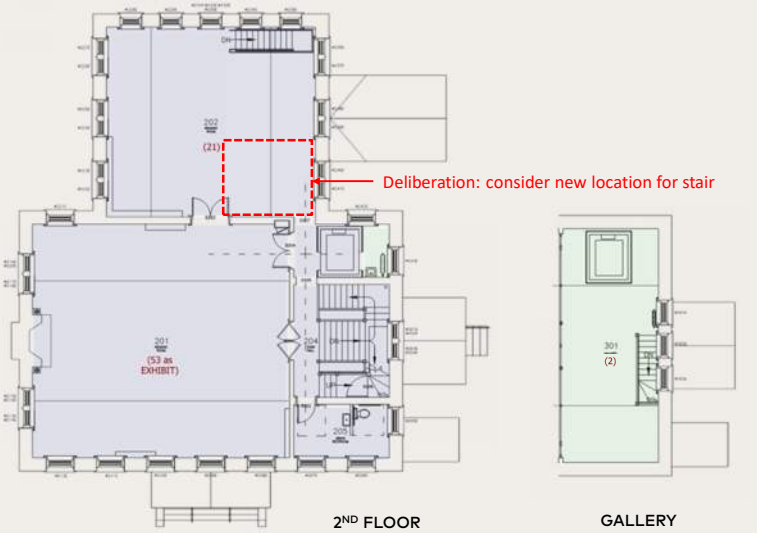


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ALTERNATIVE #1 – ENTRANCE THROUGH VESTIBULE

PUBLIC–INTERPRETIVE
KNHP STAFF USE



2ND FLOOR
Occupants: 74

GALLERY
Occupants: 2

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ALTERNATIVE #1 – ENTRANCE THROUGH VESTIBULE





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ALTERNATIVE #2 – ENTRANCE THROUGH BASEMENT



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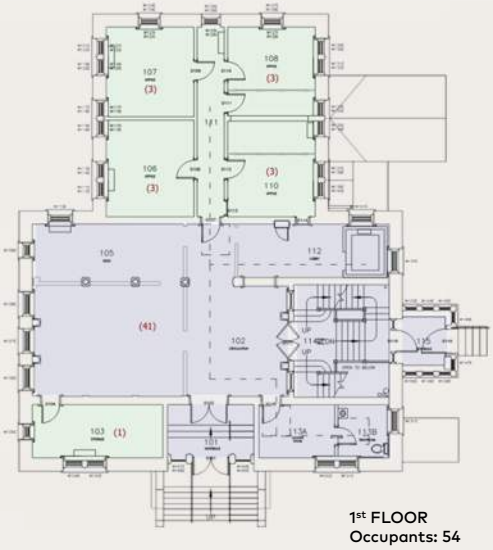
KEWE / C&H LIBRARY HSR VA/CBA LITE

ALTERNATIVE #2 – ENTRANCE THROUGH BASEMENT

PUBLIC–INTERPRETIVE
KNHP STAFF USE



BASEMENT
Occupants: 23



1st FLOOR
Occupants: 54

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ALTERNATIVE #2 – ENTRANCE THROUGH BASEMENT



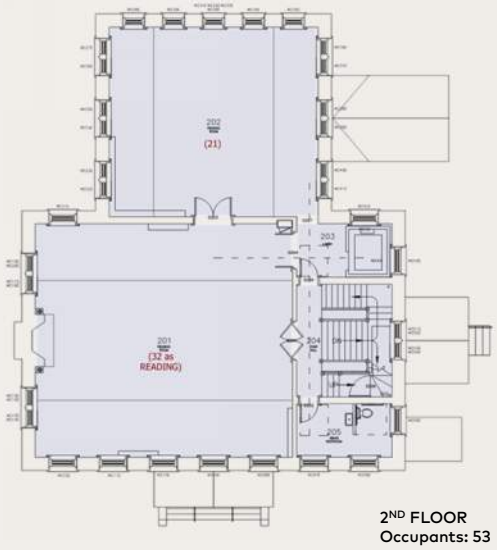


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ALTERNATIVE #2 – ENTRANCE THROUGH BASEMENT

PUBLIC–INTERPRETIVE
KNHP STAFF USE



2ND FLOOR
Occupants: 53

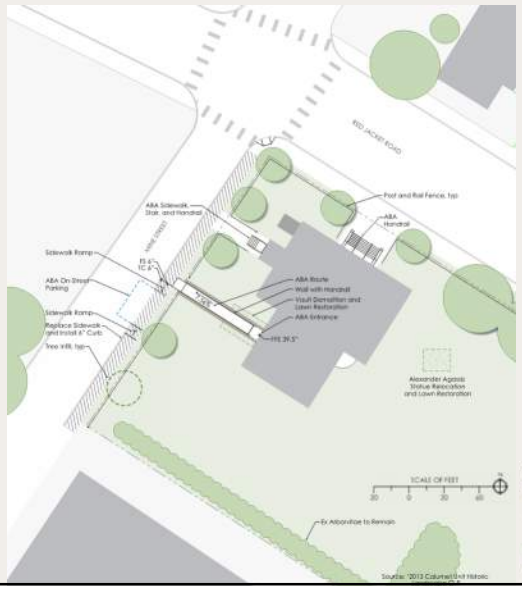


GALLERY
Occupants: 2

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ALTERNATIVE #3 – ENTRANCE THROUGH VAULT



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ALTERNATIVE #3 – ENTRANCE THROUGH VAULT

☐ PUBLIC – INTERPRETIVE
☐ KNHP STAFF USE



BASEMENT
Occupants: 22



1st FLOOR
Occupants: 52

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ALTERNATIVE #3 – ENTRANCE THROUGH VAULT



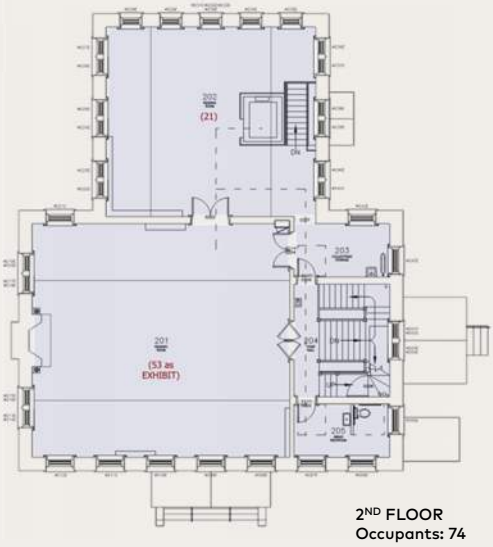


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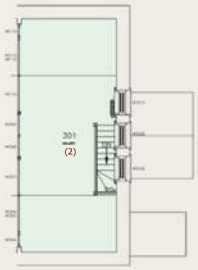
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ALTERNATIVE #3 – ENTRANCE THROUGH VAULT

PUBLIC–INTERPRETIVE
KNHP STAFF USE



2ND FLOOR
Occupants: 74



GALLERY
Occupants: 2

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ALTERNATIVE #3 – ENTRANCE THROUGH VAULT

