National Park Service
U.S. Department of the Interior



SAND POINT/MUNISING USCG LIFE SAVING STATION
PICTURED ROCKS NATIONAL LAKESHORE
Historic Structure Report

October 2017



Cover Illustration: Life Saving Station and Oil House (Anderson Hallas 2016)

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Sand Poitsnisi CG Life Saving Station

Pictured Rocks National Lakeshore
Sand Point/Munising USCG Life Saving Station

Historic Structure Report

Recommended: _____ Date: 10-4-17
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Concurred: _____ Date: 10-16-17
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Executive Summary and Administrative Data

Report Summary

This Historic Structure Report (HSR) presents a planning document for the three historic buildings at Pictured Rocks National Lakeshore in Munising, Michigan. It identifies characteristics and features that convey the historic significance and character of the Life Saving Station, Boathouse and Oil House and provides a plan for long term preservation and stewardship.

Pictured Rocks National Lakeshore was created on October 6, 1972 to protect the diminishing shoreline of Lake Superior which was being lost to private ownership. The park preserves the natural, historic and cultural resources within and provides opportunities for public recreation. Within the park are the 200 foot tall Pictured Rocks cliffs along Lake Superior, five square miles of sand dunes, twelve miles of undeveloped beach and cultural resources related to the human use of Lake Superior.

Part of the land included in Pictured Rocks National Lakeshore was originally a U.S. Coast Guard complex constructed in the 1930s which was an operating station until the 1960s. When the station closed, the property and buildings were transfered from the U.S. Coast Guard to the City of Munising. A land swap in the early years of the Pictured Rocks National Lakeshore transfered the station property and buildings to the NPS. Minor rehabilitation projects were conducted on the buildings so they could serve as the Park's headquarters. Though this was intended to be a temporary function, over forty years later these buildings still house the headquarters. There is no official visitor contact at the Station but visitors do drop in to get a National Park Service Passport stamp or use the restroom.

The intent of the HSR is to document the history and current conditions and to recommend appropriate treatments for the buildings. Presenting a comprehensive understanding of the physical evolution of the buildings, the HSR also provides guidance for their care. Documentation of historic significance and evaluation of integrity of the buildings provides the framework upon which treatment recommendations are based. All treatment recommendations follow National Register of Historic Places (NRHP or national register) guidelines and Secretary of the Interior Standards for the Treatment of Historic Properties.

The condition assessment for each element/feature are documented in Part 1. Treatment options for each element/feature of the building is documented in Part 2.

Project Purpose and Need

The purpose of this project is to document building development, evaluate how the structures are used today and recommend changes if needed. Additionally, current conditions are analyzed and treatment recommendations provided for building stabilization and maintenance where indicated. Generally the exteriors of the Life Saving Station, Boathouse and Oil House are in fair condition with roofing and exterior finishes in need of repair or replacement and repainting. Interior finishes are generally in good condition, with repairs required at a few locations. Universal access, both to the buildings and through the interior spaces, is lacking and options to address these issues are presented in this report. Treatments are needed to preserve these historically significant buildings and ensure they are safe and accessible to all employees and the public.

The HSR will be used as a planning tool

to inform future park decisions related to Pictured Rocks National Lakeshore and to support compliance as required by the National Historic Preservation Act (NHPA) of 1966, as amended and by the National Environmental Policy Act (NEPA) of 1969, as amended.

The HSR provides a plan that addresses operational needs while also recognizing that the mission of the NPS is to provide a rich and authentic visitor experience for all and to ensure that long-term preservation and stewardship objectives are met to the maximum extent practicable.

A Cultural Landscape Report (CLR) and Environmental Assessment (EA) were developed in conjunction with this HSR to provide a full understanding of the area, and should be referenced for further guidance.

Methodology

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 buildings. General research methods include a review of existing literature, interviews with current and previous employees and on-site inspection. A number of documents related to the history of the site were located and reviewed. Principal sources for the report's historic documentation include the Northern Michigan Archives, PIRO archives, "Historic Resource Study, Pictured Rocks National Lakeshore" and historic photographs. History contained in this report provides a general overview of the area's history for context and then focuses on the chronology and use of the buildings.

Research, coupled with on-site investigations, verified the accuracy of previous documentation and uncovered new information.

Historic Structure Report Methodology

The HSR presents documentary, graphic and physical information for the Life Saving Station, Boathouse and Oil House. Primary historic documents (original drawings, historic photographs, historic maps and other historic documentation), rehabilitation/restoration drawings, park maintenance records, material testing, and site investigations were analyzed to compile the record of the structure's development, historic alterations and current condition. The assessment process utilized a multidisciplinary approach to more fully understand each building and its alterations. Disciplines included architectural, structural and hazardous materials experts. A separate CLR was produced in conjunction with this HSR and addresses the site development and features.

Significant dates and periods of construction were established to document features and to determine the relative significance of each building feature.

Existing Condition

A brief physical description of each building precedes a description of the individual building features and includes information such as massing, form, orientation, materiality and general plan layout. Field observations contributed to descriptions of each extant feature and attendant condition rating. Features observed by discipline included the following as applicable by building:

Architecture: roofing, chimneys, exterior walls, exterior trim, windows, doors, wall finishes, ceiling finishes, interior trim, flooring, stairs, code/life safety and

accessibility.

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

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.

Character Defining Features
A list of the contributing features - those characteristics that embody the structure's special and notable qualities - follow the description of physical features. Mass and form, exterior materials, openings and interior materials are included.

Treatment Alternatives
In Part 2 the treatment alternatives and associated impacts are discussed. Treatment recommendations are provided for each feature.

Summary of Recommendations

Recommended treatment for each building is rehabilitation. This treatment allows for altering a building to adapt to continuing or changing uses. Lead based paint was found on the exterior and interior of the buildings and needs to be mitigated. The paint should be scraped and prepped and the buildings repainted. Paint color analysis was done as part of this report and should be used to inform future paint color decisions. Recommendations generally include repairing damaged finishes where needed.

Universal access will need to be provided to the Life Saving Station and Boathouse. Options for providing this at the Station include a ramp, lift or elevator. At the Boathouse, a universal ramp should be constructed in the location of the existing ramp on the east side. In the Station, the existing restroom configuration will need to be modified by moving the south wall further south to meet clearance requirements. Public restrooms for the Boathouse can be provided in a separate restroom building or within the south side of the building.

Neither the Station nor the Boathouse have an operational fire suppression system - the infrastructure is installed in the Station but there is no viable water source. The municipal water line should be extended to both buildings and an operational fire suppression system installed in each.

Description of the Study Area

All buildings addressed in this report are located within Pictured Rocks National Lakeshore. The park is forty-two miles of lakeshore on Lake Superior and has fifteen miles of cliffs. The buildings are located at Sand Point, adjacent to the Sand Point Road. Parking is adjacent to the Station or southeast of the Boathouse. The launchway extends west from the Boathouse into Lake Superior.

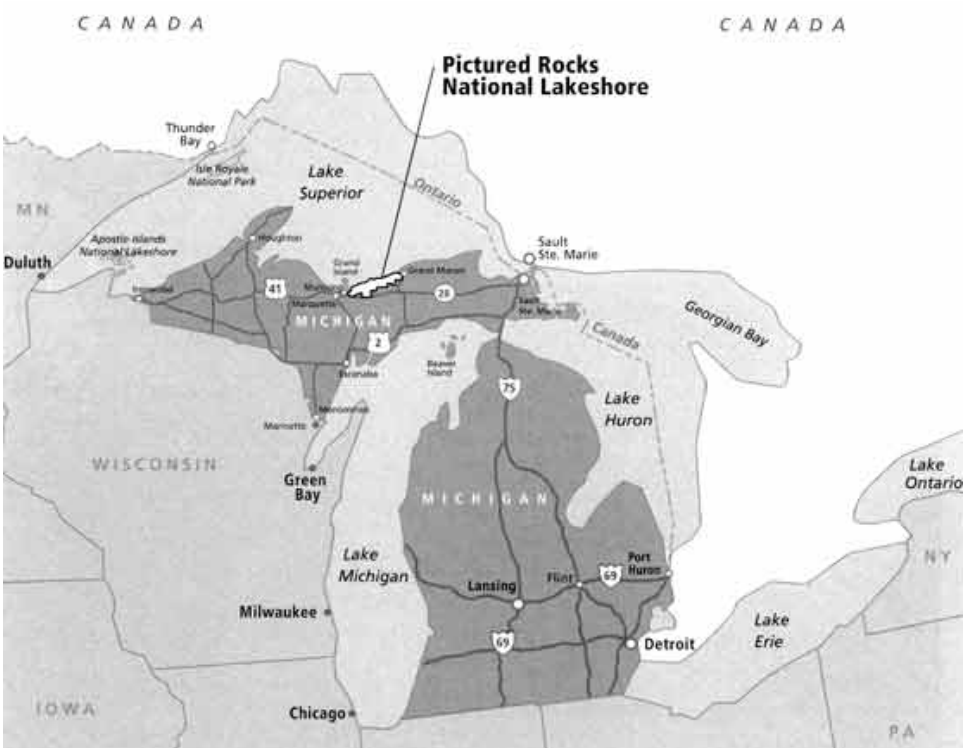


Figure 1-1. Area Map - Location of Pictured Rocks National Lakeshore within the state of Michigan (Source: Pictured Rocks National Lakeshore Map Page, 7/5/2016)

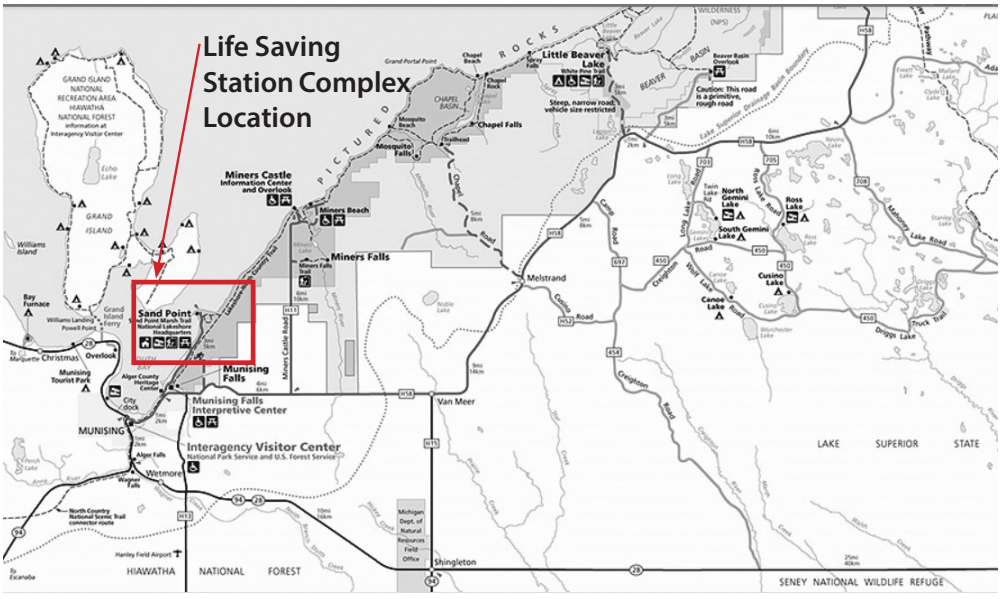


Figure 1-2. Location of the project area within Pictured Rocks National Lakeshore, Michigan. (Source: Pictured Rocks National Lakeshore Map Page, 7/5/2016)



Figure 1-3. Life Saving Station Complex Map
(Source: Google maps, 7/5/2016)

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Part 1: Developmental History

Statement of Significance

The Sand Point (Munising) Coast Guard Station has not been listed in the National Register of Historic Places, or on any local or state listings of historic places. Other Life-Saving/Coast Guard stations in Michigan that have been previously listed either as individual structures or as contributing to a district include the Sleeping Bear Point Life-Saving Station (constructed 1901, designated 1979), the South Manitou Island Life-Saving Station (constructed 1901, designated 1983), the North Manitou Island Life-Saving Station (constructed 1875, designated 1998), and the Pointe aux Barques Life-Saving Station (constructed 1876, designated 1995). The scope of work for this project notes that the station was determined eligible for listing in 1999 under Criterion A due to its association with the maritime heritage of the Upper Great Lakes, and under Criterion C, as it represents the final era of lifesaving station design. Pursuit of National Register listing is a stated internal National Park Service goal, but not part of the current project.

The Sand Point (Munising) Coast Guard Station is potentially eligible for listing in the National Register of Historic Places under the "U.S. Government Lifesaving Stations, Houses of Refuge, and Pre-1950 U.S. Coast Guard Lifeboat Stations" Multiple Property listing. Under this MPDF, certified by the Keeper of the National Register in 2013, the Sand Point (Munising) Coast Guard Station meets the registration requirements for listing.

Constructed in 1932-33 on Sand Point, east of Munising, Michigan, the Sand Point station is an example of the station complex property type, where the living quarters, boat storage and other functions were dispersed in multiple dwellings around the property. This property type replaced the earlier integrated station type (in which living quarters and boat storage were in the same building) in the early twentieth century when the Coast Guard began using larger and heavier boats and required more storage that could not be accommodated in a single building. Typical elements of the station complex type that were represented at the Sand Point Station were a boathouse with launchway, living quarters, lookout station, flagpole, and miscellaneous outbuildings such as a garage and oil house.

The Coast Guard selected station locations based on a number of factors, including proximity to areas that would make navigation in a particular area dangerous (shoals, rocks, currents), ease of access to the water and visibility from the water, position relative to coverage by other stations, and degree of protection from storms and other weather factors. A good station would have a slightly elevated area where the personnel in the station could easily see the water and where the buildings would be somewhat protected from storms and high water, as well as a level area near the water where the station boats could be quickly launched from a separate boathouse. The Sand Point Station was constructed midway along the southern Lake Superior shoreline between existing stations at Marquette to the west and Grand Marais to the east. Its location along the east side of South Bay across from Grand Island meant it was relatively protected from the notorious fury of Lake Superior, but still closer to the open water than the main part of Munising. The siting of the boathouse on the south side of the point provided further protection, while the relatively elevated location of the living quarters gave it good visibility toward the lake, augmented by the watchtower west of the quarters.

Coast Guard stations were organized by a

naval structure with its personnel serving in various ranks. The military-style operation of a station (as opposed to the more family-oriented Lighthouse Service) resulted in specific elements such as barracks-style rooms in the living quarters, mess halls rather than dining rooms, and separate quarters including a bedroom and office for the officer in charge. In addition to their regular life-saving drills, crews were required to perform most of the maintenance and upkeep of the station and the station facilities were regularly inspected by the commanding officer and by district inspectors. This included maintenance of the station's landscape to present a "ship-shape" appearance and ensure that the vegetation did not block sightlines and that crew could easily access the boathouse and other storage facilities in an emergency (again, contrast this with the more domestic character of the landscape at civilian light stations during this period).

From its establishment in the 1870s, the Life-Saving Service/Coast Guard utilized standard designs for its station buildings. This practice, implemented first in the Lighthouse Service in the 1850s, made it more efficient and less expensive to construct stations even in remote locations. The service utilized a series of standard designs throughout the late nineteenth and early to mid twentieth centuries. The Sand Point Station is an excellent example of the Chatham design, created in 1914, just before the establishment of the Coast Guard, and popular into the mid to late 1940s; at least 30 stations around the country were built to this design, which was characterized by a symmetrical, two-story living quarters with minimal trim and typically painted standard Coast Guard colors of white with a red shingle roof and trim. This design exhibited some minor variations, typically at the roofline. The Sand Point station has a "kick" at the base of the first floor that was an interesting variation of the typical Chatham design.

The Sand Point (Munising) Coast Guard Station is significant under National Register Criterion A, at the local level, for its association with the history of maritime transportation and lifesaving activities on Lake Superior. Although built when the Coast Guard was in a period of contraction following the Great Depression, the need for a station at Sand Point reflected the continued importance of shipping on Lake Superior during this period, and the continued dangers posed by the often uncertain marine conditions on the big lake. While the crew at Sand Point only participated in a few notable rescues, the logs reflect the day-to-day importance of their less well-known duties, rescuing fishermen, pleasure boaters, and other mariners who fell into harm's way on the lake. The occupation of the Sand Point Station was short, only 25 years, due to improvements in technology that made boats safer and gave individual stations greater range. However, during that period, the station served an important function in the Munising area.

The Sand Point (Munising) Station is also significant under National Register Criterion C for embodying the distinctive characteristics of the station complex style of landscape design and the Chatham style of architecture, both standard designs of the Coast Guard during the early twentieth century. The station retains a high degree of integrity overall, with some minor impacts. It has integrity of location, design, setting, materials, workmanship, feeling, and association. The most significant impacts to integrity are the loss of the watch tower

and some other minor associated features. The landscape has also been impacted by beach fluctuations, previous attempts to stabilize the shoreline, and some reduction of visibility due to the subsequent growth of trees and other vegetation. The landscape around the living quarters has a high degree of integrity and retains the crucial visual/ functional connection to the boathouse, a character-defining feature of Coast Guard stations. The buildings in general retain most of their historic materials, and replacement materials have mostly been in kind. A few minor alterations have been made for the adaptation of the living quarters to office use and the installation of exhibits and storage in the boathouse, but these have generally been compatible and have minimally impacted integrity.

The period of significance for Sand Point/ Munising USCG Life Saving Station is 1932 to 1958, the period during which it was an active Coast Guard facility. This reflects the significant associations of the property with the Coast Guard's lifesaving operations and its architectural significance as a exemplar of Coast Guard station design.

History Introduction

The Sand Point (Munising) Station was an active Coast Guard Station from its construction in 1932-33 until it was decommissioned in 1958. Constructed near the site of a historic Ojibwe village and cemetery, the station sat on lands donated to the United States government by the Cleveland-Cliffs Iron Company, a dominant industry and landholder in the Upper Peninsula. The station personnel were active in local rescues for the next two decades, although they rarely participated in any high-profile rescue operations. Following the station's decommissioning, the property reverted back to the Cleveland-Cliffs Iron Company, who donated the property to the City of Munising. In turn, the City deeded the land and station buildings to the National Park Service following the establishment of the Pictured Rocks National Lakeshore. The NPS continues to use the station buildings and landscape for administration and interpretive purposes.

Historical Background and Context/ Chronology of Development and Use

Preconstruction

In 1932, the United States Coast Guard chose Sand Point as the location for a new lifesaving station. Located within the city limits of Munising, but northeast along the coast, Sand Point was a strategic location long before the Coast Guard selected the site. Sand Point was inhabited for hundreds of years by Anishinaabe-speaking Ojibwe people who camped at various locations around the southern shore of Lake Superior. In particular, there are historical accounts of an Ojibwe village between Munising and Sand Point in the eighteenth and nineteenth centuries, where the people fished, hunted, and harvested wild or cultivated rice. An Ojibwe cemetery was also located on Sand Point near the current Sand Point Road/parking lot, which remained in active use into the early twentieth century.

While Euroamericans such as French fur traders had been present in the Upper Peninsula (UP) since the seventeenth century, the first permanent white settlement of the area began in the early to mid 1800s. A town site was platted at the future location of Munising in 1850, but it was not developed until the 1890s. During the latter decades of the nineteenth century, a number of industries in the UP drew more settlers to the area, including logging, iron smelting, and commercial fishing; land cleared for logging was often converted to agricultural use, and a small tourist industry also began to grow. While there is no evidence to suggest that Sand Point hosted any logging or fishing camps during this period, there are reports of the point being used for Methodist camp meetings in the 1880s. In 1885, Alger County was set off from Schoolcraft County, and ten years later, ground was cleared to create the village of Munising, which was incorporated in 1896.

In 1900, 300,000 acres of land in Alger County, including a tract on Sand Point, were purchased by the Cleveland-Cliffs Iron Company. The company was founded in 1847 as the Cleveland Iron Company to mine and process iron ore in the Upper Peninsula. Reincorporated as Cleveland-Cliffs in 1891, by the early 1900s the company was the largest independent producer of iron ore in the United States. Iron mining and smelting was a lumber intensive process, so the company purchased vast tracts of land which they clear cut for timber. They then sold the

cleared land for agricultural development. By the early 1930s, the company's operations included a separate land department to manage their extensive holdings. At that time, the company investigated opening a silica sand plant along the coast between Sand Point and Munising. There is no evidence that, aside from the proposed silica sand operation, the company logged or otherwise utilized the land it owned at Sand Point. In the early 1930s, the Cleveland-Cliffs Company agreed to provide land on Sand Point to the United States Coast Guard for a new lifesaving station.

The United States government had been engaged in maritime lifesaving operations since 1848, when the U.S. Congress appropriated the first funds to build and equip lifesaving stations on the East Coast. The U.S. Life-Saving Service was officially incorporated as a separate agency in 1878. The first life-saving stations appeared on the Great Lakes in the early 1870s, including several on Lake Superior. In 1900, a station was established at Grand Marais. There were also many lighthouses constructed on Lake Superior in the late nineteenth and early twentieth centuries, but at this time the Lighthouse Service was still separate from the Life-Saving Service, and would remain so until 1939. In 1915, the Life-Saving Service merged with the Revenue Cutter Service to form the United States Coast Guard.

Interestingly, the decision to build a Coast Guard Station at Sand Point came at a period when the Coast Guard was in a period of contraction rather than expansion. The Great Depression resulted in reduced funding for the Coast Guard and the service went through a period of reorganization. Fifteen lifeboat stations on the East Coast were decommissioned while construction of Sand Point was underway, and the closures would continue during the 1930s.

Preconstruction Chronology

Precontact
"Sandy beaches and coves or sheltered bays, such as those found intermittently along the southern shore of Lake Superior (e.g. Miners Beach, Grand Marais, Raspberry Beach, Sand Point), were choice camping places for Ojibway parties traveling by canoe. These features offered dry ground and protection from the elements; fishing and hunting in the immediate higher grounds also afforded subsistence means for campers."[1]

Late 18th century – late 19th century
An Ojibwe village was located on a strategic resource area at Sand Point. Ojibwe people fished at Sand Point beyond the ledge and beyond the current NPS headquarters. The swampy grounds on Sand Point were an important source for rice, both wild and cultivated. There was a cemetery, in the vicinity of the current parking lot. It was still being actively cared for ca. 1918 and contained burials of non-Ojibwe fishermen from Powell Point as well as older Ojibwe burials.[2]

1850
The Munising town site was platted but never developed.[3]

1 M. Nieves Zedeno, Richard W. Stoffle, Fabio Pittaluga, Genevieve Dewey-Hefley, R. Christopher Basaldu, and Maria Porter, "Traditional Ojibway Resources in the Western Great Lakes: An Ethnographic Inventory in the States of Michigan, Minnesota, and Wisconsin," (Tucson, Arizona: University of Arizona in Tucson Bureau of Applied Research in Anthropology, prepared for the National Park Service Midwest Regional Office, 2001), 72.

2 Zedeno, et. al., "Traditional Ojibway Resources," 128, 153-55.

3 Charles A. Symon, Ed., *Alger County: A Centennial History, 1885-1985*, (Munising, MI: Alger County Historical Society, 1986, 154.

1867
Munising Township was organized.[4] Logging, iron smelting, agriculture, commercial fishing, and tourism were all important industries in the late nineteenth and early twentieth centuries [No evidence was found to suggest there were logging or fishing camps on Sand Point].

1870s
United States Life-Saving Service established; first lifesaving stations opened on Lake Superior.

1880s
Ca: Sand Point was used for Methodist camp meetings as well as Ojibwe camps.[5]

1885
Alger County was set off from Schoolcraft County.[6]

1895-96
Ground was cleared for a town site and Munising was founded. There were a large number of saw mills in the town in its early years.[7]

1900
The Cleveland-Cliffs Iron Company purchased 300,000 acres in Alger County; they planned to clear cut the land for timber and then sell the cleared land for agriculture.[8]

The Grand Marais Life Saving Station opened.

1905
An article in the Marquette *Daily Mining Journal* in September of this year described active burials at the Sand Point cemetery by Ojibwes.[9]

1909
Munising Range Lights were put into regular service.[10] They replaced the ineffective Grand Island East Channel Light to guide vessels safely into the Munising harbor.

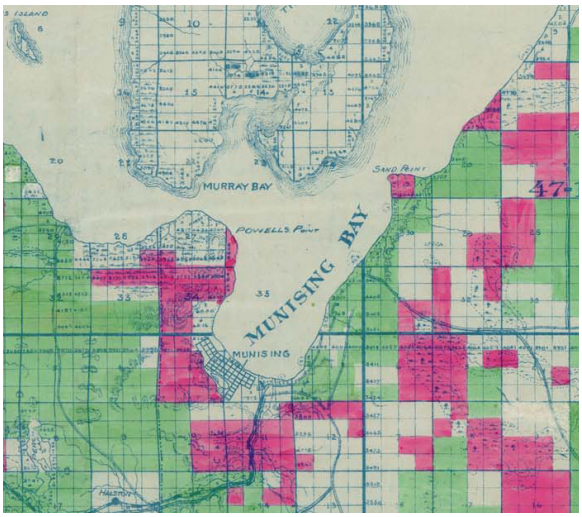


Figure 1-4. A map of land owned by mining companies in the mid-Upper Peninsula, dated 1913 denotes pink for Cleveland Cliffs Iron Co. and green for the Munising Company (excerpt) (source: "Land Owned by Mining Companies in the mid-Upper Peninsula," 1913, Archives of Michigan).

1915
The US Life-Saving Service merged with the

4 Charles A. Symon, Ed., *Alger County: A Centennial History, 1885-1985*, (Munising, MI: Alger County Historical Society, 1986, 6.
5 Frederick Stonehouse, "Historic Resource Study, Pictured Rocks National Lakeshore," January 1981, 2.
6 Charles A. Symon, Ed., *Alger County: A Centennial History, 1885-1985*, (Munising, MI: Alger County Historical Society, 1986, 8.
7 Charles A. Symon, Ed., *Alger County: A Centennial History, 1885-1985*, (Munising, MI: Alger County Historical Society, 1986, 155.
8 Institute for Community Development, "The Proposed Pictured Rocks National Lakeshore: An Economic Study," National Park Service, 1963, 7. The ownership of the property prior to Cleveland Cliffs' purchase was not found during research.
9 Cited in Frederick Stonehouse, "Historic Resource Study, Pictured Rocks National Lakeshore," January 1981, 1.
10 Stonehouse, *Historic Resource Study*, 99.

Revenue Cutter Service to form the United States Coast Guard.

1929-33
Economic decline connected to the stock market crash and Great Depression led to reductions in federal expenditures and the reorganization of the Coast Guard for more efficiency. Funding for lifesaving operations was reduced and 15 lifeboat stations were deactivated in 1933, mostly on the East Coast, with more closures coming in the late 1930s.[11]

1931
The Cleveland-Cliffs Company investigated opening a silica sand plant near Sand Point.

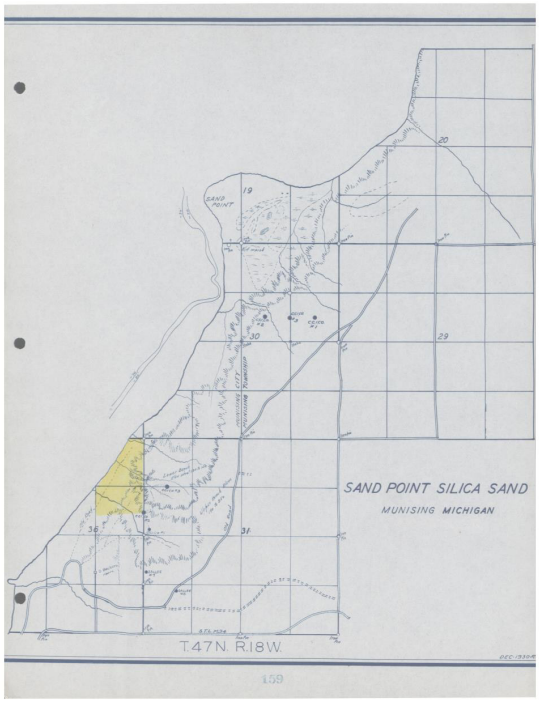


Figure 1-5. A map of the proposed silica sand facility (source: Cleveland-Cliffs Company Land Department Report, 1931)

11 "US Government Lifesaving Stations, Houses of Refuge, and Pre-1950 US Coast Guard Lifeboat Stations," (Multiple Property Documentation Form), E-14.

R. A. Brotherton in his report recommended subdividing the section and setting corners, as well as running contours on the land from which the sand would be mined.[12]

Episode 1: Coast Guard Station 1932-1958

Contemporary newspaper reports suggest that the Sand Point Coast Guard Station was originally planned for Grand Island. While they note that Sand Point was instead chosen as a better site, the specific reasons were not cited. The Coast Guard purchased a 7.11 acre plot from the Cleveland-Cliffs Iron Company for the nominal price of $1, and a contractor was chosen and construction begun in the summer of 1932. Construction was delayed by weather and material shortages, and even when the station was complete, its commissioning was delayed because the station's boats were stuck in Marquette due to ice blockages.

A separate project was the construction of a road from Munising to Sand Point. Originally started as a County Aid project, construction was taken over by the federal government's Civil Works Administration. During construction, Ojibwe remains from the Sand Point cemetery were disturbed and reportedly reinterred elsewhere in the vicinity.

The Munising Station crew, while they regularly engaged in local rescues, only participated in two major rescues, both in November of 1940: the wreck of the *Sparta* on the 7th and the steamer *Sinola* on Lake Michigan on the 12th. The crew, originally at around 8-10 men,

12 Cleveland-Cliffs Company, "Land Department Report for the Year Ending December 31, 1931," Cleveland-Cliffs Iron Company Land Records, Subseries 2: Agents Annual Reports of the Land Department 1904-1942, 114-5. Downloaded from the Central Upper Peninsula and Northern Michigan University Archives, http://archives.nmu.edu/cci/Land.html, June 3, 2016.

increased during World War II as the station was used as a training facility. However, by the mid 1950s, changes in technology and improvements in vessel safety meant that the work of the lifesaving station was virtually obsolete. After operating with a skeleton crew for some time, the station ceased operations on September 10 of 1958.

Episode 1 Chronology

1932

May 2: Cleveland-Cliffs Company annual report noted Conveyance number 5049, dated May 2, 1932, to the United States of America for $1. The remarks column stated "Coast Guard Station site. Nominal charge. Expect this will be paid in 1933. Invoice rendered August 15, 1932." [payment not noted in subsequent annual reports][13] The quit claim deed noted: "For Coast Guard Station, in case same is not used for such purpose for 2 yrs said lot to revert to first party with all buildings thereon."[14]

May 6: The Marquette *Daily Mining Journal* reported that the federal government sent bids out for the construction of the new Coast Guard Station the previous day. Congressman [Frank P.] Bohn had secured an appropriation of $60,000 for the station, which was originally planned for Grand Island; Sand Point was instead selected as a better location. It noted that the station would be erected "at the base of the point near the old Chippewa cemetery."[15] On the same day, the *Munising News* runs a similar story, noting that local contractors George Leiphart and William Muffett had received the invitation to bid. This article also noted that there had been no definite plans for construction of a roadway to the station.[16]

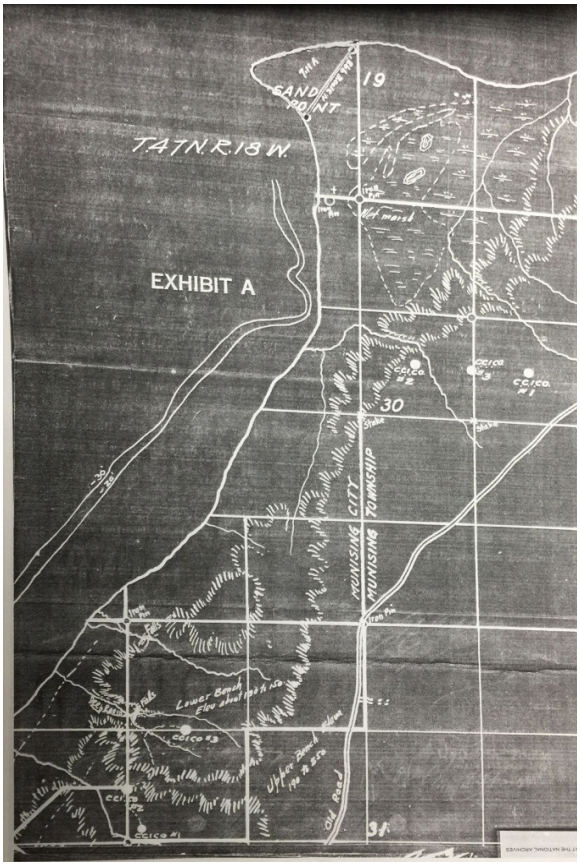


Figure 1-6. Exhibit A from the deed conveying the Sand Point property to the United States Government (soure: PIRO Lands Files, Box 13, Folder 144).

May 25: Bids were submitted for Munising Coast Guard Station. They called for a "two-story frame dwelling, 30 feet by 45 feet, with concrete foundations; a one-story

13 Cleveland-Cliffs Company, "Land Department Report for the Year Ending December 31, 1932," Cleveland-Cliffs Iron Company Land Records, Subseries 2: Agents Annual Reports of the Land Department 1904-1942, 135. Downloaded from the Central Upper Peninsula and Northern Michigan University Archives, http://archives.nmu.edu/cci/Land.html, June 3, 2016.

14 Transcription of Quit Claim Deed in PIRO Lands Files, Box 13, Folder 144.

15 "New Coast Guard Station Approved," *The Daily Mining Journal* (Marquette, Michigan), May 6, 1932, 4.

16 "Ask Bids on Coast Guard Station," *The Munising News*, May 6, 1932, 1.

frame boathouse, 37 feet by 55 feet, with creosoted pile foundation; a creosoted wood pile and timber marine launch way, 32 feet by 128 feet; two creosoted pile and timber bulkheads, each 129 feet long; and a creosoted timber and pile landing wharf, 10 feet by 40 feet; together with all necessary excavation, grading, dredging, etc." Forty bid invitations were sent out.[17]

The Munising Station was an example of a Station Complex, where separate buildings were provided for different functions (housing, boathouse, storage, etc.). The station was built in the Chatham design style, a popular style with almost 30 stations constructed in the style between 1914 and 1947. It was influenced by Colonial Revival.[18] A very similar station building was constructed for the Port Huron Coast Guard Station at around the same time (1932), with only minor differences at the roofline and layout.

June 3: G. A. Gustafson of Iron Mountain was awarded the construction contract for the station. Gustafson was the low bid at $26,700. Fifteen other bidders from around the region (as far as Chicago) sent in bids up to $42,230. Gustafson had also recently been awarded a contract to construct a concrete highway bridge over the Au Train river.[19]

June 6: "Munising Coast Guard Station" was officially designated by the Coast Guard.[20]

July 29: Construction began on the station

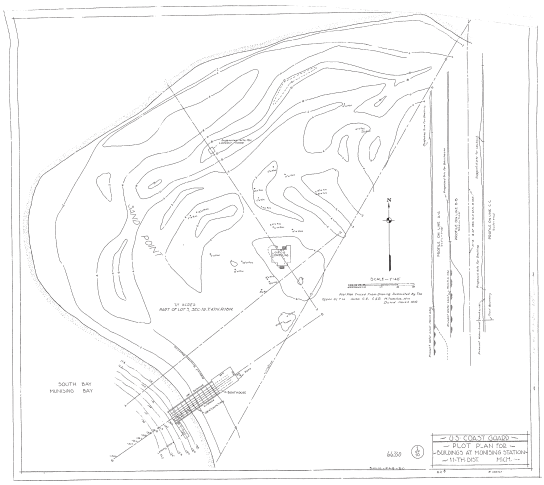


Figure 1-7. Plot Plan of the new station, dated March 1932 (source: United States Coast Guard).

with the landing of a scow and equipment by Anderson and Meade of Marquette, who were subcontracted for the pile driving and marine work. The crew began dredging out a spot near the shore for unloading materials. [21]

August 17: The 7.11 acre plot at Sand Point was acquired from the Cleveland-Cliffs Iron Company for $1.00.[22] [This is the date of record.]

The lookout tower and watch house were manufactured by McClintic-Marshall Corporation of Bethlehem, PA (one of eight, total cost for all eight was $2,092). Contractor F. A. Hunnelwell erected it for $865.80.[23]

Fall: The survey for the Sand Point Road was undertaken by the Cleveland-Cliffs Company. It passed over land being considered for a silica sand project.[24]

17 "Munising U.S.C.G. Station," undated pamphlet produced by the National Park Service.

18 "US Government Lifesaving Stations, Houses of Refuge, and Pre-1950 US Coast Guard Lifeboat Stations," (Multiple Property Documentation Form), F-17.

19 "Gustafson Low on Station Job," *The Munising News*, June 3, 1932, 1.

20 "Munising U.S.C.G. Station," undated pamphlet produced by the National Park Service.

21 "Scow Arrives at Sand Point to Make Ready," *The Munising News*, July 29, 1932, 1.

22 "Munising U.S.C.G. Station," undated pamphlet produced by the National Park Service.

23 "Munising U.S.C.G. Station," undated pamphlet produced by the National Park Service.

24 Cleveland-Cliffs Company, "Land Department Report for the Year Ending December 31, 1933," Cleveland-Cliffs Iron Company Land Records, Subseries 2: Agents

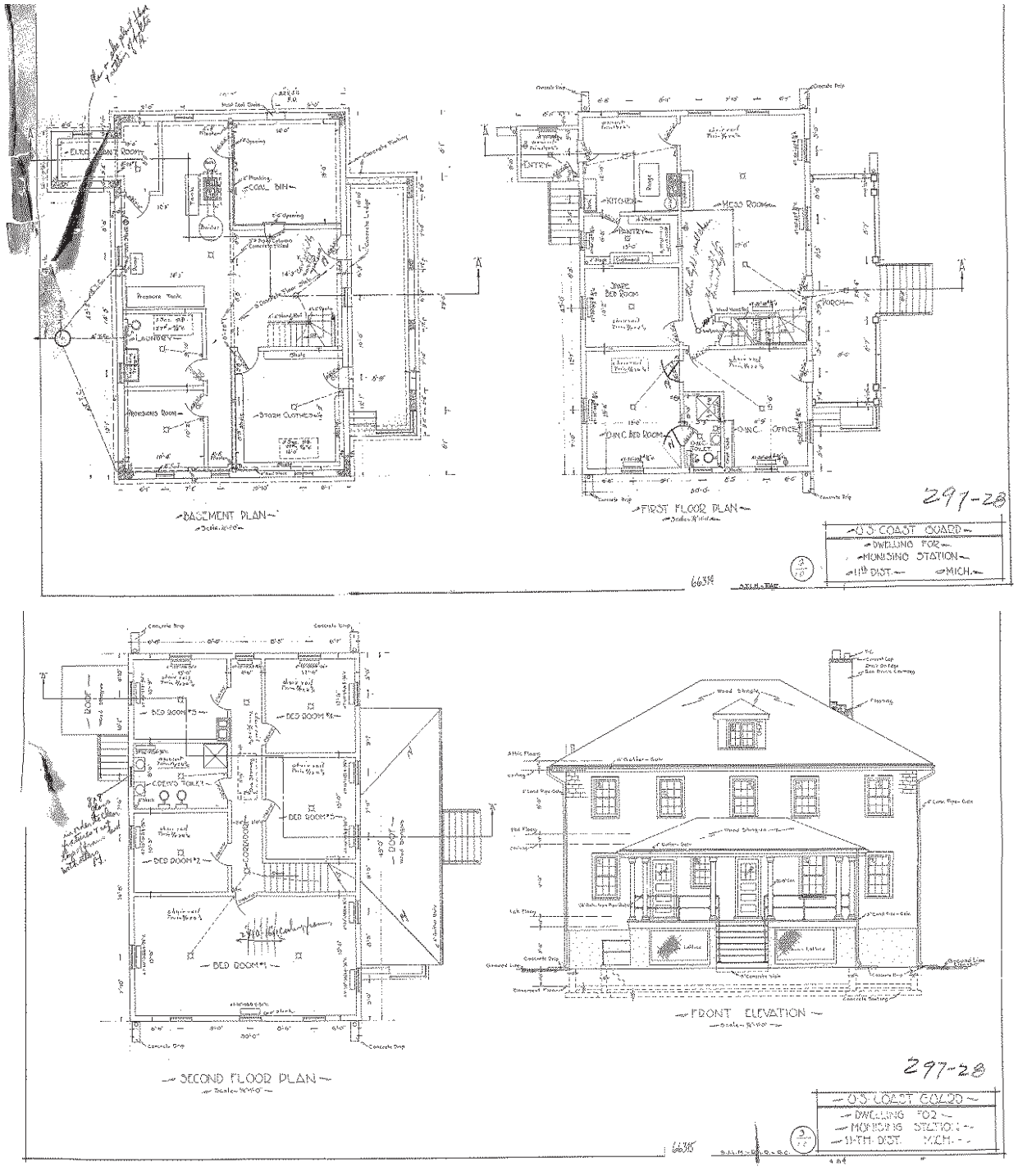


Figure 1-8. Basement, first floor, second floor, and front elevation of the station, 1932 (source: United States Coast Guard). *(See Appendix E for larger scale drawing.)*



Figure 1-9. Side and rear elevations, 1932 (source: United States Coast Guard). *(See Appendix E for larger scale drawing.)*

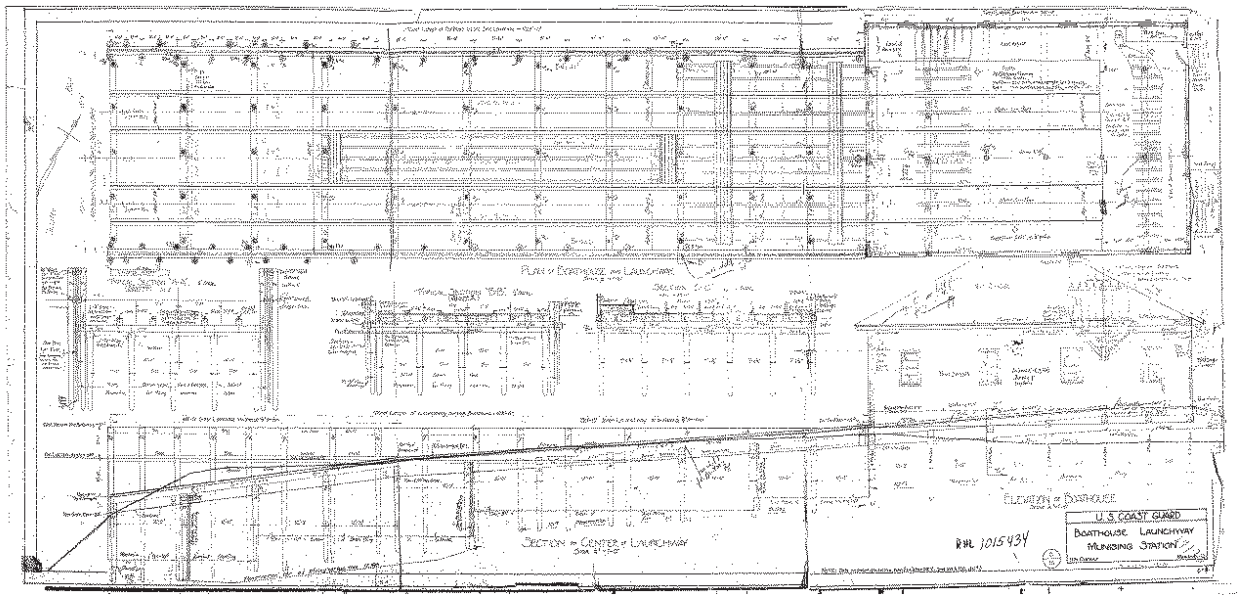


Figure 1-10. Boathouse section and launchway, 1932 (source: United States Coast Guard). *(See Appendix E for larger scale drawing.)*

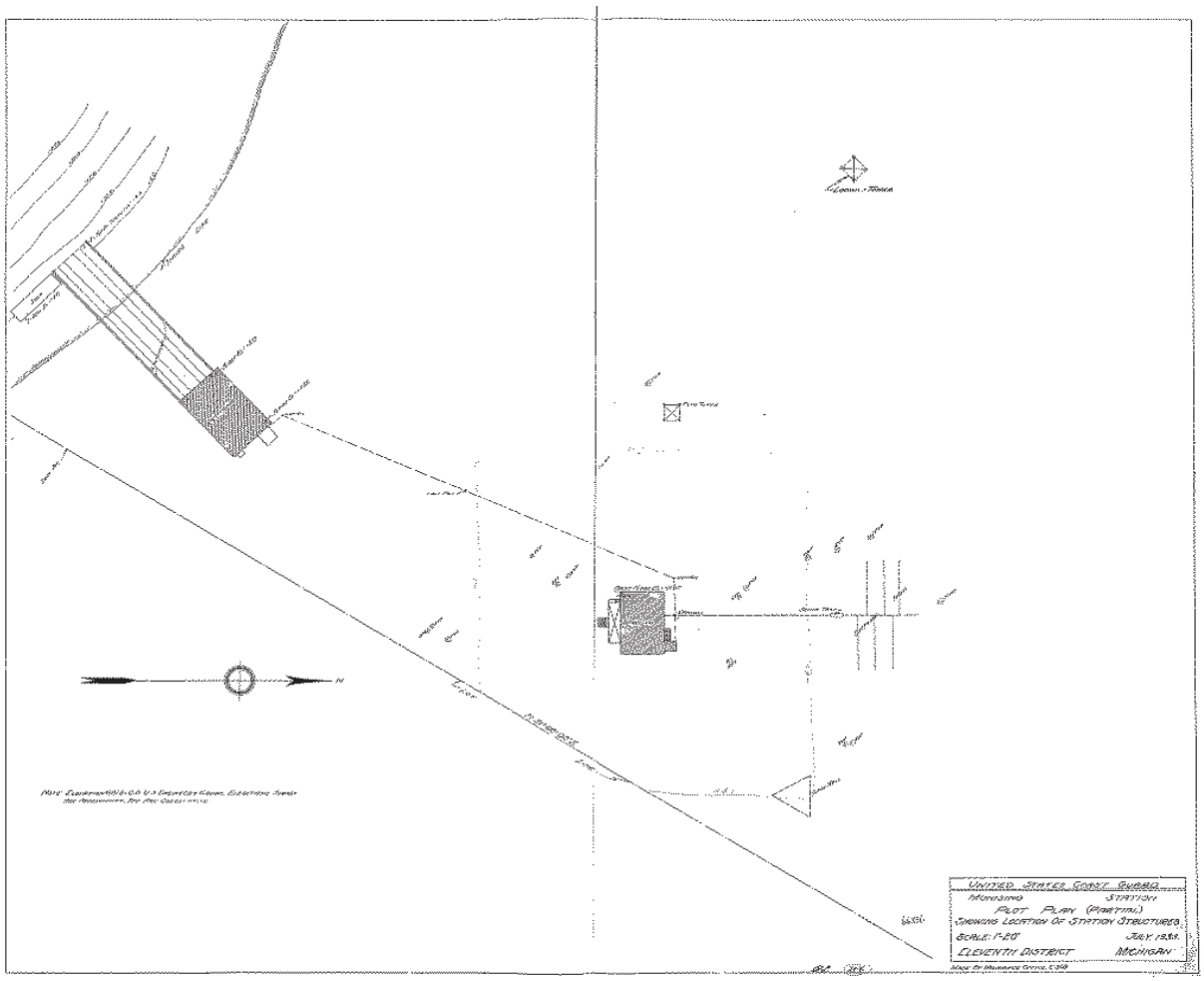


Figure 1-11. Plot plan showing location of structures, 1932 (source: United States Coast Guard).