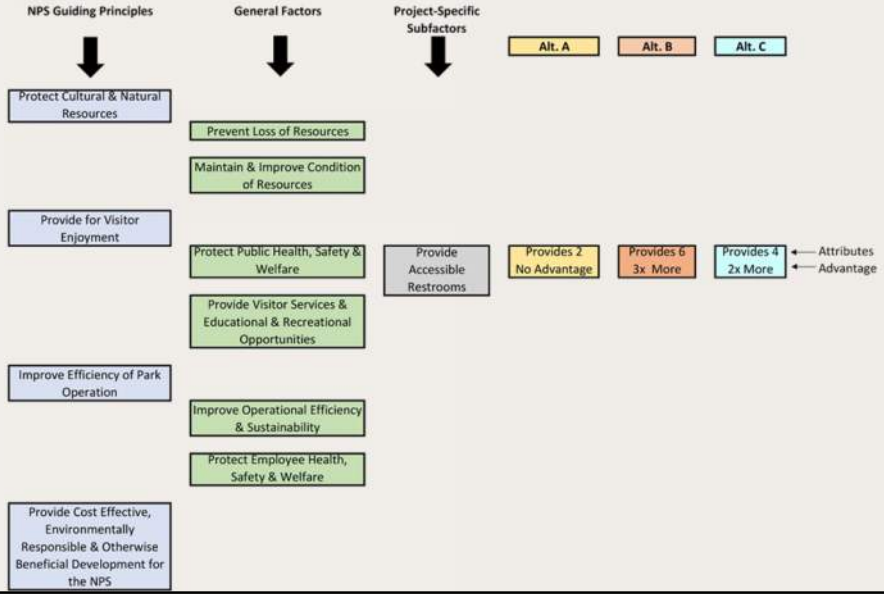




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CHOOSING BY ADVANTAGES PROCESS



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EVALUATION OF ADVANTAGES

Proposed Factor Criteria

Principle 1 – Protect Natural & Cultural Resources

Factor 1 – Prevent Loss of Resources
- **1A** Minimize Impact to Historic Fabric, Spaces and Setting
- **1B** Minimize Impact to Archival Resources

Factor 2 – Maintain & Improve Condition of Resources
- **2A** HSR Treatment Recommendations - Common to all

Principle 2 – Provide for Visitor Enjoyment

Factor 3 - Provide Visitor Services & Opportunities
- **3A** Expand opportunities for site-based interpretation of related themes
- **3B** Improve site and building access per 7 principles of universal design

Factor 4 – Protect Public Health, Safety, & Welfare
- **4A** Improve egress conditions

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EVALUATION OF ADVANTAGES

Proposed Factor Criteria

Principle 3 – Improve Efficiency of Park Operations

Factor 5 – Improve Operational Efficiency and Sustainability
- **5A** Improve utility of south wing offices
- **5B** Establish secure zones for work areas
- **5C** Minimize maintenance efforts
- **5D** Facilitate efficient operation of reading room(s)

Principle 4 – Provide Cost Effective, Responsible & Otherwise Beneficial Development for NPS

Factor 6 – Provide Other Advantages to the National Park System
- **6A** Expand opportunities for revenue sources

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EVALUATION OF ADVANTAGES

PRINCIPLE
PROTECT NATURAL & CULTURAL RESOURCES

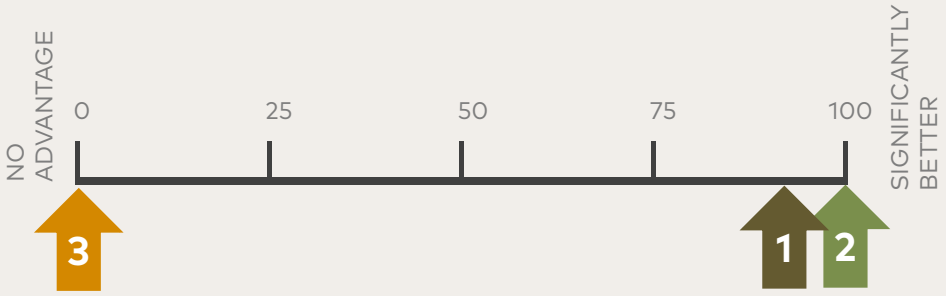
FACTOR 1
PREVENT LOSS OF RESOURCES

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EVALUATION OF ADVANTAGES

1A MINIMIZE IMPACT TO HISTORIC FABRIC, SPACES & SETTING



Alternative 1
Entry through vestibule

Alternative 2
Entry through basement

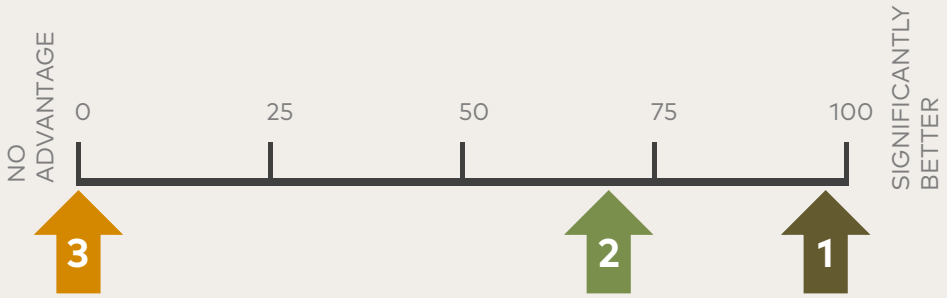
Alternative 3
Entry through vault

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EVALUATION OF ADVANTAGES

1B MINIMIZE IMPACT TO ARCHIVAL RESOURCES



Alternative 1
Entry through vestibule

Alternative 2
Entry through basement

Alternative 3
Entry through vault

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EVALUATION OF ADVANTAGES

PRINCIPLE
PROVIDE FOR VISITOR ENJOYMENT

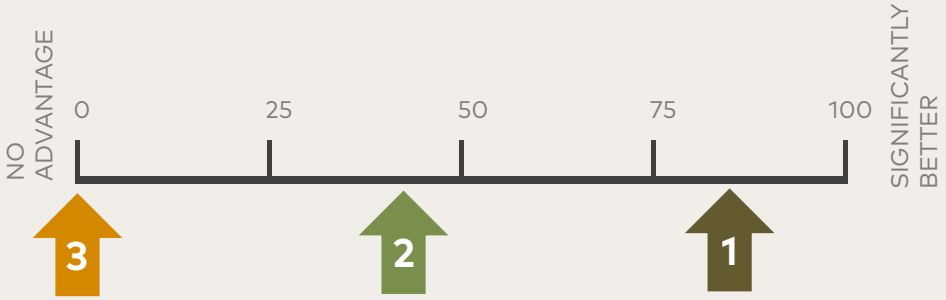
FACTOR 3
PROVIDE VISITOR SERVICES AND OPPORTUNITIES

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EVALUATION OF ADVANTAGES

3A EXPAND OPPORTUNITIES FOR INTERPRETATION



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Alternative 1
Entry through vestibule

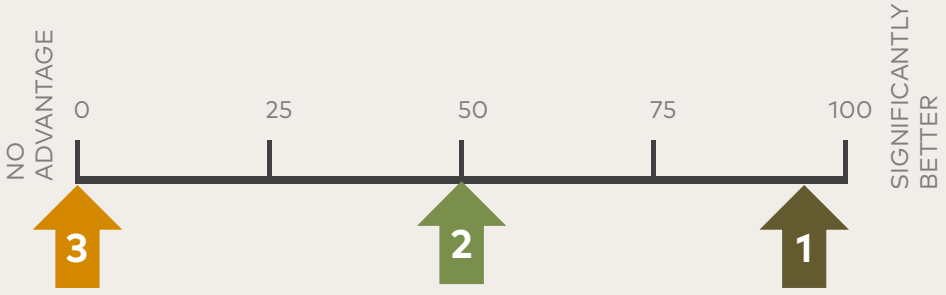
Alternative 2
Entry through basement

Alternative 3
Entry through vault

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EVALUATION OF ADVANTAGES

3B IMPROVE SITE AND BUILDING UNIVERSAL ACCESS



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Alternative 1
Entry through vestibule

Alternative 2
Entry through basement

Alternative 3
Entry through vault

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EVALUATION OF ADVANTAGES

PRINCIPLE
PROVIDE FOR VISITOR ENJOYMENT

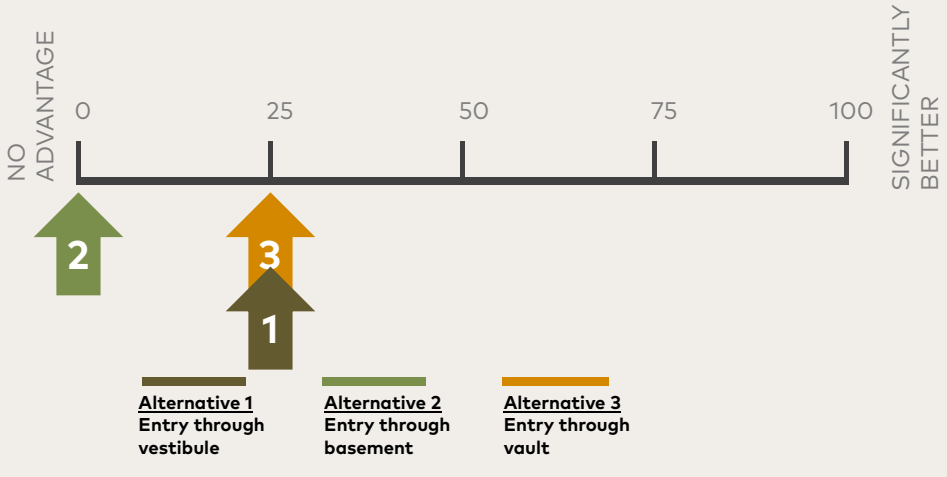
FACTOR 4
PROTECT PUBLIC HEALTH, SAFETY AND WELFARE

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EVALUATION OF ADVANTAGES

4A IMPROVE EGRESS CONDITIONS



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EVALUATION OF ADVANTAGES

PRINCIPLE
IMPROVE EFFICIENCY OF PARK OPERATIONS

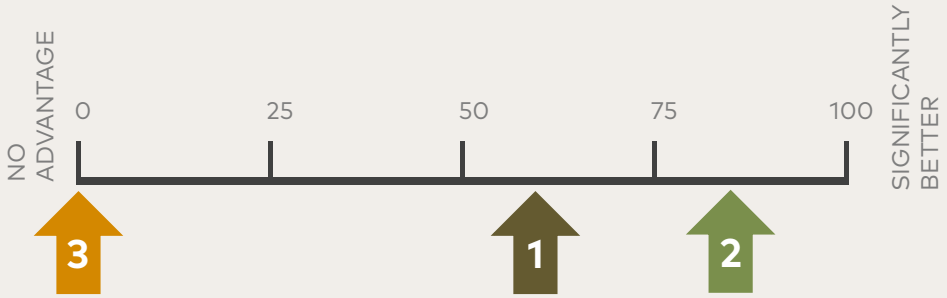
FACTOR 5
IMPROVE OPERATIONAL EFFICIENCY

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EVALUATION OF ADVANTAGES

5A IMPROVE UTILITY OF SOUTH WING OFFICES



Alternative 1
Entry through vestibule

Alternative 2
Entry through basement

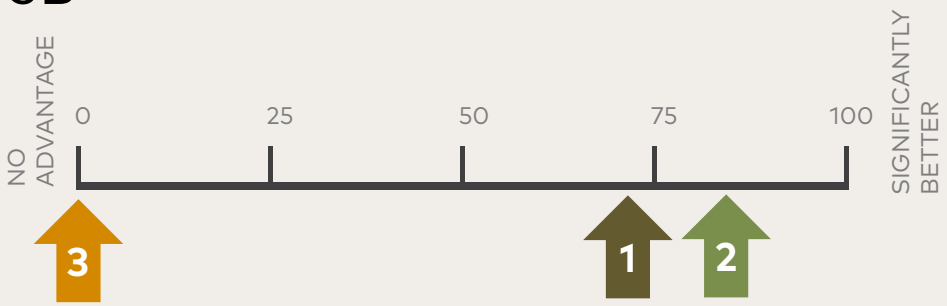
Alternative 3
Entry through vault

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EVALUATION OF ADVANTAGES

5B ESTABLISH SECURE ZONES FOR WORK AREAS



Alternative 1
Entry through vestibule

Alternative 2
Entry through basement

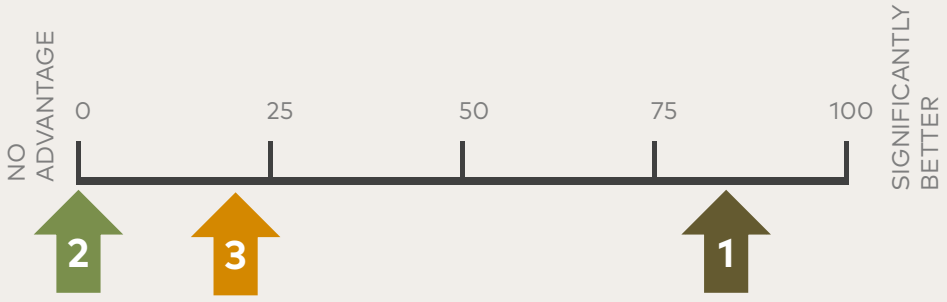
Alternative 3
Entry through vault

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EVALUATION OF ADVANTAGES

5C MINIMIZE MAINTENANCE EFFORTS



Alternative 1
Entry through vestibule

Alternative 2
Entry through basement

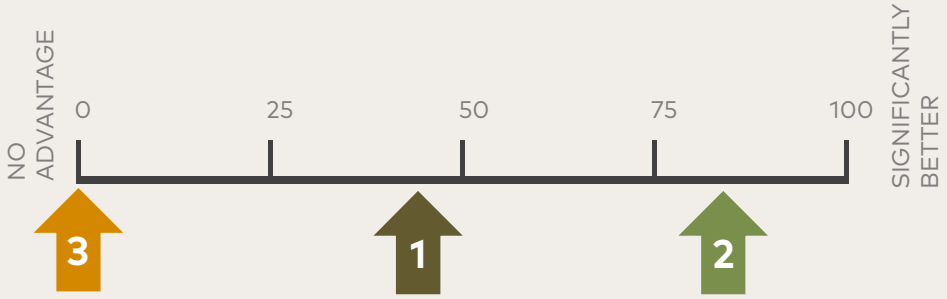
Alternative 3
Entry through vault

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EVALUATION OF ADVANTAGES

5D FACILITATE EFFICIENT OPERATION OF READING ROOM(S)