December: Work on the road to Sand Point was halted because there was a question as to whether the federal government or the city would pay for it. The right of way for the road had been cleared but none of the "grading, grubbing, and gravelling" had been done.[25]

Construction of the station was delayed due to a shortage of yellow pine lumber for the boathouse.[26]

1933

April 1: The Munising Station was officially accepted by the supervising engineer and a caretaker assigned until the assigned crew could arrive. [27]

April 11: the Senior Civil Engineer for the USCG reported that the Munising Station buildings were ready for occupancy. He noted that the work "comprised a dwelling, for the personnel, with all modern conveniences including hot water heating system, toilet facilities and electric lights, a boathouse with two track launchway, a landing wharf, and the usual steel flag tower and drill pole." The memo referenced enclosed photographic views of the dwelling, boathouse, launchway and landing dock, dated March 3, when "there was considerable snow and ice remaining in the locality."[28] [The photos referenced were not attached to the document.]

May 15: The Marquette *Daily Mining Journal* noted that while the Marquette Coast Guard Station had resumed its summer duties, the Munising Station was still waiting for their boats, which were trapped in Marquette by ice in Munising Bay. The lighthouse tender Amaranth was expected to deliver other equipment to the station.[29]

May 16: The station was officially commissioned; two weeks late due to delays in transferring boats and equipment from Marquette because of thick ice in Munising Bay. The crew was 10 total; the station had four boats (motor lifeboat, motor surfboat, surfboat, and skiff). The station had a truck but it had to remain in storage as the road from Munising to Sand Point was not complete.[30]



Figure 1-12. Crew on the station steps in winter, undated but probably circa 1930s-40s (source: PIRO Archives).

Annual Reports of the Land Department 1904-1942, 127. Downloaded from the Central Upper Peninsula and Northern Michigan University Archives, http://archives.nmu.edu/cci/Land.html, June 3, 2016.

25 "Halt Work on New Road to Station," *The Munising News*, December 2, 1932, 1.

26 "New Guard Station," *Ironwood Daily Globe*, December 7, 1932, 6.

27 "Munising U.S.C.G. Station," undated pamphlet produced by the National Park Service.

28 P. Julian Latham, Senior Civil Engineer, USCG, Memorandum for Operations, dated 11 April 1933. In "Assorted Station Correspondence" folder, PIRO Archives.

29 "Coast Guards Doing Routine Summer Duty," *The Daily Mining Journal* (Marquette), May 15, 1933, 3.

30 "Munising U.S.C.G. Station," undated pamphlet produced by the National Park Service. Date of commission is confirmed by a memorandum from the Commandant of the Eleventh USCG District to the Commandant of the USCG, in "Assorted Station Correspondence" folder, PIRO Archives.

The crew mustered at 8:00 am in uniform; orders were read and the national ensign was hoisted. The Officer in Charge, J. F. Janssens, inspected the station buildings and apparatus and found all to be in excellent condition.[31]

May 20: Three station boats arrived at Munising Station. These were a 36 foot boat with a 90hp motor and two 26 foot surf boats. Captain John F. Janssens was in command of the station of 8 men, instead of the 10 originally expected. The other crew members were George A. Smith, boatswains mate, first class; Fred O. Hella, motor machinist, first class; Lloyd Campbell, George T. Salminen, Leon Parks, Tolvi Linnamaki, and Bror E. Carlson. Six of the crew were married and planned to build homes near the station "as soon as the site can be procured." Crew members were responsible for the cost of building their own home. The road was still incomplete, as was the placement of telephone and power lines. In addition to the buildings, there was a 55 foot steel flag tower. There was no wireless station; distress calls were instead telephoned from Sault Ste. Marie, Grand Marais, or Marquette.[32]



Figure 1-13. Station boats with station in the background, undated but probably circa 1930s (source: Alger County Historical Society).

Work was started on the Sand Point Road as a County Aid project. In December the Civil Works Administration (CWA) took over the project. By the end of December, the right-of-way had been cut out and three-quarters of a mile of grading and 1 ½ miles of grubbing completed.[33]

1934

April: The CWA was a short-lived program in the hard winter of 1933-34, and work on the Sand Point Road by the CWA had been abandoned several months prior. New bids were to be submitted to continue the work under the Federal Emergency Relief Administration (FERA). "Numerous" graves were uncovered along the road during the previous fall and winter.[34]

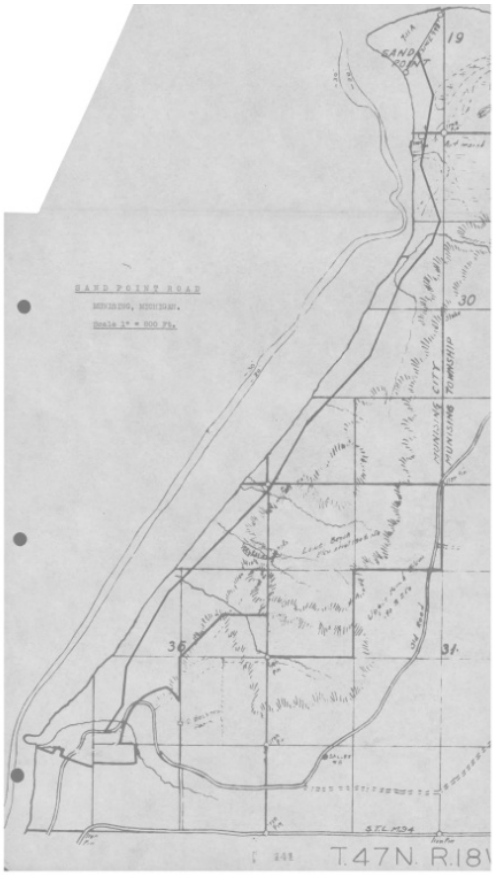
June: The crew had increased to 10, consisting of the Officer in Charge, boatswains mate, motor machinist, and seven surfmen. The interior of the station had just been completely painted but the floors did not have a "neat appearance." No improvements had been made to the grounds, with the reason cited as the delay in finishing the road to the station, which was "now under construction." It was expected that a lawn would be built around the station when the road was completed and a truck assigned to the station. The crew experienced difficulty with the water supply, which was yellow in color and contaminated with fine sediment. A new spring had been found near the station

31 Memorandum from the Officer in Charge, Munising Station, to the Commandant of the USCG, dated 16 May 1933, in "Assorted Station Correspondence" folder, PIRO Archives.

32 "Coast Guards Get Most of Equipment," *The Daily Mining Journal* (Marquette), May 20, 1933, 5; "New Guard Station," *Ironwood Daily Globe*, December 7, 1932, 6.

33 Cleveland-Cliffs Company, "Land Department Report for the Year Ending December 31, 1933," 127.

34 "Sand Point Project," *The Escanaba Daily Press*, April 15, 1934, 5.



Annual Report_Land_MS86100_2048_1933_170.tif

Figure 1-14. Map of station road from Cleveland-Cliffs Annual Report.

and the crew planned to pipe water from this spring to eliminate the sediment.[35]

November: The crew was now 11 in number. The crew was still awaiting the completion of the road so they could haul black dirt and clay to fill in around the station. The District commander noted that a new sidewalk was needed around the station and from the station to the signal tower and recommended that this be done under contract rather than by the crew. He also noted that the road was



Figure 1-15. Two crew members by the station steps, undated but probably circa 1930s-40s (source: PIRO Archives)

nearly complete, with expenditure estimated at nearly $80,000. Road construction was hampered by springs which kept washing out the road.[36]

"Late": The road from Munising to Sand Point was completed.[37] The road construction was reportedly a WPA project (Zedeno, et. al. date this to 1936). The road reportedly went through the Ojibwe burial site and a number of bodies were dug up and reinterred nearby during the process.[38]

35 Memorandum from the Commander, Eleventh District to the Commandant of the USCG, dated 29 June 1934 in "Assorted Station Correspondence" folder, PIRO Archives.

36 Commander, Eleventh District, to USCG Commandant, Munising Station inspection report, dated 2 November 1934, in "Assorted Station Correspondence" folder, PIRO Archives.

37 "Munising U.S.C.G. Station," undated pamphlet produced by the National Park Service.

38 Zedeno, et. al., "Traditional Ojibway Resources," 156-7.

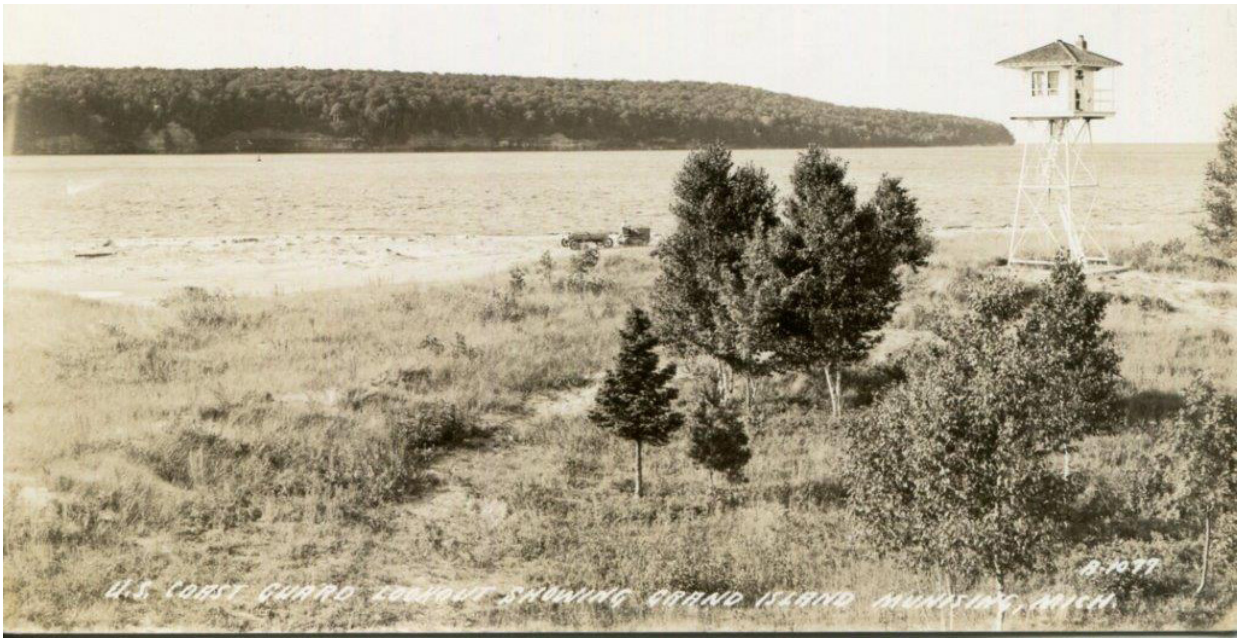


Figure 1-16. Station beach and lookout tower, undated, but probably circa 1930s (source: Alger County Historical Society).

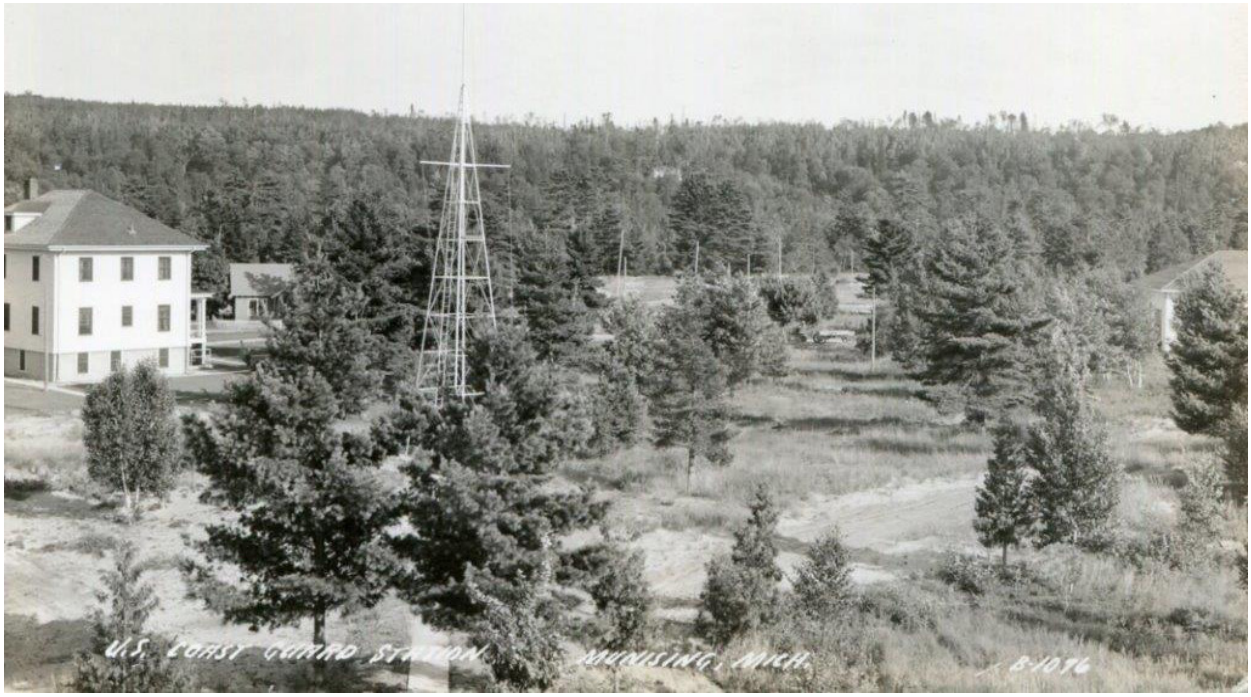


Figure 1-17. Station, undated but probably circa 1930s-1940s (slource: Alger County Historical Society).

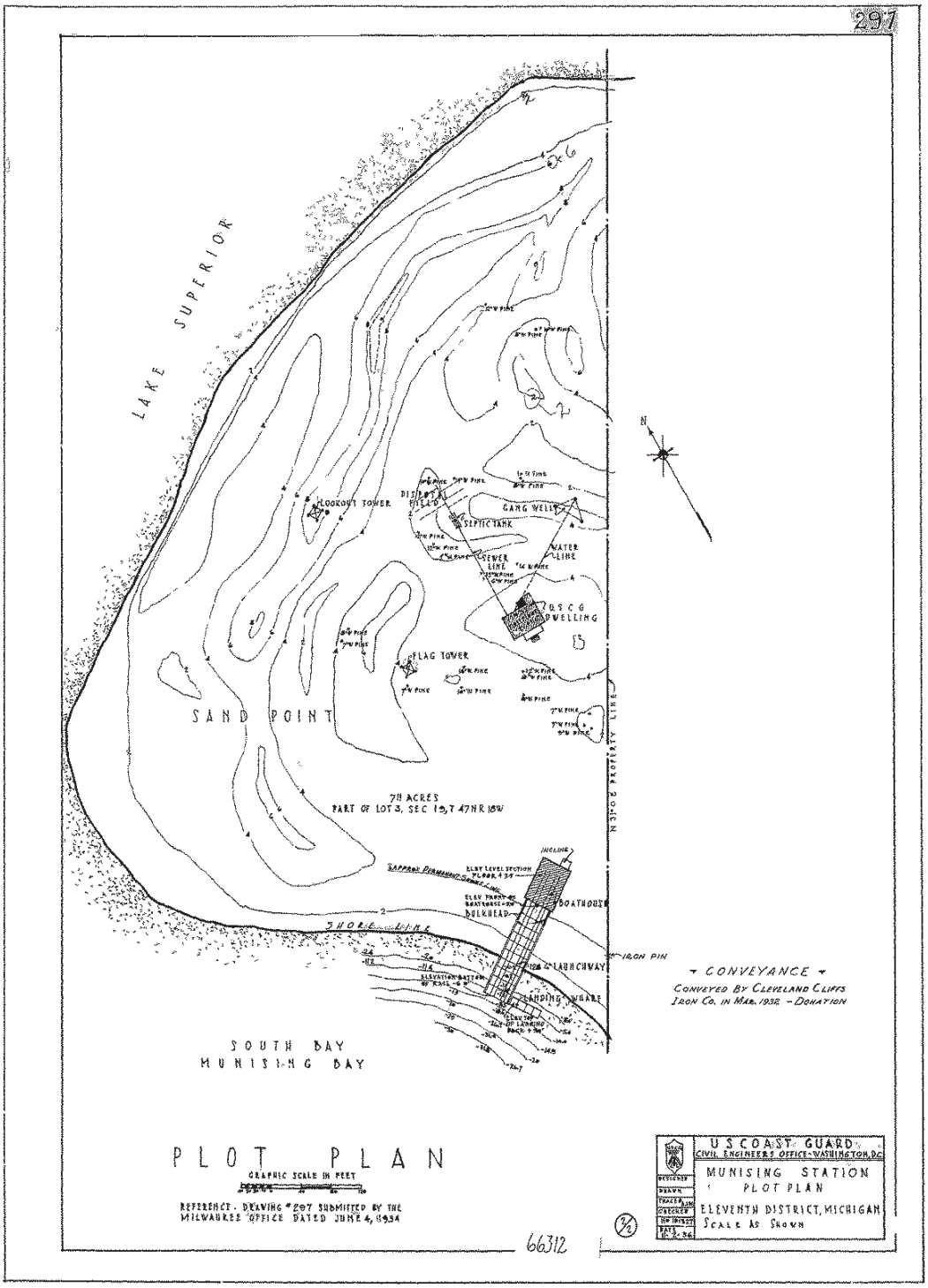


Figure 1-18. Munising Station Plot Plan, 1934 (source: United States Coast Guard).



Figure 1-19. Aerial image of the station, ca. 1940s (source: PIRO Archives).

The Cleveland-Cliffs Company Annual Report for 1934 stated "This road was practically completed during the year but there still remains considerable work to be done to put the road in good shape. F.E.R.A. labor does not accomplish much, due to lack of proper supervision and the small amount of work done by the men during the hours worked. Work done on these Government projects costs four to five times more than it should."[39] [No mention of the road was found in the 1935 report.]

1936

August/September: Three crew members from Munising assisted in fighting a forest fire on Isle Royale.[40]

In general, the crew responded to emergencies about two times a month, typically for small fishing or pleasure craft that were overdue or disabled. They occasionally had to search for missing ice fishermen.[41]

39 Cleveland-Cliffs Company, "Land Department Report for the Year Ending December 31, 1934," Cleveland-Cliffs Iron Company Land Records, Subseries 2: Agents Annual Reports of the Land Department 1904-1942, 134. Downloaded from the Central Upper Peninsula and Northern Michigan University Archives, http://archives.nmu.edu/cci/Land.html, June 3, 2016.

40 Frederick Stonehouse, "Historic Resource Study, Pictured Rocks National Lakeshore," January 1981, 99.

41 Frederick Stonehouse, "Historic Resource Study, Pictured



Figure 1-20. Station building, dated 1944 (source: PIRO Archives).

1937
May: Work begins on a Works Progress Administration (WPA) project to improve the Coast Guard grounds. The project included construction of 490 feet of curbing, grubbing, clearing and filling grounds, and other incidental work. It was noted the grounds were practically impossible to travel.[42]

1940
The 1940 census listed 14 men at the Coast Guard station, ranging in age from 19 to 58. Eight of them had been at the station since at least 1935, while the remainder were newer to the station. Of the men, eleven were listed as married, but apparently their families were not counted in the census as none of their spouses or families were listed as living in the same county. The names were not divided by household, so it is not possible to tell who was living in the station and who in married quarters.[43]

Rocks National Lakeshore," January 1981, 99.

42 "WPA Coast Guard Project Launched," *The Escanaba Daily Press*, May 8, 1937, 12.

43 United States Census Bureau, *1940 Census* (Alger County, Michigan), Enumeration District No 2-11, Sheet 1-A. The 1950 census will not be available until 2022.

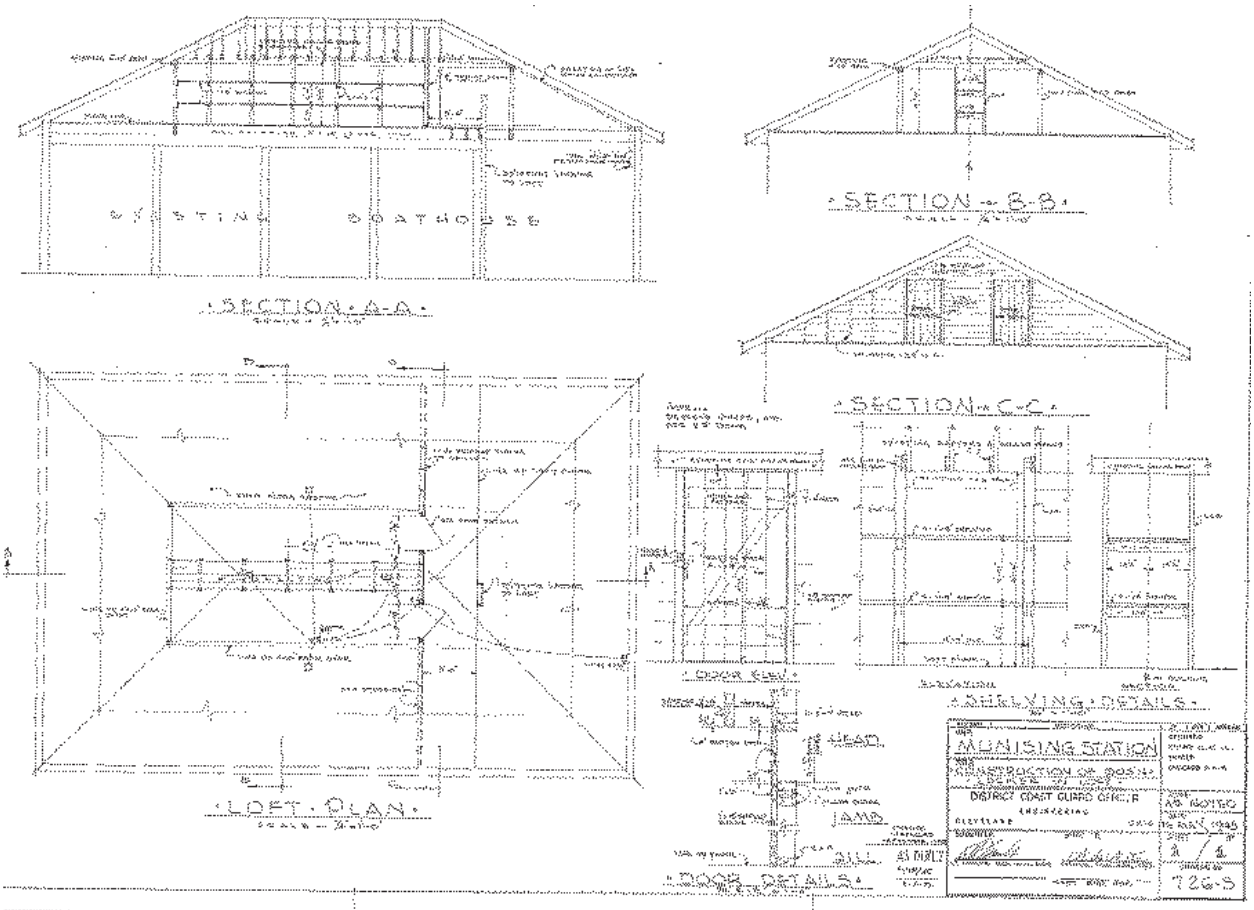


Figure 1-21. Construction Drawings for the Bos'n locker, 1945 (source: United States Coast Guard).

January 1: The Munising crew took over responsibility for the Munising Range Light.[44] [The Coast Guard and Lighthouse Service had merged in 1939.]

November 7: Wreck of the *Sparta*. First of two large vessel rescues that the station participated in.[45]

November 12: Munising Crew participated in second major rescue, of the steamer Sinola on Northern Lake Michigan near Fayette.[46]

1936-1941
Crew numbers fluctuated between 10 and 13 men.[47]

1940s Ca.: Smuck House and other residences were built as Coast Guard personnel residences.

1941
October: Crew members attempted to rescue a

44 Frederick Stonehouse, "Historic Resource Study, Pictured Rocks National Lakeshore," January 1981, 99.
45 Frederick Stonehouse, "Historic Resource Study, Pictured Rocks National Lakeshore," January 1981, 99.
46 Frederick Stonehouse, "Historic Resource Study, Pictured Rocks National Lakeshore," January 1981, 99.
47 "Munising U.S.C.G. Station," undated pamphlet produced by the National Park Service.

bull moose from a rock ledge along the bluff at Miner's Castle. They were unable to reach the ledge due to rough seas, and the moose found his own way off the ledge.[48]

Following the Japanese attack on Pearl Harbor and the entry of the United States into World War II, the station personnel numbers initially decreased due to transfers, but numbers afterward increased to a high of 28 men during World War II.[49]

1942
The Munising Station was used as a training facility during WWII. Recruits arrived from the Detroit recruiting station.[50]

1945
A Bos'n locker was constructed in the boathouse loft, and the launchway was dredged and extended, likely due to low water levels.[51]

1946
December: The six-room home of Martin Hendrickson at the Coast Guard station was destroyed by fire. Another home had been destroyed the previous May. The local newspaper report noted that firefighters were delayed in getting water onto the fire because their truck could not get close enough to the water to run the hose, due to the soft sand beach. The only firefighting equipment at the station was a pump which also failed due to low water. There was no hydrant system at Sand Point.[52]

1949
August: The Coast Guard proposes decommissioning the Sand Point station. Representatives of the city of Munising and Alger County as well as many local organizations testified at a U.S. Maritime Service board meeting objecting to the closure. The local community cited the station's protection of the S.S. South American, the Grand Island ferry, Pictured Rocks Boat Service, coal boats, local pleasure craft, commercial fisheries, and sport trollers as among those who benefited from the station. The decision was to be made later, but the station was not actually decommissioned for another nine years.[53]

1957-58
The National Park Service conducted a survey to determine the suitability of the Pictured Rocks area for inclusion in the National Park system.

1958
September 10: The Coast Guard "ceased all operations upon the premises." [54] The responsibilities of the Coast Guard were transferred to the Coast Guard Auxiliary which was headquartered in the lighthouse on West Munising Avenue.[55] Changes in technology, including the use of helicopters and large offshore cutters, and improvements in vessel safety, had made the lifeboats and station crews obsolete. The Munising Station operated with a skeleton crew for some time before it was decommissioned.[56]

48 Frederick Stonehouse, "Historic Resource Study, Pictured Rocks National Lakeshore," January 1981, 99.
49 "Munising U.S.C.G. Station," undated pamphlet produced by the National Park Service.
50 Frederick Stonehouse, "Historic Resource Study, Pictured Rocks National Lakeshore," January 1981, 99.
51 USCG drawings.
52 "Hendrickson Home Destroyed in a Fire Wednesday at Noon," *The Escanaba Daily Press*, December 12, 1946, 13.
53 "Munising Opposes Plan to Abandon Coast Guard Unit," *The Escanaba Daily Press*, August 19, 1949, 2.
54 L. J. Hoch, District Legal Officer, Ninth Coast Guard District,"Attorney's Report of Title, Munising Lifeboat Station, Alger County, Michigan," in "Assorted Station Correspondence" folder, PIRO Archives.
55 Charles A. Symon, Ed., *Alger County: A Centennial History, 1885-1985*, (Munising, MI: Alger County Historical Society, 1986, 174.
56 Frederick Stonehouse, "Historic Resource Study, Pictured



Figure 1-22. A 1960s aerial of Sand Point (source: PIRO Archives).

Episode 2: Ownership Transition and National Park Service Headquarters, 1960-present

Following the Coast Guard's decommissioning of the Munising Station, they complied with a provision in the original deed that the property revert back to the Cleveland-Cliffs Iron Company, with all improvements, after two years of vacancy. A little over one year after Cleveland-Cliffs regained title to the property, the company sold the property to the city of Munising for the sum of $1. It appears that the City did not formally develop the property, but it was used informally as a picnic/recreation area. When the federal government designated Pictured Rocks National Lakeshore, the City donated the property to the government for use as the administrative headquarters of the new NPS unit. The NPS allocated money for "deferred maintenance." Although there is no record of the work undertaken at this time, it is likely that it included items such as repairing or replacing the roof, painting, etc. The Park Service adapted the station building for use as a headquarters, which generally consisted of converting the rooms to office space, with few major alterations. Known changes since the NPS took ownership include the replacement of the latticework under the front porch with painted plywood, the construction of interior walls in the second floor barracks room to subdivide it into offices, minor reconfiguration of the west end of the first floor, and the replacement of bathroom fixtures.

The boathouse was remodeled for storage and exhibit space. A new floor was constructed on the storage (south) side to match the level of

Rocks National Lakeshore," January 1981, 100.



Figure 1-23. The station circa 1968 when acquired by the NPS (source: PIRO Archives).



Figure 1-24. The boathouse circa 1968 when acquired by the NPS (source: PIRO Archives).



Figure 1-25. Munising Station aerial, undated but probably circa 1960s (source: PIRO Archives).

the north end floor. The interior walls on the storage side have also been refinished with plywood and fiberboard. This likely represents several different work campaigns, but the dates of these are not known.

Episode 2 Chronology

1960
An inventory of the Munising Station by the Coast Guard Board of Survey noted that the station had not been used "for about three years" and that the buildings were in poor condition and presented "an unsightly appearance." This document also noted the clause requiring the property to be returned to Cleveland-Cliffs if the USCG decommissions it. The report concluded that the Munising Station was surplus to the needs of the Coast Guard and should be deeded back to the Cleveland-Cliffs Company.[57]

1961
The United States deeded the Munising Coast Guard Station property back to the Cleveland-Cliffs Company for $1. The instrument was dated May 10, 1961, and recorded September 5, 1961.[58]

August: The American Legion Post in Munising wrote to Senator Patrick McNamara asking to lease or purchase the vacant station building for its Legion building as well as space for the local National Guard Unit. McNamara wrote to the Coast Guard to inquire about the status of the station, and the Coast Guard explained that the property has been quitclaimed back to the Cleveland-Cliffs Company.[59]

1962
The Cleveland-Cliffs Company deeded the Sand Point property to the City of Munising for $1. The instrument was dated December 12, 1962, and recorded January 23, 1963.[60]

1963
A few cabins were located on Sand Point on land leased from the Cleveland-Cliffs Company. A developing residential area was also present on Sand Point.[61]

1966
Pictured Rocks National Lakeshore was established by the United States Congress.

1968
April: The Munising City Commission and the NPS were in talks over the donation of the Sand Point property. The city planned to retain the boathouse and move it "back" to Munising over the ice. The city was also concerned about maintenance of Sand Point Road given the foreseen increase in park traffic.[62]

May 31: The City of Munising executed a quit claim deed (as a donation) to the United States for the property at Sand Point. It had previously been used as a public park and

57 "Proceedings of a Board of Survey," Supply Section, 9th Coast Guard District, 14 June 1960, in "Assorted Station Correspondence" folder, PIRO Archives.
58 Transcription of Quit Claim Deed in PIRO Lands Files, Box 13, Folder 144.
59 Edward S. Genry, Postmaster, Munising, to Senator Patrick V. McNamara, August 25, 1961; Senator Patrick V. McNamara to Admiral Alfred C. Richmond, Commandant, USCG, January 18, 1962; USCG (unnamed individual) to Senator Patrick V. McNamara, September 18, 1961; all in "Assorted Station Correspondence" folder, PIRO Archives.
60 Transcription of Warranty Deed in PIRO Lands Files, Box 13, Folder 144.
61 Institute for Community Development, "The Proposed Pictured Rocks National Lakeshore: An Economic Study," National Park Service, 1963, 16-17.
62 Memorandum to File from the Superintendent, PIRO, dated April 5, 1968. Copy held at Pictured Rocks National Lakeshore Archives, Box 3, Folder 33.



Figure 1-26. Aerial photo of Sand Point, ca. 1974 (source: PIRO Archives).

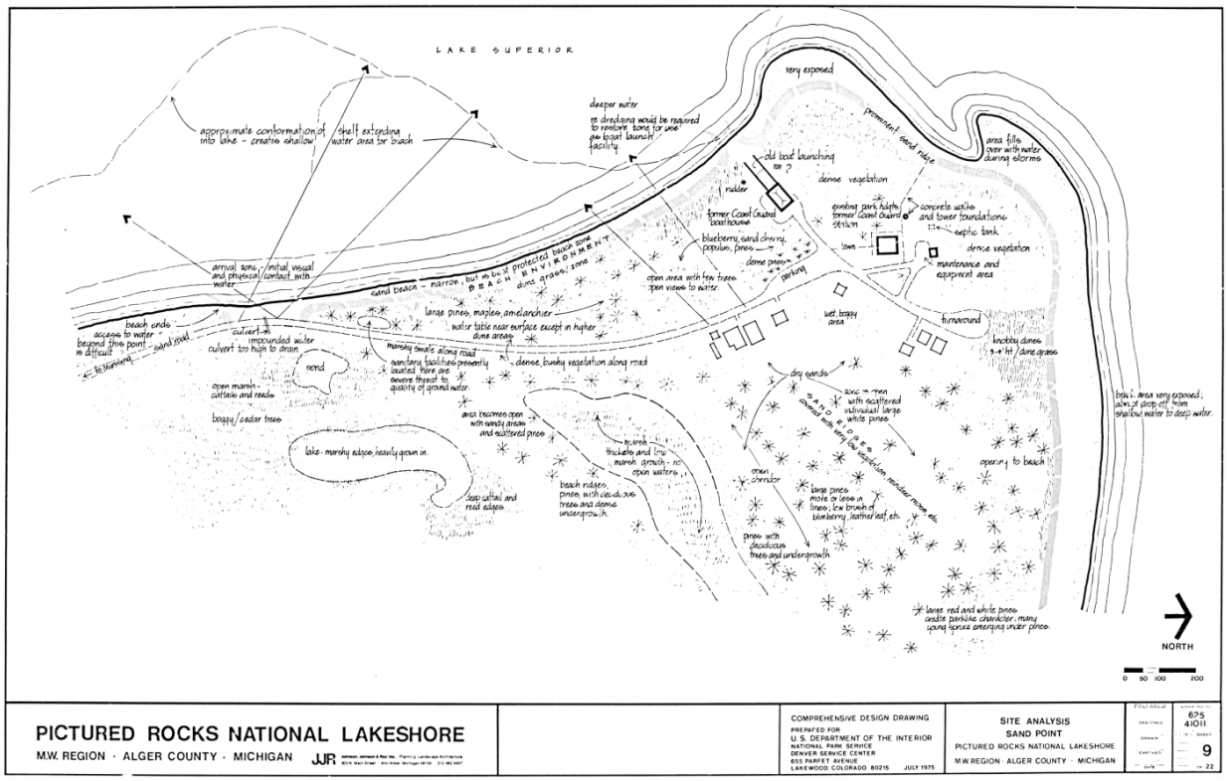


Figure 1-27. Site analysis of Sand Point, ca. 1975 (source; PIRO Archives).

picnic area.[63] The City of Munising retained the right to use and/or move the boathouse for two years, after which it would become NPS property. The city was also to remove the paint locker, and there was a "gentlemen's agreement" that the NPS would defer fee collection for the beach and picnic ground as long as possible.[64]

June: The new park issued purchase orders in the amount of $7,999.89 for initial deferred maintenance work prior to moving into the building. They expected to occupy the building in early August.[65] The NPS also requested that the city immediately remove the paint locker as it was interfering with the development of the lawn.[66]

1971

May 3: The US Government purchased the mineral interests on the Sand Point property from the Cleveland-Cliffs Iron Company.[67]

63 "Court Action Approved by Munising to Regain Sand Point Property," *The Mining Journal* (Marquette), September 2, 1971, 2.

64 "Tract Record and Valuation Data of Land to Be Acquired (Tract PIRO-201)," National Park Service, 1968. Copy held at Pictured Rocks National Lakeshore Archives, Box 3, Folder 33.

65 Memorandum from Hugh P. Beattie, Superintendent, to Regional Director, Northeast Region, NPS, dated June 19, 1968. Copy held at Pictured Rocks National Lakeshore Archives, Box 3, Folder 33.

66 Letter from Brooks Hamilton, Land Acquisition Officer, to the City of Munising, dated June 12, 1968. Copy held at Pictured Rocks National Lakeshore Archives, Box 3, Folder 33.

67 Memorandum from Robert J. Panton, Acting Chief, Office of Land and Water Rights, to the Assistant Attorney General,

August: The United States Attorney General sent a memo to the Secretary of the Interior confirming that the United States Government held valid title to the Sand Point property. The city of Munising, State of Michigan, and the public retain public easements and riparian rights.[68]

September: The City of Munising authorized civil action against the United States to return the 12 acres at Sand Point it donated in 1968, citing lack of funding appropriations to develop Pictured Rocks National Lakeshore, and the failure of expected tourism revenue to offset the loss of tax revenue from NPS land.[69]

November: Norman Davidson, Park Manager, prepared a rebuttal which was never published. He noted that the city had not filed the suit and that the threatened suit was "nothing more than a publicity gag."[70]

1972
November: Perhaps in response to the city of Munising's threatened civil action the prior year, the National Park Service allocated over $200,000 for the construction of roads and trails and work to buildings and utilities at Pictured Rocks National Lakeshore in 1973. Proposed work cited included the construction of trails, overlooks, campgrounds, picnic grounds, and parking areas.[71] A 1975 article suggests this work was delayed due to spending restrictions (see below).

1974
June 12: The City of Munising's salvage rights to the boathouse expired.[72]

1975
September: A local newspaper article noted that the funds appropriated for improving the park in 1972 were delayed due to federal spending restrictions in previous years. U.S. Representative Philip E. Ruppe had been "applying pressure" to the NPS to release the funds and the director of the NPS had written to Ruppe promising to contract for the work. The funding was estimated at $769,000 in addition to $84,000 which had already been spent. It was targeted for planning and construction of roads, trails, parking, picnic and sanitation facilities at Miner's Basin, Miner's Castle Overlook, Munising Falls, and Sand Point. Stabilization and improvement work was already underway at Sand Point. An additional appropriation of $191,000 was in planning for fiscal year 1976.[73]

1980s
Ca: a fire detection/alarm system was installed in the station building.[74]

Photos from around this period appear to show a new roof on the boathouse.

NPS converted the south bay of the boathouse into a carpenter shop and storage. Interior

Land and Natural Resources Division, Department of Justice, dated July 13, 1971. Copy held at Pictured Rocks National Lakeshore Archives, Box 3, Folder 33.

68 Memorandum dated August 12, 1971. Copy held at Pictured Rocks National Lakeshore Archives, Box 3, Folder 33.

69 "Court Action Approved by Munising to Regain Sand Point Property," *The Mining Journal* (Marquette), September 2, 1971, 2; "Munising Will Sue US for Park Land," *The Milwaukee Journal*, September 3, 1971.

70 Norman H. Davidson, Memo re: Sand Point Property, November 11, 1971. Copy held at Pictured Rocks National Lakeshore Archives, Box 3, Folder 33.

71 "U.P...The Peninsula!" *The Ironwood Daily Globe*, November 29, 1972, 19.

72 Memorandum from Irving L. Dunton to Joe Riha, Property Chief, Park Maintenance, PIRO, dated August 1, 1974. Copy held at Pictured Rocks National Lakeshore Archives, Box 3, Folder 33.

73 Tom Ochiltree, "Prodding Finally Works," *The Escanaba Daily Press*, September 29, 1975, 2.

74 PMIS Statement for proposed upgrade, 2003, in Maintenance files, PIRO.

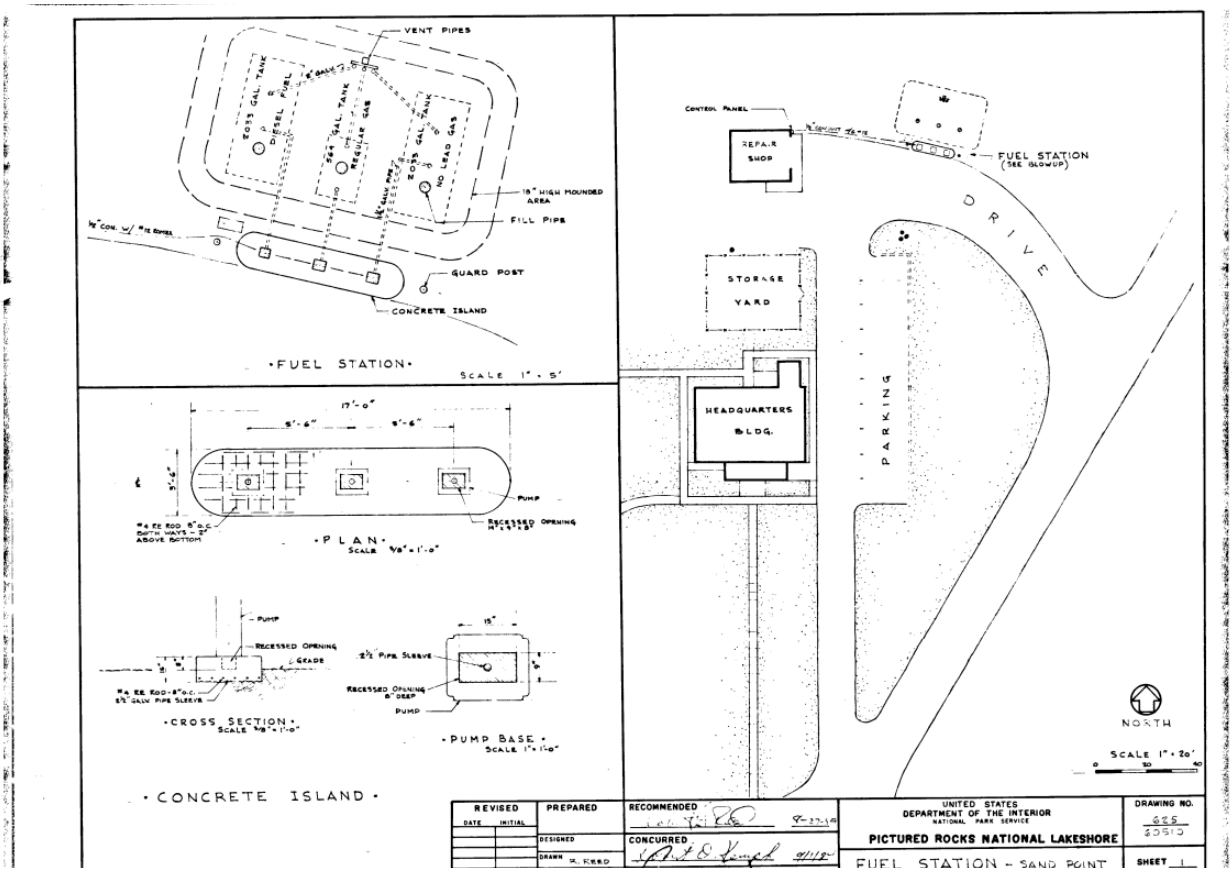


Figure 1-28. Drawing showing location of fuel station, 1984 (source: PIRO Archives).

partitions were constructed which divided the space into five rooms.

1983
Ca: A new cedar shake roof was installed on the station front porch.[75]

1980s
Mid: a 300m rock revetment was installed to halt erosion of the beach at Sand Point.[76]
1984
A fuel station was constructed by the NPS at Sand Point, north of the headquarters building.

1991
Three underground storage tanks were removed from Sand Point. Subsequent soil testing showed no further remediation was necessary.[77]

1998
A Site Development and Landscape Rehabilitation Plan was prepared (draft). It recommended rehabilitation of the landscape and buildings and interpretation to the 1940s

75 PMIS Statement for proposed replacement, 2004, in Maintenance files, PIRO.

76 Robert S. Young, "An Analysis of Coastal Erosion and Management Issues at Sand Point, Pictured Rocks National Lakeshore," Western Carolina University Department of Geosciences and Natural Resources Management, August 23, 2004.

77 Clifton Clark, Michigan Department of Natural Resources, to Grant A. Petersen, PIRO, October 2, 1992, in Maintenance Files, PIRO.

period. It noted that "only the grounds inside the perimeter concrete 'wall' were maintained in a manicured fashion by the 'coasties.'"[78]

2001
Specifications were issued for a project to upgrade the station's electrical service and distribution (they noted that the system had previously been upgraded with modern wiring but that this was now insufficient). Work included removal and replacement of the service panel and service conductors and the installation of additional circuits.[79]

The fire detection/alarm system stopped working.[80]

2003
The Munising City Commission approved two resolutions requesting that the NPS return more than 700 acres of land, including 12 acres at Sand Point, to the city. The city cited as reasons the early closure of a landfill that was originally provided in exchange for the Sand Point property, the original donation of the site specifically for the park headquarters (the NPS was exploring plans to relocate the headquarters elsewhere), concerns over stewardship of cultural resources by the NPS, and concerns that the NPS, as a majority landowner in the city, did not pay taxes or make any payments in lieu of taxes.[81]

August: NPS issued specifications for washing the exterior of the station building and painting the soffits and fascia.[82]

2004
A PMIS Statement requested replacement of the cedar shake roof on the station porch. It noted that water and ice were sliding off the main roof and accumulating on the porch roof which had accelerated deterioration of the porch roof. Specifications for the project, which also included the south facing roof on the main building, were issued later that year. The specs called for 16" sawn cedar wood shingles, hot dipped zinc coated nails, galvanized steel flashing, and semi-transparent redwood stain.[83] It appeared this project was never completed.

A PMIS Statement requested the replacement of the overhead power line serving Sand Point.[84]

2005
NPS contracted with SimplexGrinnell to design and install a new fire detection, alarm, and suppression system in the station building.[85] [The suppression system was not connected to a water source and is non-functional.]

2006
The Smuck Garage was demolished.[86]

2008
The septic mound at Sand Point was relocated to provide a more appropriate setback from the shoreline.[87]

78 "Munising Station – US Coast Guard (ret.) Site Development and Landscape Rehabilitation Plan," April 10, 1998, unfinished draft copy in Maintenance files, PIRO.
79 Specifications in Maintenance files, PIRO.
80 PMIS Statement for proposed upgrade, 2003, in Maintenance files, PIRO.
81 "City Wants Park Property," *The Munising News,* December 10, 2003, 1; *John* Pepin, "Munising Wants Park Land Returned," *The Mining Journal* (Marquette), December 14, 2003, 1A.
82 Specifications in Maintenance Files, PIRO.
83 PMIS Statement for proposed replacement, 2004, in Maintenance files, PIRO.
84 PMIS Statement for proposed replacement, 2004, in Maintenance files, PIRO.
85 Correspondence and specifications in Maintenance files, PIRO.
86 Section 106 for Removal of Smuck Garage in Maintenance files, PIRO.
87 Plan and correspondence in Maintenance Files, PIRO.

A new fire and intrusion detection and alarm system was installed in the boathouse.[88]

88 Specifications in Maintenance Files, PIRO.

Tables Comparing Current and Historic Room Names/Functions

Table 1. Life Saving Station Current Room Function/Name vs. Historic - Basement

Current Room Name / Function	Historic Room Name / Function
Storage (001)	area below the porch - open to the exterior
Storage (002)	area below the porch - open to the exterior
Work Room (003)	no assigned function
Conference Room (104)	Storm Clothes
Hall (005)	hall
Storage (006)	Provisions
Restroom (007)	Laundry
Mechanical (008)	mechanical (equipment has been relocated within the room but function remains the same
Electrical (009)	Electrical Plant Room
Storage (010)	Coal Bin

Table 2. Life Saving Station Current Room Function/Name vs. Historic - First Floor

Current Room Name / Function	Historic Room Name / Function
Library (101)	Mess Room
Hall (102)	originally part of what is now Office (103)
Office (103)	O-in-C Office
Restroom (104)	O-in-C Toilet
Superintendent Office (105)	O-in-C Bedroom
Office (106)	Spare Bed Room
File Storage (107)	Pantry
File Storage (108)	Kitchen
Office (109)	Entry

Table 3. Life Saving Station Current Room Function/Name vs. Historic - Second Floor

Current Room Name / Function	Historic Room Name / Function
Office (201)	Bed Room #5
Office (202)	Bed Room #1
Office (203)	Bed Room #1
Office (204)	Bed Room #1
Hall (205)	Bed Room #1
Hallway (206)	hall
Office (207)	Bed Room #2
Bathroom (208)	Crew's Toilet
Office (209)	Bed Room #3
Office (210)	Bed Room #4

Building Overview

Three historic buildings are located at the Sand Point Munising Life Saving Station complex. This section includes a brief overview of the buildings followed by a detailed evaluation and analysis of each building element at all three buildings.

Munising Life Saving Station (HS-01)
The Life Saving Station is a two story structure with a full basement. Exposed concrete foundation is painted at the basement level and the upper floors have painted wood shingle siding. The hipped roof has painted wood shingles. Three entrances access the building - the main entrance at the porch level on the south facade, an entrance on the north facade at the first floor level and an entrance to the basement under the south porch.

Munising Life Saving Station Oil House (HS-02)
The Oil House is a prefabricated cylindrical metal structure set on a concrete pad and capped by a conical metal roof. It is accessed via one entry door on the south side of the structure.

Munising Life Saving Station Boathouse & Launchway (HS-08)
The Boathouse is a one story structure with a wood pier foundation and hipped roof. It has painted wood shingle siding and roofing. There are four entrances to the building - two overhead boat launch doors on the west (lake) elevation and a third overhead garage door and man door on the east elevation. The Launchway extends from the west doors out to Lake Superior, though drifting sand obscures this connection currently.



Figure 1-29. Three Coast Guard Station buildings remain at Sand Point - Life Saving Station (top), Oil House (middle) and Boathouse & Launchway (bottom), (KAC, 6/8/2016)

Building Existing Conditions & Condition Assessments

The disciplines of architecture and structural engineering are addressed individually in each section.

Existing Conditions

The Existing Conditions section describes the current conditions, by discipline and by component, as observed on site during the June 2016 site visit.

Condition Assessment

Following the Existing Conditions section, each feature/system is evaluated and assigned an attendant condition rating. A general building condition assessment is presented first, followed by the condition assessment and ratings of each feature component. The condition rating system is as follows. (Note: These terms are also applied to the overall structure/building.)

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.

Munising Life Saving Station
General Existing Conditions

The Life Saving Station is a wood frame, two story structure with a full basement. It is clad with painted wood shingle siding and the hipped roof also has painted wood shingles. Half hipped roofs extend over the porch on the main, south, facade and the secondary entrance on the north facade.

The first floor consists of eight spaces which generally retain the original layout, though a few openings have been altered. Originally this first floor served as the food storage, preparation and eating area on the east side with the Officer-in-Charge's bedroom, bathroom and office on the west side and a spare bedroom in between. Stairs off what was originally the Mess Room, now the Library, lead to the basement and second floor. First floor rooms have been converted and now are offices or file and book storage rooms.

Basement spaces generally retain their original layout. Walls and openings at three spaces have been changed - what was originally the coal storage room, the space under the porch and the north wall of the Conference Room. Coal is no longer used in the building and the room used for storing this has now been converted to Storage (010) with man doors into it. The area under the south porch has been enclosed and is now used for storage. The north wall of Conference Room (004) was extended north to provide a sink and counter space.

Second floor spaces have been the most altered but still retain much of the original layout. Originally the west third of the building was a large, single dormitory which has now been subdivided into three offices and a hall. Room configuration on the rest of the second floor matches the original, with minor changes to openings.



Figure 1-30. Main facade (KAC, 6/8/2016)



Figure 1-31. North facade (KAC, 6/8/2016)



Figure 1-32. First Floor Library (KAC, 6/8/2016)

Existing Conditions - Architecture

Architecture - Roofing System
In general, the roofing system retains the historic layout and materials, though materials have been replaced in kind over the years. There are three roofs on the Station - the main roof, the roof over the south porch and the roof over the north entry. A dormer window is located on the north and south sides of the main roof.

Architecture - Roofing
Roofing is sawn wood shingle with a 4 3/4" exposure and a red paint which was applied after installation. Existing shingles were installed in 1983. A weather vane and a metal pole are mounted on the roof.

Architecture - Gutters and Downspouts
Galvanized metal gutters are mounted to the roof edges with a 6" diameter at the main roof and 4" diameter at the two lower roofs. Downspouts, also galvanized metal, lead from the gutters to concrete splash blocks at grade. Gutters and downspouts are painted to match the color of the building they are adjacent to - white at upper levels and gray at the basement level.

Architecture - Chimney
A brick chimney extends through the east side of the roof and confirms original drawings which called for a brick chimney with a concrete parge cap.

Architecture - Fascia
A simple 1x wood fascia board, painted white, is mostly obscured by the gutters which are mounted to it. Fascia at the dormer is exposed as no gutter is mounted to it.

Architecture - Soffit
1 x 3 1/4" tongue and groove wood soffit, painted white, extends from the face of the building to the inside edge of the fascia.



Figure 1-33. Roofing (KAC, 6/8/2016)



Figure 1-34. Wood shingle roofing and metal gutter (NAA, 6/8/2016)



Figure 1-35. Exterior facade (KAC, 6/8/2016)

Architecture - Exterior Facade
Exterior finishes are in keeping with materials called out on the original drawings.

Architecture - Exterior Walls - Concrete
At the basement level, the concrete foundation is exposed and painted grey. Paint sample analysis revealed the foundation was painted Almost Cream originally, see the full report in the Appendix for additional information. See Structural section for more information on the foundation.

Architecture - Exterior Walls - Shingles
Exterior finish above the foundation is wood dimension shingle siding which is 5" wide with a 5 1/2" exposure. The lowest three rows of shingles flare out, creating a noticeable projection. Shingles are painted white. Paint sample analysis revealed the shingles were painted Almost Cream originally, see the full report in the Appendix for additional information.

Architecture - Exterior Trim
Trim consists of a wood ogee moulding at the junction of the soffit and wood shingle siding. It is a simple moulding, small in scale and painted white so it visually blends into the building.

Architecture - South Porch
At grade level the porch has concrete piers with plywood panels installed in-between them. Original finish in this area was latticework and based on historic photos, see history section, it also appears to have been reconfigured to create a "screened-in" look at one point. Beadboard paneling has been installed on the east and west sides in place of the latticework. The columns, plywood and beadboard are all painted grey. Paint sample analysis revealed the beadboard was originally painted Almost Cream, see the


Figure 1-36. South porch (KAC, 6/8/2016)


Figure 1-37. Wood shingle siding (KAC, 6/8/2016)


Figure 1-38. South porch finishes (KAC, 6/8/2016)

full report in the Appendix for additional information. A metal pipe rail, painted black, is located adjacent to the beadboard siding on the east side of the porch. This handrail has several layers of paint, evidenced by paint divots where previous layers chipped off and were painted over. Paint sample analysis revealed the railing was originally a silver metallic paint, see the report in the Appendix for additional information.

Wood stairs lead from grade up to the porch at the first floor level. Treads are painted gray and the risers, stringers and latticework on the sides of the stair are painted white. Metal pipe rail handrails are mounted to the treads on both sides of the stair and are painted black.

At the first floor level, the porch has wood tongue and groove floor boards 3 1/4" wide, painted gray. Wood columns with wood base and capitols are spaced along the south side of the porch. Wood base is modern and painted gray, while the columns and capitols appear to be historic and are painted white. Paint sample analysis revealed the columns were painted Almost Cream, see Appendix for additional information. Metal pipe rail guardrails are installed along the edges of the porch. The railing were removed and recently refinished offsite. Original shop drawings call out 1 1/4" diameter rails but the current are 2" diameter so it is possible that the railings were replaced at some point. The porch ceiling has beadboard paneling, painted white. The porch has a beadboard ceiling, painted white. Paint sample analysis revealed it was original painted Moss Black, see Appendix for additional information.

Architecture - North Stair

Wood steps lead from a concrete pad at grade up to the first floor level on the north



Figure 1-39. North stair (KAC, 6/8/2016)



Figure 1-40. Typical window with an exterior storm (KAC, 6/8/2016)

elevation. Risers, treads and the stringer are painted gray. A metal pipe handrail, painted black, is mounted to the treads on the north side of the stair.

Architecture - Windows

The majority of the windows are historic 6-over-6, double hung, wood windows. Windows have true divided lites set in glazing compound. Hardware on the interior consists of bronze spoon style locks, sash cords and weights. Holes and outlines in the paint indicate where sash lifts were attached at the bottom of the lower sash. Insulating shades are mounted on the interior side of the first and second floor windows. On the exterior, all of the first and second floor windows and most of the basement have storm window hooks at the heads and lead flashing over the window trim at the head. Basement windows generally have the historic twelve-lite wood exterior storm windows. Most first and second floor windows have a non-historic operable, exterior aluminum storm sash with a mill finish. Window sash are currently painted green and trim is white. Paint sample analysis revealed the sash were originally Moss Black and the trim was Almost Cream. Storm windows which are painted green today, were originally painted Almost Cream, See the Appendix for additional information.

Four openings have window types that are different - the two roof dormers and the two windows under the porch. The south dormer has the historic wood casement window with six lites per sash and an exterior aluminum storm sash. Lead flashing is installed at the window head. A metal vent has been installed in the north dormer where the original window was removed. Both windows at the basement level below the south porch are eight lite, wooden sash in a wood frame. These windows are not historic and do not



Figure 1-41. Typical window interior side (KAC, 6/8/2016)



Figure 1-42. Typical three panel door with upper lites (KAC, 6/8/2016)

have a storm window.

Architecture - Doors
Many of the original doors remain in the building, though hardware on many doors has been changed. There are two styles of original doors - a five horizontal panel door and a door with three horizontal panels below a glazed upper window. Original door trim is simple with 3/4" x 4 1/2" painted wood trim with rounded edges while new trim is 7/8" x 3 1/2" trim with straight edges (see Figures 1-47, 1-48, 1-49).

Door 001
5'-5 1/2" x 3'-3" exterior painted plywood door. This is a non-original door and opening installed in the east side of the porch. Hardware consists of a door knob and pull with three gate hinges. The threshold is concrete and requires a step up from grade.

Door 002
Modern interior door with a 1x wood frame around panels consisting of wire screening and opaque plastic. Hardware consists of hinges, a sliding bolt and pull handle.

Door 004
Historic wood door with three horizontal panels below an upper four lite window. Hardware consists of a door knob with a thumb lock which is modern. The original escutcheon and knob were removed. There are two original hinges with two new hinges installed between and all are painted. The door has metal weatherstripping installed at the bottom and a wood threshold with metal flashing installed over it. An insulating window shade has been installed on the interior side over the window. A security sensor is mounted to the door and frame at the upper latch side of the door. The door has painted wood trim and a deep wood frame


Figure 1-43. Typical five panel door with historic hardware and new deadbolt (KAC, 6/8/2016)


Figure 1-44. Typical historic bronze escutcheon plate and doorknob (KAC, 6/8/2016)

since this door opening is punched through the foundation.

Door 006
Interior flush wood door with a stained finish and a wood frame and trim. Trim is painted on the Work Room side and stained on the Conference Room side. Hardware consists of hinges and a door knob.

Door 007
Historic painted wood door with three horizontal panels and a four lite window above. The opening has a painted wood frame and trim. Two historic hinges remain, though the escutcheon was removed and replaced with a lockable door knob.

Door 008
Historic painted wood door with five horizontal panels. Hardware consists of two historic hinges, an escutcheon and door knob. It has a painted wood frame and trim.

Door 010
Historic five panel painted wood door. Hardware has been removed and the door fixed in place.

Door 011
Historic five panel wood door with two historic hinges and a modern door knob. Door has a painted wood frame and trim.

Door 101
Exterior historic painted wood three horizontal panel door with a six lite window above. Hardware consists of historic hinges and a modern brass latchset with a lever handle. An insulating shade has been installed on the interior side of the door and a security sensor is mounted on the latch side of the door and trim. An exterior aluminum



Figure 1-45. Door 101 - typical three panel door with lites above (KAC, 6/8/2016)



Figure 1-46. Door 103, interior side (KAC, 6/8/2016)

storm with an operable glazed and screened opening has been installed on the exterior side with weatherstripping. Hardware on the screen door consists of hinges and a lever handle. There is a wood threshold which requires a step up from the porch.

Door 102
Exterior historic painted wood three horizontal panel door with a six lite window above. Hardware consists of historic hinges and a modern latchset with a lever handle. An insulating shade has been installed on the interior side of the door. A security sensor is mounted on the latch side of the door and trim. An exterior aluminum storm with an operable glazed and screened opening has been installed on the exterior side with weatherstripping around it. Hardware on the screen door consists of hinges and a latch. There is a wood threshold which requires a step up from the porch.

Door 103
Exterior painted wood door with a panel in the lower third of the door and a single glazed lite above it. There is a wood Coast Guard emblem on the door which is also painted white. Hardware consists of three historic bronze hinges, an escutcheon and door knob. An exterior aluminum storm with an operable glazed and screened opening has been installed on the exterior side with weatherstripping around it. Hardware on the screen door consists of hinges, a latch and a chain to restrict it from swinging too far open.

Door 104
Historic painted wood door with five horizontal panels. Hardware consists of two hinges and a bronze escutcheon and door knob. Door frame and trim are historic and holes and outlines on the wood indicate that the door was originally mounted on the other side of the frame.

Door 105
Historic painted wood door with five horizontal panels. Top and bottom panels have been removed and replaced with wire mesh on the File Storage (108) side and a painted wood panel on the File Storage (107) side. The door has two historic hinges but they were removed and reinstalled on the other side of the frame to reverse the door frame. The escutcheon has been removed and a new door knob installed.

Door 106
Historic painted wood door with five horizontal panels within a painted wood frame and trim. Hardware consists of three modern hinges and a door knob.

Door 107
Historic painted wood door with five horizontal panels. Door has two original bronze hinges, an escutcheon and door knob. A modern deadbolt has been installed above the escutcheon. Original wood frame and trim are painted.

Door 108
Historic painted wood door with five horizontal panels. Door has two original hinges and escutcheon with a bronze door knob. A modern brass deadbolt has been installed above the escutcheon. Original wood frame and trim are painted.

Door 108a
Historic painted wood door with five horizontal panels. The door has two original hinges which are painted but the escutcheon and knob have been removed. Currently fixed in place, the door has a painted wood panel installed over the Restroom side. Original wood frame and trim are painted.

Door 109
Modern painted flush wood door with two hinges and a door knob. It is secured by a sliding bolt on the Restroom side. The modern trim and frame are painted wood.

Door 110
Modern painted flush wood door with two hinges and a door knob. Both the modern frame and trim are painted wood.

Door 201
Historic painted wood five panel door with the original bronze door knob and a newer brass door knob. Door frame and trim are historic painted wood.

Door 202
Modern flush hollow core wood door with a brass knob and hinges. It has a painted wood frame and trim.

Door 203
Pocket flush, hollow core, painted wood door with brass pull hardware.

Door 204
Modern flush, hollow core painted wood door. Hardware consists of a brass knob and hinges. Door frame and trim are painted wood.

Door 205
Historic painted wood door with five horizontal panels. Hardware includes hinges, a bronze knob and a brass deadbolt. Door frame and trim are painted wood.

Door 206
Historic painted wood door with five horizontal panels. Hardware includes hinges, a bronze knob and a bronze latch. Door frame and trim are painted wood.

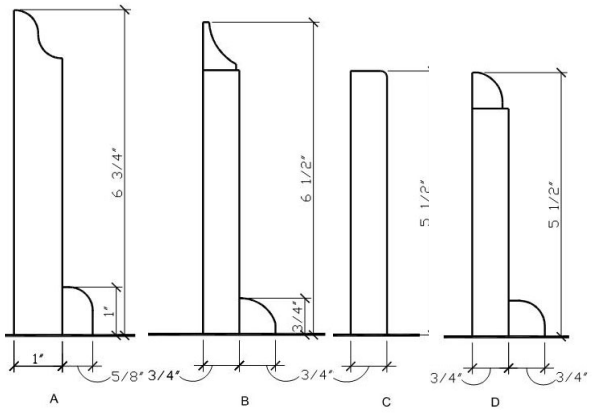


Figure 1-47. Base profiles - Profile A is original (KAC, 6/8/2016)

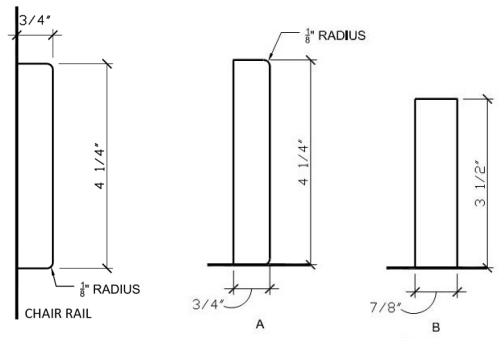


Figure 1-48. Historic chair rail profile (left) and door trim profiles (right) A is historic (KAC, 6/8/2016)

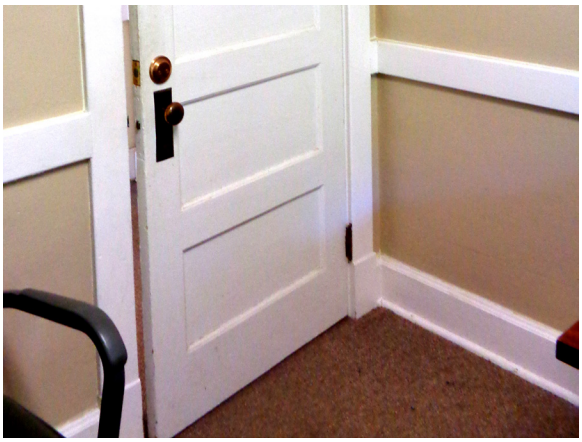


Figure 1-49. Historic base, door trim and chair rail (KAC, 6/8/2016)

Door 207
Historic painted wood door with five horizontal panels. Hardware includes hinges, a brass escutcheon and a new brass door knob. Door frame and trim are painted wood.

Door 208
Historic painted wood door with five horizontal panels. Hardware includes hinges, a bronze knob and a modern brass deadbolt. Door frame and trim are painted wood.

Door 209
Historic painted wood five panel door with the original five knuckle hinges and escutcheon. It has a new deadbolt and hook installed on it. The historic frame and trim are painted wood.

Architecture - Interior Finishes
Finishes are generally consistent throughout the Station. Typical wall and ceiling finishes are painted plaster. Plaster is applied directly to exterior masonry walls and over wood lath on wood framed walls and ceilings. Walls have a painted wood trim and chair rail. Original base is a 6 3/4" tall with a 1" ogee moulding. New walls have three different types of base - two are a close match to the original in shape though the height varies and the third is simple trim with a rounded top. Historic chair rail has rounded edges and is mounted with the top edge 31 1/4" above the floor. Original door and window openings have the original wood trim which has rounded edges while new door trim is narrower and has square cut edges.

Investigation into the layers of flooring on the first and second floors revealed a historic jute-backed linoleum over wood flooring, now covered by carpet or resilient flooring.

Paint sample analysis was conducted in



Figure 1-50. Carpet flooring over historic wood flooring and linoleum (KAC, 6/8/2016)



Figure 1-51. Storage (001) with limited interior finishes (KAC, 6/8/2016)

select rooms, see Paint Sample Report in the Appendix for additional information.

Mechanical and electrical systems were excluded from the scope of this report, though locations of plumbing fixtures and radiators are noted. A fire sprinkler system was installed (circa 2004) throughout the building in a sensitive manner, heads are located in sidewalls and strategically placed to limit impact to the historic fabric on the first and second floors. In the basement the sprinkler system is exposed. Unfortunately, the sprinkler system has no water supply (a waterline from the town of Munising to the site was never installed) and therefore provides no protection. No original lighting fixtures remain, with the exception of the second floor restroom fixture which may be historic. Surface mounted conduit is visible in all rooms though a few rooms have recessed boxes and switches.



Figure 1-52. Interior finishes in Work Room (003) (KAC, 6/8/2016)



Figure 1-53. Interior finishes in Conference Room (004) (KAC, 6/8/2016)

Storage (001)

This space was originally an exterior space which has now been enclosed and serves as a storage room and staff entry. There is no ceiling finish so the porch structure and flooring above is visible. The south wall is comprised of concrete piers with plywood infill, the east wall is beadboard and the north wall is the exposed concrete foundation. A wood frame wall with translucent plastic and wire mesh infill divides this room from Storage (002). Floor is concrete. Concrete steps on the east side of the room lead up to grade level. A painted wood handrail is mounted with metal brackets on the south side of the stair.

Storage (002)

Like Storage (001), this was originally an exterior space which has been enclosed and is used as storage. There is no ceiling finish

so the porch structure and flooring above is visible. The south wall is comprised of concrete piers with plywood infill, the west wall is beadboard and the north wall is the exposed concrete foundation. A historic door in the north wall is mostly covered by shelving but enough of it is visible to see it is a three panel door with an upper light. A wood frame wall with translucent plastic and wire mesh infill divides this room from Storage (001). Floor is concrete. Concrete steps lead up to grade at the west end of the room.

Work Room (003)
Ceiling finish is painted beadboard with conduit and pipes installed on the underside. The south wall is the concrete foundation, which is painted. East and west walls have a painted beadboard finish with painted wood base. The north side of the room is open to the Hall (005) and Mechanical (008) rooms. Floor is concrete with no applied finish.

Conference Room (004)
Ceiling finish is painted beadboard with conduit and pipes installed on the underside. Walls are plywood with a laminate wood finish and a wood wall base with a stained finish. Wall panels are continuous over the door and opening to Storage (002) so there is no visual indication of the door in this room. Radiators are located at the south and west walls. Built-in wood cabinets with a plastic laminate counter and stainless steel sink are located at the northwest corner of the room. Flooring is carpet.

Hall (005)
Ceiling has a painted beadboard finish with conduit and pipes installed on the underside. The south and west walls have a painted plywood finish. Wood boards with hooks to hang equipment are mounted on the south wall. The north wall has painted beadboard



Figure 1-54. Ceiling and wall finishes in Storage (006) (KAC, 6/8/2016)

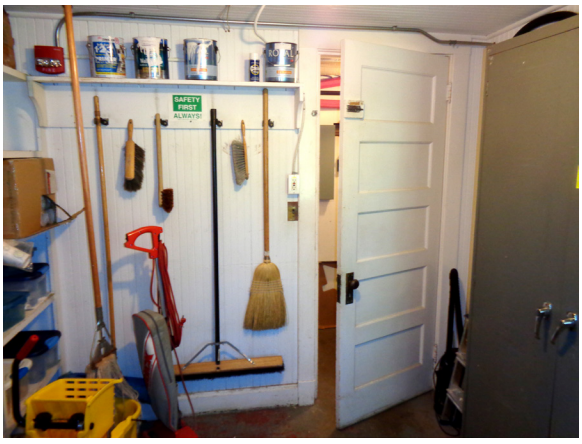


Figure 1-55. Finishes in Restroom (007) (KAC, 6/8/2016)



Figure 1-56. Finishes and equipment in Mechanical (008) (KAC, 6/8/2016)

finish with painted wood trim. Floor is concrete.

Storage (006)
Ceiling is painted beadboard with conduit and pipes installed on the underside. North and west walls are the painted concrete foundation walls. South and east walls have a painted beadboard finish with a painted wood base. Floor is concrete.

Restroom (007)
Ceiling finish is painted beadboard. The north wall is the concrete foundation with a painted finish. East, west and south walls are painted beadboard with a painted wood base and built-in shelving on the east and south walls. A wood toilet partition is located at the northeast corner of the room. Flooring is concrete with a raised section in the northeast corner. A water closet is mounted on the raised section of flooring and there is a trough sink at the northwest corner of the room. A radiator is located adjacent to the north wall.

Mechanical (008)
Ceiling has a painted beadboard finish with an access hatch. The north and east walls are the exposed concrete foundation with a painted finish. Remaining walls have a painted beadboard finish and painted wood base, though the west wall does not have a base. A section of the south wall has a painted plywood finish where a door was removed and the opening filled in. Flooring in the room is concrete with raised pads on which mechanical equipment is mounted.

Electrical (009)
Ceiling is painted beadboard. North, east and west walls are the concrete foundation with a painted finish. South wall has a painted beadboard finish with phone wiring screwed



Figure 1-57. Finishes in Library (101) (KAC, 6/8/2016)



Figure 1-58. Hall (102) looking into Office (103) and Restroom (104) (KAC, 6/8/2016)

directly to it and a built-in book shelf. Electrical panels are mounted to the east wall. Floor is concrete.

Storage (010)
Ceiling is painted beadboard. Wall finish at the south and east is the concrete foundation with a painted finish. Finish on the north and west wall is approximately 12" wide painted wood boards oriented horizontally. Floor is concrete.

Library (101)
Ceiling and wall finish is painted plaster. The walls have painted wood base and chair rail. There is surface mounted conduit throughout the room. Flooring is carpet. Three radiators are positioned around the room.

Hall (102)
Ceiling and wall finish is painted plaster. Walls have the original painted wood base and chair rail. Flooring is carpet.

Office (103)
Ceiling and wall finish is painted plaster. Walls have the original painted wood chair rail and base. Flooring is carpet. There are two radiators located adjacent to the exterior walls.

Restroom (104)
Ceiling and walls have a painted plaster finish. On all walls, except in the northeast corner of the room, there is a painted wood beadboard wainscot up to 44" above the floor with a 3 1/2" painted wood cap and original painted wood trim. Flooring is sheet vinyl in a tile pattern. The room has a wall mounted pedestal sink, floor mounted water closet and a number of wall mounted accessories including a trash can, toilet paper holder, soap dispenser and a wall mounted cabinet.



Figure 1-59. Finishes in Superintendent Office (105) (KAC, 6/8/2016)



Figure 1-60. Historic plaster and wainscot wall finish in File Storage (108) (KAC, 6/8/2016)

Superintendent Office (105)
Ceiling and walls have a painted plaster finish and walls have the original painted wood base and chair rail. Flooring is carpet. Radiators are located at the north and west walls.

Office (106)
Ceiling and walls have a painted plaster finish. Walls have the original painted wood base and chair rail. Flooring is carpet and there is a radiator at the north end of the room.

File Storage (107)
Ceiling has a painted plaster finish. Walls have a painted plaster finish with a historic painted beadboard wainscot up to 45" above the floor with a 3 1/2" wood cap and painted wood trim. Flooring is carpet. A radiator is located adjacent to the north wall.

File Storage (108)
Ceiling has a painted plaster finish. Walls have a painted plaster finish with historic painted beadboard wainscot up to 45" above the floor with a 3 1/2" wood cap and painted wood trim. Flooring is carpet. There is a radiator adjacent to the east wall.

Office (109)
Ceiling has a painted plaster finish. Walls have a painted plaster finish with a historic painted beadboard wainscot up to 45" above the floor with a 3 1/2" wood cap and original painted wood trim. Flooring is carpet.

Office (201)
Ceiling and walls have a painted plaster finish. Walls have original painted wall trim and the flooring is carpet. There is a radiator under each window.

Office (202)
Ceiling has a combination of painted plaster and painted gypsum board finish. Walls have

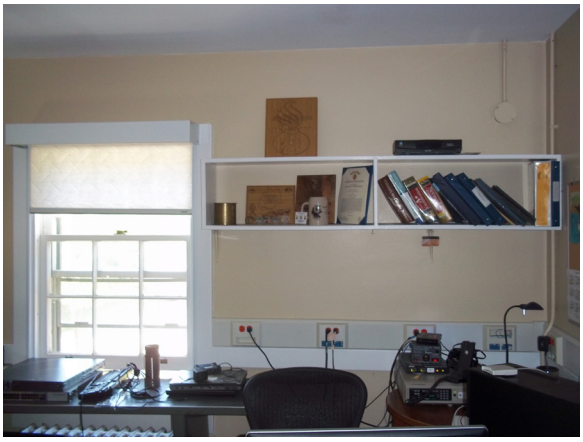


Figure 1-61. Wall and ceiling finish in Office (201) (NAA, 6/8/2016)

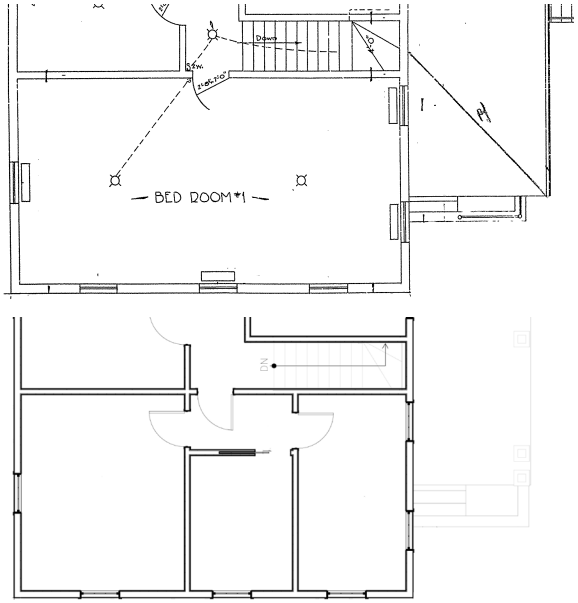


Figure 1-62. Original second floor configuration (above) and present configuration with the Bedroom divided to create Office (202), Office (203), Office (204) and Hall (205)

a painted plaster finish with painted wood base and chair rail. East, south and west walls have the original base and the north wall has Type B base. Flooring is carpet and radiators are located under each window. Figure 1-62 shows the original configuration of the space versus the current subdivided spaces.

Office (203)
Ceiling has a painted plaster finish. Wall finish is a combination of painted plaster and painted gypsum board, both have painted wood base and chair rail. The west wall has original base, the north and south walls have Type B base and the east wall has Type C base. There is a radiator under the window.

Office (204)
Ceiling has a painted plaster finish. Wall finish is a combination of painted plaster and painted gypsum board, both have painted wood base and chair rail. North, east and west walls have original base and the south wall has Type B base. Flooring is carpet. A radiator is located under the north window.

Hall (205)
Ceiling has a painted plaster finish. Wall finish is a combination of painted plaster and painted gypsum board, both have painted wood base and chair rail. The east wall has original base, north and south walls have Type B and the west wall has Type D. Flooring is carpet.

Hallway (206)
Ceiling and walls have a painted plaster finish. Walls have the original painted wood wall base and chair rail. Flooring is carpet. A radiator is located below the east window, along with a metal cabinet containing a fire escape ladder.



Figure 1-63. Finishes in Office (204) (NAA, 6/8/2016)



Figure 1-64. Finishes in Hallway (206) (NAA, 6/8/2016)

Office (207)
Ceiling and walls have a painted plaster finish. Walls have the original painted wood wall base and chair rail. Flooring is carpet. A radiator is located under the north window.

Bathroom (208)
Ceiling has a painted plaster finish. Walls have a painted plaster finish with a beadboard wainscot up to 4' with a painted wood cap and 4" rubber base. The room has resilient flooring in a 16" x 16" tile pattern. The Bathroom has two lavatories, one water closet, one urinal and one shower.

Office (209)
Ceiling has a painted plaster finish. Wall finish is a combination of painted plaster and painted gypsum board, with painted wood original base and chair rail. Flooring is carpet. A radiator is located under each window.

Office (210)
Ceiling has a painted plaster finish. Wall finish is a combination of painted plaster and painted gypsum board, with painted original wood base and chair rail. A radiator is located underneath each window.

Attic
The attic is an unoccupied space which has previously been used for museum collections storage. It is accessed via a hatch in the second floor corridor ceiling. Flooring is wood boards and the walls and ceiling are the exposed roof structure. Currently access to the space is restricted to persons wearing personal protective equipment due to the bat colony living in the attic. See the Hazardous Material section for additional information.



Figure 1-65. Stair from Basement to First Floor (KAC, 6/8/2016)



Figure 1-66. Stair from First to Second Floor (KAC, 6/8/2016)

Architecture - Interior Stairs

First Floor to Basement

This stair has wood stringers and treads. Wood risers at the bottom five steps have a stained finish, the rest of the stair has open risers. Treads and risers have a stained finish and there are applied plastic textured tread covers. Stringers are painted white. The stair is open to the Work Room on the east side and has a wood baluster and rectangular handrail along that edge. A newer, circular handrail is bracket mounted to the wall on the west side of the stair. Both handrails have a stained finish. Walls have a beadboard finish up to the first floor level where it switches to a painted plaster finish. The ceiling has a painted plaster finish.

First Floor to Second Floor

Stairs have a carpet finish that is continuous over the risers and treads. Bracket mounted wood handrails with a stained finish are mounted on both sides of the stair above the directional turn in the stair. Ceiling and walls in the stair have a painted plaster finish.

Architecture - Code/Life Safety Issues

As a National Park Service building, any proposed rehabilitation of the Station is subject to the DSC workflows. As such, it is governed by the 2015 International Building Code and its related family of codes.

The 1932 Coast Guard Life Saving Station, now serves as an administrative office building for the NPS. It is a two story, wood framed building with a full basement. Overall building dimensions are approximately 45'-1" by 30'-2", not including the south porch or north entry.

Area

Basement - 1,523 sf
First Floor - 1,372 sf
Second Floor - 1,310 sf

Use and Occupancy Classification

Business Group B - which includes use of a building for office, professional or service-type transactions.

Construction Type

Buildings and structures are classified as one of five construction types designated in Chapter 6 of the IBC. The construction type defines the fire resistance rating of the building structure, exterior walls and interior walls.

The existing type of construction of the Life Saving Station is VB non-sprinklered (Though there are sprinkler heads throughout the building, they are not connected to a viable source of water so they currently non-functional.) Per section 602.5 "Type V construction is that type of construction in which the structural elements, exterior walls and interior walls are any material permitted by this code."

Means of Egress

Section 1004 established design occupant based on the number of occupants determined by the function(s) of the space. Per Table 1004.1.2, Business areas have an occupant load factor of 100 gross. Based on the square footage of the floors, the first and second floors both have an occupancy load of 14.

Section 1006 determines the number of exits required from a space. Table 1006.2.1 states the number of occupants allowed in spaces with one exit. Per this table, B occupancy is allowed a maximum of 49 occupants on

the first floor and for an occupant load of less than 30 a maximum common path of egress travel distance of 100 feet. Table 1006.3.2 states that the second story with a Business occupancy and one exit can have 29 occupants.

However per section 1023, interior exit stairs are required to be enclosed. Exceptions are provided for situations where there are two exit stairs provided or fewer than 10 occupants. The Station only has one exit stair and it is not enclosed so the exit stair does not meet code requirements.

Existing Building Code

The IEBC, International Existing Building Code, applies to the repair, alteration, change of occupancy, addition to and relocation of existing buildings. Within this code, work is categorized into Alteration Levels 1, 2 and 3 depending on the amount of work within the building. Additional categories include Change of Occupancy, Additions, Historic Buildings and Relocated Buildings. Requirements of the code are limited to work areas of the project. This means that Alteration projects are not required to upgrade the entire building per current code, just elements that are within the project work area. Change of Use projects trigger more thorough upgrades and the building must be brought up to current code requirements for the new use.

Change of Use

The Station was changed from a residential use to office use in the 1960s when the Coast Guard moved out and the NPS rehabilitated the building. No drawings from this project have been located so it is unknown if this project updated the building to codes contemporary to that time.

Architecture - Accessibility

As a building governed by the Architectural Barriers Act, ANSI A117.1 2003 is the guiding document for accessibility. Section 4.1.7 of the ABA requires that a historic building provide one universal access route from a site access point to the building entrance, one universal access entrance, universal access routes from the entrance to the public spaces on the level of the main entry and a universal access restroom. To meet ABA requirements universal access must be provided whether the space is used for employees only or is open to the public.

A parking spot in the visitor parking lot south of the Station has a space designated for universal access parking. However, this is a dirt parking lot which does not have an acceptable universal access surface. A 36" wide concrete sidewalk leads from the parking lot to the building and does meet one way accessibility width requirements. There is no universal access entrance into the building. The south entrance is accessed via a stair which leads up to the porch from which there is a 5 1/2" step up at the entry door (Door 101). This south door has lever hardware which meets accessibility requirements. However, from the interior the door does not have the necessary clearance required for the pull side of the door.

Within the Station, first floor doors do not meet the accessibility requirement to provide a 32" clear entry to rooms. Doors 106, 107, 108 and 109 each have a 31" clear opening and Door 110 has a 30" clear opening. Restroom (104) does not provide universal access clearances for fixtures or a 60" clear turnaround space as it is only 4'-10" wide.



Figure 1-67. Overview of Life Saving Station (LMG 6/7/2016)



Figure 1-68. Cast In Place Concrete Foundation Wall (LMG 6/7/2016)



Figure 1-69. Concrete Slab on Grade (LMG 6/7/2016)

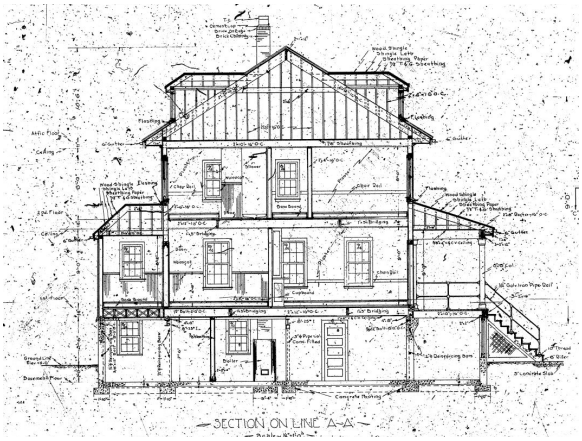


Figure 1-70. Building Section from Original Plans (LMG 6/7/2016)



Figure 1-71. Slab on Grade conceals post footing - note no settlement cracking (LMG 6/7/2016)



Figure 1-72. 2x10 Porch Framing - Storage (001) (LMG 6/7/2016)

Existing Conditions - Structural

Structural - General System Description
Basement walls are board-formed cast-in-place concrete and are partially above grade. The upper floors have interior wood framed bearing walls supporting wood framed floor systems. The basement floor plan is open with an interior steel beam-column bearing line supporting the floors above. The basement floor is an exposed concrete slab on grade.