Alternative 1
Entry through vestibule

Alternative 2
Entry through basement

Alternative 3
Entry through vault

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EVALUATION OF ADVANTAGES

PRINCIPLE
PROVIDE COST EFFECTIVE DEVELOPMENT FOR NPS

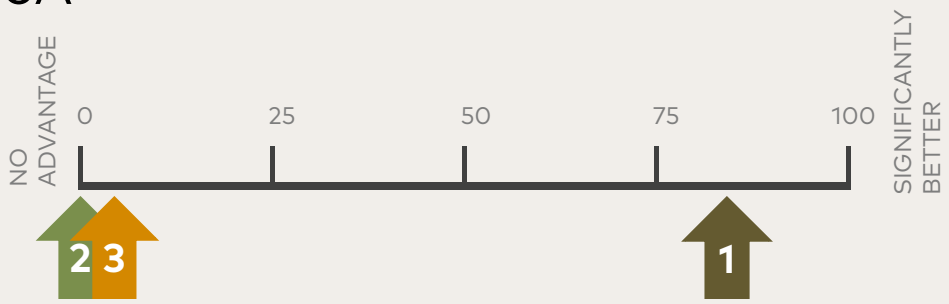
FACTOR 6
PROVDE OTHER ADVANTAGES TO THE NPS

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EVALUATION OF ADVANTAGES

6A EXPAND OPPORTUNITIES FOR REVENUE SERVICES



Alternative 1
Entry through vestibule

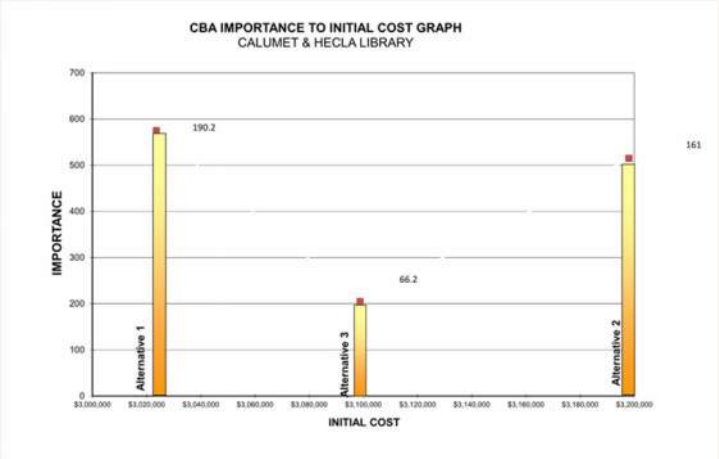
Alternative 2
Entry through basement

Alternative 3
Entry through vault

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PREFERRED ALTERNATIVE



ALTERNATIVE 1 PREFERRED

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RECONSIDERATION

ALTERNATIVE 1 RECONSIDERATION

- Review location of second egress to improve NPS reading room security
- Reconstruct missing stair section (north)
- Review egress through reading room and need for lockable cabinets

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Appendix H - Cost Estimate

United States Department of the Interior
National Park Service
Class C Construction Cost Estimate

BASIS OF ESTIMATE

PROJECT INFORMATION

Project:	Calumet & Hecla Public Library
Park:	Keweenaw National Historic Park
Park Alpha:	KEWE
PMIS Number:	237234
Estimate Date:	10/28/19 - V1.0
Prepared By:	McCabe Karcher
Company:	ACC Cost Consultants, LLC
Address:	8060 SW Pfaffle St., Suite 110
City, State Zip:	Tigard, Oregon 97223
Phone:	503-718-0075

BACKGROUND SUPPORTING MATERIAL (Scope of Work):

This Historic Structures Report (HSR) identifies characteristics and features that convey the historic significance and character of The Calumet & Hecla Library in Keweenaw National Historic Park and provides a plan for the long-term preservation and stewardship of the existing structure. The report provides park management with a comprehensive understanding of the physical evolution of the building, and provides managers with guidance for care of these features. Treatment recommendations include repair and modification of building exterior & interior surfaces, structural components, mechanical, plumbing and electrical systems.

SOURCE OF COST DATA:

Cost Data is based on ACC's work history along with ACC's database of past and current projects. When cost data is not available for certain component parts, pricing defaults to our Portland, Oregon data base and or RS Means. (The Means City Cost Index and other factor percentages adjusts for location factor and pricing). whenever possible, pricing includes contacting local suppliers and vendors for price checks. This estimate is formulated on the estimator's professional judgment and experience. This estimates makes no warranty, expressed or implied, that the quantities, bids or the negotiated cost of the work will not vary from the estimator's opinion of probable construction cost. This estimate assumes a competitive bidding environment of no fewer than three (3) competitive bidders.

ESTIMATE ASSUMPTIONS:

Assume a construction start of spring 2021

MAJOR CHANGES FROM PREVIOUS ESTIMATE:

Alternate #1 has been incorporated into the base bid. Alternates #2 & 3 have been discarded.

DESCRIPTION OF MARK-UP & ADD-ONS:

United States Department of the Interior
National Park Service
Class C Construction Cost Estimate

BASIS OF ESTIMATE

PROJECT INFORMATION

Project: Calumet & Hecla Public Library

Park: Keweenaw National Historic Park
Park Alpha: KEWE
PMIS Number: 237234
Estimate Date: 10/28/19 - V1.0

Location Factor:	-19.00%	Per NPS
Remoteness Factor:	13.00%	Site is 125 miles from published commercial center. Factor revised per RS Means with Iron Mountain as a point of reference.
Wage Rate Factor:	0.00%	Not required
State & Local Taxes:	6.00%	The state general sales tax rate of Michigan is 6% on material only. Michigan cities and/or municipalities don't have a city sales tax.
Design Contingency:	20.00%	per NPS Cost Estimating Handbook Requirements, at PD contingency range is 25% to 30%, at SD stage 15% to 20%. Use 20 % for this submittal.
Standard. General Conditions:	15.00%	Per NPS Handbook, typical range is 4 to 20%. This is Pre-Design level estimate allow 15%
Government General Conditions:	10.00%	Per NPS Handbook, typical range is 5 to 10%. This is Pre-Design level estimate allow 10%
Historic Preservation Factor:	10.00%	per NPS Cost Estimating Handbook Requirements, at SD contingency range is 0% to 10%, at DD stage 0% to 5%. Use 10 % for this submittal because it is HSR/SD.
Contractor Overhead:	15.00%	per NPS Cost Estimating Handbook Requirements, range is 10% to 25%. Use 15% for this submittal.
Contractor Profit:	10.00%	Per NPS Handbook, typical range is 10 to 25%. This is Pre-Design level estimate allow 10%
Bonds and Permits:	3.176%	Bonds 1.105%, Insurance 1.039% & Permits 1.032%
Contracting Method Adjustment:	15.00%	Assume full & open bidding process with a minimum of three qualified bidders.
Annual Inflation Escalation Factor:	0.00%	Projected annual inflation rate.
Time Until Project Midpoint (Months)	10	Number of months from estimate (or data) date until the projects midpoint of construction.