An original building section drawing with detailed structural member sizes and spacing was located. All exposed structural conditions observed during the site visit were noted to be consistent with the information presented on the original building section drawing.

Structural - Foundation
The foundation beneath the perimeter concrete bearing walls and interior steel posts was not exposed. The original building plans indicate that there are 8" thick by 22" wide concrete strip footings below the 10" thick concrete foundation walls. The original drawings specify reinforcing steel within the foundation walls, however they do not indicate reinforcing in the strip footings and it is possible the footings are unreinforced concrete. The top of the footings is depicted to be immediately below the 6" thick basement slab or approximately 2'-6" below exterior grade.

Structural – Floor Framing
Basement
As described in the foundation section, the basement floor is an exposed concrete slab on grade. The original drawings indicate a 6" thick slab.

Porch Framing
The porch floor framing consists of 2x10s (1-1/2" x 9-1/4" actual) at 16" on center. The



Figure 1-73. Steel Beam 8 Inch Depth - Work Room (003) (LMG 6/7/2016)



Figure 1-74. Steel Beam 4 inch Width - Work Room (003) (LMG 6/7/2016)



Figure 1-75. 4x8 nailer located at top flange of steel beam. Also note pipe penetration in beam web - Work Room (003) (LMG 6/7/2016)



Figure 1-76. Steel Header at entry bump out - Electrical (009) (LMG 6/7/2016)



Figure 1-77. Header beam bearing - Electrical (009) (LMG 6/7/2016)



Figure 1-78. Floor joist opening - Electrical (009) (LMG 6/7/2016)

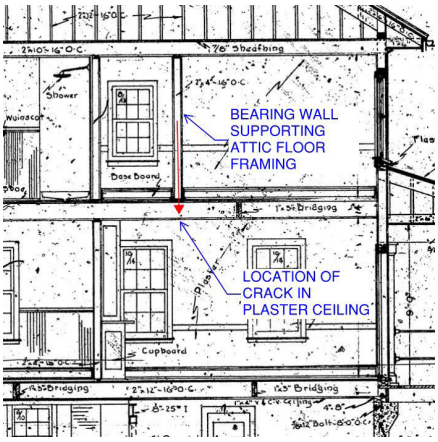


Figure 1-79. Second Floor Corridor Bearing Walls (LMG 6/7/2016)



Figure 1-80. Existing crack in plaster ceiling located below northern corridor bearing wall - Library (101) (LMG 6/7/2016)



Figure 1-81. Attic floor support stowage racks (Attic) (LMG 6/7/2016)

joists span in the east-west direction. The joists are supported by the end walls of the porch and a girder located near the mid-span of the joists. The built up wood girder consists of four plies of 2x10 lumber. The joists bear upon a 1x ledger nailed to the side of the girder.

First Floor

The first floor framing consists of hard pine 2x12s floor joists (1-1/2" x 11-1/4" actual) spaced at 16" on center and spanning in the north-south direction. The joists bear upon the north and south concrete foundation walls and on a steel beam-column line at mid-span. The joists' center bearing is a 4"x8" wood nailer over an 8" deep steel I-beam. The I-beam bears on 3-inch diameter concrete filled steel posts spaced at 8'-8" on center. There is also a 6' long steel beam header (8" deep x 4" wide) framed over the bump out at the northwest corner entry bump-out location. The first floor joist member size and spacing were confirmed at existing openings in the basement ceiling finishes. A small wood sample was taken from a first floor joist for species identification. See the appendix for the species identification results report.

Second Floor

The second floor framing members were not accessible due to existing floor and ceiling finishes. The original drawings indicate 2x12s spaced at 16" on center. The depth of the second floor plate is consistent with the 12" joist depth on the original plans. The second floor framing is supported by wood framed bearing walls which are offset from the steel beam-column line supporting the first floor joists below.

Attic

The attic floor framing consists of 2x10s at 16 inches on center. The attic floor is supported



Figure 1-82. Roof Framing Overview - Attic (LMG 6/7/2016)



Figure 1-83. Rafter nailing to hip - Attic (LMG 6/7/2016)



Figure 1-84. Collar tie - Attic (LMG 6/7/2016)



Figure 1-85. Collar nailing - Attic (LMG 6/7/2016)



Figure 1-86. Dormer framing - Attic (LMG 6/7/2016)

by the second floor corridor walls. The southern corridor wall is aligned with the bearing wall below. The northern corridor bearing wall is located directly above a crack in the first floor Library [101] ceiling. The attic was used for storage.

Structural - Roof & Ceiling Framing
The basement, first, and second floor ceilings are framed by the wood floor joists of each floor level (refer to descriptions above). The basement ceiling consists of 1x4 board sheathing. The first and second floor ceilings are plaster.

The roof framing consists of 2x12s (1-1/2 X 11-1/4" actual) at 16" on center. The rafters are toe-nailed to the hips. There are 2x6 collar ties located approximately 4' below the ridge. The collar ties are typically nailed to the rafters with three nails. The dormers walls are framed with 2x4s at 16 inches.

Structural - Wall Framing
The wood stud wall framing was concealed by existing finishes at the time of observation. The original drawings indicate 2x6 studs at 16" on center for the exterior bearing walls and 2x4 studs at 16" on center at the interior bearing walls. The measured wall thicknesses are consistent with the original drawing dimensions. The first floor bearing wall does not align with the beam-column line in the basement (see Figure 1-79).

Structural - Lateral System
The lateral force resisting sytem (LFRS) consists of wood floor diaphragms and wood shear walls at the upper floors and the reinforced concrete basement wall at the basement level.

Structural - Load Requirements
The load requirements for the Life Saving

Station are based on the type of occupancy (live load) and geographical location of the building (climatic design criteria). The required floor live load capacity per the 2015 IEBC for residential occupancies is 40 pounds per square foot (psf) and for office use it is 50 psf.

The ground snow load required for Munising Michigan per Figure 1608.2 in the 2015 IEBC is 70 psf. This ground snow load translates to a roof snow load of 50 psf per ASCE 7-10, Minimum Design Loads for Buildings and Other Structures.

Existing Conditions - Hazardous Materials

Hazardous Materials - General Description

See the full Hazardous Materials Evaluation by Landmark Environmental in the Appendix.

Asbestos Assessment

The Station was visually reviewed and samples were taken at locations of potential asbestos containing building materials. Bulk materials samples were collected of a composite core which included all layers within the suspected asbestos containing material (ACM). Samples were then sent to Reservoirs Environmental, Inc. for testing.

Lead Containing Paint

The lead containing paint inspection included a visual inspection and sampling of the structure. Paint chip samples were submitted to Reservoirs Environmental, Inc. for testing using the Atomic Absorption / Inductively Coupled Plasma protocol to determine lead content.

Additionally, soil grab samples were collected to determine if lead was present at concentrations above applicable regulatory screening in soils at the drip line of the Station.

General Condition Assessment

Depending on the element, the Life Saving Station is in good to poor condition - requiring repairs or replacement of some exterior features and repairs to a few interior elements.

Condition Assessment - Architecture

Architecture - Roofing System
Condition: Fair to Poor
In general, the roofing system is in poor condition with many of the elements requiring replacement or repair.

Architecture - Roofing
Condition: Fair to Poor
Wood shingles on the main roof are in fair to poor condition with some deterioration and the red paint worn away in many areas. Moss is growing on the shingles on the north side of the roof.

Shingles on the south porch roof are in poor condition with warping and wood deterioration evident (Figure 1-87). The red paint finish is significantly worn away.

Architecture - Gutters and Downspouts
Condition: Fair to Poor
A section of the gutter at the south side of the main roof has fallen off and been placed at grade adjacent to the building. Hangers securing this section of the gutter appear to have failed. A few downspouts are missing lower sections, leaders or splash blocks at grade. Paint is peeling off the gutters and downspouts.

Architecture - Chimney
Condition: Poor
Chimney is in poor condition with failing mortar, deteriorated brick and a tree growing out of it. Free-thaw deterioration appears to



Figure 1-87. Deteriorated shingles on the south porch roof (KAC, 6/8/2016)



Figure 1-88. Moss growing on the shingles (KAC, 6/8/2016)



Figure 1-89. Missing section of gutter at main roof (KAC, 6/8/2016)

become problematic at the course above the red step flashing.

Architecture - Fascia
Condition: Fair
Paint is peeling off the fascia on all sides of the building, though most significantly on the north.

Architecture - Soffit
Condition: Poor
Paint is peeling off the soffit on all sides of the building, though most significantly on the north.

Architecture - Exterior Facade
Condition: Fair
Finishes on the exterior facade are in fair condition with deterioration to select finishes.

Architecture - Exterior Walls - Concrete
Condition: Fair
Paint is peeling off the foundation on all elevations and there are areas of staining below vents on the west elevation. See Structural section for more information on the foundation.

Architecture - Exterior Walls - Shingles
Condition: Fair
Shingles are in fair condition with chipped and peeling paint on all elevations. Some shingles are cracked. (Figures 1-93 and 1-94)

Architecture - Exterior Trim
Condition: Fair
Paint is peeling off the moulding in places.

Architecture - South Porch
Condition: Good to Fair
Paint on the concrete piers is in good condition. See Structural section for more information on the piers. The plywood infill panels are in fair condition with the paint


Figure 1-90. Deteriorated brick at the chimney (LMG, 6/7/2016)


Figure 1-91. Peeling paint on the downspout and soffit (KAC, 6/8/2016)


Figure 1-92. Peeling paint on the foundation and staining below vents (KAC, 6/8/2016)

wearing off (Figure 1-95). The beadboard panel infill is in good condition, as is the handrail at the east side though the top layer of paint is chipped in a few places.

Wood stair elements are generally in good condition. There is evidence of rust on the treads where the handrail posts are mounted.

Porch flooring is in good condition. Columns are in good condition, though evidence of previous paint alligatoring is still visible through the current layer of paint on the columns. Steel guardrails and the beadboard ceiling are both in good condition.

Architecture - North Stair
Condition: Fair
The stair is in fair condition, with a few locations were paint has peeled off the wood. The handrail is in good condition.

Architecture - Windows
Condition: Good to Fair
Windows are in good to fair condition with cracked glazing compound in most sash. A few windows have broken panes and a couple of the basement windows have deteriorated sills and trim. See Window Condition Table in the appendix for information on the condition of each sash.

Architecture - Doors
Condition: Good
The doors are generally in good condition.

Door 001
Door is in fair condition with paint wearing off in some places.

Door 002
Door is in good condition.


Figure 1-93. Peeling paint on the shingle siding (KAC, 6/8/2016)


Figure 1-94. Cracked shingle and peeling paint on the shingle siding (KAC, 6/8/2016)


Figure 1-95. Plywood infill panels below the south porch are weathering (KAC, 6/8/2016)

Door 004
Door is in good condition. Trim is in fair condition with dents and chipped paint in places.

Door 006
Door is in good condition.

Door 007
Door is in good condition though there are a few dents and areas of chipped paint on the bottom rail.

Door 008
Door is in good condition though paint is chipping off the door and trim in places.

Door 010
Door is in good condition.

Door 011
Door is in good condition, though paint is chipping at the bottom of the door.

Door 101
Door is in good condition.

Door 102
Door is in good condition.

Door 103
Door is in good condition.

Door 104
Door is in good condition.

Door 105
Door is in good condition.

Door 106
Door is in good condition.

Door 107
Door is in good condition.

Door 108
Door is in good condition.

Door 110
Door is in good condition.

Door 201
Door is in good condition.

Door 202
Door is in fair condition.

Door 203
Door is in good condition.

Door 204
Door is in good condition.

Door 205
Door is in good condition.

Door 206
Door is in good condition.

Door 207
Door is in good condition.

Door 208
Door is in good condition.

Door 209
Door is in good condition.

Architecture - Interior Finishes
Condition: Good to Fair
Generally the building has been well maintained and finishes are in good condition. Some finishes, such as carpet, require semi-regular replacement due to normal wear.

There are two types of cracking evident in the Station. Most of the cracking is minor, caused by normal thermal movement. Ceiling

cracks in the Library are caused by deflection of the ceiling due to an unconnected load path on the second floor. See structural recommendations for additional information.

Storage (001)
The ceiling and all but the west wall are exposed structure systems, see Structural section for conditions. The west wall is in good condition. Concrete flooring is generally in good condition, though there is a crack on the west side of the room and at the west wall. Stairs are in fair condition with chips out of the edges of the treads.

Storage (002)
The ceiling and all but the east wall are exposed structural systems, see Structural section for conditions. The east wall is in good condition. Concrete flooring is generally in good condition with a few minor, narrow cracks.

Work Room (003)
Ceiling finish is generally in good condition, though there are a few holes in places where pipes or conduit was removed. Wall finishes are all in good condition, as is the trim. Concrete floor is in good condition with a few minor chips.

Conference Room (004)
Ceiling and wall finishes are in good condition. Carpet flooring is in fair condition and is showing signs of wear. Cabinets, countertop and sink are in good condition.

Hall (005)
Beadboard ceiling finish is in fair condition with areas of patching evident and random holes. Wall finishes are in good condition, though there are areas of chipping paint on the north wall. Concrete flooring is in good condition.

Storage (006)
Ceiling is in good condition, with a few minor holes. North and west walls are mostly obscured by storage shelving systems but what is visible is in good condition. South and east walls finishes are in good condition. Floor is in good condition.

Restroom (007)
Ceiling finish is in good condition. Walls are in good to fair condition with random holes and chipped paint. Floor is in good condition.

Mechanical (008)
Ceiling, wall and floor finishes are in good condition.

Electrical (009)
Ceiling finish is in poor condition with an area of water damage at the north end and peeling paint throughout (Figure 1-96). Finish on the north, east and west walls is in good condition. Beadboard on the south wall is in fair condition with numerous holes for the phone equipment. Floor is in good condition.

Storage (010)
Ceiling finish is in good condition. Wall finishes are mostly obscured by storage systems but where visible are in good to fair condition with random holes. Floor is in good condition.

Library (101)
Ceiling is in poor condition with significant cracks caused by differential load settlement, especially at the north end of the room. Previous repairs to the cracks have included taping, patching and painting (Figure 1-97). See Structural recommendations for additional information. Walls are in good condition. Flooring is in fair condition and is showing signs of wear.

Hall (102)
Ceiling and wall finishes are in good condition. Carpet flooring is in fair condition.

Office (103)
Ceiling is in fair condition with cracks visible at the north side of the room. Wall finish and trim are in good condition. Carpet flooring is in fair condition.

Restroom (104)
Ceiling, wall and floor finishes are in good condition.

Superintendent Office (105)
Ceiling and wall finishes are in good condition. Carpet flooring is in fair condition and worn in places.

Office (106)
Ceiling finish is in fair condition with a few cracks at the east side of the room. Wall finish is in good condition. Carpet flooring is in fair condition.

File Storage (107)
Ceiling finish is in fair condition with cracking and visible previous repairs. Wall finish is in good condition. Carpet flooring is in fair condition.

File Storage (108)
Ceiling is in fair condition with a few cracks at the north end and visible areas of patching. Wall finish is generally in good condition. There is a small crack on the column on the south wall. Flooring is in fair condition.

Office (109)
Ceiling is in fair condition with a few cracks at the north and south ends (Figure 1-98). Wall finish is in good condition. Flooring is in fair condition.



Figure 1-96. Peeling paint with water damage at the far end of Electrical (009) (KAC, 6/8/2016)



Figure 1-97. Cracks which have been repaired and taped on the Library (101) ceiling (KAC, 6/8/2016)



Figure 1-98. Cracks at the north end of Office (109) ceiling (KAC, 6/8/2016)

Office (201)
Ceiling finish is in good condition. Wall finish is in fair condition with holes at former nail locations and a crack in the east wall. Carpet is in fair condition.

Office (202)
Ceiling is in fair condition with a crack running north to south. Wall finish is in good condition and the flooring is in fair condition.

Office (203)
Ceiling and wall finishes are in good condition. Flooring is in fair condition.

Office (204)
Ceiling finish is in fair condition with a crack running north-south and one running east-west. Wall finish is in good condition. Flooring is in fair condition.

Hall (205)
Ceiling and wall finishes are in good condition. Flooring is in fair condition.

Hallway (206)
Ceiling finish is in fair condition with a crack at the west side. Wall finish is in good condition and the flooring is in fair condition.

Office (207)
Ceiling and wall finishes are in good condition and the flooring is in fair condition.

Bathroom (208)
Ceiling, wall and floor finishes are in good condition.

Office (209)
Ceiling and wall finishes are in good condition and the carpet flooring is in fair condition.

Office (210)
Ceiling and wall finishes are in good condition and the carpet flooring is in fair condition.

Architecture - Stairs
Condition: Good
First Floor to Basement
The stair finishes are in good condition. See Code section for additional information.

First Floor to Second Floor
The stair finishes are in good condition. See Code section for additional information.

Architecture - Code/Life Safety Issues
Condition: Poor
There is no code requirement for a fire suppression system in this building but NPS Director's Order 58 section 9.1.8 requires consideration for fire suppression of structural fires "to prevent loss of human life and minimize damage to historic property resources." Piping and sprinkler heads have been installed throughout the building and are inspected annually. However, the system is not connected to a viable water source so the system is currently not functional. The source is a domestic supply well which has inadequate volume and pressure to supply the system.

On the exterior stair from grade to the porch, risers range from 7 3/4" - 8 3/8" with treads which range from 11" - 11 3/8". At the interior, the stair from the first floor to the second has risers which range from 7 1/2" - 8 3/8" and treads are 11 1/4". The stair from the first floor to the basement has risers that range from 7 1/4" - 8" with treads which are 11" except the bottom tread which is 10 1/2". The stair from the basement to first floor has open risers. Both the stair from the first floor to the second and from the basement to the first floor are winder stairs. None of these stairs meet current code requirements. Additionally the stair to the porch and from

the basement to the first floor do not have required guardrails. The stair from the first to the second floor does not have a handrail on either side at the lower section. However, per the IEBC these existing conditions do not have to be addressed as long as a project qualifies as alteration level work and the stair is not within the work area.

Based on the second floor square footage and B occupancy, 14 occupants can be anticipated which is less than the 29 occupants which would trigger requirements for a second exit. However, the stair does not meet enclosure requirements for an interior exit stairway so a second stair would be required under IBC requirements. Per IEBC this existing condition does not have to be addressed as long as a project qualifies as alterations level work and the stair is not within the work area.

NPS has provided an emergency ladder which is kept in a metal case at the east end of the second floor corridor to provide a second exit. However, the window at this ladder does not open correctly - the top sash is operable instead of the lower sash. There is also a radiator located directly under the window which occupants would have to climb on or over to get through the window.

Architecture - Accessibility
Condition: Poor
The current configuration does not meet accessibility standards due to the lack of an universal access entry, various narrow door widths that do not provide the required 32" clear space and an inaccessible restroom, see Figure 1-99. Additionally, neither interior door hardware nor restroom fixtures meet universal access requirements.

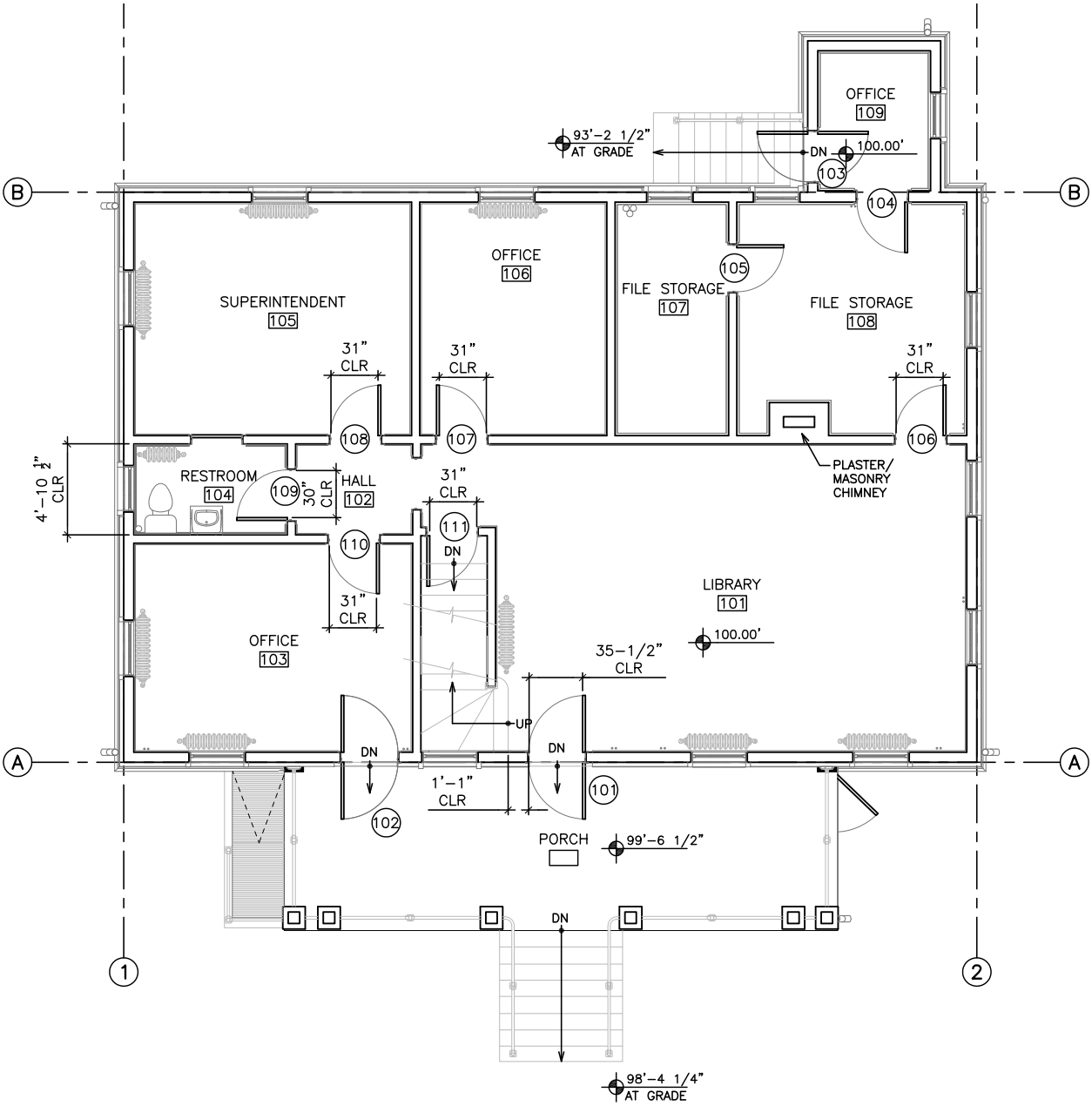


Figure 1-99. First Floor Plan - Clearance and Level Changes

Condition Assessment - Structural

Applicable Codes:
The code references used for this assessment include the 2015 IEBC and ASCE 7-10 Minimum Design Loads for Buildings and Other Structures.

Structural - Foundation
Condition: Unknown with no apparent settlement issues
The physical condition of the below grade elements of the concrete foundations are concealed, were not reviewed, and are unknown. However, above grade portions of the foundation walls are in good physical condition and do not exhibit any freeze thaw deterioration near grade. The concrete walls bearing on the footings are level and plumb and no signs of differential settlement distress such as cracking due to foundation subsidence were noted.

The above grade concrete is coated with several layers of protective coating. The most recently applied top coat is debonding from the surface of the concrete at discrete locations. Also, there are small diagonal cracks in the concrete located at many window opening locations. This type of crack size and location are consistent with thermal cracking at the re-entrant corners of the openings.

The flues for the boilers vent through openings in the foundation wall at the rear elevation. The boiler exhaust gases escaping are focused onto the concrete wall by the vents and are causing localized surface erosion of the concrete. The deterioration mechanism is likely the result of freeze-thaw distress due to water vapor in the exhaust gases or erosion caused by acidic exhaust gases.

A small concrete spall was observed in the



Figure 1-100. Multiple Coating Layers on Foundation (LMG 6/7/2016)



Figure 1-101. Peeling Coatings (LMG 6/7/2016)



Figure 1-102. Thermal crack at Re-entrant corner (LMG 6/7/2016)

top corner of the Storage [001] space below the porch (Figure 1-105). The spall is not at a loadbearing portion of the corbel and is not structurally significant.

The edges of the concrete stair treads into the Storage [001] spaced are chipped and worn.

It should be noted that the interior faces of the heated concrete basement walls are not insulated. This heating of the basement walls has likely prevented any freeze-thaw deterioration of the concrete. Any proposal to insulate the basement walls should consider what effect insulation would have on the walls with respect to lowering the concrete temperature during winter and potentially exposing it to freeze-thaw cycling.

Structural - Floor Framing
Condition: Good
The exposed concrete slab on grade in the basement is in good structural condition. No settlement cracking was observed.

The 2x10 porch framing is generally in good condition. No signs of overstress such as fractured or sagging joists were observed. Measured moisture content levels at the floor joists is below the threshold which promotes wood decay. The wood members in the multi-ply center girder have elevated moisture levels near to the bearing on the exterior foundation wall. The beam is not pocketed into the foundation, but rather bears directly on the foundation. The water source is most likely environmental such as rain water or snow melt through the deck planks above. No significant wood decay was currently noted, but if the source of the moisture is not eliminated, decay could occur in the future.

The first floor framing is in good condition. No signs of overstress such as fractured



Figure 1-103. Boiler flue vents exterior view (LMG 6/7/2016)



Figure 1-104. Localized concrete erosion below flues (LMG 6/7/2016)



Figure 1-105. Small concrete spall at top of ledger in foundation wall - Storage (101) (LMG 6/7/2016)

or sagging joists were observed. No signs of water infiltration or wood decay were observed. The upper level floor capacities are limited by the non-aligned first floor bearing wall and steel beam-column support line in the basement.

The second floor framing is concealed by ceiling and floor finishes. The second floor does not exhibit any significant sagging, however there is evidence of patched cracks in the library plaster ceiling below the floor system that are directly below a second floor bearing wall. The second floor wall bears directly on the second floor joists rather than aligning with a bearing wall on the first floor or a beam. A review of the original drawings indicates that this was the original framing condition and a first floor bearing wall was not removed to induce this condition.

JVA reviewed a structural live load capacity report prepared by Integrated Designs, Inc dated September 19, 2001. This report was requested to provide an opinion regarding the live load capacity of the LSS floors with respect to locating 5-drawer file cabinets at the second floor offices. The report assumed the existing wood joists were Spruce-Pine-Fir (SPF) grade No.1/No.2 matching locally available soft pine wood species. Their analysis concluded that the existing floor joists were adequate for 50 psf office live loads at most areas, provided the first floor joists below the non-aligned bearing walls were strengthened.

The wood species analysis identified that the floor joists are hard pine which is not a locally available wood species. It is presumed that the hard pine joists are Southern Yellow Pine (SYP) and that they were shipped to the site from the East Coast. Allowable design values for Southern Yellow Pine are significantly



Figure 1-106. Basement entry stair tread edge damage - Storage (001) (LMG 6/7/2016)



Figure 1-107. Typical porch floor joist framing moisture content levels - Storage (001) (LMG 6/7/2016)



Figure 1-108. Porch girder elevated moisture content levels at bearing - Storage (001) (LMG 6/7/2016)

higher than Spruce Pine Fir design values (Table in Appendix). Our analysis indicates the 2x12 floor joists are adequate for office live loads, provided the attic remains empty or very lightly loaded.

If a change in use to public assembly loading is desired, the first floor joists over the mechanical room would need to be strengthened by sistering to achieve these greater load capacities. It is understood from a discussion with Mr. O'Bright that there were previously heavy bookcases on the second floor offices above the crack location. These bookcases have since been removed.

Although this ceiling crack was likely exacerbated by deflection exceeding Code allowable limits for the rigid plaster, there are other contributing ceiling conditions that warrant discussion. At other locations there are taped repairs which appear to coincide with locations where electrical wires powering the non-original ceiling mounted fluorescent light fixtures are likely located. There is one crack below the second floor that jogs at right angles, a crack pattern which is not consistent with flexural cracking at mid-span of the beams. Rather, it appears that an electrical conduit was buried in the ceiling to power the fluorescent lights.

The attic floor framing is concealed. There were no signs of overstress such as a sagging attic floor. No significant signs of water infiltration were observed at the attic flooring.

Structural - Roof and Ceiling Framing
Condition: Good
The ceiling structure is the same structural framing above at each level, see condition as noted above.



Figure 1-109. Ceiling crack in Library (underside second floor joist) - Library (101) (LMG 6/7/2016)



Figure 1-111. Locationofburiedelectricalconduit-Library (101) (LMG 6/7/2016)



Figure 1-110. Roof rafter overview - Attic (LMG 6/7/2016)



Figure 1-112. Roof eave at outriggers - Attic (LMG 6/7/2016)



Figure 1-113. Hallway 206 overview - Hallway (206) (LMG 6/7/2016)



Figure 1-114. Hallway 206 wall plumb measurement (LMG 6/7/2016)



Figure 1-115. Hallway 206 sill level (LMG 6/7/2016)



Figure 1-116. Infill wall sill decay (LMG 6/7/2016)



Figure 1-117. Porch Stair Rails (LMG 6/7/2016)

Structural - Roof Framing
Condition: Good
The roof framing is in good condition. No signs of overstress such as fractured or sagging rafters were observed. No signs of water infiltration or wood decay were observed.

It should be noted that the roof framing is not insulated. Heat loss through the roof reduces the roof snow loads it is exposed to by melting action. Consideration should be given to the increased snow load the roof will be exposed to if the roof is insulated.

Structural - Wall Framing
Condition: Unknown but no apparent issues
The walls in the second floor corridor, Hallway [205], visually appear to be leaning or out of plumb. However, measurements with a spirit level indicate they are not.

The non-original wood infill framing enclosing the storage spaces below the porch exhibit moderate wood decay near the sill.

Structural - Stair Rail Fasteners
Condition: Poor at entry stair and porch, Good at other locations
The original porch railings were reportedly removed and reinstalled during a porch maintenance project that included installing new stair treads at the main entry. The rails appear to have been coated with an epoxy paint system. The fasteners at the porch rail bases are corroding. The new fasteners appear to be stainless steel and the corrosion appears to be a galvanic corrosion issue which is the result of material incompatibility between the new stainless fasteners and the original galvanized pipe rails. These two materials are too different on the galvanic scale and have a propensity to corrode when



Figure 1-118. Typical fastener corrosion at Porch Rail bases (LMG 6/7/2016)



Figure 1-119. Original Rail away from Porch (LMG 6/7/2016)



Figure 1-120. No fastener corrosion at bases away from porch deck (LMG 6/7/2016)

in contact with each other. The original pipe rails are specified as, "All pipe is 1-1/4" diameter Galv. Iron Gas Pipe" per the A.F. Wagner Architectural Iron Works shop drawings dated 07.14.1932. The bases of original rails elsewhere do not exhibit this galvanic corrosion issue.

Structural - Lateral System
Condition: Good
The wood shear walls and floor diaphragms composing the lateral force resisting system (LFRS) are in good structural condition. The wooden floor diaphragms, perimeter wood shear walls, and concrete shear walls are in good condition and appear adequate for the wind loads the structure had been exposed to. It is probable that the LFRS has been exposed to and adequately resisted a design wind event during its 80+ year lifetime.

No racking or lateral distortions were noted at the shear walls. No failed nailed connections or other signs of overstress in the building's lateral system were observed. The lateral system appears structurally adequate for the anticipated structural demands.

Structural - Load Requirements
Condition: Good
Our analysis of the lifesaving station roof framing members indicates that they are of adequate size to carry the Code required snow loads for Munising, Michigan. No signs of overstress or damage were noted at the roof framing.

The live load analysis of the floors in the life saving station assumes no storage load in the attic. Floor capacities are slightly greater if there is no storage load in the attic.
Our analysis indicates that the second floor live load capacity is approximately 50 to 55 psf. The first floor live load capacity is approximately 55 psf at the longer spans. The porch framing live load capacity is adequate for a 100 psf assembly load rating. Details of the governing structural limitations for various components are provided in the Live Load Table included in the Appendix which also provides comparative values for Southern Pine versus local pine species.

The wood species identification analysis indicates that the wood samples collected from the Life Saving Station roof rafter and first floor joist are hard pine and not a local species of soft pine. The microscopic analysis indicates that the pine is most likely Southern or Western Yellow pine, but this type of analysis cannot definitively differentiate between the two sub-species. The structural properties of both of these sub-species are very similar. Although the site is relatively equidistant to the east and west coasts, it is likely the wood for the boathouse and lifesaving station were shipped from the east coast where the Coast Guard was based.
The wood is straight grained and mostly knot free, therefore Southern Yellow Pine was used for our analyses. Both Select Structural and Number 1 grades were evaluated providing a range of approximate live load capacities.
The analysis also assumes that there will be a limited attic storage load of approximately 20 psf in the future. The attic currently has very little storage use and live loading.

Condition Assessment - Hazardous Materials

Hazardous Materials - General Description
Condition: Good or Poor
See the full Hazardous Materials Evaluation by Landmark Environmental in the Appendix.

Asbestos Assessment
ACM is defined as a material containing greater than one percent asbestos by weight, volume or surface area. Regulations distinguish treatment requirements between friable and non-friable forms of ACM. Test results confirmed ACM in four materials in the Station:

- Red Floor Tile - 9" x 9" red floor tile in File Storage (107)
- Plaster and White Skim Coat - plaster and skim coat located throughout the Station.
- Pink Sink Undercoating - coating at the underside of the sink in Conference Room (004).
- Hot Water Expansion Tank Insulation - the hot water expansion tank insulation located in the basement above the ceiling

Additionally, roofing materials were not sampled as part of this survey and are assumed to be ACM.

Lead Containing Paint
Lead Based Paint (LBP) is defined as a paint containing 0.5% lead by weight or 1.0 milligram per cubic centimeter by both the EPA and HUD. The following samples were determined to contain greater then 0.5% lead concentrations:

- LBP-1 - collected from gray paint on exterior concrete foundation (1.1%)
- LBP-2 - collected from gray paint on exterior walls and floor porch (0.96%)
- LBP-3 - collected from white paint on exterior wood shingles (6.1%)
- LBP-4 - collected from green paint on exterior wood window (3.4%)
- LBP-5 - collected from gray and white paint on exterior metal downspout (3.4%)
- LBP-6 - collected from black paint on exterior metal handrail (2.7%)
- LBP-9 - collected from white paint on interior wood (1.8%)
- LBP-12 - collected from white paint on interior metal shower (2.7%)
- LBP-13 - collected from white paint on interior concrete foundation (24.9%)
- LBP-15 - collected from white/yellow/brown paint on interior metal beam (17.2%)

In Michigan, established screening levels/cleanup criteria for lead in soils based on direct contact in residential scenarios is 400 mg/kg and non-residential is 900 mg/kg. Samples at the station were above this:

- LBP-16 - collected from north exterior soils (929 mg/kg)
- LBP-17 - collected from south exterior soils (7,268 mg/kg)

It should be noted that paint chips were visible in soils adjacent to each structure.

Bats
Bats have utilized the attic in the Station for a long time. Retired park staff have indicated at least since the 1980's, but the exact timeframe is unknown. Over the years, there have been multiple attempts to exclude the bats, which have all failed. Bats show strong site fidelity, returning year after year to the same roosting locations.

The species of bat occupying the building has not been determined; the bats are present in the summer breeding season, and it is believed to be a maternity colony.[1.1] Acoustic units were deployed, and detected both little brown bats and northern long-eared bat calls. Based on conversation with Dr. Kurta, a respected bat researcher, this was the best available hands-off method of determining species, other than feces identification or catching them. Due to the federally threatened status of the northern long-eared

1.1 Discussion between Cindy Heyd, Pictured Rocks National Lakeshore Wildlife Biologist, and Dr. Kurta, U.S. Fish and Wildlife Service, who is a respected bat researcher.

bat, those methods have not been done. Emergence counts have been conducted, and bats exit the building at dusk, typical for Myotis species. The 2015 estimate is 30-70 bats in the building. It was initially hoped that a bat netting project would be able to assist with identification, but federal permits do not allow for netting right at a known roost. Female little brown bats were caught on Sand Point, however.

Due to the presence of White-Nose Syndrome (WNS), a fungus that is decimating bat populations, there is the very real possibility that the park will lose bat species most affected by the fungus. It has been forecast that due to WNS, the little brown bat will become extinct in the Northeast in about 50 years. Per Dr. Kurta, there is no reason to believe the Midwest will not have the same drastic declines, and so far this has proven true. NPS Management Policies indicate that parks will maintain all native species and work to maintain and restore threatened and endangered species. The Endangered Species Act also says that federal agencies will maintain and restore threatened and endangered species.

The park is very concerned about this substantial maternity colony, and wants to maintain a suitable habitat for the colony. Through discussions with Dr. Kurta, USFWS, and BCI and reading about bat houses, it was determined that this is a harsh site, and there are limited options in this area.[1.2] Temperatures are substantially below the average July temperatures mentioned in bat house literature. A very real concern is if the bats are excluded from this building, they will move into a nearby building, which is seasonal housing. Bats living in the Station or season housing is a substantial safety issue, since both buildings are occupied.

Bats living in the Station attic have left droppings which create a hazardous environment. Currently no access is allowed to the space without proper protective gear.

1.2 Discussion between Cindy Heyd, Pictured Rocks National Lakeshore Wildlife Biologist and Dr. Kurta, U.S. Fish and Wildlife Service.

Character Defining Features

Mass/Form
The overall form of the building, from its rectangular plan with a hipped roof the to projecting covered porch on the south elevation and enclosed north entry, is a character defining feature. The chimney and dormers also contribute to the character of the building.

Exterior Materials
The majority of the building features are original or have been replaced in kind to maintain the historic building appearance. They all contribute to the historic character of the building and include:

- Painted Almost Cream wood shingle siding with base flair
- Painted concrete foundation
- Painted red wood shingle roofing
- Columns, with simple base and caps, and the pipe railings on the porch
- Gutter system, both the half-round shape and the different diameters on the main versus lower roofs.

Openings
The rhythm, size and scale of the windows and door openings are important contributors to the character of the building. Original wooden double hung casement windows are contributing features, as are the original wood storm sash that remain. Original exterior doors with three horizontal panels and a six lite opening at the top are character defining features.

Interior Materials
Many of the materials have been retained, though some have been replaced over time but the room layout has generally remained the same and is therefore a contributing feature. Historic plaster wall and ceiling finishes are important character defining features. Historic five panel wood doors also contribute to the character of the building.

Boathouse and Launchway General Existing Conditions

The Boathouse is a wood frame, one story structure with an attic. It is clad with painted wood shingle siding and the hipped roof has painted wood shingle roofing. It has two doors on the west and two on the east elevations. On the east elevation there is a man door and an overhead garage door. Both doors on the west elevation are overhead roll up boat launch doors which lead to the launchway. The launchway is a wood ramp with metal rails which runs out to Lake Superior. However, the connection is currently obscured by an accumulation of sand over the launchway.

The interior of the Boathouse is divided into two main spaces - the north space which is open to the public and the south portion which is used for NPS storage. On the north side of the building, the space appears much as it did when in use by the Coast Guard with sloped flooring, a historic rescue boat and other equipment and displays. The south side now has a flat floor and is used for storage of park materials. The attic is accessible via a wood ladder on the north side of the space and has a stock of old furniture.



Figure 1-121. South and east elevations (KAC, 6/8/2016)



Figure 1-122. West elevation and launchway (KAC, 6/8/2016)

Existing Conditions - Architecture

Architecture - Roofing System

In general, the roofing system retains the historic layout and materials, though materials have been replaced in kind over the years.

Architecture - Roofing

Roofing is wood shingle, painted red. Shingles were recently replaced and are an in-kind match to the original. A U.S. Coast Guard sign visible on the side of the roof in the circa 1968 photo of the Boathouse has been removed and is now displayed inside the building (Figure 1-24).

Architecture - Fascia
A simple wood fascia board, painted white.

Architecture - Soffit
1 x 3 1/4" beadboard soffit is painted green.

Architecture - Exterior Facade
Exterior features are in keeping with materials indicated on the original drawings.

Architecture - Exterior Walls - Shingles
Exterior finish is painted wood dimension shingles which are 5" wide with a 5 1/2" exposure. Shingles stop above grade and this gap is infilled by plywood painted white. Paint sample analysis revealed the shingles were painted Almost Cream originally, see the full report in the Appendix for additional information.

Architecture - Exterior Trim
Trim consists of a wood ogee moulding at the junction of the soffit and shingle siding. It is a simple moulding, small in scale and painted white so it visually blends with the shingle siding.

Architecture - East Ramp
A wood ramp leads from grade to the first floor of the Boathouse. Boards at the top of the ramp are painted. A rubber walking strip has been installed down the center of the ramp and is secured by brass strips. Guardrails on the side of the ramp consist of 4x4 wood posts with rope stretched between them.

Architecture - East Stair
The wood stair and landing are constructed of 2x wood members - including wood stringers and treads and open risers. Both the stair and landing adjacent to the door have wood 2x handrails.



Figure 1-123. Painted soffit, fascia and exterior trim (NAA, 6/8/2016)



Figure 1-124. Typical exterior finishes (NAA, 6/8/2016)



Figure 1-125. East elevation with ramp and stair (KAC, 6/8/2016)

Architecture - Launchway
The launchway extends out from the west wall of the Boathouse to Lake Superior. The first approximately 20' of the Launchway has wood planks for the full width and then transitions to a center walkway and the boat launch rails. Two rails originally extended from each bay door to support the boats. The inside rail is located on the center walkway and the outside rail is mounted to a wood support that extends past the end of the full walkway out to the lake. Vertical sheet pile wood bulkheads run along both the north and south side of the Launchway.



Figure 1-126. Launchway (KAC, 6/8/2016)

Architecture - Windows
Windows are historic six-over-six lite, wood double hung. Hardware consists of bronze spoon style locks, sash cords and weights. Trim on the interior and exterior is painted wood. Currently the exterior trim is painted white and paint sample analysis revealed it was originally painted Almost Cream, see the full report in the Appendix for additional information.



Figure 1-127. Typical windows (KAC, 6/8/2016)

Architecture - Doors
Exterior doors are located on the east and west elevations. West doors are overhead doors that open to the launchway. A man door and an overhead garage door access the east side. Interior doors secure storage areas.

<u>Door 101</u>
Historic painted wood, exterior man door with three horizontal panels below a six lite window. The historic door knob and escutcheon remain, however they have been painted over on the exterior and a new brass door knob has been installed above them. The wood trim and frame are painted.



Figure 1-128. Door 101 (KAC, 6/8/2016)

<u>Door 102</u>
Plywood interior door with gate style hinges,

a wood pull handle and a slide bolt. A metal vent is installed at the bottom of the door. Unpainted wood 1x forms the door frame.

Door 103
Pair of interior plywood doors on an overhead sliding track. A clear stain has been applied to the doors. Doors are latched on the Storage room side with an eye and key hook and a latch.

Door 104
Unpainted flush wood door with an unpainted wood door frame. Hardware consists of hinges and a keyed door knob.

Door 105 & 106
Doors are historic, overhead metal coiling doors set in metal tracks. A metal manufacturer's tag indicates the doors are Moeschl-Edwards rolling doors. Doors are painted green on the exterior and the metal frame is painted white. Painted wood trim surrounds the openings on the exterior. On the interior, the door is painted white. Paint sample analysis revealed the original door color was Dark Green and the trim was Almost Cream, see the full report in the Appendix for additional information. These doors open from the Boathouse to the Launchway. Doors stop above the metal rails, so the space between the top of the rails and flooring is infilled with wood timbers. Door 105 is covered on the interior side by an interior partition installed by NPS.

Door 107
Overhead, sectional wood garage door with five rows of panels. The center row is glazed and the upper and lower two rows are wood panels. It is painted green on the exterior and white on the interior. Paint color analysis revealed it was originally painted Almost Cream, see the full report in the Appendix for



Figure 1-129. Doors 105 & 106 (KAC, 6/8/2016)



Figure 1-130. Frame of Door 105 (KAC, 6/8/2016)



Figure 1-131. Door 107 (NAA, 6/8/2016)

additional information. Hardware consists of hinges between sections, metal tracks, a slide bolt lock on the interior and lift handles on the exterior and interior. The opening has a painted wood frame and trim.

Architecture - Interior Finishes

Exhibit (101)

There are no ceiling or wall finishes in this room so the wood framing and sheathing is exposed. See Structural description. Flooring is 1 x 3 1/4" tongue and groove wood with a painted or varnished finish. This space is set up as it was when used by the Coast Guard, so the center of the floor where the boat sits slopes down to the west while the north edge is level across the building. Metal tracks are mounted on the sloping section and continue to the Launchway. A modern viewing platform, constructed of 2x wood members, has been installed on the north end to allow visitors to view the boat. Large exhibit items include a boat from the era during which the Station functioned, a historic boat trolley and associated engine. The exhibit boat is from the Grand Marais station and is similar to the original boat that was stationed in Munising. It is a 36' Motor Lifeboat which is self-righting and has "Grand Marais" and "U.S. Coast Guard CG - 36528" painted on the hull. The boat is cradled in a steel frame wheeled crib that was designed to roll down steel rails located on the sloping launchway ramp. Display plaques and small exhibit objects are also located throughout the space. A wood ladder leads up to the attic space and public access is restricted by a hinged section of plywood which swings over the ladder and is secured with a padlock.

Storage (102)

Ceiling and wall finishes are fiberboard. Three holes have been drilled in the ceiling.



Figure 1-132. Exhibit (101) (KAC, 6/8/2016)



Figure 1-133. Level platform and sloping floor in Exhibit (101) (KAC, 6/8/2016)



Figure 1-134. Coast Guard Lifeboat displayed in Exhibit (101) (DAM, 6/8/2016)

Flooring is the original 1 x 3 /4" wood tongue and groove with a varnished finish.

Entry (103)
Ceiling and exterior walls are unfinished so the wood structural system and sheathing is exposed. Interior walls have a plywood finish. Flooring is the original 1 x 3 1/4" tongue and groove with a varnished finish.

Storage (104)
Ceiling finish is fiberboard with wood trim at the joints. Wall finish is mostly plywood, with fiberboard in a few places. Neither the floor or ceiling are painted. At the east side of the room the original 1 x 3 1/4" tongue and groove flooring remains. From where the ramp begins and west, new plywood flooring has been installed over new structure to create a level floor surface. Figure 1-107 shows the flooring transition.

Locked Storage (105)
Ceiling finish is fiberboard with wood trim applied at the joints. Wall finish is a combination of fiberboard and plywood, neither are painted. Flooring is plywood with a clear finish.

Attic
In most of the space, there are no finishes so the wood structural elements are exposed. The east wall has wood planks oriented horizontally. Flooring is approximately 8" wide wood plank. Doors with two gate hinges and composed of vertical wood planks allow access from the attic catwalk into the rest of the attic.

Architecture - Code/Life Safety Issues
As a National Park Service building, any proposed rehabilitation of the Boathouse is subject to the DSC workflows. As such, it is



Figure 1-135. Original flooring transition to new floor system in Storage (104) (KAC, 6/8/2016)



Figure 1-136. Interior finishes in Storage (104) (KAC, 6/8/2016)



Figure 1-137. Attic space (KAC, 6/8/2016)

governed by the 2015 International Building Code and its related family of codes.

The 1932 Coast Guard Boathouse now serves as storage for the NPS and a display area for a Coast Guard boat and other exhibits. It is a one story, wood framed building. Overall building dimensions are approximately 53'-12" by 37'-3".

Area
First Floor - 2,038 sf

Use and Occupancy Classification
The north portion of the building, which contains exhibits, is Assembly Group A-3 which includes assembly uses intended for worship, recreation or amusement and includes museums.

The south portion of the building, which is used for storage, is Storage Group S-1 which is for buildings which are occupied for moderate-hazard storage uses.

Construction Type
Buildings and structures are classified as one of five construction types designated in Chapter 6 of the IBC. The construction type defines the fire resistance rating of the building structure, exterior walls and interior walls.

The existing type of construction of the Boathouse is VB non-sprinklered Per section 602.5 "Type V construction is that type of construction in which the structural elements, exterior walls and interior walls are any material permitted by this code."

Means of Egress
Section 1004 established design occupant based on the number of occupants determined by the function(s) of the space. Per Table 1004.1.2 Exhibit gallery areas have an occupant load factor of 30 net. Based on the square footage of the north section of the building this creates an occupant load of 39. Mercantile storage, stock and shipping areas have an occupant load factor of 300 gross. This results in an occupant load of 3 in the south portion of the building.

Section 1006 determines the number of exits required from a space. Table 1006.2.1 states the number of occupants allowed in spaces with one exit. Per this table, Group A occupancies are allowed a maximum of 49 occupants and for an occupant load of more than 30, a maximum common path of egress travel distance of 75 feet.

Existing Building Code
The IEBC, International Existing Building Code, applies to the repair, alteration, change of occupancy, addition to and relocation of existing buildings. Within this code, work is categorized into Alteration Levels 1, 2 and 3 depending on the amount of work within the building. Additional categories include Change of Occupancy, Additions, Historic Buildings and Relocated Buildings. Requirements of the code are limited to work areas of the project. This means that Alteration projects are not required to upgrade the entire building per current code, just elements that are within the project work area. Change of Use projects trigger more thorough upgrades and the building must be brought up to current code requirements for the new use.

Change of Use
The Boathouse was changed from a boat storage space to other materials storage and exhibit space in the 1960s when the Coast Guard moved out and the NPS rehabilitated the building. No drawings from this project

have been located so it is unknown if this project updated the building to current codes at that time.

Architecture - Accessibility
As a building governed by the Architectural Barriers Act, ANSI A117.1 2003 is the guiding document for accessibility. Section 4.1.7 of the ABA requires that an historic building provide one universal access route from a site access point to the building entrance, one universal access entrance, universal access routes from the entrance to the public spaces on the level of the main entry and an universal access restroom. To meet ABA requirements universal access must be whether the space is used for employees only or is open to the public.

There is no universal access from the parking area to the east entrance. Currently, there is a dirt path that leads from the parking lot to the building. The east entrance is accessed via a ramp which is steeper than 1:12 which is the maximum slope allowed for an universal access ramp. The door at this entry is an overhead sectional wood garage door which is left open when the building is open. This opening provides the necessary clear space.

Within the Boathouse, first floor doors do not have lever hardware to meet accessibility requirements.

Existing Conditions - Structural

Structural - General System Description
The Munising Life Saving Station Boathouse & Launchway (HS-08) is a one-story wood framed structure with a hipped roof and wood pier foundation.

The launchway to Lake Superior is a sloping wood pier with longitudinal wood stringers



Figure 1-138. Exhibit Motorized Life Saving Boat the Grand Marais on steel crib in Exhibit space - Exhibit (101) (LMG 6/7/2016)



Figure 1-139. Second boat crib located at ramp (LMG 6/7/2016)



Figure 1-140. Wood pile foundation located below boathouse - Crawl Space (LMG 6/7/2016)



Figure 1-141. Wood sheet pile bulkhead wall at launch ramp (LMG 6/7/2016)



Figure 1-142. Typical 12” diameter wood pile at sheet pile wall (LMG 6/7/2016)



Figure 1-143. Typical first floor stringers and diagonal board floor sheathing - Crawl Space(LMG 6/7/2016)



Figure 1-144. Attic Floor joist bearing at exterior wall - Exhibit (101) (LMG 6/7/2016)



Figure 1-145. Attic Floor Joist bearing close-up - Exhibit (101) (LMG 6/7/2016)

over timber pile caps over wood piles. The ramp is approximately 28' wide by 129' long. The sides of the launchway are vertical wood sheet pile bulkheads. Original drawings detailing the boathouse and ramp structures were located after the site visit was performed and can be found in the Appendix.

The function of the boathouse and launchway was to store and launch the motorized lifesaving boat and a motorized surf boat. The exhibit boat is from the Grand Marais station and is similar to the original boat that was stationed in Munising. The boat is cradled in a steel frame wheeled crib that was designed to roll down steel rails that were located on the sloping launchway ramp. Some of the rails are no longer extant. There currently is one boat in the boathouse with a crib. The second crib is present and is located outside on the ramp.

Structural - Foundation

The boathouse does not have a conventional building foundation. Rather the building encloses a maritime pier structure consisting of a series of 12" diameter driven wood piles. Piles spaced at approximately 7' on center support 12"x12" horizontal timber pile caps. The timber pile caps support 4"x12" wood stringers. The stringers span approximately 12' between adjacent pile cap timbers. The vertical wood bulkhead walls at the lake end of the ramp are formed with vertical wood sheet pile walls consisting of double 2x10s. The bulkhead sheet pile walls are braced by the 12" diameter wood piles.

Structural - Floor Framing

The first floor framing consists of 4"x12" timber stringers at approximately two feet on center bearing on the 12"x12" timber pile caps. The floor sheathing is 7/8" thick diagonal board sheathing.



Figure 1-146. Attic floor joists at center bearing portal frame - Exhibit (101) (LMG 6/7/2016)



Figure 1-147. Typical attic floor joist cross bridging - Exhibit (101) (LMG 6/7/2016)



Figure 1-148. Overview storage bay - Exhibit (101) (LMG 6/7/2016)

The attic floor framing consists of 2x12s (1-1/2" x 11-1/4" actual) at 16" on center at the shorter 15 foot bay and 2x14's at 16" spacing at the longer 22 foot bay. The second floor joists are supported by the exterior wood stud walls. The joists are side nailed to the studs with a 1x4 wood ribbon used for erection purposes (i.e. the 1x4 is not the primary means of joist bearing support).

The joists bear upon an interior timber beam-column line. The interior support is located slightly off center. The larger bay is approximately 21'-6" wide at the motor boat exhibit Room [101] and the storage bay is approximately 17' wide. The joists visible at the exhibit bay have 1x nailed cross bridging located near mid-span.

The motor surf boat bay has been modified for use as a storage locker. The walls and ceiling have been sheathed.

Structural - Roof & Ceiling Framing
The hip roof has a 6 on 12 pitch and is framed with hard pine 2x8s (1-1/2" x 7-1/4" actual) at 16" on center. There is an interior support ring framed with 3x5 timber purlins supported by 3x3 posts at approximately 8' on center. There are also 2x6 collar ties located approximately 3' below the ridge that tie the 2x6 rafters.

Structural - Wall Framing
The boat house wall framing consists of 2x6 wood studs at 16" on center with 7/8" diagonal board sheathing. The walls also have let in diagonal braces.

Structural - Lateral System
The LFRS includes the wood floor and roof diaphragms which are laterally braced by the exterior wood shear walls and an interior knee-braced portal frame. The interior portal



Figure 1-149. Hip Roof Overview (LMG 6/7/2016)



Figure 1-150. Typical Rafter Size - Attic Storage (202) (LMG 6/7/2016)



Figure 1-151. Typical rafter spacing - Attic Storage (202) (LMG 6/7/2016)

frame is constructed with 7-1/4" x 7-1/4" timber posts at approximately 10' on center supporting a 7x12 top plate (with one end bay span of 14'). The 5 1/4" x 5 1/4" knee braces are through-bolted between the post and top plate.

Structural - Load Requirements
The load requirements for the boathouse floors and ramp structure are a function of the boat weight. A US Coast Guard History Program Document on the 36-Foot Motor Lifeboat – Type TRS indicates a hull displacement of approximately 20,000 pounds.

The attic floor has been used as a storage space. It is currently posted for a safe live load capacity of 30 PSF.

The ground snow load required for Munising, Michigan per Figure 1608.2 in the 2015 IEBC is 70 psf. This ground snow load translates to a roof snow load of 50 psf per ASCE 7-10, Minimum Design Loads for Buildings and Other Structures.

Existing Conditions - Hazardous Materials

Hazardous Materials - General Description
See the full Hazardous Materials Evaluation by Landmark Environmental in the Appendix.

Asbestos Assessment
The Boathouse was visually reviewed and samples were taken at locations of potential asbestos containing building materials. Bulk materials samples were collected of a composite core which included all layers within the suspected asbestos containing material (ACM). Samples were then sent to Reservoirs Environmental, Inc. for testing.

Lead Containing Paint
The lead containing paint inspection included a visual inspection and sampling of the structure. Paint chip samples were submitted to Reservoirs Environmental, Inc. for testing using the Atomic Absorption / Inductively Coupled Plasma protocol to determine lead content.

Additionally, soil grab samples were collected to determine if lead was present at concentrations above applicable regulatory screening in soils at the drip line of the Boathouse.

General Condition Assessment

Depending on the element, the Boathouse is in good to poor condition - requiring repairs or replacement of some exterior features and repairs to a few interior elements.

Condition Assessment - Architecture

Architecture - Roofing System
Condition: Good
In general, the roofing system retains the historic layout and finishes, though materials have been replaced in kind over the years.

Architecture - Roofing
Condition: Good
Shingles are were recently installed and are in good condition.

Architecture - Fascia
Condition: Good
Fascia is in good condition, though paint is starting to peel in places.

Architecture - Exterior Facade
Condition: Fair
Finishes on the exterior facade are in fair condition with deterioration in areas.

Architecture - Exterior Walls - Shingles
Condition: Fair
Shingles are in fair condition with chipped and peeling paint on all elevations. Some shingles are cracked.

Architecture - Exterior Trim
Condition: Good
Trim is in good condition though paint is starting to peel.

Architecture - East Ramp
Condition: Fair
Wood boards are in fair condition with some cracked and starting to deteriorate. The elements of the guardrail are in good



Figure 1-152. Peeling paint on the wood shingle siding (KAC, 6/8/2016)



Figure 1-153. Deteriorating paint on the wood shingle siding (KAC, 6/8/2016)



Figure 1-154. East ramp with some cracking and deteriorating boards (KAC, 6/8/2016)

condition, however see Code section for further information.

Architecture - East Stair
Condition: Fair
Wood elements are in fair condition, they are unfinished and weathering.

Architecture - Launchway
Condition: Fair
Wood is weathering in places and boards are deteriorating in a few locations. The metal rails which extended from the south door have been removed. Rails that remain are starting to oxidize in places. Sand has drifted over the west end of the Launchway so there is no longer a clear connection to the lake.



Figure 1-155. Weathered boards and rails on the Launchway (KAC, 6/8/2016)

Architecture - Windows
Condition: Good to Fair
Windows are in good or fair condition with those on the south elevation in worse condition than the north. Paint is flaking and peeling off the windows and the glazing compound is chipping.

Architecture - Doors
Condition: Good to Poor
Condition of the doors varies, as described below.

Door 101
Door is in poor condition with a loose bottom stile, cracked panels and holes from former hardware.

Door 102
Door is in fair condition with water damage to the lower portion of the door.

Door 103
Door is in good condition.



Figure 1-156. Damaged Door 101 (KAC, 6/8/2016)

Door 104
Door is in good condition.

Door 105 & 106
Doors are in fair condition and difficult to operate. There is also peeling paint in places. Timbers between the rails are deteriorating on the exterior side.

Door 107
Door is in fair condition, the hinges are dirty and do not operate smoothly. The door tends to jamb and require someone on a step ladder to assist it to close properly. Some of the wood panels have water damage.

Architecture - Interior Finishes
Condition: Fair
Exhibit (101)
Finishes are in fair condition. There is wear and tear on the floor board finish.

Storage (102)
Finishes are in fair condition. There is water damage on the ceiling and the flooring finish is worn in places.

Entry (103)
Finishes are in fair condition with wear in places and a few areas of water damage.

Storage (104)
Finishes are in fair condition. Some of the ceiling panels are warped or sagging. Both the original tongue and groove and the new hardwood flooring show signs of wear.

Locked Storage (105)
Finishes are in fair condition with some wear and tear. The finish on the plywood is worn off in many places.

Attic
Finishes are in fair condition with wear and



Figure 1-157. Typical wear and tear on the original wood flooring (KAC, 6/8/2016)



Figure 1-158. Warping ceiling finish in Storage (104) (KAC, 6/8/2016)

water stains in places, which likely occurred prior to the recent reroofing project.

Architecture - Code/Life Safety Issues
Condition: Fair
The Boathouse generally meets code requirements. However, appropriate guardrails are not provided at level changes within the building exhibit space. Rope handrails on the ramp do not meet code requirements for handrail/guardrails. The handrail at the east stair also does not meet current code requirements. However, per the IEBC this existing condition does not have to be addressed as long as any future project qualifies as alterations level work and existing deficiencies are not within the work area.

Architecture - Accessibility
Condition: Poor
The current configuration does not meet accessibility standards due to the lack of an universal access entry and non-compliant door hardware.

Condition Assessment - Structural

Applicable Codes:
The code references used for this assessment include the 2015 IEBC and ASCE 7-10 Minimum Design Loads for Buildings and Other Structures.

Structural - Foundation
Condition: Good beneath boathouse / Fair to Poor at exposed bulkhead
The wood piles below the boathouse are in good condition. The foundation piles below the boathouse are protected from the weather. The creosote coating appears intact and has protected the wood from decay.



Figure 1-159. Wood piles and pile caps below boathouse (LMG 6/7/2016)



Figure 1-160. Decaying wood piles at bulkhead (LMG 6/7/2016)



Figure 1-161. Corroding steel rails (LMG 6/7/2016)

Portions of the pilings and ramp that are exposed to the weather have lost most of the original creosote coating. The wood is weathering and decay pockets are beginning to form in the tops of the wood piles. The decay pockets pond water and will deteriorate at an accelerating rate as they are no longer protected by creosote. It is likely that the portions of the piles that are below the waterline are in better condition due to their constantly saturated state and low availability of oxygen in the cold lake. Both of these conditions retard the development of wood decay.



Figure 1-162. Wood piles and pilecaps below boathouse - Attic (LMG 6/7/2016)

Surface corrosion was observed on visible areas of the steel rails. The corrosion appears active at the lake waterline. The condition of the portions of the rails below the sand line are unknown.



Figure 1-163. Underside of exposed attic floor framing - Exhibit (101) (LMG 6/7/2016)

Structural - Floor Framing
Condition: Good with one unbraced beam issue at Exhibit [101], Unknown at Storage [104]
The first floor framing is robust and is in good condition. At the exhibit area it supports the 20,000-pound lifesaving boat with no visible signs of overstress or sagging.

The visible portion of the attic floor framing at the exhibit space is in good condition except as noted below.

The attic level floor beam over the Storage space that supports a wood post to the roof purlins is not laterally braced. The beam is buckling laterally and should be braced to prevent additional lateral displacement.



Figure 1-164. Unbraced beam supporting roof - Exhibit (101) (LMG 6/7/2016)

The condition of the attic floor framing at the Storage [104] and [105] spaces is concealed. However, no visible signs of distress such

as sagging were noted in the attic floor over these spaces.

Structural - Roof and Ceiling Framing
Condition: Good
The roof framing is in good structural condition. No visible signs of overstress such as sagging or fractured members was observed.

One of the support purlin posts bears upon an unbraced beam at the attic floor level. The beam is unbraced laterally and is lateral-torsional buckling as described in the floor framing section above.

Organic growth was observed on rafters and collar ties near the ridge. No obvious visible signs of roof leaks were noted and the location of the organic growth suggests condensation issues near the unvented attic. The current levels of organic growth are not structurally significant.

Structural - Wall Framing
Condition: Good
The wood wall studs are dry and in good physical condition. No visible signs of water infiltration, decay, or structural overload were noted. Moisture meter readings of studs and the interior posts were below levels required to promote wood decay.

Structural - Exterior Ramps and Stair
Condition: Fair to Poor
The exterior ramps and stair are weathered. They do not appear to have been treated with protective coatings such as paint or creosote. The exterior entry stair into the Storage space exhibits decay of the wood floor planks. Moisture content readings at the stair are significantly higher than the threshold moisture content that promotes wood decay.



Figure 1-165. Attic floor over concealed floor framing - Attic Storage (202) (LMG 6/7/2016)



Figure 1-166. Organic growth on rafters - Attic Storage (202) (LMG 6/7/2016)



Figure 1-167. Organic growth on rafters - Attic Storage (202) (LMG 6/7/2016)

The wooden ramp used by the public to enter the exhibit space is weathered. The ramp has been repaired in the past with a new stringer sistered to the original stringer with carriage bolts and several of the floor planks nearest to grade have been replaced with new pressure treated floor planks.

The horizontal timbers that brace the tops of the vertical wooden sheet pile walls are weathering. The original creosote coating appears to have weathered completely away.

Structural - Lateral System
Condition: Good
The wooden floor diaphragms, perimeter wood shear walls, and knee braced interior portal frame are in good condition and appear adequate for the wind loads the structure had been exposed to over its 80+ year life. No racking or lateral distortions were noted at the shear walls or interior knee braced frame. It is probable that the lateral force resisting system (LFRS) has been exposed to a design wind event during its 80+ year lifetime. We did not observe any failed nailed connections or other signs of overstress in the building's lateral system. The lateral system appears structurally adequate for the anticipated structural demands.

Structural - Load Requirements
Condition: Good
Our analysis of the boathouse roof framing members indicates they are of adequate size to carry Code snow loads for Munising, Michigan.

The live load analysis of the loft framing in the boathouse indicates the members are adequate for the 30 psf posted live load capacity.

A detailed analysis of the rolling boat crib



Figure 1-168. Wall framing - Exhibit (101) (LMG 6/7/2016)



Figure 1-169. Typical post moisture content reading - Exhibit (101) (LMG 6/7/2016)



Figure 1-170. Typical wall stud moisture content reading - Exhibit (101) (LMG 6/7/2016)



Figure 1-171. Exterior stair (LMG 6/7/2016)



Figure 1-174. Entry ramp - note new floor planks near grade (LMG 6/7/2016)



Figure 1-172. High moisture content in tread planking (LMG 6/7/2016)



Figure 1-175. Weathering timbers at bulkhead walls (LMG 6/7/2016)



Figure 1-173. Entry ramp - note new 2x sistered to original stringer (LMG 6/7/2016)



Figure 1-176. Shear walls plumb and square (LMG 6/7/2016)

loads on the heavy timber stringers and piers at the Exhibit is beyond the scope of this HSR, however, the exhibit floor structure is robust and appears to have been designed for this loading.

The wood species identification analysis indicates that the wood samples collected from the boathouse rafters and timber post are hard pine and not a local species of soft pine. The microscopic analysis indicates that the pine is most likely Southern or Western Yellow pine, but this type of analysis cannot definitively differentiate between the two sub-species. The structural properties of both of these sub-species are very similar. Although the site is relatively equidistant to the east and west coasts, it is likely the wood for the boathouse and lifesaving station were shipped from the east coast where the Coast Guard was based.

The wood is straight grained and mostly knot free, therefore Select Structural grade Southern Yellow Pine was used for our analyses.



Figure 1-177. Knee braced interior portal frame - Exhibit (101) (LMG 6/7/2016)

Condition Assessment - Hazardous Materials

Hazardous Materials - General Description

Condition: Good or Poor

See the full Hazardous Materials Evaluation by Landmark Environmental in the Appendix.

Asbestos Assessment

ACM is defined as a material containing greater than one percent asbestos by weight, volume or surface area. Regulations distinguish treatment requirements between friable and non-friable forms of ACM. Test results of samples taken in the Boathouse identified the materials as non-ACM. However, roofing materials were not sampled as part of this survey and are assumed to be ACM.

Lead Containing Paint

Lead Based Paint (LBP) is defined as a paint containing 0.5% lead by weight or 1.0 milligram per cubit centimeter by both the EPA and HUD. The following samples were determined to contain greater then 0.5% lead concentrations:

- LBP-1 - collected from white multi layered paint on the exterior siding (8.8%)
- LBP-2 - collected from green paint on exterior metal doors (4.6%)
- LBP-3 - collected from green paint on exterior wood door (5.5%)

In Michigan, established screening levels/ cleanup criteria for lead in soils based on direct contact in residential scenarios is 400 mg/kg and non-residential is 900 mg/kg. One sample at the station was above this:

- LBP-5 - collected from north perimeter (1,196 mg/kg)

It should be noted that paint chips were visible in soils adjacent to each structure.

Character Defining Features

Mass/Form

The overall shape of the building, the rectangular plan with a hipped roof, is a character defining feature. The Launchway extending west from the building also contributes to the character of the building.

Exterior Materials

The majority of the building features are original or have been replaced in kind to maintain the historic building appearance. Painted Almost Cream shingle siding and painted red shingle roofing are important character defining features.

Openings

The rhythm, size and scale of the window and door openings are important character defining features. The historic coiling doors on the west elevation are especially significant features.

Interior Materials

Due to the nature of the building, there are relatively few historic interior finishes. Exposed wood structure and sheathing is therefore a character defining feature. Also, the historic wood flooring and interior boat ramp are important character defining features. Exhibit items including the boat, trolley and engine, contribute to the character of the building.

Munising Oil House
General Existing Conditions

The Oil House is an eight foot diameter prefabricated metal cylindrical structure capped by a metal conical roof. It contains one room which is accessed via the entry door on the south side. The Oil House is set on a concrete pad.



Figure 1-178. Oil House with steel door (KAC, 6/8/2016)



Figure 1-179. Oil House exterior finishes (KAC, 6/8/2016)

Existing Conditions - Architecture

Architecture - Roofing
Roofing is steel sections which are riveted together and painted red. A metal vent cap is located at the top of the conical roof and is also painted red.

Architecture - Exterior Walls
Walls are three steel sections which are riveted at all edges and painted white.

Architecture - Door
A riveted steel door, 2' wide, is located on the south side of the building and painted white. A series of punched round openings at the top and bottom of the door provide ventilation. Hardware consists of metal strap and pin hinges and the door is locked by a steel strap and eye hook secured by a modern padlock.

Architecture - Interior Finishes
No interior finish is applied to the exterior walls or roof so the structure is exposed. Shelving is mounted to the walls. Flooring is concrete.

Existing Conditions - Hazardous Materials

Hazardous Materials - General Description
See the full Hazardous Materials Evaluation by Landmark Environmental in the Appendix.

Lead Containing Paint
The lead containing paint inspection included

a visual inspection and sampling of the structure. Paint chip samples were submitted to Reservoirs Environmental, Inc. for testing using the Atomic Absorption / Inductively Coupled Plasma protocol to determine lead content.

General Condition Assessment

Generally the Oil House is in fair condition with exterior finishes needing repair and repainting.

Condition Assessment - Architecture

Architecture - Roofing
Condition: Fair
Roofing is in fair condition. Paint is flaking and peeling off and the metal is exposed in places.

Architecture - Exterior Walls
Condition: Fair
Walls are in fair condition with rust visible through the paint in many locations. Paint is peeling in many places.

Architecture - Door
Condition: Fair
The door is in fair condition, with areas of rusting steel and peeling paint.

Architecture - Interior Finishes
Condition: Good
This utilitarian structure does not have any applied floor, wall or ceiling finishes. Shelving is in good condition.

Condition Assessment - Hazardous Materials

Hazardous Materials - General Description
Condition: Good or Poor
See the full Hazardous Materials Evaluation by Landmark Environmental in the Appendix.

Lead Containing Paint
Lead Based Paint (LBP) is defined as a paint containing 0.5% lead by weight or 1.0 milligram per cubit centimeter by both the EPA and HUD. The following samples were determined to contain greater then 0.5% lead

concentrations:

- LBP-1 - collected from white multi layered paint on the exterior (16.7%)
- LBP-2 - collected from red paint on the roof (10.8%)

Character Defining Features

Mass/Form
The overall building shape, with the cylindrical form and conical roof, is a character defining feature.

Exterior Materials
Exterior building materials are original. Riveted steel panels, forming the walls and roof of the building, are an important character defining feature.

Openings
The single door opening contributes to the character of the building.

Interior Materials
A lack of interior finish materials, aside from the shelving, is character defining because it reflects the structure's utilitarian purpose.

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Part 2: Treatment and Use Overview

Overview

Presented after the Existing Conditions and Condition Assessments, the treatment section presents treatment recommendations for the repair, protection and stewardship of the buildings at Pictured Rocks National Park. Treatment recommendations are founded on review of historic documentation, assessment of existing conditions and history, current building function and application of the Secretary of the Interior's Standards and guidelines as they apply to the treatment of historic buildings. Samples of any removed unique or diagnostic architectural features from the historic structures are to be added to the park's museum collection.

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.

Chapter Organization

Each element that was addressed in Part 1 is identified and assigned a priority. Then a description of the recommended treatment(s) is provided.

Munising Life Saving Station Treatment and Use

The recommended treatment for the Life Saving Station is rehabilitation. Rehabilitation allows for altering a building to adapt to changing or continuing uses while preserving its historic character. This building was originally a residence for the men stationed at the point. It currently functions as the park headquarters.

The layout of the Life Saving Station has generally remained unchanged, however, finishes have been replaced or damaged over the years. The general recommended approach in this report is to repair damaged materials and finishes and leave undamaged surfaces in their current state whether they are historic or modern. For cultural landscape recommendations, refer to the CLR produced in conjunction with this HSR.

Lead based paint has been identified throughout the interior and exterior of the Life Saving Station as well as in the soil surrounding the station. Any rehabilitation, restoration or alteration projects anticipated for the building will need to follow applicable regulations for the treatment, handling and disposal of lead based paint-painted surfaces and lead-contaminated soils.

Recommended Treatments by Feature / Element

Treatment - Architecture

Architecture - Roofing
Priority: Critical
The south porch roofing is in critical condition and needs new shingles while the main roof shingles are in slightly better condition. However, to keep the roof replacement on the same schedule, all of the shingles should be replaced. New wood shingles should be installed to match historic materials and coursing. Shingles should be painted red.

Architecture - Gutters and Downspouts
Priority: Critical
The fallen section of gutter should be reinstalled with new hangers. Any loose hangers on other sections should be secured. Missing sections of downspouts should be reinstalled, prepped and painted. Leaders and/or splash blocks should be installed at grade to direct water away from the foundation. Two leaders will be adjacent to the drive path so their type and location will need to be carefully considered.

Architecture - Chimney
Priority: Serious
The sapling should be removed from the chimney. All damaged and deteriorated bricks should be replaced in kind. Brick salvaged from the burned courthouse is from the same quarry as brick at the Station so it should be a good material match. It is stored in the Au Sable garage and if confirmed to match the existing should be used for repairs. Deteriorated mortar joints should be repointed with a mortar that matches the historic in strength, color, texture and workmanship. Flashing at the base of the chimney should be removed and reinstalled to properly drain. Historic drawings indicate step flashing and a cap parging. Both should be included in the chimney restoration.

Architecture - Fascia
Priority: Serious
All paint should be scraped and prepped and the fascia should be repainted.

Architecture - Soffit
Priority: Serious
All paint should be scraped and prepped and the soffit should be repainted.

Architecture - Exterior Walls - Concrete
Priority: Serious
All paint should be scraped and prepped and the concrete should be repainted the original "Almost Cream" color. See Structural section for more information on the foundation.

Architecture - Exterior Walls - Shingles
Priority: Serious
All cracked or damaged shingles should be replaced in kind. All paint should be scraped and prepped and the shingles should be repainted the original "Almost Cream" color.

Architecture - Exterior Trim
Priority: Serious
All paint should be scraped and prepped and the trim should be repainted.

Architecture - South Porch
Priority: Serious
All paint should be scraped and prepped and all porch elements should be repainted the colors listed in the Existing Conditions and identified in the Paint Sample Analysis.

Priority: Minor
Depending on the use of the building, consider removing the plywood infill panels and installing wood lattice work to match the original as seen in historic photos.

Architecture - North Stair
Priority: Serious
Any wood which has deteriorated should be replaced in kind. All paint should be scraped and prepped and all porch elements should be repainted.

Architecture - Windows
Priority: Serious
Deteriorated glazing compound should be removed and replaced. Cracked panes should be replaced in kind. Deteriorated sill and trim at the basement windows should be epoxy stabilized or replaced in kind. All paint should be scraped and prepped and the window should be repainted with "Almost Cream" on the trim and storm windows and "Moss Black" on the sash.

Architecture - Doors
Priority: Serious/Minor
The majority of doors are a minor priority,.

Door 001
The exterior paint has been determined to be lead containing. All paint should be scraped and prepped and the door should be repainted.

Door 002
No work is required at this time.

Door 004
Repair damaged areas of the trim and repaint.

Door 006
No work is required at this time.

Door 007
Repair dents in the bottom rail and repaint the door.

Door 008
Repaint the door and trim.

Door 010
No work is required at this time.

Door 011
Repaint the door.

Door 101
All paint should be scraped and prepped and the door should be repainted.

Door 102
All paint should be scraped and prepped and the door should be repainted.

Door 103
All paint should be scraped and prepped and the door should be repainted.

Door 104
No work is recommended at this time.

Door 105
No work is recommended at this time.

Door 106
No work is recommended at this time.

Door 107
No work is recommended at this time.

Door 108
No work is recommended at this time.

Door 110
No work is recommended at this time.

Door 201
No work is recommended at this time.

Door 202
No work is recommended at this time.

Door 203
No work is recommended at this time.

Door 204
No work is recommended at this time.

Door 205
No work is recommended at this time.

Door 206
No work is recommended at this time.

Door 207
No work is recommended at this time.

Door 208
No work is recommended at this time.

Door 209
No work is recommended at this time.

Architecture - Interior Finishes
Priority: Minor

Storage (001)
Monitor the chips at the edges of the stair. If they continue to wear and become a trip hazard then the concrete treads should be patched. For all exposed structural systems, see Structural section for recommendations.

Storage (002)
No work is recommended at this time. For all exposed structural systems, see Structural section for recommendations.

Work Room (003)
Patch the holes in the beadboard ceiling and repaint.

Conference Room (004)
Replace the carpet flooring.

Hall (005)
Patch the holes in the beadboard ceiling and repaint the ceiling and walls.

Storage (006)
Repair the holes in the beadboard ceiling and repaint.

Restroom (007)
Repair the holes in the beadboard wall finish and repaint the walls.

Mechanical (008)
No work is recommended at this time.

Electrical (009)
Replace the beadboard ceiling at the north end of the room where it is water damaged. Remove loose paint from the rest of the ceiling and repaint.

Storage (010)
Patch holes in the wooden board wall finish.

Library (101)
Replace the carpet flooring. Retape (with fiberglass tape) previous repairs where they are visible on the plaster ceiling and repaint the ceiling.

Hall (102)
Replace the carpet flooring.

Office (103)
Patch cracks in the plaster ceiling and replace the carpet flooring.

Restroom (104)
No work is recommended for the finishes at this time. The original door opening on the north wall is currently boarded over but not acoustically sealed. Install acoustic materials and gasketing, in a reversible manner which does not damage the historic fabric, to create a sound barrier between this room and the Superintendent Office to the north. See Code section for additional recommendations.

Superintendent Office (105)
Replace the carpet flooring.

Office (106)
Patch cracks in the plaster ceiling and replace the carpet flooring.

File Storage (107)
Patch cracks in the plaster ceiling and refinish edges of previous repairs which are visible. Replace the carpet flooring.

File Storage (108)
Patch cracks in the plaster ceiling and refinish previous repairs which are visible. Patch the crack on the south wall. Replace the carpet flooring.

Office (109)
Patch the cracks in the ceiling and replace the carpet flooring.

Office (201)
Patch nail holes and the crack in the east wall. Replace the carpet flooring.

Office (202)
Patch the crack in the ceiling and replace the carpet flooring.

Office (203)
Replace the carpet flooring.

Office (204)
Patch the cracks in the ceiling and replace the carpet flooring.

Hall (205)
Replace the carpet flooring.

Hallway (206)
Patch the crack in the ceiling and replace the carpet flooring.

Office (207)
Replace the carpet flooring.

Bathroom (208)
No work is recommended at this time.

Office (209)
Replace the carpet flooring.

Office (210)
Replace the carpet flooring.

Architecture - Stairs
Condition: Minor
First Floor to Basement
No work on the finishes is recommended at this time. See Code section for additional information.

First Floor to Second Floor
No work on the finishes is recommended at this time. See Code section for additional information.

Architecture - Code/Life Safety Issues
Priority : Serious
The municipal water lines should be extended to the site and building from Munising to provide a functional fire suppression system. Location of the existing fire suppression heads would need to be reviewed to ensure compliance with current codes.

The IEBC, International Existing Building Code, applies to the repair, alteration, change of occupancy, addition to and relocation of existing buildings. Within this code, work is categorized into Alteration Levels 1, 2 and 3 depending on the amount of work within the building. Additional categories include Change of Occupancy, Additions, Historic Buildings and Relocated Buildings. Requirements of the code are limited to work areas of the project Levels 1-3. This means that Alteration projects are not required to upgrade the entire building per current code, just elements that are within the project work area dependent on the nature of the alteration work. Change of Use projects trigger more thorough upgrades and the building must be brought up to current code requirements for the new use.

A full code study will be required as part of any design project. If the occupancy of the building changes, a second exit may be required from the second floor.

Architecture - Accessibility
Priority: Serious
Accessibility must be provided whether the building is open to the public or only to staff. Location of the universal access entry could vary depending on which use is selected (public or park staff only). Currently, the park anticipates a public use in all future plans so public access that addresses ABA should be provided.

Common to Both Treatment Alternatives
An universal access path will be needed within the first floor. Door openings along the path will need to be widened to provide 32" clear opening and hardware will need to be changed to lever handles. The restroom configuration will need to be altered, one of the side walls removed and the room expanded to create a unisex restroom with proper fixture and turning clearances.

Public Access
Universal access would need to provide the same experience for all visitors, so the entry should be through the south entry and proximal to universal access parking. Three options would provide ABA compliant access - a ramp, lift or elevator. A ramp located on the west side of the building would be less visible from the main building approach. The ramp would extend across the porch to the main door. A lift could be installed on the southwest side of the porch along with a raised landing from it to the main door. A lift could also be constructed within the porch, to the west of the stair. In all options, the main entry door would need to be rotated 180 degrees to provide universal access clearances and the screen door removed. Considerations of snow removal should be evaluated for all exterior options. This

would be easier to maintain on the east side during winter months. An elevator within or adjacent to the building could provide access to all floors. The location and impact of the selected access method on the building fabric will be studied by the design team in schematic design.

Staff Only
An enclosed lift could be constructed on the north side of the building (near an universal access staff parking space). This would require relocation of the existing stair to provide a landing for the lift and stair.

Architecture - Wood Frame Building Restrictions
One of the potential future uses for the building is museum space for exhibits and visitor use. Since the Station is a historic building, care would need to be taken in regards to the materials exhibited and how the installation of exhibits and support systems are handled. The historic wood frame building may not be conducive to maintaining humidity levels often required for exhibits. Museums, requiring sophisticated HVAC and humidification systems are best accommodated by purpose-built structures that can be constructed to retain humidity where its required. Humidity introduced into historic buildings may leak into interstitial spaces and cause unintended moisture damage.

A full study would need to be conducted on the nature of the materials to be exhibited and the environment they require. Any new mechanical or lighting systems introduced to the building would need to be installed in a manner which is sensitive to the historic fabric of the structure. Additionally, a review of other factors which could pose a danger to museum collections at this facility would need to be reviewed prior to the NPS exhibiting collections in the building.

Treatment - Structural

Structural - Foundation
Priority: Minor
No structural work is recommended at this time.

Remove and replace the failing protective coating with an appropriate coating. See the architectural sections of the treatments for recommendations.

At the thermal cracks in the concrete near the window openings, rout and seal the cracks with an acrylic elastomeric coating or coat the surface with a silicone based elastomeric coating.

To prevent further surface erosion of the concrete wall caused by exhaust gases from the boiler, reposition the ducts so that the gases are exhausted farther away from the wall surface.

At the small concrete spall top corner of Storage [001] space below porch, remove the spalled material since it is not at loadbearing portion of corbel and not structurally significant

The worn edges of concrete stair treads at Storage [001] are not of structural concern at this time, but could present a tripping hazard. Refer to the architectural section for recommendations.

Since the concrete foundation walls are currently heated by the interior of the building during the winter, there are no issues

with freeze-thaw action in the concrete walls. If insulation is installed, consideration should be given to the freeze-thaw damage of the concrete elements that could occur.

Depending on the chosen alternative for ABA access (a ramp, an exterior lift, or an interior elevator), new foundations may be necessary. Any new foundations will need to be constructed to be compatible with the adjacent existing foundations.

Structural - Floor Framing
Priority: Minor
No structural work for the concrete slab on grade in the basement is recommended at this time.

Since the elevated moisture levels in the porch girder beam is caused by rain water, there are no ways of eliminating the source of the moisture. Therefore, monitor the beam and sister with pressure treated members as necessary.

No structural work for the first floor framing is recommended at this time.

At the second floor, the 2x12 joists are not currently overstressed, but visible signage or verbal directions to new tenants should limit the amount of weight allowed near the midspan of these members. In other words, no paper or book storage is allowed in these areas to prevent extreme deflection and possibly broken joists.

No structural work for the attic framing is recommended at this time.

If a lift is added on the interior of the building, minor framing modifications may be necessary such as bolstering members and adding header beams.

Structural - Roof Framing
Priority: Minor
No structural work for the roof framing is recommended at this time. However, if adding insulation to the roof system is up for consideration, the framing may need to be bolstered to handle the resultant increased snow load.

Structural - Wall Framing
Priority: Minor
No structural work for the framed walls is recommended at this time.

At the non-original wood infill framing at the porch, the wood elements have started to rot. Since these elements are not original, remove and replace them with pressure treated wood elements and galvanized fasteners.

Structural - Stair Rail Fasteners
Priority: Minor
The fasteners at the rail bases are corroding because of material incompatibility. Remove the current fasteners and replace them with hot dipped galvanized fasteners which are more materially compatible with the original galvanized iron pipe.

Structural - Lateral System
Priority: Minor
No structural work is recommended at this time.

Structural - Load Requirements
Priority: Minor
It is recommended to limit the use of the attic space to light storage to prevent overloading of the second floor framing members.

If the use changes from a headquarters or office use to a museum use, the loading will increase on the space. Structurally there are two options to prepare the floors for the new

use: bolster the framing with new members or provide visible signage that limits the number of people allowed in each room at one time.

Treatment - Hazardous Materials

Treatment - Hazardous Materials
Priority: Serious
See the full Hazardous Materials Evaluation by Landmark Environmental in the Appendix.

Asbestos Assessment
The identified floor tile, sink undercoating and hot water expansion tank insulation should be removed according to Local, State and Federal Regulations if renovation activities will disturb these materials. Roofing materials should be sampled prior to any work and if ACM is present, it should be appropriately mitigated.

One plaster sample tested positive for ACM while the others did not which means that this may have been an area of patching. Further testing and sampling of plaster may limit the extent of ACM and reduce the quantity of material requiring abatement, should alterations be anticipated.

Lead Containing Paint
Renovation which will impact LBP will require OSHA trained workers and safety programs. Personal protective equipment will be required to handle these items until negative exposure assessment is completed that shows work activities do not result in exposures above the OSHA permissible exposure limit. A waste management plan will also need to be developed for the disposal of these materials.

Bats
Options that have been considered include a regular bat house, huge "bat condo", trying to heat a bat house, etc. In order to put a bat house in the vicinity, a huge swath of trees would have to be cut down in order for there to be enough sunlight to possibly heat the bat house. This would negatively impact other state listed species, and remove travel corridors for the bats.

The preferred alternative is to create a bat enclosure in the south dormer which would be sealed off from the rest of the attic. This would protect people from bats and bats from people, and help to preserve a threatened species. Currently, the NPS One Health Coordinator is on-board with this approach, as long as it is sealed off from occupied areas. Despite the long history of bats in the attic, there has not been a known incidence of a bat coming down inside from the attic into the rest of the building. This approach will require the park to secure approval from the local health department to allow the bats to continue to live in an occupied building.

The attic should be cleaned by workers in personal protective equipment. Once all bat guano is removed, a biocide should be applied to the attic. An enclosure should then be constructed to seal off the south dormer with a protective layer (Tyvek) installed over all surfaces. An access point should be provided into this space from the attic to allow for annual cleaning.

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Boathouse and Launchway Treatment and Use

The recommended treatment for the Boathouse and Launchway is rehabilitation. This allows for altering a building to adapt to changing or continuing uses while preserving the historic character. Building use has changed since the original use. Originally the building was a boathouse and today half is a display area for a historic lifeboat and other museum items while the other side is storage space for the NPS park.