United States Department of the Interior
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BASIS OF ESTIMATE

PROJECT INFORMATION

Project: Calumet & Hecla Public Library

Park: Keweenaw National Historic Park
Park Alpha: KEWE
PMIS Number: 237234
Estimate Date: 10/28/19 - V1.0

OTHER COMMENTS:

This estimate is for direct construction cost only. It does not include furnishings & equipment, architect and engineer design fees, consultant fees, inspection and testing fees, plan check fees, hazardous material testing and removal, financing costs, nor any other normally associated development costs. This estimate assumes a competitive bidding process. This is a probable cost estimate based on in-progress documentation provided by the architect. The actual bid documents will vary from this estimate due to document completion, detailing, specification, addendum, etc. The estimator has no control over the cost or availability of labor, equipment, materials, over market conditions or contractor's method of pricing, contractor's construction logistics and scheduling.

United States Department of the Interior
National Park Service
Class C Construction Cost Estimate

PROJECT COST SUMMARY

Project: Calumet & Hecla Public Library
Park: Keweenaw National Historic Park
Alpha: KEWE
PMIS: 237234

Estimate By: McCabe Karcher
Date: 10/28/19 - V1.0

Reviewed By: Seth Pszczolkowski
Date: 10/28/19

Item No.	Description	Quantity	Unit	Cost/Unit	Total
1	Base Bid	1	VALUE	$1,295,781	$1,295,781
	Subtotal Direct Construction Costs				**$1,295,781**
	Value of Government Furnished Property (GFP) Included in Direct Cost (see footnote)*				**$0**
				Direct Cost Subtotal without GFP	**$1,295,781**
	Published Location Factor	-19.00%			-$246,198
	Remoteness Factor	13.00%			$168,452
	Federal Wage Rate Factor	0.00%			$0
	State & Local Taxes - 40% of Direct Costs	6.00%			$31,099
	Design Contingency	20.00%			$259,156
	Total Direct Construction Costs				**$1,508,290**
	Standard General Conditions	15.00%			$226,243
	Government General Conditions	10.00%			$150,829
	Historic Preservation Factor	10.00%			$150,829
	Subtotal NET Construction Cost				**$2,036,191**
	Overhead	15.00%			$305,429
	Profit	10.00%			$203,619
	Estimated NET Construction Cost				**$2,545,239**
	Bonds & Permits	3.18%			**$80,837**
	Contracting Method Adjustment	15.00%			$381,786
	Inflation Escalation	10	Months	0.00%	$0
	Total Estimated NET Cost of Construction				**$3,007,861**

* GFP costs are only used when the Government pre-purchases items, or provides other materials out of Government inventory, to be installed by contractor. Adjustments and Markup on GFP only include Inflation Escalation; No other adjustment factors or O&P markup have been applied.

United States Department of the Interior
National Park Service
Class C Construction Cost Estimate

LINE ITEM COST SUMMARY

Project:	**Calumet & Hecla Public Library**	**Estimate By:**	McCabe Karcher
Park:	**Keweenaw National Historic Park**	**Date:**	10/28/19 - V1.0
Park Alpha:	**KEWE**	**Reviewed By:**	Seth Pszczolkowski
PMIS Number:	**237234**	**Date:**	10/28/19
Summary Item 1	**Base Bid**	**Total Cost:**	$1,295,781

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
A10	**FOUNDATIONS**					
Level 3 Code	Install foundation crack gauge monitor	1	LS	$ 500.00	$500	
Level 3 Code	Elevator Pit	1	LS	$ 20,000.00	$20,000	Includes potential underpinning
Level 3 Code	Staircase sonotube footings	4	EA	$ 350.00	$1,400	Alternate 1
Level 3 Code	Description	0	Unit	$ -	$0	
	SUBTOTAL FOUNDATIONS	**1**	**VALUE**	**$ 21,900.00**	**$21,900**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
B10	**SUPERSTRUCTURE**					
Level 3 Code	Wall framing - demo paint N elevation & waterproof	400	SF	$ 7.50	$3,000	
Level 3 Code	Elevator CMU shaft	1165	SF	$ 12.00	$13,980	Alternate 1
Level 3 Code	2-hr fire rated ceiling	46	SF	$ 45.00	$2,070	Alternate 1
Level 3 Code	Ceiling steel	1	LS	$ 4,000.00	$4,000	Alternate 1
Level 3 Code	Steel transfer beam & post through cast iron floor plates	1	ALLW	$ 3,000.00	$3,000	Alternate 1
Level 3 Code	Retrofit lintels in cut brick	2	EA	$ 750.00	$1,500	Alternate 1
Level 3 Code	1st/2nd floors - Demo ceiling, sister joists, replace ceilings	5080	SF	$ 10.83	$55,000	Assume 5080 SF sistered joists
Level 3 Code	Description	0	Unit	$ -	$0	
	SUBTOTAL SUPESTRUCTURE	**1**	**VALUE**	**$ 82,550.00**	**$82,550**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
B20	**EXTERIOR CLOSURE**					
Level 3 Code	Exterior masonry - demo & repoint mortar	2895	SF	$ 2.50	$7,238	40% of 7,283 sf

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LINE ITEM COST SUMMARY

Project:	**Calumet & Hecla Public Library**	**Estimate By:**	McCabe Karcher
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PMIS Number:	**237234**	**Date:**	10/28/19

Summary Item 1 **Base Bid** **Total Cost:** $1,295,781

Level 3 Code	Exterior masonry - repair sandstone cracks	1	LS	$ 1,000.00	$1,000	per design team
Level 3 Code	Remove wood and nails from façade & patch	1	LS	$ 2,000.00	$2,000	
Level 3 Code	Repoint separated bed joint at vault	20	LF	$ 75.00	$1,500	
Level 3 Code	Storm Windows: scrape, sand, & repaint	66	EA	$ 350.00	$23,100	
Level 3 Code	Window 125 - replace rails, frame, sill, reinstall	1	LS	$ 1,000.00	$1,000	
Level 3 Code	Door 101 & 102 - square up stiles, rails, sand, refinish	1	LS	$ 2,500.00	$2,500	
Level 3 Code	Door 101 & 102 - new tempered glass	2	EA	$ 650.00	$1,300	
Level 3 Code	Door 101 & 102 - clean & oil hinges	2	EA	$ 150.00	$300	
Level 3 Code	Door 101 & 102 - new exterior thumb latch	2	EA	$ 500.00	$1,000	
Level 3 Code	Door 101 & 102 - new panic bar & closer	2	EA	$ 2,500.00	$5,000	
Level 3 Code	Door 118 - sand & refinish door	1	EA	$ 400.00	$400	
Level 3 Code	Door 119 - square up stiles, rails, sand, refinish	1	EA	$ 1,250.00	$1,250	
Level 3 Code	Miscellaneous Trim Repaint Allowance	1	ALLW	$ 5,000.00	$5,000	per design team
Level 3 Code	Doors 109 & 110 reverse swing	2	EA	$ 1,250.00	$2,500	Alternate 1
Level 3 Code	Door 118 - salvage existing glazing	1	EA	$ 250.00	$250	Alternate 1
Level 3 Code	Door 118 - new tempered glass & glazing compound	1	EA	$ 1,500.00	$1,500	Alternate 1
Level 3 Code	Door 118 - ABAAS hardware, panic bar & closer	1	EA	$ 2,500.00	$2,500	Alternate 1
Level 3 Code	Door 119 - adjust head & jamb to reverse swing	1	EA	$ 1,250.00	$1,250	Alternate 1
Level 3 Code	Door 119 - new tempered glass & glazing compound	1	EA	$ 1,500.00	$1,500	Alternate 1
Level 3 Code	Door 119 - ABAAS hardware, panic bar & closer	1	EA	$ 2,500.00	$2,500	Alternate 1
Level 3 Code	Door 011 - adjust head & jamb to reverse swing	1	EA	$ 1,250.00	$1,250	Alternate 1
Level 3 Code	Description	0	Unit	$ -	$0	
SUBTOTAL EXTERIOR CLOSURE		**1**	**VALUE**	**$ 65,837.50**	**$65,838**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
B30	**ROOFING**					
Level 3 Code	Inspect flashing, add flashing over base wall & kick out	1	LS	$ 2,500.00	$2,500	
Level 3 Code	Roof framing - inject crack in concrete roof	1	LS	$ 500.00	$500	
Level 3 Code	Description	0	Unit	$ -	$0	