The exterior of the building retains the original configuration, though the interior space configuration has changed and finishes have been replaced in some rooms. The general recommendation approach in this report is to repair damaged materials and finishes and leave undamaged surfaces in their current state whether they are historic or modern. For cultural landscape recommendations refer to the CLR produced in conjunction with this HSR.

Lead based paint has been identified throughout the interior and exterior of the Boathouse as well as in the soil surrounding the building. Any rehabilitation, restoration or alteration projects anticipated for the building will need to follow applicable regulations for the treatment, handling and disposal of lead based paint-painted surfaces and lead-contaminated soils.

Treatment - Architecture

Architecture - Roofing
Priority : Minor
No work is recommended at this time.

Architecture - Fascia
Priority : Serious
All paint should be scraped and prepped and the fascia should be repainted.

Architecture - Exterior Walls - Shingles
Priority: Serious
All cracked or damaged shingles should be replaced in kind. All paint should be scraped and prepped and the shingles should be repainted the original "Almost Cream" color.

Architecture - Exterior Trim
Priority : Serious
All paint should be scraped and prepped and the trim should be repainted.

Architecture - East Ramp
Priority : Serious
Replace deteriorated boards in kind. See code section for further recommendations on the ramp.

Architecture - East Stair
Priority : Serious
Reconstruct the east stair with wood. The landing should be flush with the interior floor level.

Architecture - Launchway
Priority : Minor
Deteriorated wood should be replaced in-kind. A coating could be applied to the rails to prevent oxidation. For treatments related to the sand at the launchway, see the CLR which was created in conjunction with this report.

Architecture - Windows
Priority: Serious
Deteriorated glazing compound should be removed and replaced. All paint should be scraped and prepped and the windows should be repainted.

Architecture - Doors
Priority : Serious/Minor
The majority of doors are a minor priority, with the exception of Door 101 which requires reconstruction.

Door 101
If possible, reconstruct the door using salvaged sections of the current door and replacing damaged sections in kind or replace the door in kind. All paint should be scraped and prepped and the door painted the original "Almost Cream" color.

Door 102
If the water damage to the bottom of the door worsens, replace the plywood door in kind.

Door 103
No work is recommended at this time.

Door 104
No work is recommended at this time.

Door 105 & 106
The operating mechanism should be cleaned, oiled and rebalanced, if possible, to provide easier operation. Timbers between the rails should be replaced in kind. These are the original doors and should be retained. All paint should be scraped and prepped and the doors repainted the original "Dark Green".

Door 107
Clean and oil the tracks to provide smoother operation for the door. If the door still jambs, realign the existing or replace the tracks if necessary to ensure smooth operation. Replace the water damaged wood panels in kind. All paint should be scraped and prepped and the doors repainted the original "Almost Cream".

Architecture - Interior Finishes
Priority : Minor
Exhibit (101)
Lightly sand and refinish the original wood flooring with marine grade varnish.

Storage (102)
Lightly sand and refinish the original wood flooring with marine grade varnish. Depending on the final use determined for the space, consider removing the plywood wall finish and replacing it with a more appropriate material.

Entry (103)
Lightly sand and refinish the original wood flooring with marine grade varnish. Depending on the final use determined for the space, consider removing the plywood wall finish and replacing it with a more appropriate material.

Storage (104)
Lightly sand and refinish the original wood flooring at the east end of the room with marine grade varnish. Depending on the final use determined for the space, consider removing the plywood flooring and fiberboard ceiling and replacing them with more appropriate materials.

Locked Storage (105)
No work is recommended at this time. Depending on the final use determined for the space, consider removing the plywood flooring and fiberboard ceiling and replacing them with more appropriate materials.

Attic
Organic growth should be removed from the structural framing members and a biocide applied. Ventilation should be provided to the space through the installation of roof vents. The design team should ensure the vents are installed in locations which do not visually detract from the character of the building.

Architecture - Code/Life Safety Issues
Priority : Serious
Appropriate guardrails should be installed

within the Exhibit space at floor level changes where required by Code.

A fire sprinkler system is required per NPS Director's Order 58. Storing museum collection items in the building also triggers a fire suppression requirement. The municipal water line should be extended to the site and building from Munising to support a functional fire suppression system. The design team should ensure the suppression system is installed in a way that is not detrimental to the historic fabric.

The IEBC, International Existing Building Code, applies to the repair, alteration, change of occupancy, addition to and relocation of existing buildings. Within this code, work is categorized into Alteration Levels 1, 2 and 3 depending on the amount of work within the building. Additional categories include Change of Occupancy, Additions, Historic Buildings and Relocated Buildings. Requirements of the code are limited to work areas of the project Levels 1-3. This means that Alteration projects are not required to upgrade the entire building per current code, just elements that are within the project work area dependent on the nature of the alteration work. Change of Use projects trigger more thorough upgrades and the building must be brought up to current code requirements for the new use. A full code study will be required as part of any design project.

Architecture - Accessibility
Priority: Serious
Access
Accessibility must be provided whether the building is open to the public or only to staff. ABA-compliant access should be provided from the east side of the building, which currently serves as the main entrance. The existing ramp would need to be replaced with a ramp which meets universal access slope requirements. To provide access to the building when Door 107 is closed, the ramp should have a landing which connects over to Door 101. To minimize the impact of the ramp on the building and landscape, guardrails could be installed only when the ramp reaches a height of 30" above grade. Also, the lower section could possibly be an earthen ramp that transitions to a wood ramp to minimize the visual impact.

When exhibits within the Boathouse are updated, an universal access route, displays and content should be provided.

Restrooms
Several restroom options were discussed in the treatment workshop.

Restrooms Option 1:
A single user restroom could be constructed at the east end of the south side of the building.

Restrooms Option 2:
Multiple single user restrooms could be constructed in the south side of the building. Interior finishes and layout would be modified to accommodate the restrooms and necessary plumbing.

Restrooms Option 3:
A separate restroom building or vault toilet could be constructed which provides an universal access restroom. The location of this building would need to be coordinated with the CLR.

Preferred Alternative:
Construct three single user restrooms in the south side of the Boathouse, all of which meet universal access design requirements. To address immediate need until this project

is completed, an interim vault toilet may be constructed in a location recommended by the CLR.

Treatment - Structural

Structural - Foundation
Priority: Minor
No structural work at the foundations under the Boathouse is recommended at this time.

Where the pilings and ramp are exposed to the weather, the creosote coating has disappeared. Without this protective coating, decay pockets have begun to form, allowing water to pond and accelerate the decay process. The tops of the piles should be filled with epoxy that contains biocides to kill the fungi causing the decay. Each pile should then be capped with a copper, galvanized, or plastic pile cap to protect the vulnerable end-grain from further direct exposure to water. These measures will help slow the deterioration of the wood piles.

If a ramp is added that blocks the existing ventilation into the space under the first floor framing, an additional form of ventilation will be necessary such as a new opening in a different location.

Structural - Floor Framing
Priority: Minor
The attic level floor beam over the storage space which is buckling laterally needs to be braced. This can be accomplished by adding a 4x4 kicker in the plane of the attic framing back to the near side wall.

Structural - Roof Framing
Priority: Minor
See architectural recommendations for removing the organic growth that was observed on some of the rafters and collar ties and providing ventilation into the attic.

Structural - Wall Framing
Priority: Minor
No structural work is recommended at this time.

Structural - Exterior Ramps and Stair
Priority: Minor
Generally, the wood elements of the exterior ramps and stairs are showing signs of weathering. Many of the elements have either lost their protective coatings or they have weathered away over time. Therefore, the moisture content of the wood elements is generally higher than the threshold moisture content that promotes wood decay. These elements that have started to decay should be removed and replaced in kind with pressure-treated wood elements and galvanized fasteners.

Structural - Lateral System
Priority: Minor
No structural work is recommended at this time.

Structural - Load Requirements
Priority: Minor
No structural work is recommended at this time.

Treatment - Hazardous Materials

Treatment - Hazardous Materials
Priority: Serious
See the full Hazardous Materials Evaluation by Landmark Environmental in the Appendix.

Asbestos Assessment
Roofing materials should be sampled prior to any work and if ACM is present, it should be appropriately mitigated.

Lead Containing Paint

Lead containing paint is present on the exterior of the building and has contaminated the soil adjacent to the building. Rehabilitation which will impact LBP will require OSHA trained workers and safety programs. Personal protective equipment will be required to handle these items until negative exposure assessment is completed that shows work activities do not result in exposures above the OSHA permissible exposure limit. A waste management plan will also need to be developed for the disposal of these materials.

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Munising Oil House Treatment and Use

The recommended treatment for the Oil House is rehabilitation.

Lead based paint has been identified on exterior of the Oil House. Any rehabilitation, restoration or alteration projects anticipated for the building will need to follow applicable regulations for the treatment, handling and disposal of lead based paint-painted surfaces.

Treatment - Architecture

Architecture - Roofing
Priority : Serious
All paint should be scraped and prepped and the roof should be repainted.

Architecture - Exterior Walls
Priority : Serious
All paint should be scraped and prepped and the exterior walls should be repainted. Rust should be removed prior to repainting.

Architecture - Door
Priority : Serious
All paint should be scraped and prepped and the exterior walls should be repainted. Rust should be removed prior to repainting.

Architecture - Interior Finishes
Priority : Minor
No work is recommended at this time.

Treatment - Hazardous Materials

Treatment - Hazardous Materials
Priority: Serious
See the full Hazardous Materials Evaluation by Landmark Environmental in the Appendix.

Lead Containing Paint
Rehabilitation which will impact LBP will require OSHA trained workers and safety programs. Personal protective equipment will be required to handle these items until negative exposure assessment is completed that shows work activities do not result in exposures above the OSHA permissible exposure limit. A waste management plan will also need to be developed for the disposal of these materials.

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Appendix

Appendix A.	2016 Life Saving Station, Boathouse and Oil House Drawings
Appendix B.	Window Condition Table
Appendix C.	Preferred Alternative Drawings
Appendix D.	Cost Estimate
Appendix E.	Historic Drawings
Appendix F.	Wood Species Identification Results
Appendix G.	Paint Sample Analysis
Appendix H.	Hazardous Materials Evaluation
Appendix I.	Live Load Capacity Table
Appendix J.	Bibliography
Appendix K.	Site Plans
Appendix L.	FMSS Tables

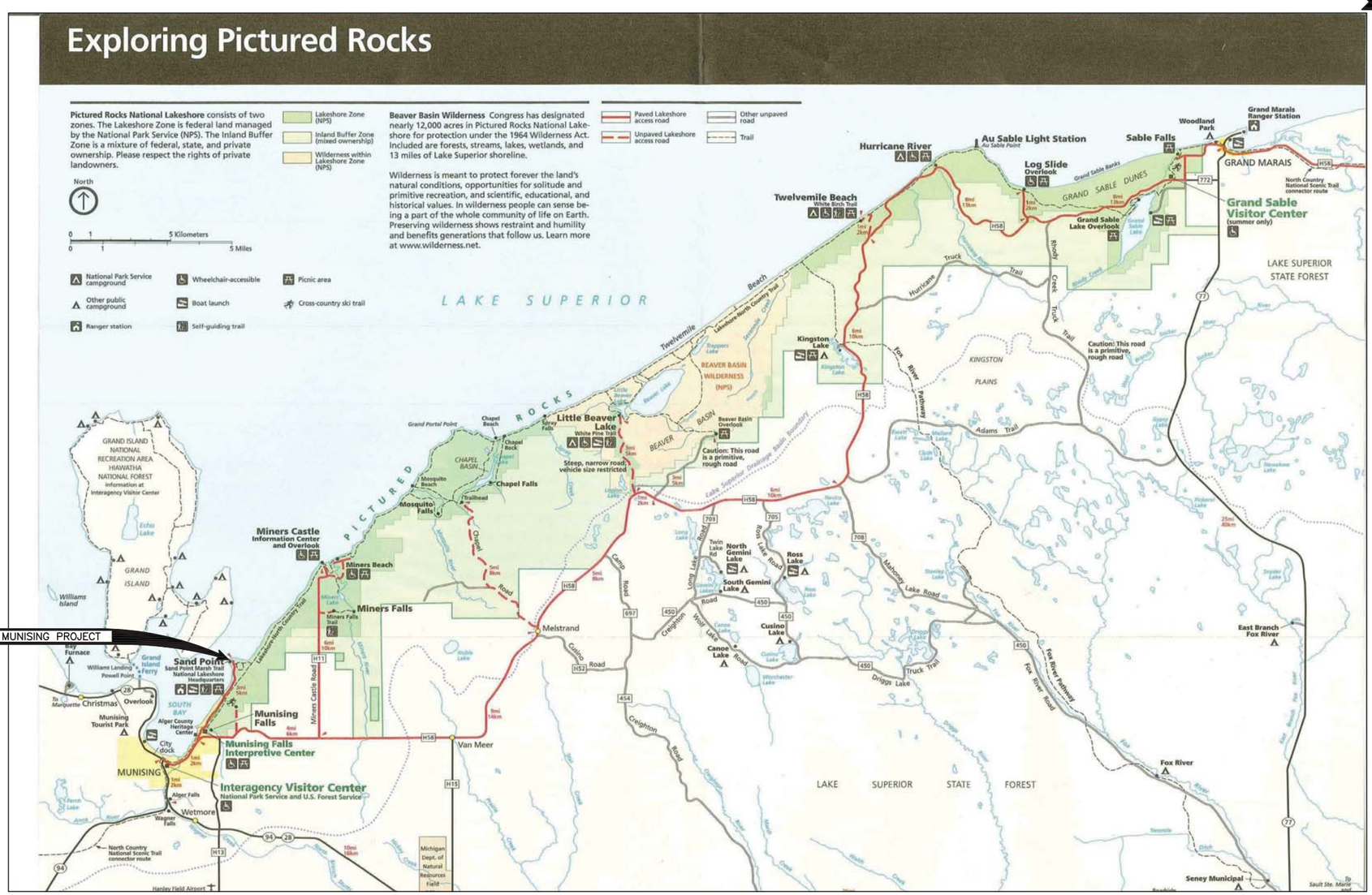
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Appendix A. 2016 Life Saving Station, Boathouse and Oil House Drawings

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Exploring Pictured Rocks



MIDWEST
MICHIGAN

PICTURED ROCKS NATIONAL LAKESHORE

ARCHITECTS	Mark	Sheet	REVISION	Date	Initial
ANDERSON HALLAS ARCHITECTS, P.C. GOLDEN, COLORADO 80401					

QUALITY DESIGN CERTIFICATION
- ☐ Prepared in Accordance with design Development (Title I) OR Drawing No.
- ☐ Variance from Design Development (Title I) Approved by Superintendent on Date OR
- ☐ Construction Drawing Not Preceded by Design Development (Title I)

Project Manager Date

HISTORIC STRUCTURE REPORT
UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DENVER SERVICE CENTER

TITLE OF PROJECT
MUNISING USCG LIFE SAVING STATION
LOCATION WITHIN PARK
SAND POINT
NAME OF PARK
PICTURED ROCKS NATIONAL LAKESHORE
REGION MIDWEST | COUNTY ALGER | STATE MICHIGAN

DRAWING NO. 625 80055
PMIS/PKG NO. 152048
SHEET 1 OF 13

BASIC DATA:

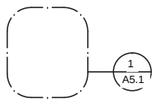
#	POUND(S) or NUMBER
&	AND
<	ANGLE
@	AT
A/V	AUDIO VISUAL
ABV	ABOVE
ACM	ASBESTOS CONTAINING MATERIAL
ACT	ACOUSTICAL CEILING TILE
ABAAS	ARCHITECTURAL BARRIERS ACT ACCESSIBILITY STANDARDS
ADD	ADDENDUM
ADJ	ADJACENT or ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
AL	ALUMINUM
ALT	ALTERNATE
APPROX	APPROXIMATE(LY)
ARCH	ARCHITECTURAL
ASPH	ASPHALT
B.O.	BOTTOM OF
BLDG	BUILDING
BLKG	BLOCKING
BR	BACKER ROD
BTWN	BETWEEN
CAB	CABINET
CJ	CONTROL JOINT
CL	CENTERLINE
CLG	CEILING
CLG HT	CEILING HEIGHT
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONST	CONSTRUCTION
CONT	CONTINUOUS
CORR	CORRIDOR
CPT	CARPET
CT	CERAMIC TILE
CTBB	CEMENTITIOUS TILE BACKER BOARD
CTR	CENTER
DBL	DOUBLE
DEMO	DEMOLITION
DET	DETAIL
DF	DRINKING FOUNTAIN
DIAM	DIAMETER
DIM	DIMENSION
DN	DOWN
DS	DOWNSPOUT
<E>	EXISTING
E	EAST
EA	EACH
EG	FOR EXAMPLE
ELEC	ELECTRICAL
ELEV	ELEVATION
EMER	EMERGENCY
ENGR	ENGINEER
EQ	EQUAL
EQP	EQUIPMENT
ETR	EXISTING TO REMAIN
EXT	EXTERIOR
FACP	FIRE ALARM CONTROL PANEL
FD	FLOOR DRAIN
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FIN	FINISH(ED)
FIXT	FIXTURE
FLR	FLOOR(ING)
FO	FACE OF
FP	FIRE PROTECTION
FRP	FIBERGLASS REINFORCED PANEL(ING)
FT	FEET
FTG	FOOTING
FURR	FURRING
GA	GAUGE
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GD	GRADE
GL	GLASS or GLAZING
GND	GROUND
GWB	GYPSUM WALLBOARD
HM	HOLLOW METAL
HAZMAT	HAZARDOUS MATERIAL
HDR	HEADER
HDW	HARDWARE
HORIZ	HORIZONTAL
HT	HEIGHT
HVAC	HEATING, VENTILATION and AIR CONDITIONING
IBC	INTERNATIONAL BUILDING CODE
ID	INSIDE DIAMETER
INFO	INFORMATION
INS	INSULATION or INSULATED
INT	INTERIOR
JT	JOINT
LAV	LAVATORY
LIN	LINOLEUM
MATL	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL
MEP	MECHANICAL, ELECTRICAL and PLUMBING
MFG	MANUFACTURING
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MO	MASONRY OPENING
MTD	MOUNTED
MTL	METAL
<N>	NEW
N	NORTH
NA	NOT APPLICABLE
NIC	NOT IN CONTRACT
NO.	NUMBER
NOM	NOMINAL
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OH	OPPOSITE HAND
OPNG	OPENING
OPP	OPPOSITE
OSB	ORIENTED STRAND BOARD
PLAM	PLASTIC LAMINATE
PLAS	PLASTER
PLUMB	PLUMBING
PT	PAINT
PTD	PAINTED
PWD	PLYWOOD
QT	QUARRY TILE
RAD	RADIUS
RB	RUBBER BASE
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
REF	REFER TO or REFERENCE
REINF	REINFORCED
RELOC	RELOCATED
REQ	REQUIRED
REV	REVISE, REVISED or REVISION
RM	ROOM
RO	ROUGH OPENING
RS	ROUGH SAWN
(S)	SEALANT
S	SOUTH
SCHED	SCHEDULE
SF	SQUARE FEET
SHTG	SHEATHING
SIM	SIMILAR
SOG	SLAB ON GRADE
SPEC	SPECIFICATION(S)
SQ	SQUARE
SS	STAINLESS STEEL
STD	STANDARD
STL	STEEL
STN	STAIN
STRUC	STRUCTURE or STRUCTURAL
(T)	TEMPERED
T&G	TONGUE AND GROOVE
T.O.	TOP OF
TD	THRESHOLD
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
VB	VAPOR BARRIER
VCT	VINYL COMPOSITION TILE
VERT	VERTICAL
VIF	VERIFY IN FIELD
VIN	VINYL
VTR	VENT THROUGH ROOF
W	WEST
W/	WITH
W/O	WITHOUT
WD	WOOD
WIN	WINDOW

GENERAL NOTES:

1. DO NOT SCALE DRAWINGS.

STANDARD SYMBOLS

DETAIL REFERENCE



INTERIOR ELEVATION



EXTERIOR ELEVATION



BUILDING SECTION

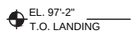


ROOM NAME & NUMBER

Room name

101

ELEVATION MARK



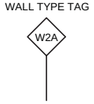
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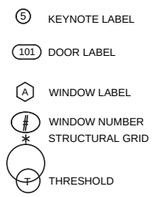


NORTH ARROW



WALL TYPE TAG



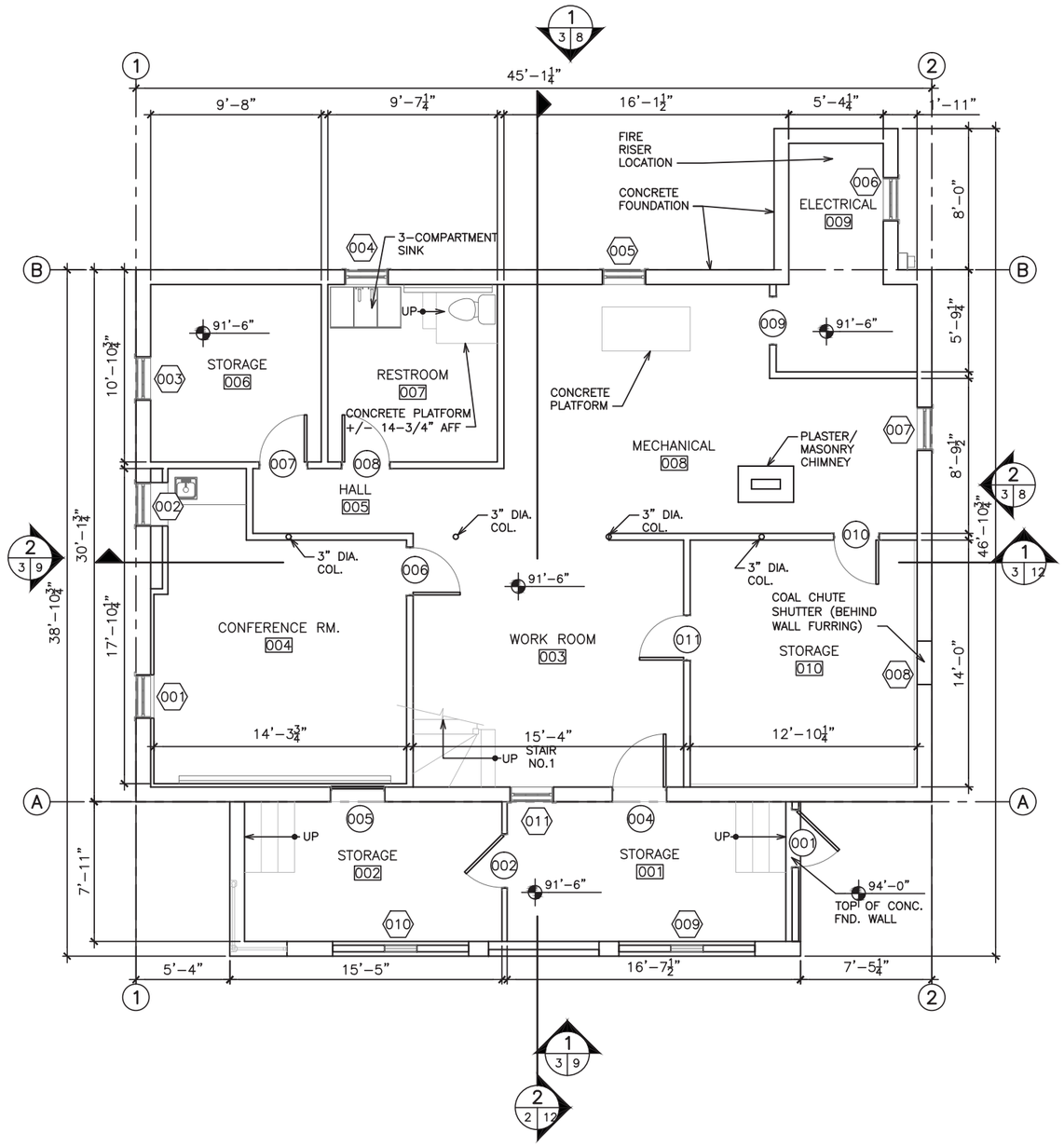


INDEX

SHEET	SUB. SHT.	NAME OF SHEET
GENERAL 1	G0.0	ARCHITECTURAL COVER SHEET
2	G0.1	INDEX, AND GENERAL NOTES
ARCHITECTURAL 3	A1.0	LIFE SAVING STATION – BASEMENT AND FIRST FLOOR PLANS
4	A1.1	LIFE SAVING STATION – SECOND FLOOR AND ROOF PLAN
5	A1.2	LIFE SAVING STATION – ROOF AND OIL HOUSE PLANS AND ELEVATIONS
6	A1.3	BOATHOUSE – MAIN AND ATTIC FLOOR PLANS
7	A1.4	BOATHOUSE – ROOF PLAN
8	A2.0	LIFE SAVING STATION – NORTH AND SOUTH EXTERIOR ELEVATIONS
9	A2.1	LIFE SAVING STATION – SOUTH AND WEST EXTERIOR ELEVATIONS
10	A2.2	BOATHOUSE – NORTH AND WEST EXTERIOR ELEVATIONS
11	A2.3	BOATHOUSE – SOUTH AND EAST EXTERIOR ELEVATIONS
12	A3.0	LIFE SAVING STATION – BUILDING SECTIONS
13	A3.1	BOATHOUSE – BUILDING SECTIONS

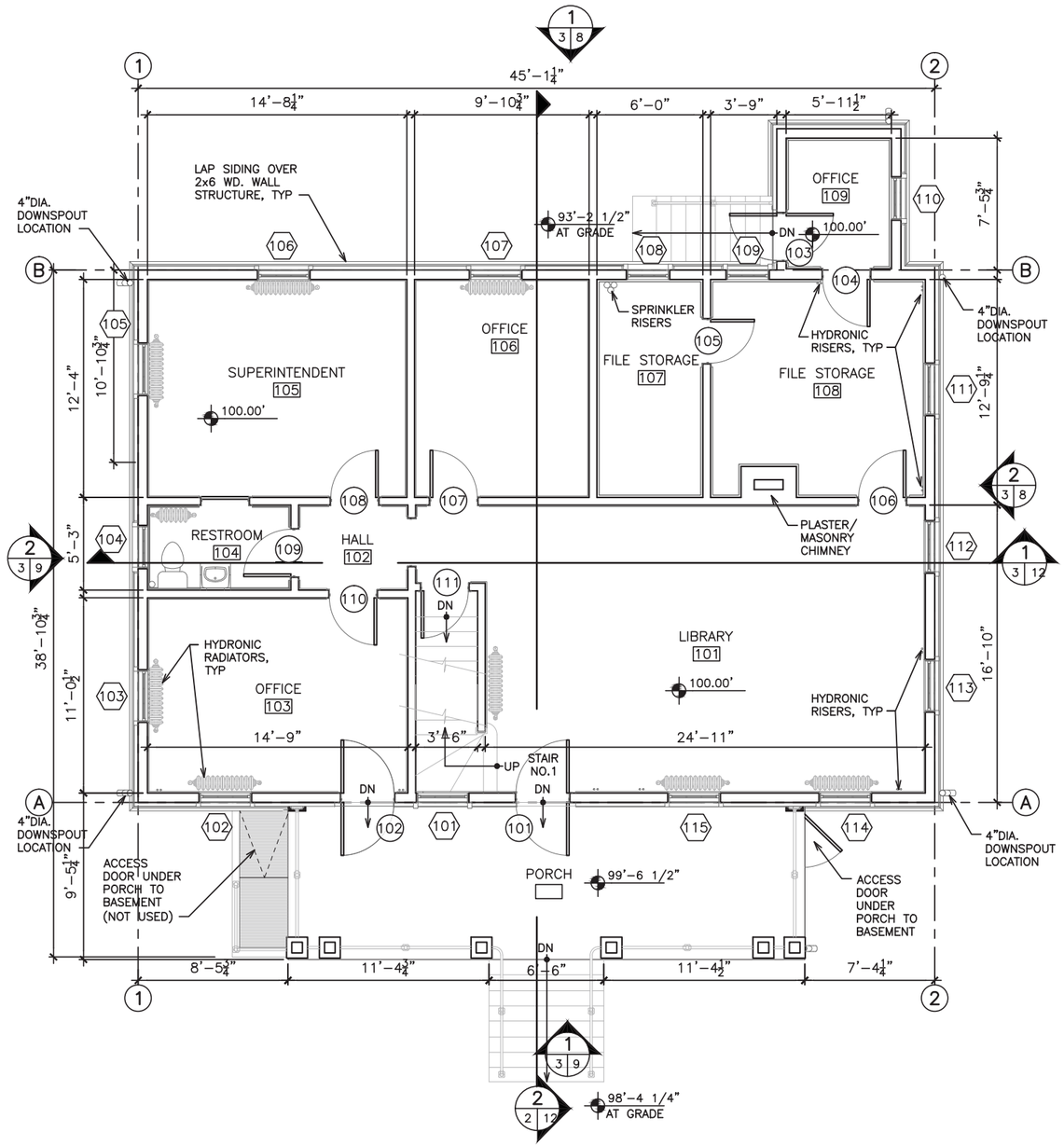
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SCALE Ⓐ



2 3 3 LIFE SAVING STATION – FIRST FLOOR PLAN

SCALE Ⓐ

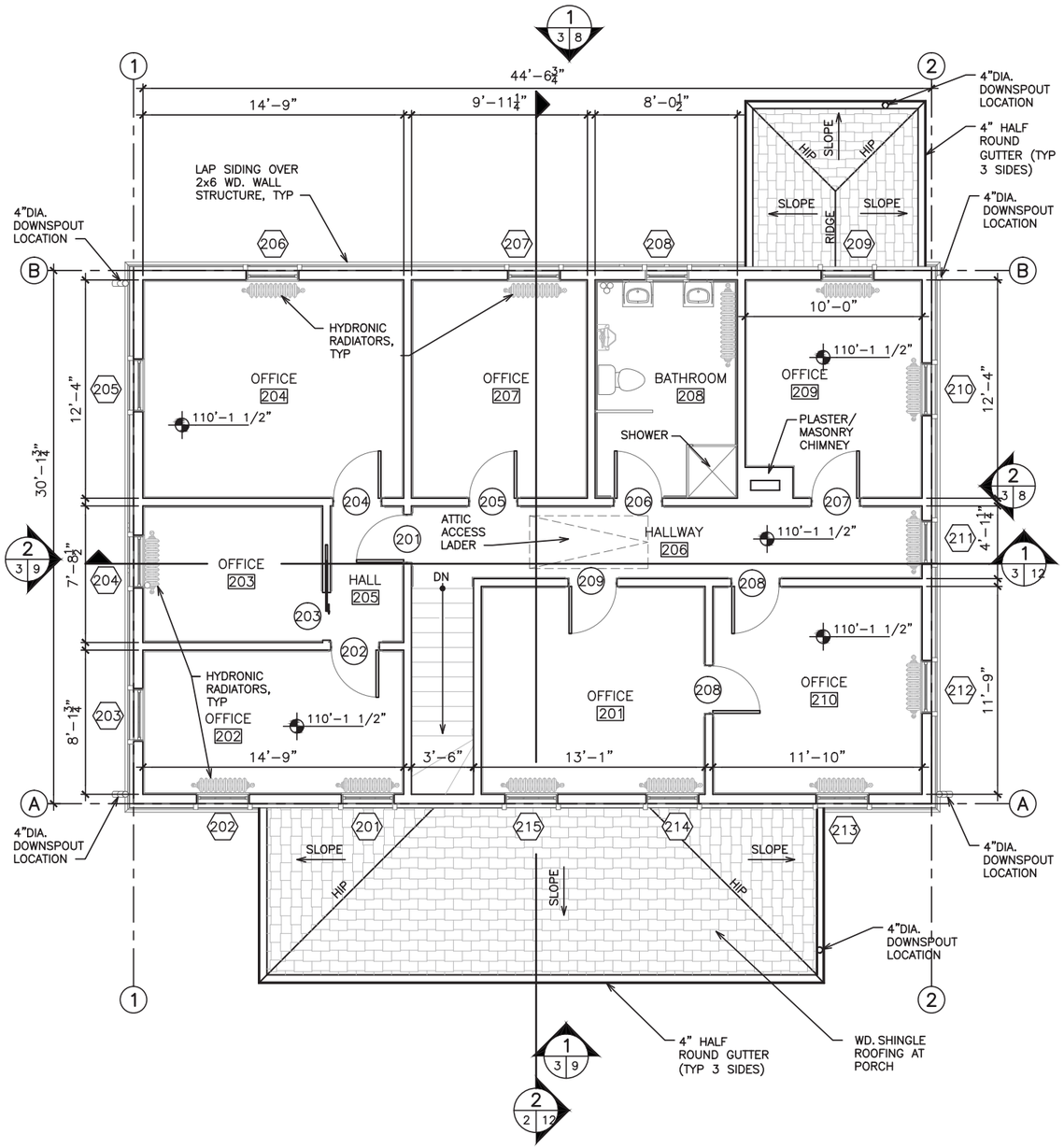
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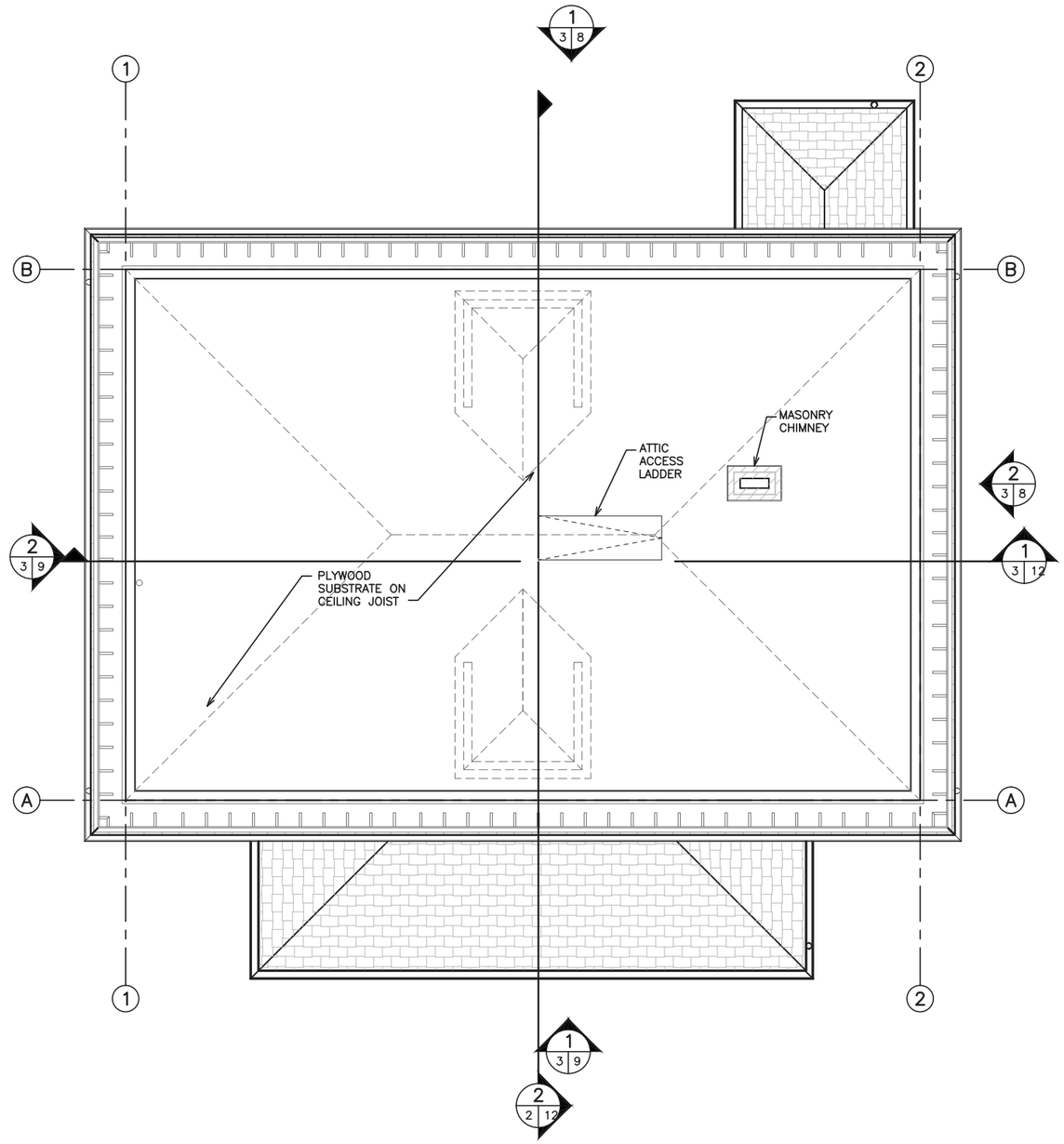
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1 4|4 LIFE SAVING STATION – SECOND FLOOR PLAN

SCALE Ⓐ



1 4|4 LIFE SAVING STATION – ATTIC PLAN

SCALE Ⓐ

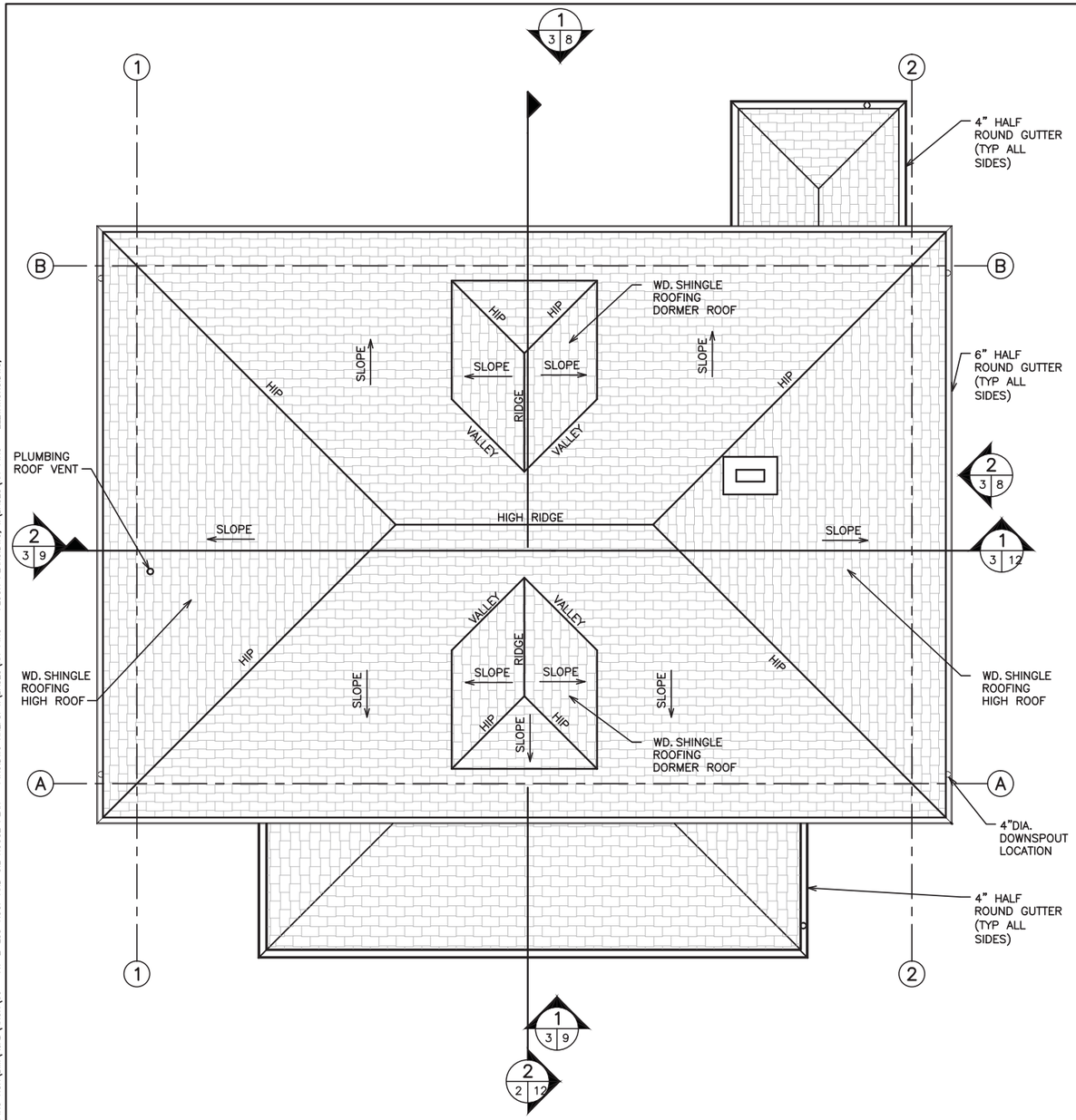
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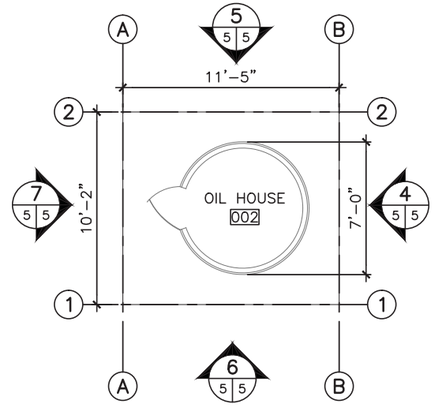
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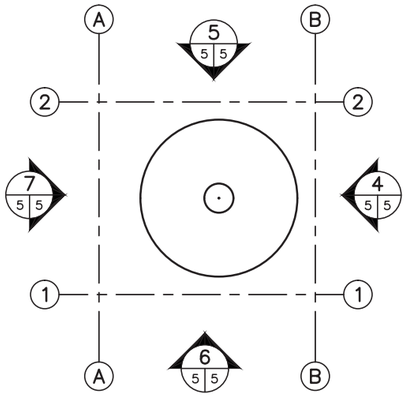
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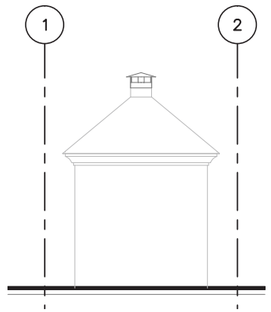
1 5 5 LIFE SAVING STATION – ROOF PLAN
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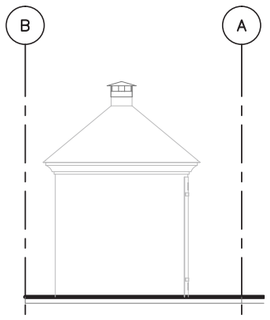
2 5 5 OIL HOUSE – FLOOR PLAN
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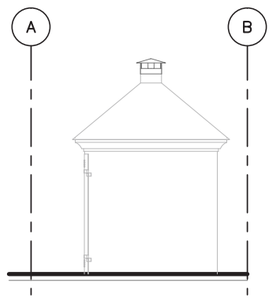
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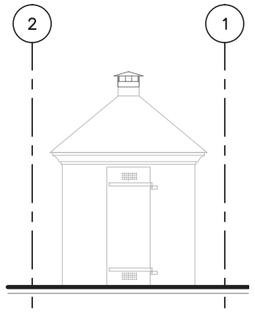
4 5 5 OIL HOUSE – EAST
SCALE A