United States Department of the Interior
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LINE ITEM COST SUMMARY

Project:	**Calumet & Hecla Public Library**	**Estimate By:**	McCabe Karcher
Park:	**Keweenaw National Historic Park**	**Date:**	10/28/19 - V1.0
Park Alpha:	**KEWE**	**Reviewed By:**	Seth Pszczolkowski
PMIS Number:	**237234**	**Date:**	10/28/19
Summary Item 1	**Base Bid**	**Total Cost:**	$1,295,781

SUBTOTAL ROOFING	**1**	**VALUE**	**$ 3,000.00**	**$3,000**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
C10	**INTERIOR CONSTRUCTION**					
Level 3 Code	Room 114 - extend landing	1	LS	$ 2,000.00	$2,000	Alternate 1
Level 3 Code	Room 205 new partition wall	60	SF	$ 35.00	$2,100	Alternate 1
Level 3 Code	Room 108 - Infill wall	300	SF	$ 35.00	$10,500	Alternate 1
Level 3 Code	Description	0	Unit	$ -	$0	
SUBTOTAL INTERIOR CONSTRUCTION		**1**	**VALUE**	**$ 14,600.00**	**$14,600**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
C20	**STAIRCASES**					
Level 3 Code	Remove staircase treads, sand & refinish treads, nosings, landings	1	LS	$ 14,000.00	$14,000	
Level 3 Code	Remove / reinstall basement stairs	1	LS	$ 1,500.00	$1,500	Alternate 1
Level 3 Code	New steel stairs w/ 2 landings	1	LS	$ 9,000.00	$9,000	Alternate 1
Level 3 Code	Description	0	Unit	$ -	$0	
SUBTOTAL STAIRCASES		**1**	**VALUE**	**$ 24,500.00**	**$24,500**	

United States Department of the Interior
National Park Service
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LINE ITEM COST SUMMARY

Project:	**Calumet & Hecla Public Library**	**Estimate By:**	McCabe Karcher
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Park Alpha:	**KEWE**	**Reviewed By:**	Seth Pszczolkowski
PMIS Number:	**237234**	**Date:**	10/28/19

Summary Item 1 **Base Bid** **Total Cost:** $1,295,781

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
C30	INTERIOR FINISHES					
Level 3 Code	First floor doors - touch up stain, glazing compound, clean & oil hinges	11	EA	$ 500.00	$5,500	
Level 3 Code	Second floor doors - touch up stain, glazing compound, clean & oil hinges	6	EA	$ 500.00	$3,000	
Level 3 Code	Basement floor doors - touch up stain, glazing compound, clean & oil hinges	7	EA	$ 500.00	$3,500	
Level 3 Code	Interior Finishes - Paint plaster	250	SF	$ 1.75	$438	
Level 3 Code	Interior Finishes - Patch plaster	1	ALLW	$ 10,000.00	$10,000	
Level 3 Code	Interior Finishes - Refinish wood window sills	66	EA	$ 250.00	$16,500	
Level 3 Code	Interior Finishes - new ABAAS handrail, brick mounted	1	LS	$ 3,500.00	$3,500	
Level 3 Code	Rooms 5,6,7,8,9 rubber base	212	LF	$ 2.75	$583	
Level 3 Code	Room 101 - repaint concrete steps	45	SF	$ 3.00	$135	
Level 3 Code	Room 101 - walk-off mat	1	LS	$ 275.00	$275	
Level 3 Code	Room 115 - sand & refinish floor	120	SF	$ 11.50	$1,380	
Level 3 Code	Room 115 - Touch up painted brick	54	SF	$ 2.50	$135	
Level 3 Code	Room 115 - Refinish wood work at sill & jamb	8	EA	$ 350.00	$2,800	
Level 3 Code	Rooms 201, 202 - repair, patch, refinish cork flooring	510	SF	$ 18.00	$9,180	
Level 3 Code	Room 201 - Replace ACT	1517	SF	$ 18.25	$27,685	Fabric-wrapped tiles
Level 3 Code	Room 202 - refinish wainscot entire N wall	280	SF	$ 4.00	$1,120	
Level 3 Code	Room 301 - remove shelving & metal tracks	1	LS	$ 50.00	$50	
Level 3 Code	Room 301 - sand & refinish wood floor	592	SF	$ 11.50	$6,808	
Level 3 Code	Furring / gyp board finish	522	SF	$ 17.00	$8,874	Alternate 1
Level 3 Code	Rooms 102, 104, 105, & 112 Refinish Wood Floor	1190	SF	$ 3.50	$4,165	Alternate 1
Level 3 Code	Rooms 102, 104, 105, & 112 Repair Wood Floor	119	SF	$ 7.00	$833	Assumes 10%
Level 3 Code	Repair of Finishes due to Systems Work	1	ALLW	$ 25,000.00	$25,000	Alternate 1
Level 3 Code	Room 205 beadboard finish	1	LS	$ 1,500.00	$1,500	Alternate 1
Level 3 Code	ABAAS RR Accessories	1	LS	$ 3,500.00	$3,500	Alternate 1

United States Department of the Interior
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LINE ITEM COST SUMMARY

Project:	**Calumet & Hecla Public Library**	**Estimate By:**	McCabe Karcher
Park:	**Keweenaw National Historic Park**	**Date:**	10/28/19 - V1.0
Park Alpha:	**KEWE**	**Reviewed By:**	Seth Pszczolkowski
PMIS Number:	**237234**	**Date:**	10/28/19

Summary Item 1 **Base Bid** **Total Cost:** $1,295,781

Level 3 Code	Recreate trim @ columns where missing	1	ALLW	$ 1,000.00	$1,000	Alternate 1
Level 3 Code	Description	0	Unit	$ -	$0	
SUBTOTAL INTERIOR FINISHES		**1**	**VALUE**	**$ 137,460.75**	**$137,461**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
D10	**CONVEYING SYSTEMS**					
Level 3 Code	3-stop dual opening MRL elevator installed	1	Unit	$ 89,000.00	$89,000	Alternate 1
Level 3 Code	Description	0	Unit	$ -	$0	
SUBTOTAL CONVEYING SYSTEMS		**1**	**VALUE**	**$ 89,000.00**	**$89,000**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
D20	**PLUMBING**					
Level 3 Code	Remove Water & Waste Lines from Room 203	1	LS	$ 500.00	$500	Alternate 1
Level 3 Code	Demo Water Closet & Lavatory, Cap Piping, Haul Away	2	EA	$ 1,032.00	$2,064	Alternate 1
Level 3 Code	Relocate Vent Piping	12	LF	$ 14.00	$168	Alternate 1
Level 3 Code	Demo Domestic H&C Water Piping	12	LF	$ 3.00	$36	Alternate 1
Level 3 Code	CI Waste & Vent AG 2"	44	LF	$ 23.20	$1,021	Alternate 1
Level 3 Code	CI Waste & Vent AG 3"	10	LF	$ 31.67	$317	Alternate 1
Level 3 Code	CI Waste & Vent UG 2"	22	LF	$ 21.20	$466	Alternate 1
Level 3 Code	CI Waste & Vent UG 3"	12	LF	$ 30.23	$363	Alternate 1
Level 3 Code	Flashings (VTR's) " - 4"	1	EA	$ 175.00	$175	Alternate 1
Level 3 Code	Excavation & Backfill, Sawcut & Remove Concrete	34	LF	$ 56.00	$1,904	Alternate 1
Level 3 Code	Pex Piping 1/2"	23	LF	$ 13.15	$302	Alternate 1
Level 3 Code	L-Cu Dist Piping 3/4"	16	LF	$ 19.38	$310	Alternate 1
Level 3 Code	L-Cu Dist Piping 1"	12	LF	$ 23.07	$277	Alternate 1
Level 3 Code	Access Panel for Valves	1	EA	$ 220.00	$220	Alternate 1
Level 3 Code	Piping Insulation - Domestic H&C	51	LF	$ 16.10	$821	Alternate 1
Level 3 Code	Low-Flow Tank-Type Water Closet	1	EA	$ 684.00	$684	Alternate 1

United States Department of the Interior
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Class C Construction Cost Estimate

LINE ITEM COST SUMMARY

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PMIS Number:	**237234**	**Date:**	10/28/19

Summary Item 1 **Base Bid** **Total Cost:** $1,295,781

Level 3 Code	Lavatory - Wall Hung Low-Flow Faucet	1	EA	$ 714.00	$714	Alternate 1
Level 3 Code	SP-1 Sump Pump w/ Discharge Piping & oil alarm	1	EA	$ 5,000.00	$5,000	Alternate 1
Level 3 Code	Description	0	Unit	$ -	$0	
	SUBTOTAL PLUMBING	**1**	**VALUE**	**$ 15,342.13**	**$15,342**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
D30	**HVAC**					
Level 3 Code	Heat Pump 5 Ton	4	EA	$ 39,220.00	$156,880	
Level 3 Code	Condensate Pumps	29	EA	$ 385.00	$11,165	
Level 3 Code	Housekeeping Pads	4	EA	$ 960.00	$3,840	
Level 3 Code	Wall Mounted .5 Ton VRF Unit	12	EA	$ 882.00	$10,584	
Level 3 Code	Wall Mounted .75 Ton VRF Unit	6	EA	$ 1,258.00	$7,548	
Level 3 Code	Wall Mounted 1.5 Ton VRF Unit	4	EA	$ 2,441.00	$9,764	
Level 3 Code	Wall Mounted 1 Ton VRF Unit	7	EA	$ 1,585.00	$11,095	
Level 3 Code	Branch Selectors	4	EA	$ 1,220.00	$4,880	
Level 3 Code	Dehumidifiers	4	EA	$ 500.00	$2,000	
Level 3 Code	Airius Destratification Fans	9	EA	$ 5,470.00	$49,230	
Level 3 Code	Seismic Bracing	29	EA	$ 64.00	$1,856	
Level 3 Code	Rigging	1	LS	$ 1,500.00	$1,500	
Level 3 Code	Refrigerant Piping (Suction & Liquid)	1760	LF	$ 65.63	$115,509	
Level 3 Code	Insulation	1760	LF	$ 15.00	$26,400	
Level 3 Code	EF-1 Restroom Exhaust Fan	1	EA	$ 1,012.00	$1,012	
Level 3 Code	TF-1 Transfer Fan w/ Grills	1	EA	$ 662.00	$662	
Level 3 Code	Galvanized Rectangular E/A	100	LB	$ 8.00	$800	
Level 3 Code	Transfer Grills	2	EA	$ 67.00	$134	
Level 3 Code	Exhaust Registers	2	EA	$ 84.00	$168	
Level 3 Code	Volume Dampers	2	EA	$ 52.00	$104	
Level 3 Code	DDC Controls	18	PTS	$ 975.00	$17,550	
Level 3 Code	Air & Water Balancing	1	LS	$ 1,744.00	$1,744	
Level 3 Code	Plumbing & Mechanical Indirect Costs	1	LS	$ 20,000.00	$20,000	

United States Department of the Interior
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Summary Item 1 **Base Bid** **Total Cost:** $1,295,781

Level 3 Code	Piping Insulation	99	LF	$ 23.61	$2,337	Alternate 1
Level 3 Code	L-Cu 95/5 1/2"	10	LF	$ 32.80	$328	Alternate 1
Level 3 Code	L-Cu 95/5 3/4"	63	LF	$ 37.63	$2,371	Alternate 1
Level 3 Code	L-Cu 95/5 1"	16	LF	$ 47.26	$756	Alternate 1
Level 3 Code	L-Cu 95/5 1-1/4" - 1-1/2"	10	LF	$ 51.40	$514	Alternate 1
Level 3 Code	Relocate HWS/R for New Elevator Installation	1	LS	$ 1,238.00	$1,238	Alternate 1
Level 3 Code	Relocate CUH in Rooms 108 &109 for Stairway	2	EA	$ 1,393.00	$2,786	Alternate 1
Level 3 Code	Relocate CUH in Room 104 for Wall Demo	1	LS	$ 1,504.00	$1,504	Alternate 1
Level 3 Code	Sleeves w/ Fire Sealant 1"-2"	2	EA	$ 136.00	$272	Alternate 1
Level 3 Code	Connect to Existing HWS/R Lines	2	EA	$ 550.00	$1,100	Alternate 1
Level 3 Code	Radiator Connection Piping	1	EA	$ 815.00	$815	Alternate 1
Level 3 Code	CUH-1 Cabinet Unit Heater	1	EA	$ 4,580.00	$4,580	Alternate 1
Level 3 Code	Restroom Exhaust Fan - Residential Grade	1	EA	$ 460.00	$460	Alternate 1
Level 3 Code	Transfer Fan w/ Thermostat for Elevator Room	1	EA	$ 988.00	$988	Alternate 1
Level 3 Code	Air & Water Balancing	1	LS	$ 425.00	$425	Alternate 1
Level 3 Code	Mechanical & Plumbing Indirect Costs	1	LS	$ 2,110.00	$2,110	Alternate 1
Level 3 Code	Condensate piping for 29 VRF units	500	LF	$ 45.00	$22,500	Assume 500 lf
Level 3 Code	Description	0	Unit	$ -	$0	
	SUBTOTAL HVAC	**1**	**VALUE**	**$ 499,509.04**	**$499,509**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
D50	**ELECTRICAL**					
Level 3 Code	Electrical - R or R exterior pedestrian scale light pole	1	EA	$ 2,096.00	$2,096	
Level 3 Code	Install Lightning Protection	1	LS	$ 20,000.00	$20,000	
Level 3 Code	Upgrade Lobby Lighting	1	LS	$ 4,386.00	$4,386	
Level 3 Code	Replace Upper Floor Lighting	1	LS	$ 8,901.00	$8,901	
Level 3 Code	Circuit Condensing Units	4	EA	$ 2,967.00	$11,868	
Level 3 Code	Circuit VRF Units	19	EA	$ 677.00	$12,863	
Level 3 Code	Circuit Dehumidifier	4	EA	$ 1,097.00	$4,388	