5 5 5 OIL HOUSE – NORTH ELEVATION
SCALE A



6 5 5 OIL HOUSE – SOUTH ELEVATION
SCALE A



7 5 5 OIL HOUSE – WEST ELEVATION
SCALE A

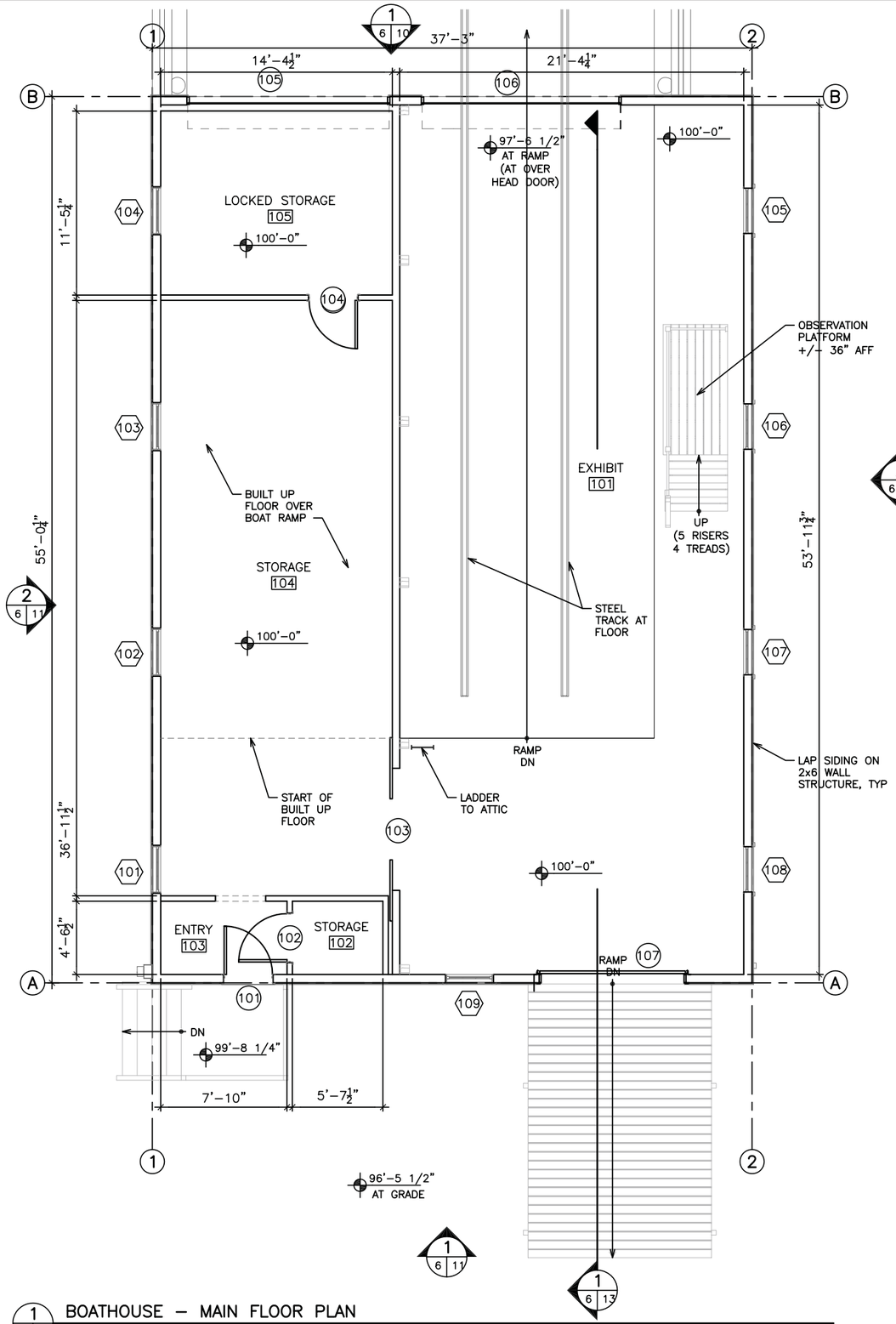
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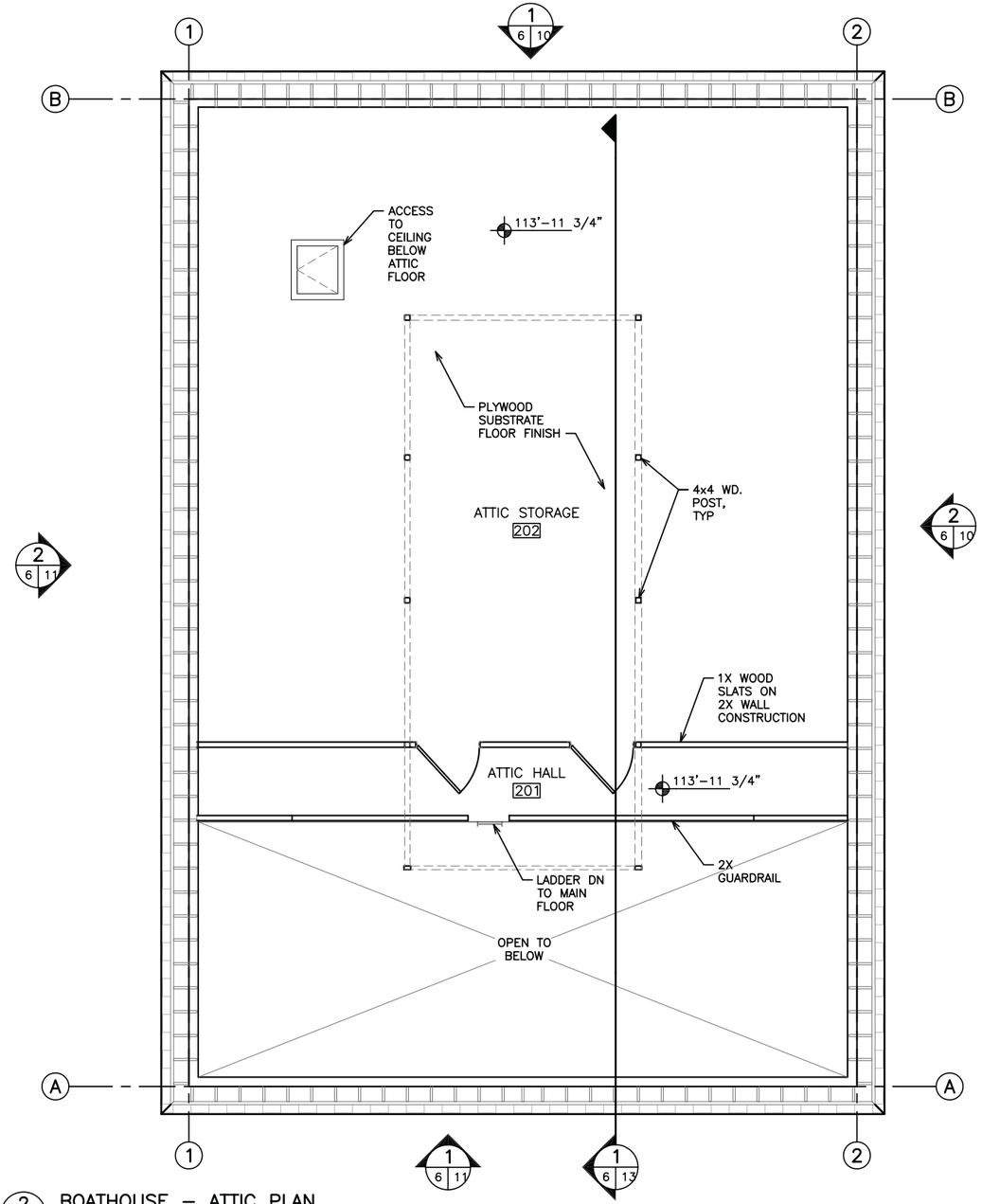
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1 6 6 BOATHOUSE – MAIN FLOOR PLAN
SCALE A

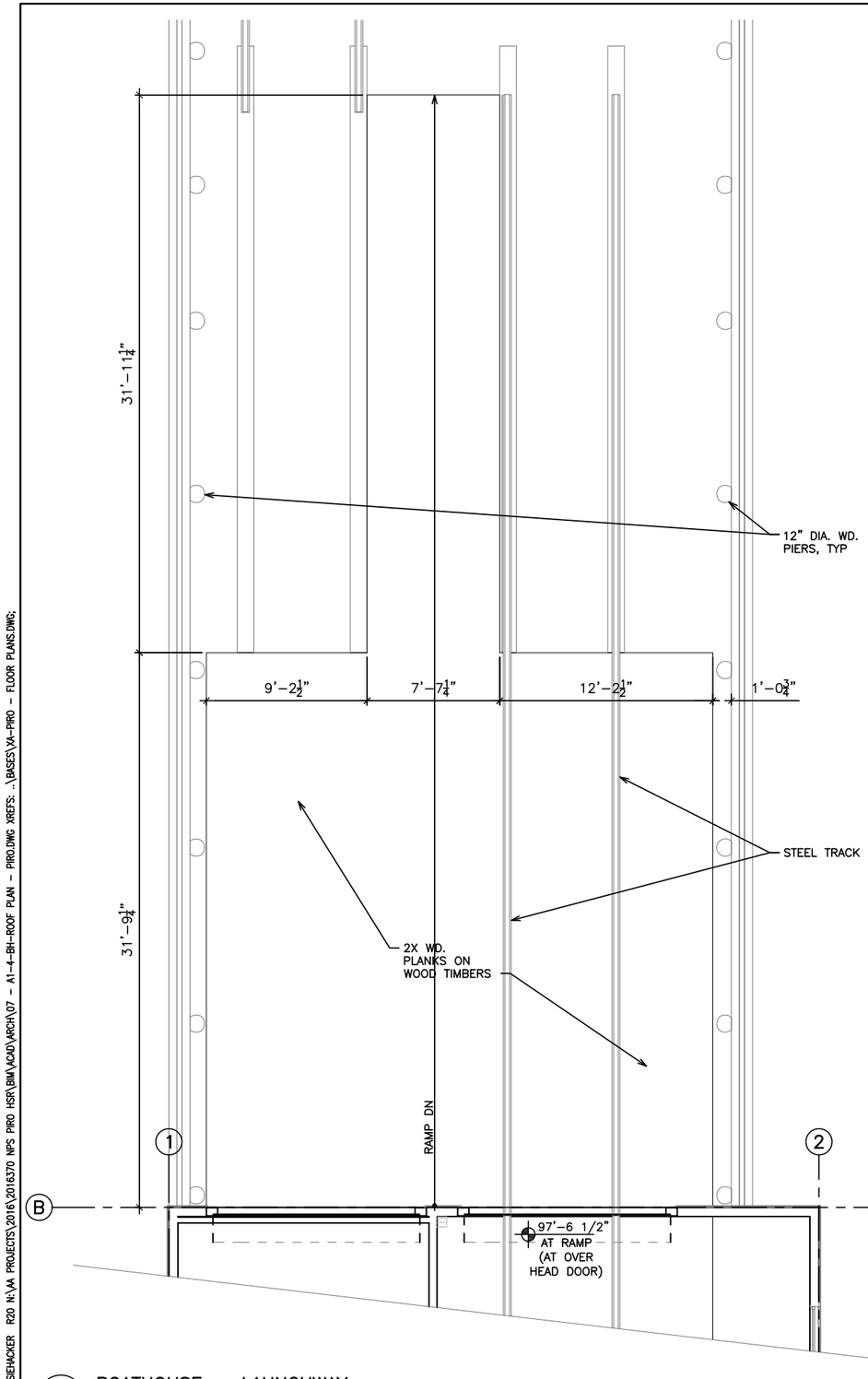


2 6 6 BOATHOUSE – ATTIC PLAN
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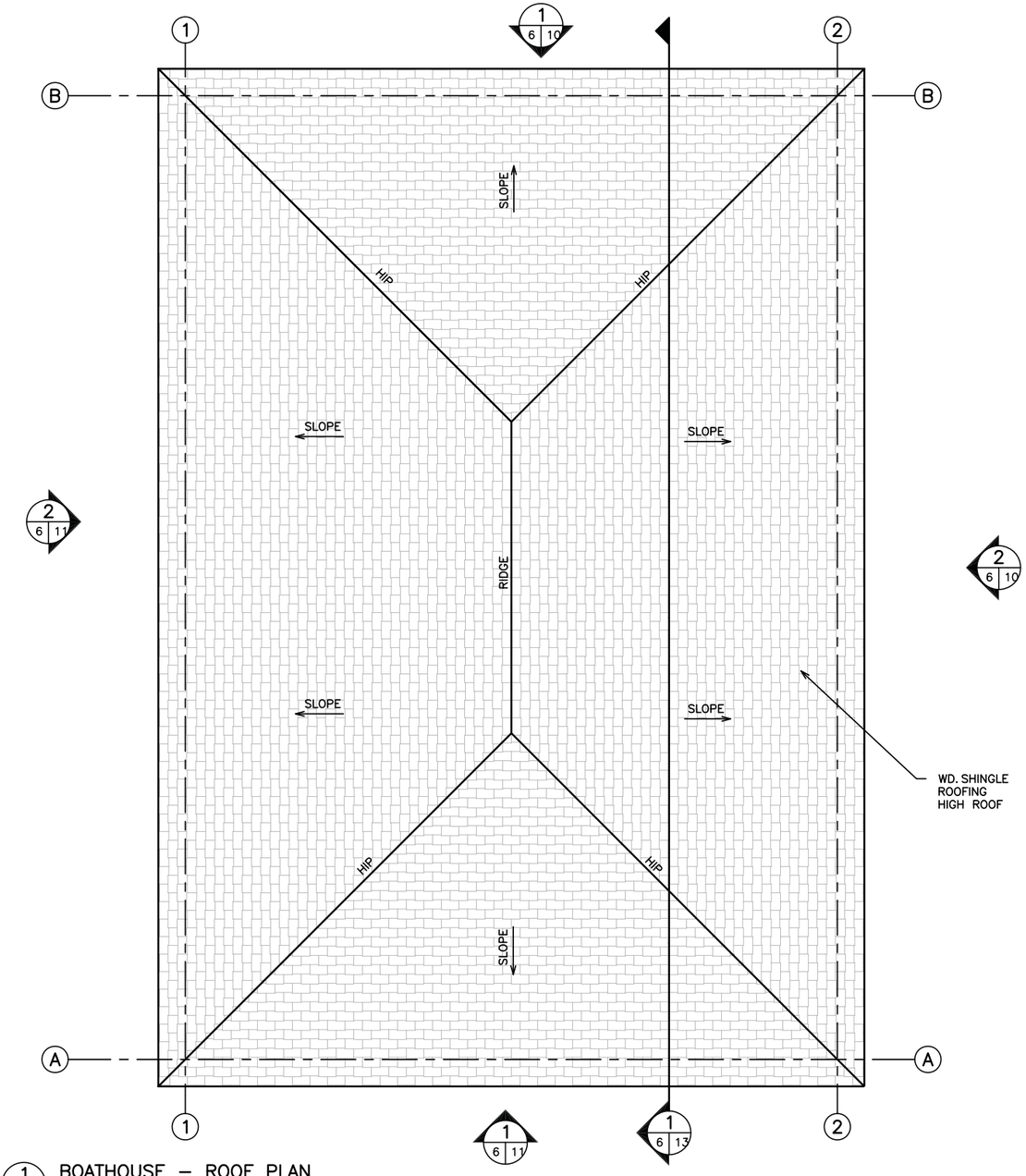
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SCALE OF FEET

PLAN NORTH

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2 / 7 | 7 BOATHOUSE – LAUNCHWAY
SCALE A



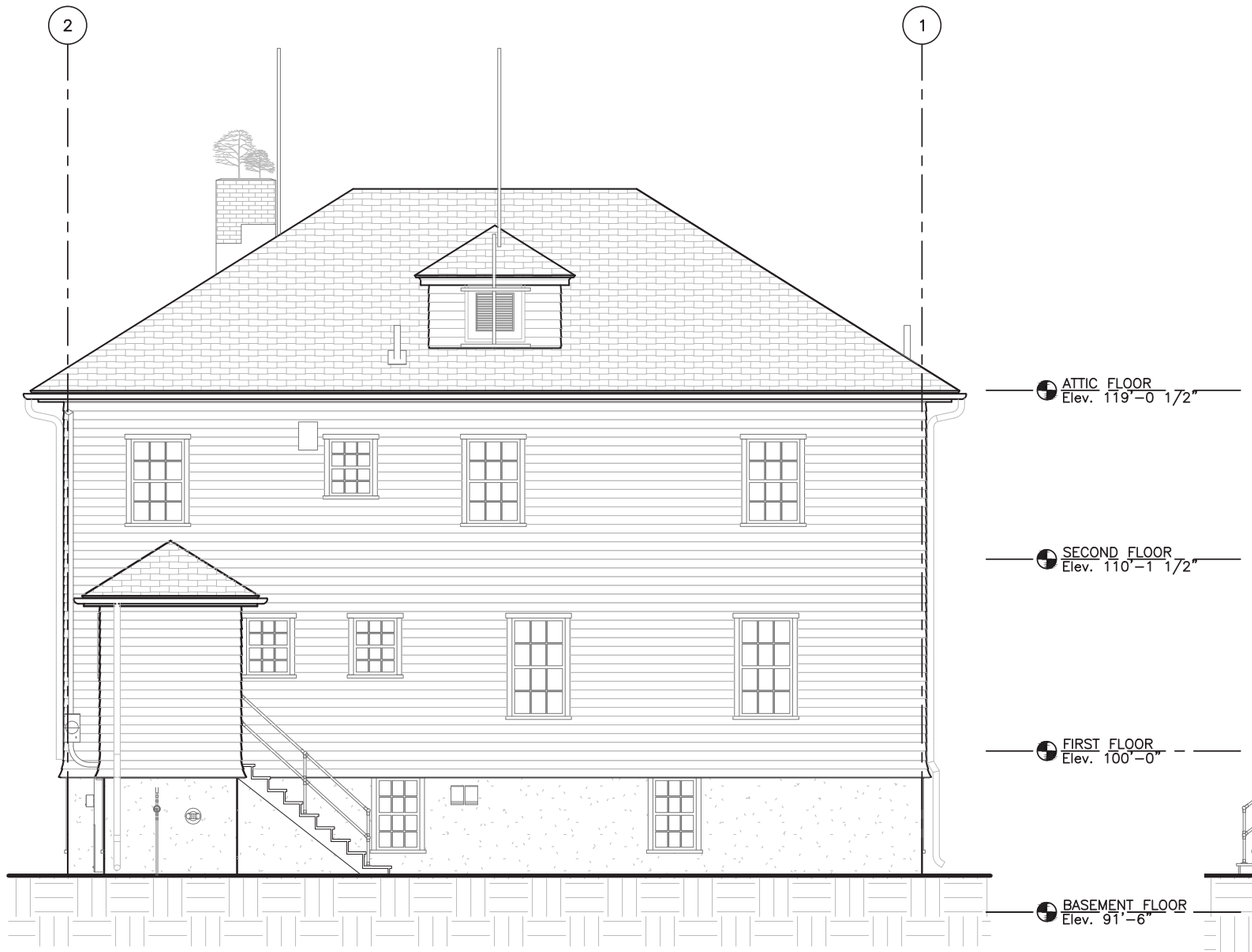
1 / 7 | 7 BOATHOUSE – ROOF PLAN
SCALE A

SCALE A 4 0 4 8
SCALE OF FEET

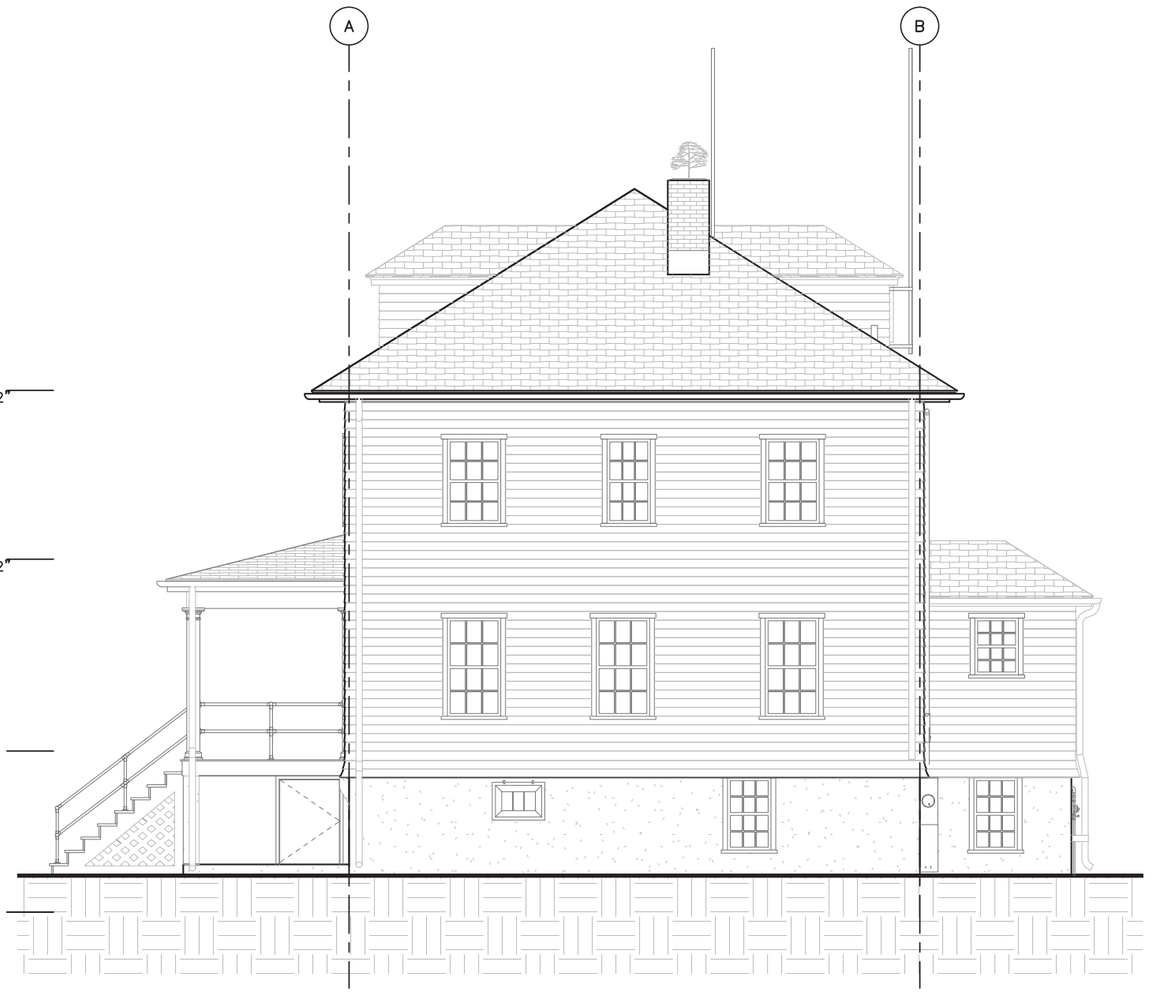
PLAN NORTH

DESIGNED: CADD DAM TECH. REVIEW: NAA DATE: 08/05/2016	SUB SHEET NO. A1.4	TITLE OF SHEET BOATHOUSE ROOF PLAN MUNISING USCG LIFE SAVING STATION ~ SAND POINT HISTORIC STRUCTURE REPORT ~ PICTURED ROCKS NATIONAL LAKESHORE	DRAWING NO. 625 80055 PMIS/PKG NO. 152048 SHEET 7 OF 13

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1 3/8 LIFE SAVING STATION – NORTH ELEVATION
SCALE (A)



2 3/8 LIFE SAVING STATION – EAST ELEVATION
SCALE (A)

SCALE (A) 4 0 4 8
SCALE OF FEET

DESIGNED: DAM TECH. REVIEW: NAA DATE: 08/05/2016	SUB SHEET NO. A2.0	TITLE OF SHEET LIFE SAVING STATION NORTH AND EAST EXTERIOR ELEVATIONS MUNISING USCG LIFE SAVING STATION ~ SAND POINT HISTORIC STRUCTURE REPORT ~ PICTURED ROCKS NATIONAL LAKESHORE	DRAWING NO. 625 80055 PMIS/PKG NO. 152048 SHEET 8 OF 13

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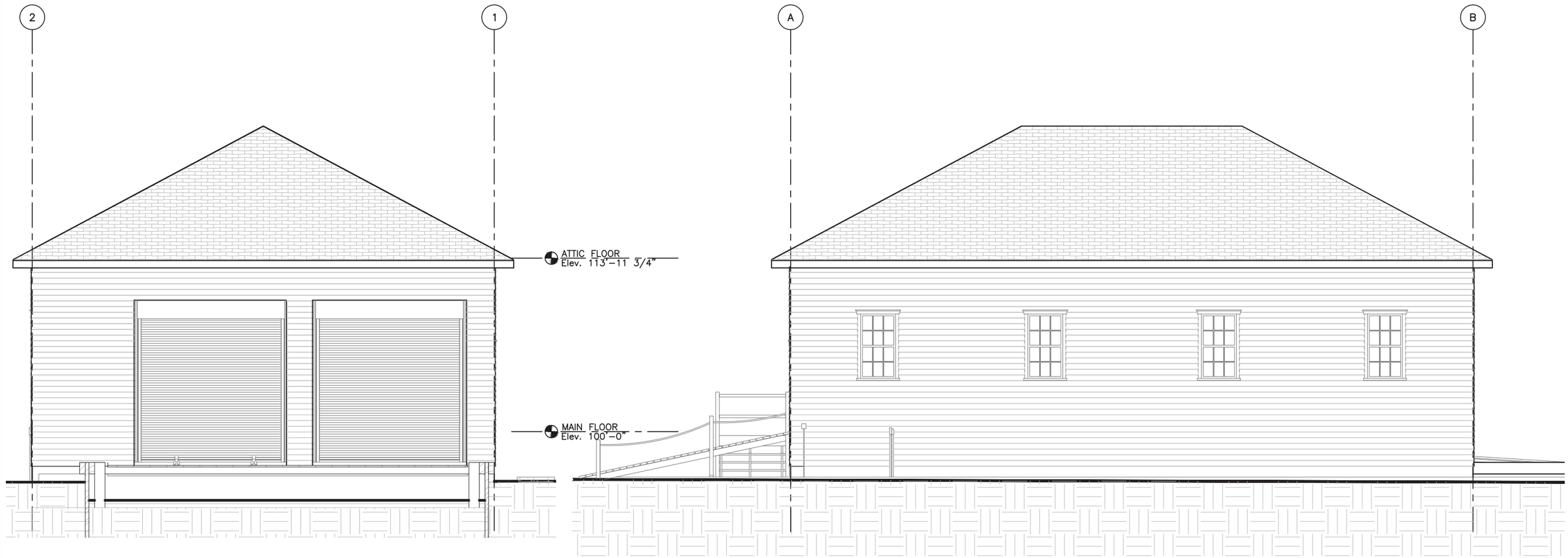
1 / 3 9 LIFE SAVING STATION – SOUTH ELEVATION
SCALE (A)

2 / 3 9 LIFE SAVING STATION – WEST ELEVATION
SCALE (A)

SCALE (A) 4 0 4 8
SCALE OF FEET

DESIGNED: CADD DAM TECH. REVIEW: NAA DATE: 08/05/2016	SUB SHEET NO. A2.1	TITLE OF SHEET LIFE SAVING STATION SOUTH AND WEST EXTERIOR ELEVATIONS MUNISING USCG LIFE SAVING STATION ~ SAND POINT HISTORIC STRUCTURE REPORT ~ PICTURED ROCKS NATIONAL LAKESHORE	DRAWING NO. 625 80055 PMIS/PKG NO. 152048 SHEET 9 OF 13

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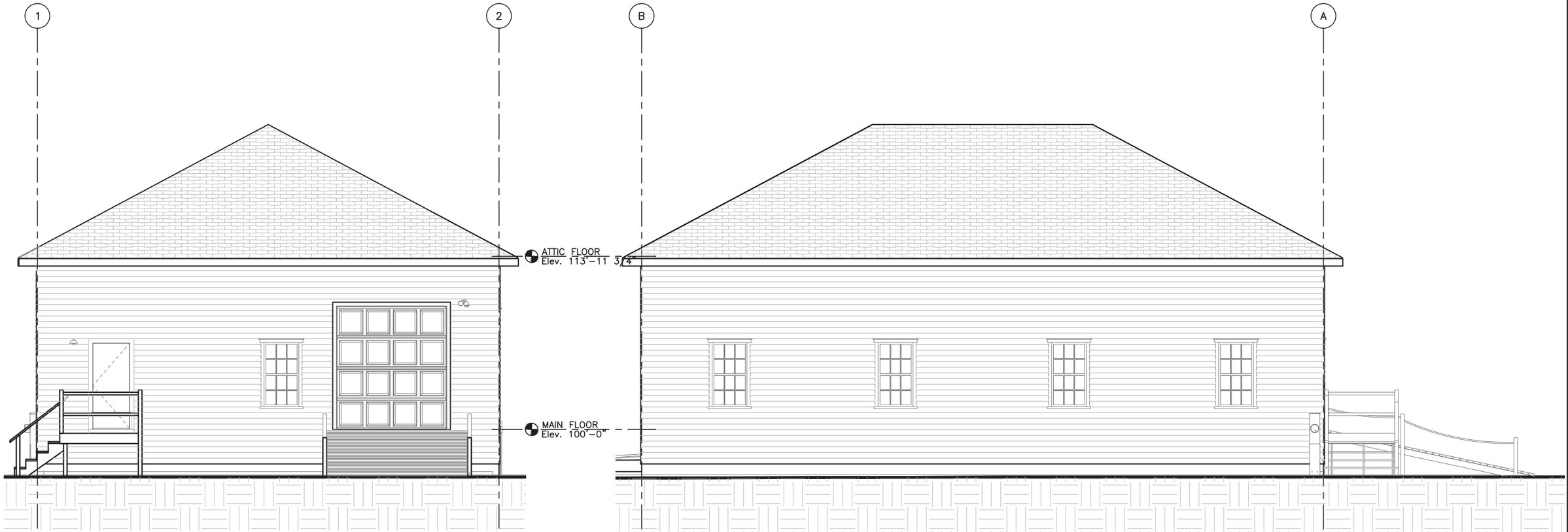
1 6|10 BOATHOUSE – WEST ELEVATION
SCALE (A)

2 6|10 BOATHOUSE – NORTH ELEVATION
SCALE (A)

SCALE (A) 4 0 4 8
SCALE OF FEET

DESIGNED: CADD DAM TECH. REVIEW: NAA DATE: 08/05/2016	SUB SHEET NO. A2.2	TITLE OF SHEET BOATHOUSE NORTH AND WEST EXTERIOR ELEVATIONS MUNISING USCG LIFE SAVING STATION ~ SAND POINT HISTORIC STRUCTURE REPORT ~ PICTURED ROCKS NATIONAL LAKESHORE	DRAWING NO. 625 80055 PMIS/PKG NO. 152048 SHEET 10 OF 13

11/4/16 14:47 SUSIEHACKER R20 N:\AA PROJECTS\2016\2016370 NPS PIRO HSR\BIM\ACAD\ARCH\10 - A2-2-BH-NORTH AND EAST ELEVATIONS - PIRO.DWG XREFS: ..\BASES\XA-PIRO - ELEVATIONS.DWG;



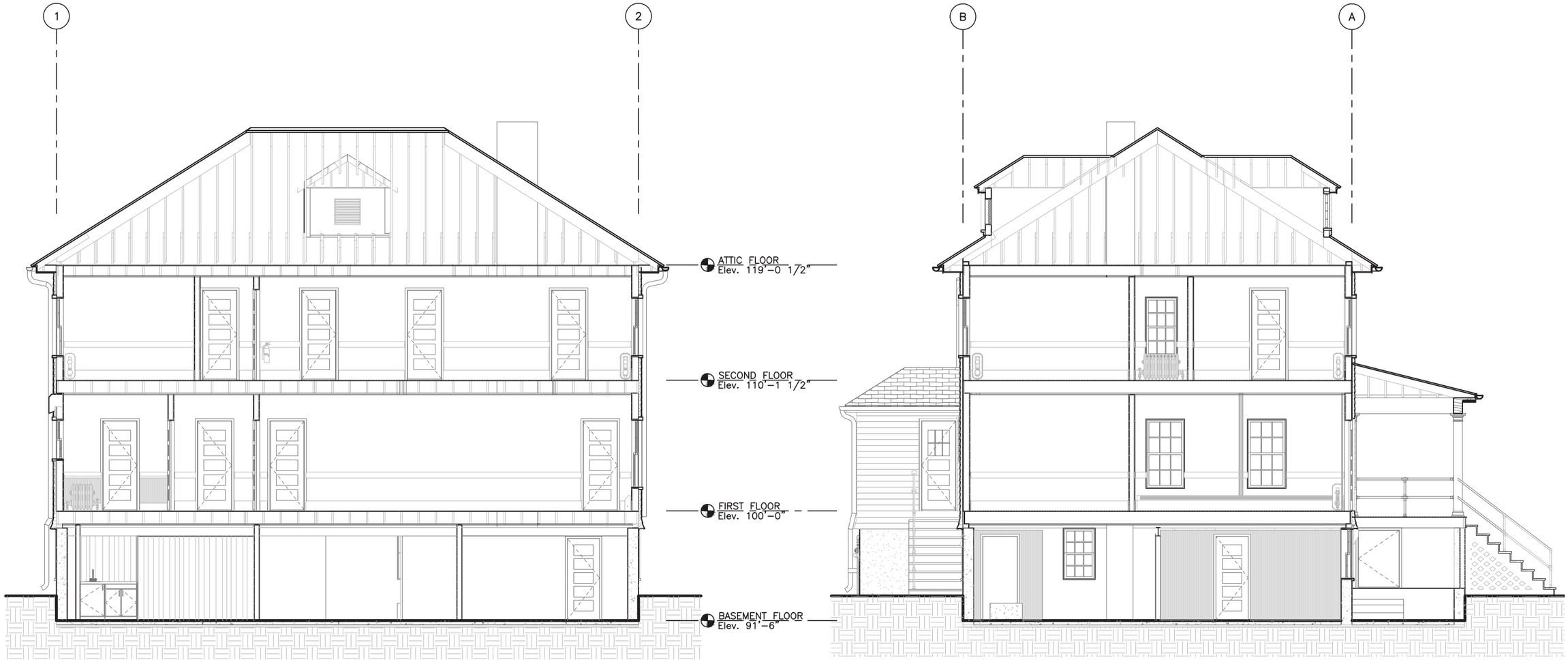
1 / 6 | 11 BOATHOUSE – EAST ELEVATION
SCALE (A)

2 / 6 | 11 BOATHOUSE – SOUTH ELEVATION
SCALE (A)

SCALE (A) 4 0 4 8
SCALE OF FEET

DESIGNED: CADD DAM TECH. REVIEW: NAA DATE: 08/05/2016	SUB SHEET NO. A2.3	TITLE OF SHEET BOATHOUSE SOUTH AND EAST EXTERIOR ELEVATIONS MUNISING USCG LIFE SAVING STATION ~ SAND POINT HISTORIC STRUCTURE REPORT ~ PICTURED ROCKS NATIONAL LAKESHORE	DRAWING NO. 625 80055 PMIS/PKG NO. 152048 SHEET 11 OF 13

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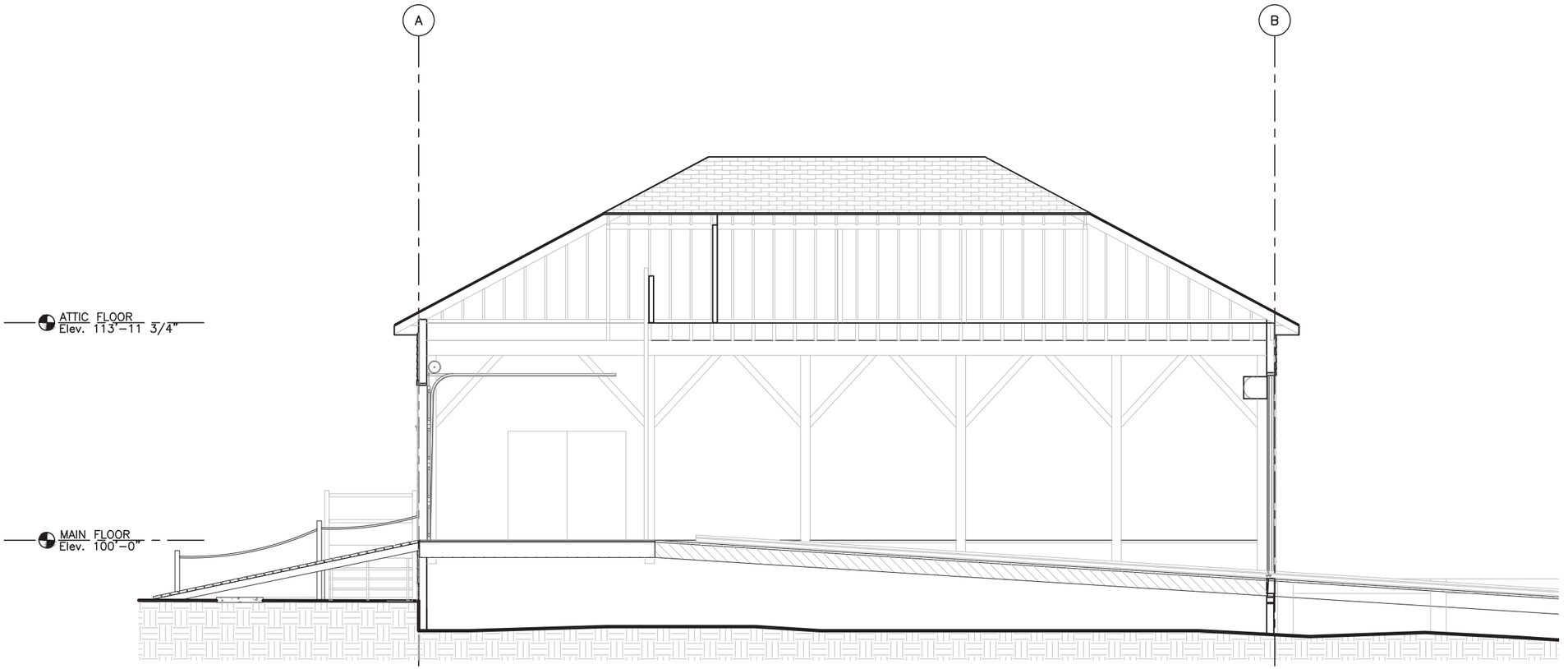
1 3 12 LIFE SAVING STATION – SECTION
SCALE Ⓐ

2 3 12 LIFE SAVING STATION – SECTION
SCALE Ⓐ

SCALE Ⓐ 4 0 4 8
SCALE OF FEET

DESIGNED: CADD DAM TECH. REVIEW: NAA DATE: 08/01/2016	SUB SHEET NO. A3.0	TITLE OF SHEET LIFE SAVING STATION BUILDING SECTIONS MUNISING USCG LIFE SAVING STATION ~ SAND POINT HISTORIC STRUCTURE REPORT ~ PICTURED ROCKS NATIONAL LAKESHORE	DRAWING NO. 625 80055 PMIS/PKG NO. 152048 SHEET 12 OF 13

11/4/16 15:24 SUSIEHACKER R20 N:\VA PROJECTS\2016\2016370 NPS PIRO HSR\BIM\ACAD\ARCH\12 - A3-0-LSS-BUILDING SECTIONS - PIRO.DWG XREFS: ..\BASES\VA-PIRO - SECTIONS.DWG;



1 / 6 | 13 BOATHOUSE – SECTION
SCALE (A)

SCALE (A) 4 0 4 8
SCALE OF FEET

DESIGNED: CADD DAM TECH. REVIEW: NAA DATE: 08/01/2016	SUB SHEET NO. A3.1	TITLE OF SHEET BOATHOUSE BUILDING SECTIONS MUNISING USCG LIFE SAVING STATION ~ SAND POINT HISTORIC STRUCTURE REPORT ~ PICTURED ROCKS NATIONAL LAKESHORE	DRAWING NO. 625 80055 PMIS/PKG NO. 152048 SHEET 13 OF 13

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Appendix B. Window Condition Table

Life Saving Station Window Matrix

Window No.	Type	Storm Window	Condition	Historic / Non-Historic	Notes
101	A	OASS	G	H	
102	A	OASS	F	H	(1) Cracked Pane
103	A	OASS	G	H	
104	A	OASS	G	H	
105	A	OASS	G	H	
106	A	OASS	G	H	
107	A	OASS	G	H	
108	A	OASS	G	H	
109	A	OASS	G	H	
110	A	OASS	F	H	Glazing compound is cracked
111	A	OASS	F	H	Glazing compound is cracked
112	A	OASS	F	H	Glazing compound is cracked
113	A	OASS	F	H	Glazing compound is cracked
114	A	OASS	F	H	Glazing compound is cracked
115	A	OASS	G	H	Glazing compound is cracked
201	A	OASS	F	H	Glazing compound is cracked
202	A	OASS	F	H	Glazing compound is cracked
203	A	OASS	F	H	Glazing compound is cracked
204	A	OASS	F	H	Glazing compound is cracked
205	A	OASS	F	H	Glazing compound is cracked
206	A	OASS	F	H	Glazing compound is cracked
207	A	OASS	F	H	Glazing compound is cracked
208	A	OASS	F	H	Glazing compound is cracked
209	A	OASS	F	H	Glazing compound is cracked
210	A	OASS	F	H	Glazing compound is cracked
211	A	OASS	F	H	Glazing compound is cracked
212	A	OASS	F	H	Glazing compound is cracked
213	A	OASS	F	H	Glazing compound is cracked
214	A	OASS	F	H	Glazing compound is cracked
215	A	OASS	F	H	Glazing compound is cracked
301	B	OASS	F	H	
302	Vent	N/A	G	NH	Window sash removed

A - 6-over-6, Double Hung, Wood Window
B - Wood Casement Window
C - 8 Lite Fixed Wood Window
OASS = Operable Aluminum Storm Sash
Φ = 12 Lite Historic Wood Storm

G - Good Condition
F - Fair Condition
P - Poor Condition

Life Saving Station Window Matrix continued

Window No.	Type	Storm Window	Condition	Historic / Non-Historic	Notes
001	A	Φ	F	H	Glazing compound is cracked
002	A	Φ	F	H	Glazing compound is cracked
003	A	Φ	F	H	Glazing compound is cracked
004	A	Φ	F	H	Glazing compound is cracked
005	A	Φ	F	H	One (1) pane cracked
006	A	Φ	F	H	One (1) pane cracked
007	A	Φ	F	H	One (1) pane cracked
008					Coal Chute
009	C	N/A	F	NH	Deterioration at sill and trim
010	C	N/A	F	NH	Deterioration at sill and trim

A - 6-over-6, Double Hung, Wood Window
B - Wood Casement Window
C - 8 Lite Fixed Wood Window
OASS = Operable Aluminum Storm Sash
Φ = 12 Lite Historic Wood Storm

G - Good Condition
F - Fair Condition
P - Poor Condition

Boathouse Window Matrix

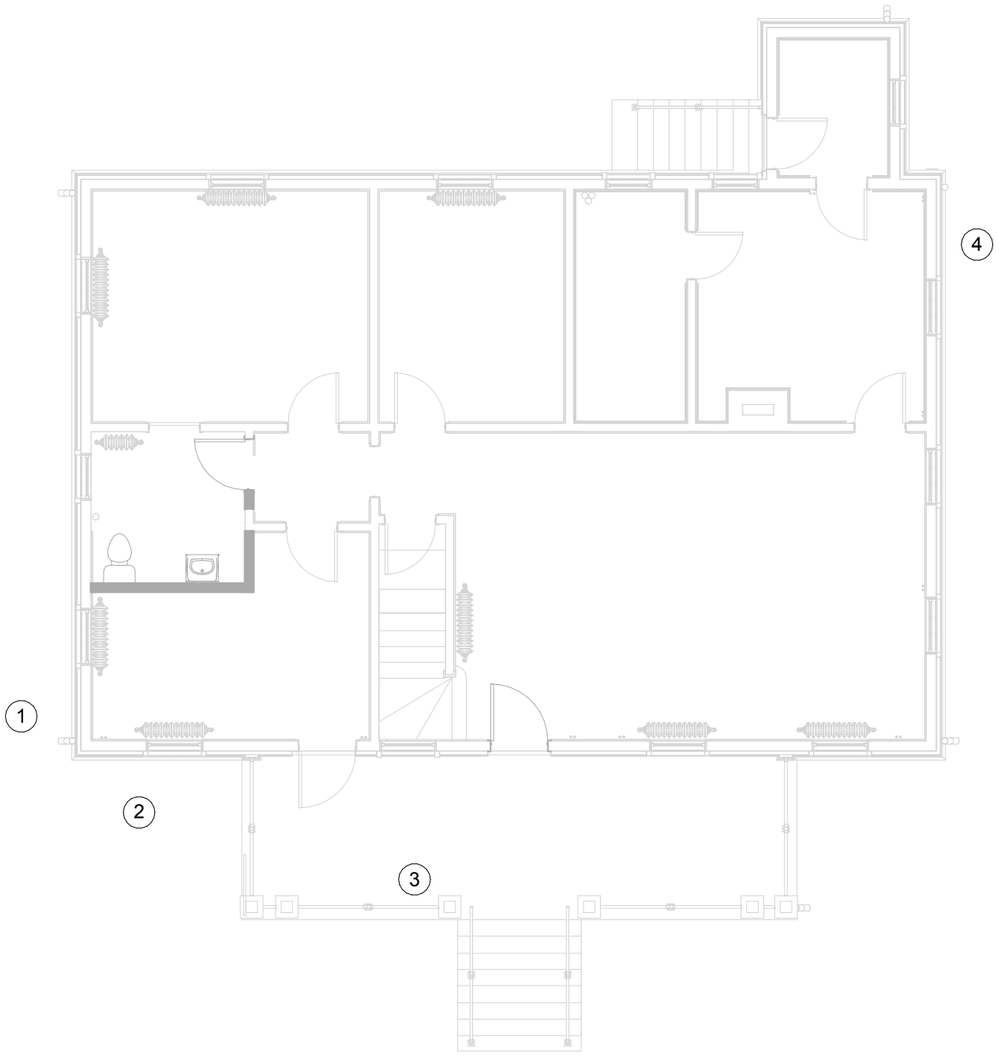
Window No.	Type	Storm Window	Condition	Historic / Non-Historic	Notes
101	A	N/A	F	H	Paint and glazing compound chipping
102	A	N/A	F	H	Paint and glazing compound chipping
103	A	N/A	F	H	Paint and glazing compound chipping
104	A	N/A	F	H	Paint and glazing compound chipping
105	A	N/A	F	H	Paint and glazing compound chipping
106	A	N/A	G	H	Paint and glazing compound chipping
107	A	N/A	G	H	Paint and glazing compound chipping
108	A	N/A	G	H	Paint and glazing compound chipping
109	A	N/A	G	H	Paint and glazing compound chipping