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Park Alpha:	**KEWE**	**Reviewed By:**	Seth Pszczolkowski
PMIS Number:	**237234**	**Date:**	10/28/19

Summary Item 1	**Base Bid**				**Total Cost:**	$1,295,781
Level 3 Code	Circuit Destratification Fans	9	EA	$ 884.00	$7,956	
Level 3 Code	Elevator Feeder & Bussman Module	1	EA	$ 10,159.00	$10,159	Alternate 1
Level 3 Code	Circuit Sump Pump	1	EA	$ 871.00	$871	Alternate 1
Level 3 Code	Circuit / Lockable Switch-Cab Lights	1	EA	$ 832.00	$832	Alternate 1
Level 3 Code	Install Pit Light Switch	1	EA	$ 1,064.00	$1,064	Alternate 1
Level 3 Code	Data Connection Elevator Controller	1	EA	$ 661.00	$661	Alternate 1
Level 3 Code	Circuit Transfer Fan Elevator Control Room	1	EA	$ 839.00	$839	Alternate 1
Level 3 Code	Circuit RR EF	1	EA	$ 258.00	$258	Alternate 1
Level 3 Code	Install GFCI Duplex	3	EA	$ 355.00	$1,065	Alternate 1
Level 3 Code	Install Occ Sensor Switch	2	EA	$ 219.00	$438	Alternate 1
Level 3 Code	Install Vanity Light	2	EA	$ 419.00	$838	Alternate 1
Level 3 Code	Install LED Downlight	2	EA	$ 371.00	$742	Alternate 1
Level 3 Code	Demo / Relocate Electrical	1	LS	$ 12,029.00	$12,029	Alternate 1
Level 3 Code	Description	0	Unit	$ -	$0	
	SUBTOTAL ELECTRICAL	**1**	**VALUE**	**$ 102,254.00**	**$102,254**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
F10	**SPECIAL CONSTRUCTION**					
Level 3 Code	2nd Floor lateral - Remove floorboards, verify or provide positive connection	1	ALLW	$ 6,000.00	$6,000	
Level 3 Code	Description	0	Unit	$ -	$0	
	SUBTOTAL SPECIAL CONSTRUCTION	**1**	**VALUE**	**$ 6,000.00**	**$6,000**	

United States Department of the Interior
National Park Service
Class C Construction Cost Estimate

LINE ITEM COST SUMMARY

Project:	**Calumet & Hecla Public Library**	**Estimate By:**	McCabe Karcher
Park:	**Keweenaw National Historic Park**	**Date:**	10/28/19 - V1.0
Park Alpha:	**KEWE**	**Reviewed By:**	Seth Pszczolkowski
PMIS Number:	**237234**	**Date:**	10/28/19

Summary Item 1 **Base Bid** **Total Cost:** $1,295,781

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
F20	**SELECTIVE BUILDING DEMOLITION**					
Level 3 Code	Lead based paint, microbial, and asbestos mgmt	1	EA	$ 6,750.00	$6,750	
Level 3 Code	Room 101 - Demo flooring	150	SF	$ 12.00	$1,800	
Level 3 Code	Room 201 - Demo ACT	1517	SF	$ 4.00	$6,068	
Level 3 Code	Cut brick to access elevator	28	SF	$ 20.00	$560	Alternate 1
Level 3 Code	Rooms 102, 104, 105, & 112 Demo Carpet	1190	SF	$ 2.00	$2,380	Alternate 1
Level 3 Code	Demo ceiling & floor for elevator	138	SF	$ 25.00	$3,450	Alternate 1
Level 3 Code	Room 070 - demo east partition walls & fixtures	1	LS	$ 3,000.00	$3,000	Alternate 1
Level 3 Code	Room 202 - demo floor for new stairs	25	SF	$ 50.00	$1,250	Alternate 1
Level 3 Code	Rooms 108,9,10 - demo partition walls	360	SF	$ 12.00	$4,320	Alternate 1
Level 3 Code	Demo first floor walls to recreate circulation	530	SF	$ 12.00	$6,360	Alternate 1
Level 3 Code	Demo asphalt parking lot, restore lawn	18000	SF	$ 6.20	$111,600	Alternate 1
Level 3 Code	Description	0	Unit	$ -	$0	
	SUBTOTAL SELECTIVE BUILDING DEMOLITION	**1**	**VALUE**	**$ 147,538.00**	**$147,538**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
G20	**SITE IMPROVEMENTS**					
Level 3 Code	Install post/rail fence on Red Jacket and Mine Streets	590	LF	$ 12.00	$7,080	Alternate 1
Level 3 Code	Infill tree planting	2	EA	$ 1,500.00	$3,000	Alternate 1
Level 3 Code	Relocate Agassiz statue and restore lawn	1	LS	$ 6,000.00	$6,000	Alternate 1
Level 3 Code	Relocate Float Copper exhibit and restore lawn	1	LS	$ 6,000.00	$6,000	Alternate 1
Level 3 Code	Demo sidewalk on Mine Street	1800	SF	$ 6.50	$11,700	Alternate 1
Level 3 Code	Replace curb	300	LF	$ 30.00	$9,000	Alternate 1
Level 3 Code	Regrade settled slopes for positive drainage	1	LS	$ 1,500.00	$1,500	Alternate 1
Level 3 Code	Pruning / thinning trees	1	LS	$ 500.00	$500	Alternate 1
Level 3 Code	Six foot wide sidewalk	1800	SF	$ 8.50	$15,300	Alternate 1
Level 3 Code	Signage / Striping	1	LS	$ 750.00	$750	Alternate 1

United States Department of the Interior
National Park Service
Class C Construction Cost Estimate

LINE ITEM COST SUMMARY

Project:	**Calumet & Hecla Public Library**	**Estimate By:**	McCabe Karcher
Park:	**Keweenaw National Historic Park**	**Date:**	10/28/19 - V1.0
Park Alpha:	**KEWE**	**Reviewed By:**	Seth Pszczolkowski
PMIS Number:	**237234**	**Date:**	10/28/19

Summary Item 1 **Base Bid** **Total Cost:** $1,295,781

Level 3 Code	Earthen Ramp	1	LS	$ 2,500.00	$2,500	Alternate 1
Level 3 Code	ABA Sidewalk	660	SF	$ 8.50	$5,610	Alternate 1
Level 3 Code	Stone Wall	558	SF	$ 25.00	$13,950	Includes Ftgs/Founds
Level 3 Code	ABA Railings	4	EA	$ 850.00	$3,400	Alternate 1
Level 3 Code	Description	0	Unit	$ -	$0	
SUBTOTAL SITE IMPROVEMENTS		**1**	**VALUE**	**$ 86,290.00**	**$86,290**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
TOTAL COST - Base Bid		**1**	**VALUE**	**$1,295,781.42**	**$1,295,781**	



CALUMET & HECLA PUBLIC LIBRARY
KEWEENAW NATIONAL HISTORICAL PARK
Historic Structure Report

2019