A - 6-over-6, Double Hung Wood Window

G - Good Condition
F - Fair Condition

Appendix C. Preferred Alternative Drawings

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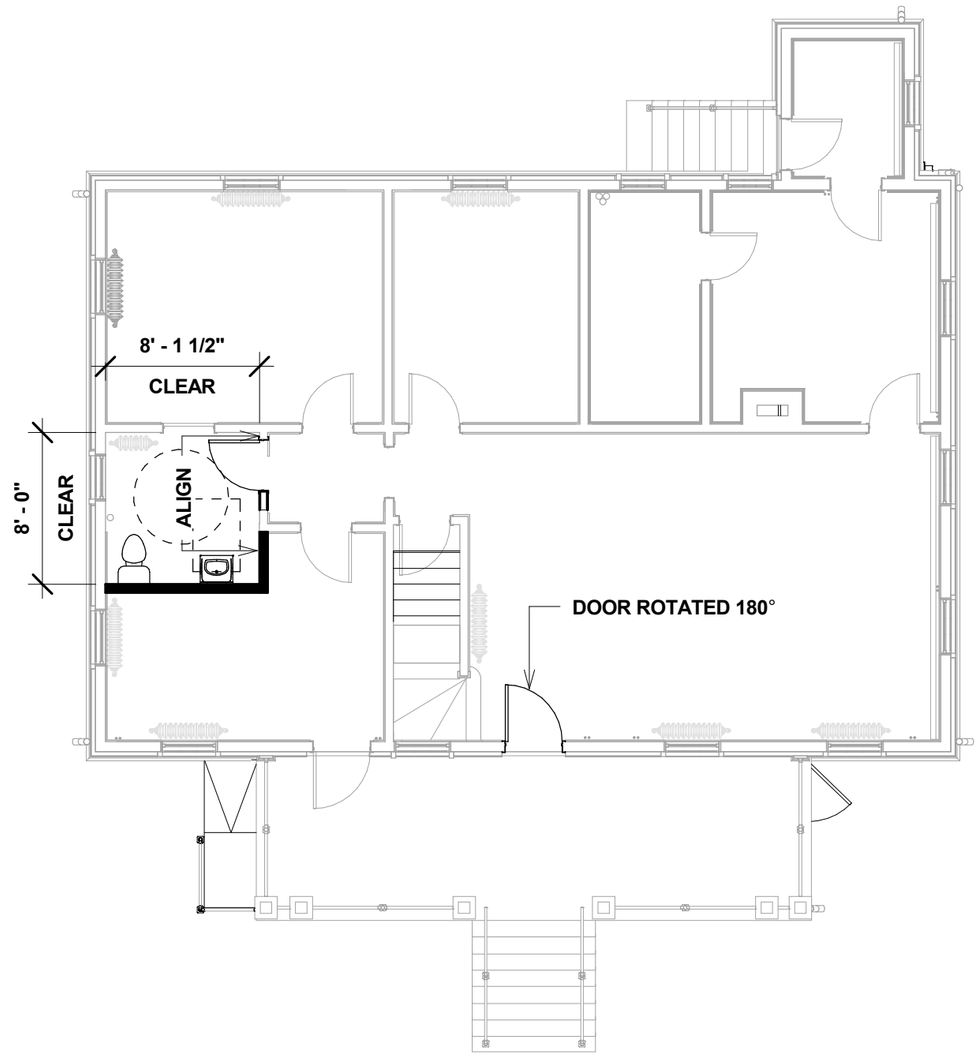
ACCESSIBLE ACCESS OPTIONS

1. SIDE YARD RAMP
2. LIFT AT WEST END OF SOUTH PORCH
3. LIFT WITHIN SOUTH PORCH
4. ELEVATOR - LOCATION TBD

8 0 8 16

SCALE OF FEET

DECEMBER 2016	TITLE OF PROJECT HISTORIC STRUCTURE REPORT
UNITED STATES DEPARTMENT OF THE INTERIOR PICTURED ROCKS NATIONAL LAKESHORE MUNISING, MICHIGAN	TITLE OF DRAWING PREFERRED ALTERNATIVE NAME OF PARK SAND POINT/MUNISING USCG LIFE SAVING STATION
	REGION: MIDWEST COUNTY: ALGER STATE: MICHIGAN

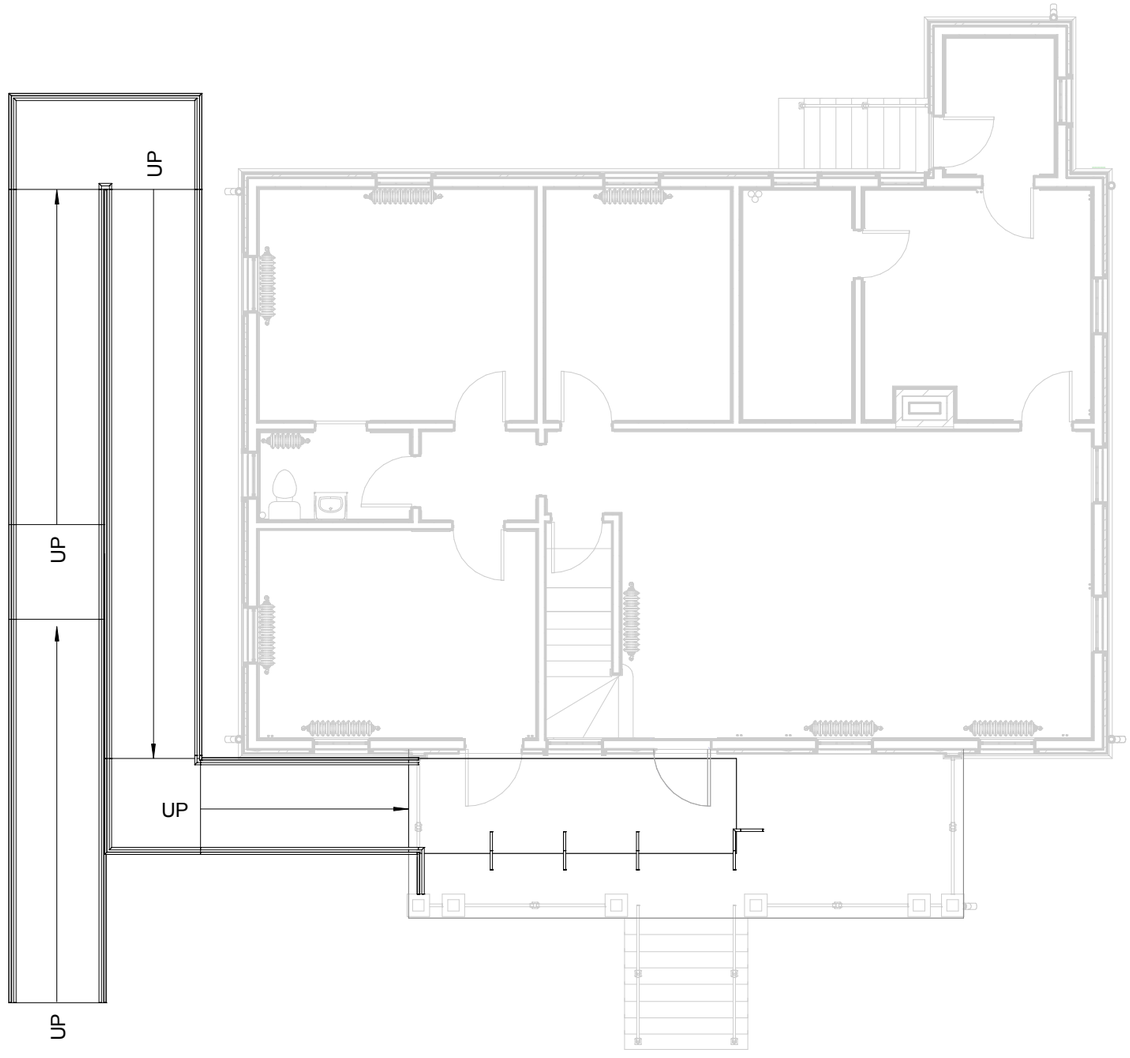


1 FIRST FLOOR – ABA Restroom Plan Changes

8 0 8 16

SCALE OF FEET

DECEMBER 2016	TITLE OF PROJECT HISTORIC STRUCTURE REPORT
UNITED STATES DEPARTMENT OF THE INTERIOR PICTURED ROCKS NATIONAL LAKESHORE MUNISING, MICHIGAN	TITLE OF DRAWING PREFERRED ALTERNATIVE NAME OF PARK SAND POINT/MUNISING USCG LIFE SAVING STATION REGION MIDWEST · COUNTY ALGER · STATE MICHIGAN



1 FIRST FLOOR – Side Yard Ramp

8 0 8 16

SCALE OF FEET

DECEMBER 2016	TITLE OF PROJECT HISTORIC STRUCTURE REPORT
UNITED STATES DEPARTMENT OF THE INTERIOR PICTURED ROCKS NATIONAL LAKESHORE MUNISING, MICHIGAN	TITLE OF DRAWING PREFERRED ALTERNATIVE NAME OF PARK SAND POINT/MUNISING USCG LIFE SAVING STATION REGION MIDWEST · COUNTY ALGER · STATE MICHIGAN



3 Side Yard Ramp

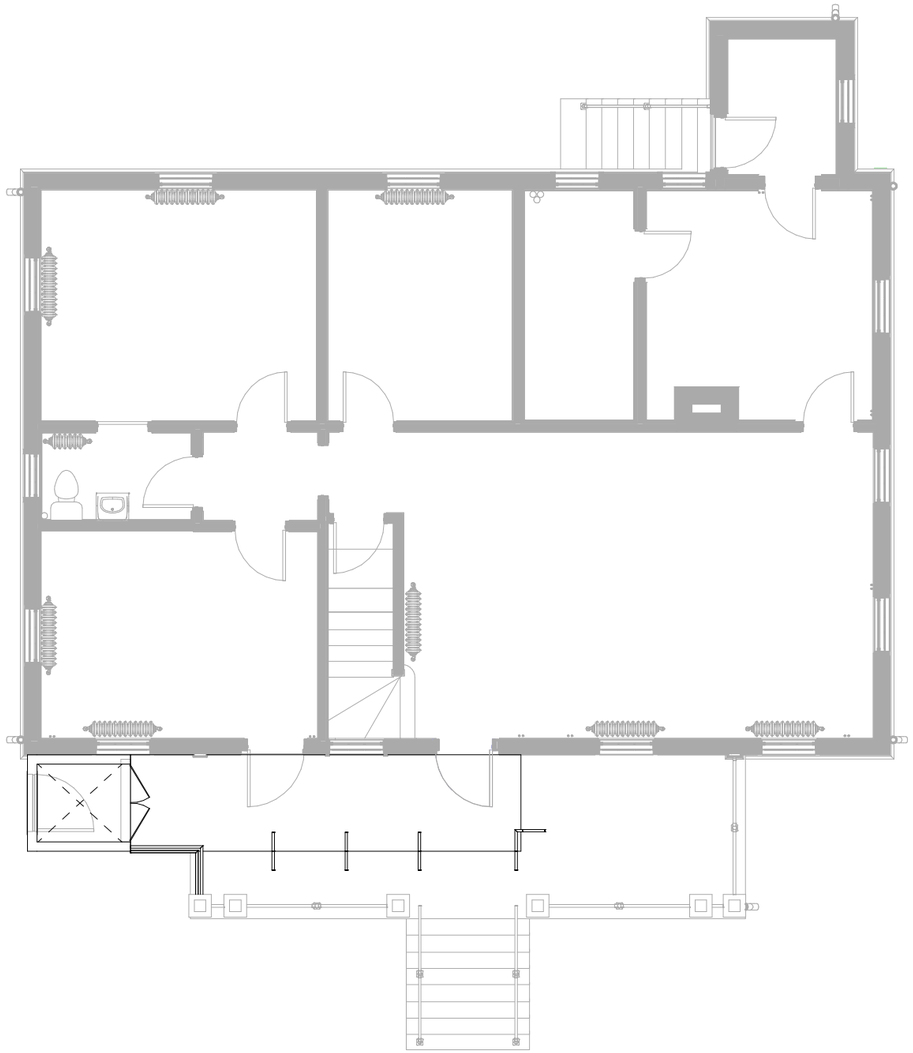


2 Side Yard Ramp



1 Side Yard Ramp

DECEMBER 2016	TITLE OF PROJECT HISTORIC STRUCTURE REPORT
UNITED STATES DEPARTMENT OF THE INTERIOR PICTURED ROCKS NATIONAL LAKESHORE MUNISING, MICHIGAN	TITLE OF DRAWING PREFERRED ALTERNATIVE NAME OF PARK SAND POINT/MUNISING USCG LIFE SAVING STATION REGION MIDWEST · COUNTY ALGER · STATE MICHIGAN



1 FIRST FLOOR – Front Yard Lift

8 0 8 16

SCALE OF FEET

DECEMBER 2016	TITLE OF PROJECT HISTORIC STRUCTURE REPORT
UNITED STATES DEPARTMENT OF THE INTERIOR PICTURED ROCKS NATIONAL LAKESHORE MUNISING, MICHIGAN	TITLE OF DRAWING PREFERRED ALTERNATIVE NAME OF PARK SAND POINT/MUNISING USCG LIFE SAVING STATION
	REGION: MIDWEST COUNTY: ALGER STATE: MICHIGAN

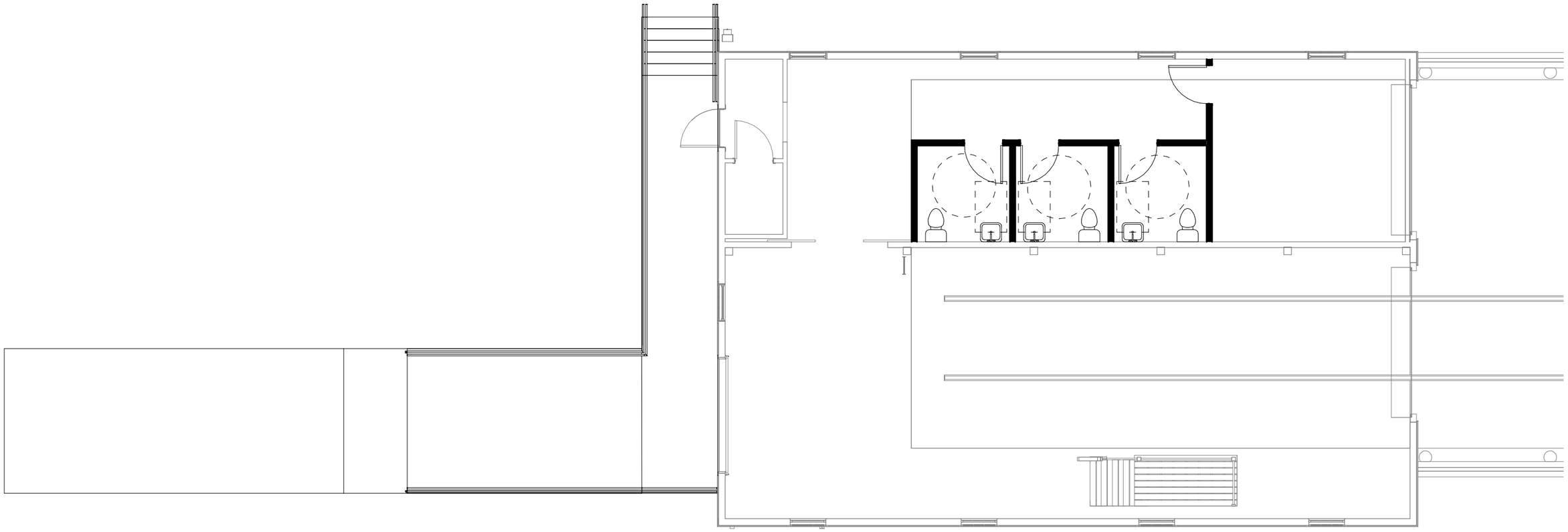


1 Front Yard Lift



2 Front Yard Lift

DECEMBER 2016	TITLE OF PROJECT HISTORIC STRUCTURE REPORT
UNITED STATES DEPARTMENT OF THE INTERIOR PICTURED ROCKS NATIONAL LAKESHORE MUNISING, MICHIGAN	TITLE OF DRAWING PREFERRED ALTERNATIVE NAME OF PARK SAND POINT/MUNISING USCG LIFE SAVING STATION
	REGION: MIDWEST COUNTY: ALGER STATE: MICHIGAN

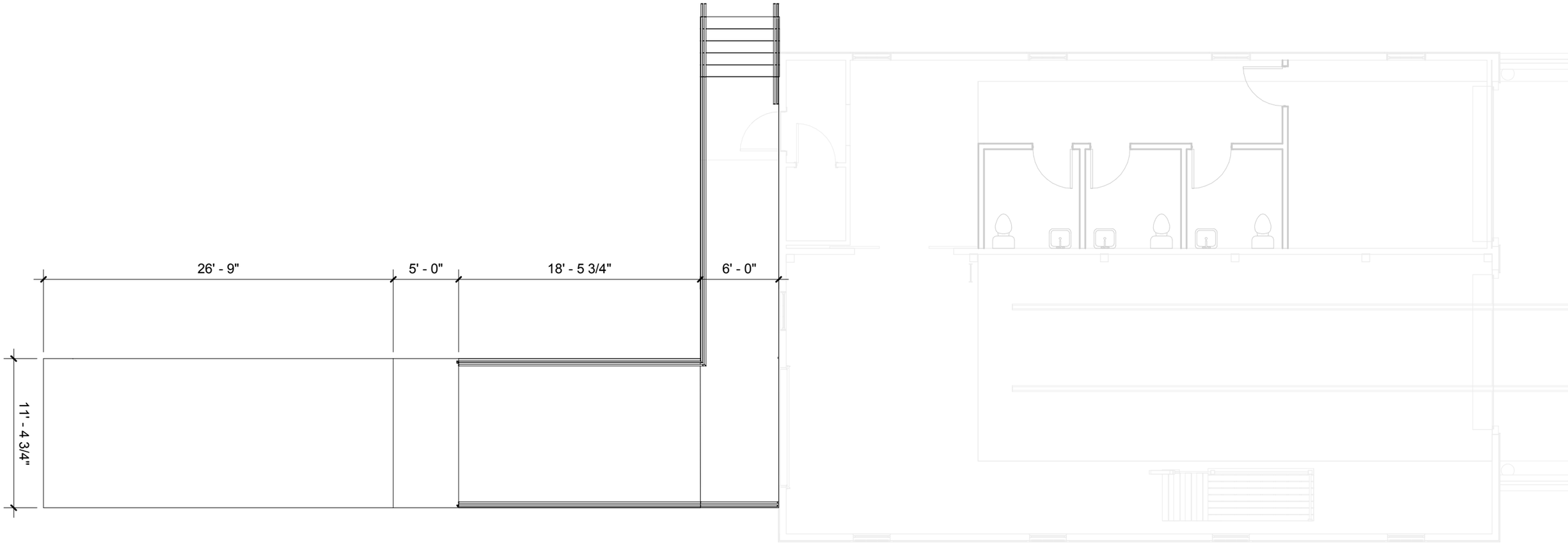


1 ABA Floor Plan Changes – Single User Restrooms

8 0 8 16

SCALE OF FEET

DECEMBER 2016	TITLE OF PROJECT HISTORIC STRUCTURE REPORT
UNITED STATES DEPARTMENT OF THE INTERIOR PICTURED ROCKS NATIONAL LAKESHORE MUNISING, MICHIGAN	TITLE OF DRAWING PREFERRED ALTERNATIVE NAME OF PARK SAND POINT/MUNISING USCG LIFE SAVING STATION REGION: MIDWEST · COUNTY: ALGER · STATE: MICHIGAN

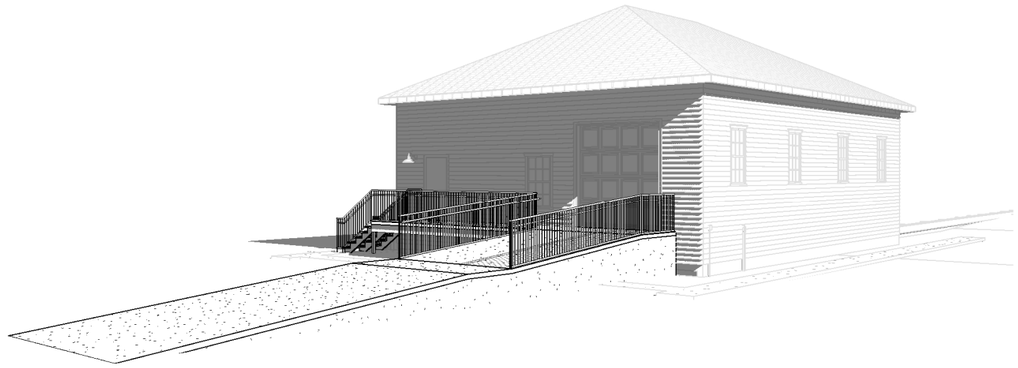


1 Boathouse Ramp with Landing

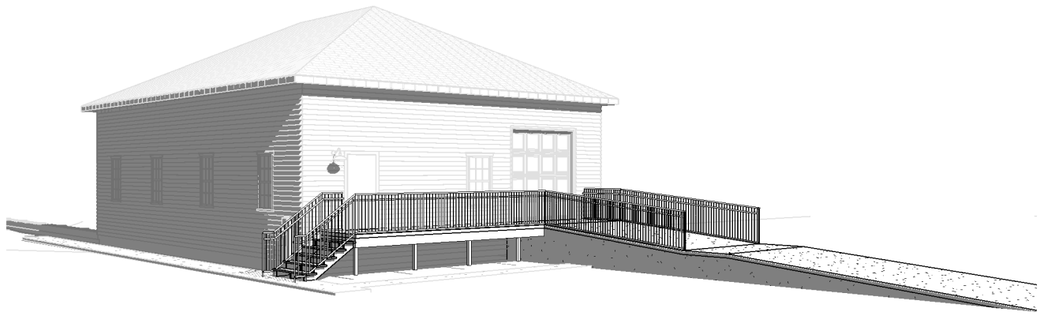
8 0 8 16

SCALE OF FEET

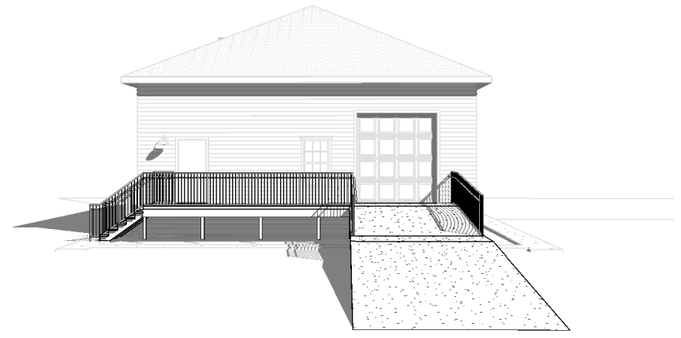
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UNITED STATES DEPARTMENT OF THE INTERIOR PICTURED ROCKS NATIONAL LAKESHORE MUNISING, MICHIGAN	TITLE OF DRAWING PREFERRED ALTERNATIVE NAME OF PARK SAND POINT/MUNISING USCG LIFE SAVING STATION
	REGION: MIDWEST COUNTY: ALGER STATE: MICHIGAN



3 Boathouse Ramp with Landing



1 Boathouse Ramp with Landing



2 Boathouse Ramp with Landing

DECEMBER 2016

UNITED STATES
DEPARTMENT OF THE INTERIOR

PICTURED ROCKS NATIONAL LAKESHORE
MUNISING, MICHIGAN

TITLE OF PROJECT
HISTORIC STRUCTURE REPORT

TITLE OF DRAWING
PREFERRED ALTERNATIVE

NAME OF PARK
SAND POINT/MUNISING USCG LIFE SAVING STATION

REGION	COUNTY	STATE
MIDWEST	ALGER	MICHIGAN

Appendix D. Cost Estimate

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United States Department of the Interior
National Park Service
Class C Construction Cost Estimate

BASIS OF ESTIMATE

PROJECT INFORMATION

Project:	PIRO HSR Renovations
Park:	Pictured Rocks National Lakeshore
Park Alpha:	PIRO
PMIS Number:	152048
Estimate Date:	11/30/2016 - V 1.1
Prepared By:	Jim Flemming
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) presents a planning document for the historic buildings at Pictured Rocks National Lakeshore in Munising, Michigan. It identifies characteristics and features that convey the historic significance and character of the Life Saving Station, Boathouse and Oil House and provides a plan for long term preservation and stewardship.

SOURCE OF COST DATA:

Cost Data is based on ACC's work history along with ACC's database of past and current projects. For this pricing, cost data 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 (Means = 100.0, Portland, Or = 99.5, for purposes of this Class C pricing the variance is minimal)). 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.

ESTIMATE ASSUMPTIONS:

The cost estimate is based on the 80% HSR dated August 11, 2016 and the recommended treatments within the HSR. Estimate assumes the mid point of construction as 24 months from the date of this report. Escalation assumed to be 4% per year.

MAJOR CHANGES FROM PREVIOUS ESTIMATE:

N/A

United States Department of the Interior
National Park Service
Class C Construction Cost Estimate

BASIS OF ESTIMATE

PROJECT INFORMATION

Project: PIRO HSR Renovations

Park: Pictured Rocks National Lakeshore
Park Alpha: PIRO
PMIS Number: 152048
Estimate Date: 11/30/2016 - V 1.1

DESCRIPTION OF MARK-UP & ADD-ONS:

Location Factor:	-9.00%	Basis of 2017 RS means = 100.0. Published Index Location, assume Iron Mountain, MI 91.0. Factor = 100.0/91.0= -9.0%
Remoteness Factor:	11.40%	Site is 114 miles from published commercial center. Allow 1% per 10 miles - 114 / 10 = 11.4%
Wage Rate Factor:	0.00%	Not Required
State & Local Taxes:	6.00%	State (6.0%) Local (0%) Total 6.0%
Design Contingency:	30.00%	Preliminary Design (PD) documents consist of a Historic Structures Report and Treatment Report . Relatively simple scope but not completely defined, warrants a 30% contingency.
Standard. General Conditions:	15.00%	Typical range 10% to 20%
Government General Conditions:	5.00%	Typical range 5% to 10%
Historic Preservation Factor:	5.00%	Building has tested for hazardous material in and around building
Contractor Overhead:	8.00%	Typical range 10% to 25%
Contractor Profit:	15.00%	Typical range 10% to 25%, small scale project
Bonds and Permits:	3.176%	Bonds 1.105%, Insurance 1.039% & Permits 1.032%
Contracting Method Adjustment:	15.00%	Typical range 10% to 25%, procurement method unknown at this time.
Annual Inflation Escalation Factor:	4.00%	Projected annual inflation rate.
Time Until Project Midpoint (Months)	24	Allowance. TBD

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 sole-source general contractor. 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: PIRO HSR Renovations
Park: Pictured Rocks National Lakeshore
Alpha: PIRO
PMIS: 152048

Estimate By: Jim Flemming
Date: 11/30/2016 - V 1.1

Reviewed By: SJP
Date: 11/28/16

Item No.	Description	Quantity	Unit	Cost/Unit	Total
1	Life Saving Station	1	Unit	$912,795	$912,795
2	Boathouse and Launchway	1	Unit	$197,421	$197,421
3	Oil House	1	Unit	$1,680	$1,680
5	Asset / Project Element 5	-	Unit	#DIV/0!	$0
6	Asset / Project Element 6	-	Unit	#DIV/0!	$0
7	Asset / Project Element 7	-	Unit	#DIV/0!	$0
8	Asset / Project Element 8	-	Unit	#DIV/0!	$0
9	Asset / Project Element 9	-	Unit	#DIV/0!	$0
10	Asset / Project Element 10	-	Unit	#DIV/0!	$0
11	Asset / Project Element 11	-	Unit	#DIV/0!	$0
12	Asset / Project Element 12	-	Unit	#DIV/0!	$0
	Subtotal Direct Construction Costs				**$1,111,896**
	Value of Government Furnished Property (GFP) Included in Direct Cost (see footnote)*				**$0**
				Direct Cost Subtotal without GFP	**$1,111,896**
	Published Location Factor	-9.00%			-$100,071
	Remoteness Factor	11.40%			$126,756
	Federal Wage Rate Factor	0.00%			$0
	State & Local Taxes	6.00%			$66,714
	Design Contingency	30.00%			$333,569
	Total Direct Construction Costs				**$1,538,865**
	Standard General Conditions	15.00%			$230,830
	Government General Conditions	5.00%			$76,943
	Historic Preservation Factor	5.00%			$76,943
	Subtotal NET Construction Cost				**$1,923,581**
	Overhead	8.00%			$153,886
	Profit	15.00%			$288,537
	Estimated NET Construction Cost				**$2,366,005**
	Bonds & Permits	3.18%			**$75,144**
	Contracting Method Adjustment	15.00%			$354,901
	Inflation Escalation	24	Months	4.00%	$228,158
	Total Estimated NET Cost of Construction				**$3,024,207**

* 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:	**PIRO HSR Renovations**	**Estimate By:**	Jim Flemming
Park:	**Pictured Rocks National Lakeshore**	**Date:**	11/30/2016 - V 1.1
Park Alpha:	**PIRO**	**Reviewed By:**	SJP
PMIS Number:	**152048**	**Date:**	11/28/16
Summary Item 1	**Life Saving Station**	**Total Cost:**	$912,795

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
A20	**BASEMENT CONSTRUCTION**					
Level 3 Code	Description	0	Unit	$ -	$0	
Level 3 Code	Paint Basement Walls	670	Sf	$ 1.00	$670	
Level 3 Code	Treat Thermal Cracks Near Window Openings	9	Ea	$ 250.00	$2,250	
Level 3 Code	Remove Concrete Spall In 001, Below Porch	1	Ea	$ 150.00	$150	
Level 3 Code	Description	0	Unit	$ -	$0	
	SUBTOTAL BASEMENT CONSTRUCTION	**1**	**VALUE**	**$ 3,070.00**	**$3,070**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
B20	**EXTERIOR CLOSURE**					
Level 3 Code	Paint Fascia Boards	242	Lf	$ 3.00	$726	
Level 3 Code	Paint Soffits At Roof Eaves	484	Sf	$ 1.00	$484	
Level 3 Code	Replace Damaged Siding Shingles	702	Sf	$ 10.00	$7,018	allow for 25%
Level 3 Code	Replace Damaged Siding Shingles From Paint Prep	561	Sf	$ 10.00	$5,614	allow for 20%
Level 3 Code	Paint Exterior Siding Shingles / Ext Trim	2807	Sf	$ 1.50	$4,211	
Level 3 Code	Paint Exterior Porch @ Entry	852	Sf	$ 1.50	$1,278	
Level 3 Code	Paint Railings @ Porch	170	Lf	$ 10.00	$1,700	
Level 3 Code	Replace Front Panels W / Lattice Work @ Porch	70	Sf	$ 5.00	$350	
Level 3 Code	Replace Damaged Wood @ North Stair	27	Sf	$ 10.00	$270	allow for 50%
Level 3 Code	Paint North Exterior Stair	54	Sf	$ 1.00	$54	
Level 3 Code	Remove And Replace Glazing Compound @ Windows	44	Ea	$ 100.00	$4,400	
Level 3 Code	Remove And Replace Cracked Panes	126	Ea	$ 40.00	$5,040	allow for 25%
Level 3 Code	Remove And Replace Deteriorated Sill/trim @ Basement	9	Ea	$ 150.00	$1,350	
Level 3 Code	Paint Windows	44	Ea	$ 75.00	$3,300	
Level 3 Code	Paint Exterior Doors - 001,101,102,103	4	Ea	$ 250.00	$1,000	
Level 3 Code	Widen Door Opening 101 For ABA Access	1	Ea	$ 1,500.00	$1,500	
Level 3 Code	New Door 101 For Widened Opening	1	Ea	$ 1,900.00	$1,900	

United States Department of the Interior
National Park Service
Class C Construction Cost Estimate

LINE ITEM COST SUMMARY

Project:	**PIRO HSR Renovations**	**Estimate By:**	Jim Flemming
Park:	**Pictured Rocks National Lakeshore**	**Date:**	11/30/2016 - V 1.1
Park Alpha:	**PIRO**	**Reviewed By:**	SJP
PMIS Number:	**152048**	**Date:**	11/28/16

Summary Item 1 **Life Saving Station** **Total Cost:** $912,795

Level 3 Code	Allowance To Modify Porch For ABA Access At Lift	1	Sum	$ 10,000.00	$10,000	
Level 3 Code	Replace Stair Rail Fasteners	13	Ea	$ 35.00	$455	
Level 3 Code	Scaffolding / Equipment	1	Sum	$ 7,500.00	$7,500	
Level 3 Code	Description	0	Unit	$ -	$0	
	SUBTOTAL EXTERIOR CLOSURE	**1**	**VALUE**	**$ 58,149.00**	**$58,149**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
B30	**ROOFING**					
Level 3 Code	New Wood Roof Shingles To Match Existing	2230	Sf	$ 20.00	$44,600	
Level 3 Code	Felt Paper Underlayment	2230	Sf	$ 0.35	$781	
Level 3 Code	Wood Shingle Ridge Cap	153	Lf	$ 10.00	$1,530	
Level 3 Code	Paint Roof Shingles Red	2230	Sf	$ 0.80	$1,784	
Level 3 Code	Replace Missing Gutter Sections	25	Lf	$ 10.00	$250	
Level 3 Code	Remove And Replace Gutters	242	Lf	$ 5.00	$1,210	after abatement
Level 3 Code	Replace Downspouts	150	Lf	$ 12.00	$1,800	
Level 3 Code	Splash Blocks/leaders @ Down Spouts	6	Ea	$ 100.00	$600	
Level 3 Code	Paint Gutters/downspouts	392	Lf	$ 5.00	$1,960	
Level 3 Code	Replace Damaged Bricks In Chimney	50	Sf	$ 25.00	$1,250	
Level 3 Code	Repair Damaged Mortar Joints	50	Sf	$ 5.00	$250	
Level 3 Code	Replace Flashing @ Base Of Chimney	11	Lf	$ 15.00	$165	
Level 3 Code	Description	0	Unit	$ -	$0	
	SUBTOTAL ROOFING	**1**	**VALUE**	**$ 56,179.50**	**$56,180**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
C30	**INTERIOR FINISHES**					
	Door 004					
Level 3 Code	Repair Damaged Trim	1	Ea	$ 150.00	$150	
Level 3 Code	Prep & Paint	1	Ea	$ 130.00	$130	

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PMIS Number:	**152048**	**Date:**	11/28/16

Summary Item 1 **Life Saving Station** **Total Cost:** $912,795

	Door 007					
Level 3 Code	Repair Dents In Bottom Rail	1	Ea	$	200.00	$200
Level 3 Code	Prep & Paint	1	Ea	$	130.00	$130
	Door 008, 011					
Level 3 Code	Prep & Paint	2	Ea	$	130.00	$260
	Room 001					
Level 3 Code	Grind Smooth Chips At Edge Of Stairs	12	Lf	$	50.00	$600
	Rooms 003, 006					
Level 3 Code	Patch Holes In Beadboard Ceiling / Repaint	307	Sf	$	2.00	$614
	Rooms 004, 102, 105, 203, 205, 207, 209, 210					
Level 3 Code	Remove Exist Carpet	945	Sf	$	1.50	$1,418
Level 3 Code	Prep Floor	945	Sf	$	1.00	$945
Level 3 Code	New Carpet	116	Sy	$	32.00	$3,696
	Room 007					
Level 3 Code	Repair Holes In Beadboard Walls / Repaint	217	Sf	$	2.00	$434
	Room 009					
Level 3 Code	Replace Water Damaged Beadboard Ceiling	22	Sf	$	15.00	$330
Level 3 Code	Prep & Paint Ceiling	44	Sf	$	2.00	$88
	Room 010					
Level 3 Code	Patch Holes In Wooden Board Wall Finish	280	Sf	$	1.00	$280
	Room 101					
Level 3 Code	Remove Exist Carpet	435	Sf	$	1.50	$653
Level 3 Code	Prep Floor	435	Sf	$	1.00	$435
Level 3 Code	New Carpet	53	Sy	$	32.00	$1,701
Level 3 Code	Retape / Paint Ceiling	435	Sf	$	2.00	$870
	Rooms 103, 106, 107, 108, 109, 201, 202, 204, 206					
Level 3 Code	Remove Exist Carpet	1128	Sf	$	1.50	$1,692
Level 3 Code	Prep Floor	1128	Sf	$	1.00	$1,128
Level 3 Code	New Carpet	138	Sy	$	32.00	$4,411
Level 3 Code	Patch Cracks In Ceiling, Wall	1128	Sf	$	2.00	$2,256

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Park Alpha:	**PIRO**	**Reviewed By:**	SJP
PMIS Number:	**152048**	**Date:**	11/28/16
Summary Item 1	**Life Saving Station**	**Total Cost:**	$912,795

	Room 104, 102					
Level 3 Code	Modifications For New ABA Accessible Restroom	71	Sf	$ 150.00	$10,650	
Level 3 Code	Description	0	Unit	$ -	$0	
	SUBTOTAL INTERIOR FINISHES	**1**	**VALUE**	**$ 33,069.72**	**$33,070**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
D10	**CONVEYING SYSTEMS**					
Level 3 Code	Description	0	Unit	$ -	$0	
Level 3 Code	Lift To Porch Level For ABA Access	1	Unit	$ 25,000.00	$25,000	
Level 3 Code	Description	0	Unit	$ -	$0	
	SUBTOTAL CONVEYING SYSTEMS	**1**	**VALUE**	**$ 25,000.00**	**$25,000**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
D20	**PLUMBING**					
Level 3 Code	Demolition					
Level 3 Code	New ABA Fixtures For Restroom 104	2	Ea	$ 2,500.00	$5,000	incl's vents, piping
Level 3 Code	Description	0	Unit	$ -	$0	
	SUBTOTAL PLUMBING	**1**	**VALUE**	**$ 5,000.00**	**$5,000**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
D30	**HVAC**					
Level 3 Code	HVAC Equipment					
Level 3 Code	Extend Boiler Exhaust Ducts Out From Building	2	Ea	$ 300.00	$600	
Level 3 Code	Description	0	Unit	$ -	$0	
	SUBTOTAL HVAC	**1**	**VALUE**	**$ 600.00**	**$600**	

United States Department of the Interior
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LINE ITEM COST SUMMARY

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Summary Item 1	**Life Saving Station**	**Total Cost:**	$912,795

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
D40	**Fire Protection**					
Level 3 Code	Description		Gsf	$ -	$0	
Level 3 Code	Allowance For New Water Service Line, assume 6"	7800	Lf	$ 60.00	$468,000	1.5 miles of piping
Level 3 Code	Hookup And Test Existing Sprinkler System	4205	Sf	$ 1.00	$4,205	
Level 3 Code	Description	0	Unit	$ -	$0	
	SUBTOTAL FIRE PROTECTION	**1**	**VALUE**	**$ 472,205.00**	**$472,205**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
D50	**ELECTRICAL**					
Level 3 Code	Description	1	Sum		$0	
Level 3 Code	Hook Up Lift For ABA Access	1	Ea	$ 1,250.00	$1,250	
Level 3 Code	Description	0	Unit	$ -	$0	
	SUBTOTAL ELECTRICAL	**1**	**VALUE**	**$ 1,250.00**	**$1,250**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
F20	**SELECTIVE BUILDING DEMOLITION**					
Level 3 Code	Remove Exist Roof Shingles	2230	Sf	$ 1.50	$3,345	
Level 3 Code	Prep Lead Paint On Gutters/downspouts	242	Lf	$ 5.00	$1,210	Allowance
Level 3 Code	Prep Lead Paint On Fascia Boards	242	Lf	$ 5.00	$1,210	Allowance
Level 3 Code	Prep Lead Paint At Soffits	484	Sf	$ 5.00	$2,420	Allowance
Level 3 Code	Prep Lead Paint On Basement Walls	670	Sf	$ 5.00	$3,350	Allowance
Level 3 Code	Prep Lead Paint On Exterior Siding Shingles / Trim	2807	Sf	$ 6.00	$16,842	Allowance
Level 3 Code	Prep Lead Paint On Exterior Porch @ Entry	852	Sf	$ 7.00	$5,964	Allowance
Level 3 Code	Prep Lead Paint On North Exterior Stair	54	Sf	$ 9.00	$486	Allowance
Level 3 Code	Prep Lead Paint On Windows	44	Ea	$ 100.00	$4,400	Allowance

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PMIS Number:	**152048**	**Date:**	11/28/16

Summary Item 1 **Life Saving Station** **Total Cost:** $912,795

Level 3 Code	Prep Lead Paint On Exterior Doors	3	Ea	$ 75.00	$225	door 101 to be replaced
Level 3 Code	Asbestos Abatement - Red Floor Tiles	50	Sf	$ 6.00	$300	per report
Level 3 Code	Asbestos Abatement - Plaster/lathe On Walls, Ceilings	16000	Sf	$ 12.00	$192,000	per report
Level 3 Code	Asbestos Abatement - Sink Undercoating	1	Sum	$ 150.00	$150	per report
Level 3 Code	Asbestos Abatement - Hot Water Tank Insulation	10	Sf	$ 1,200.00	$12,000	per report
Level 3 Code	Description	0	Unit	$ -	$0	
SUBTOTAL SELECTIVE BUILDING DEMOLITION		**1**	**VALUE**	**$ 243,902.00**	**$243,902**	

United States Department of the Interior
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Park Alpha:	**PIRO**	**Reviewed By:**	SJP
PMIS Number:	**152048**	**Date:**	11/28/16

Summary Item 1 **Life Saving Station** **Total Cost:** $912,795

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
G10	**SITE PREPARATION**					
Level 3 Code	Description	0	Unit	$ -	$0	
Level 3 Code	Lead Soil Remediation	47	Cy	$ 210.00	$9,870	includes sampling
Level 3 Code	Description	0	Unit	$ -	$0	
	SUBTOTAL SITE PREPARATION	**1**	**VALUE**	**$ 9,870.00**	**$9,870**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
G20	**SITE IMPROVEMENTS**					
Level 3 Code	Description		ea		$0	
Level 3 Code	ABA Access Path From Parking Area	300	Sf	$ 15.00	$4,500	
Level 3 Code	Description	0	Unit	$ -	$0	
	SUBTOTAL SITE IMPROVEMENTS	**1**	**VALUE**	**$ 4,500.00**	**$4,500**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
TOTAL COST - Life Saving Station		**1**	**VALUE**	**$ 912,795.22**	**$912,795**	

United States Department of the Interior
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LINE ITEM COST SUMMARY

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Park Alpha:	**PIRO**	**Reviewed By:**	SJP
PMIS Number:	**152048**	**Date:**	11/28/16
Summary Item 2	**Boathouse and Launchway**	**Total Cost:**	$197,421

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
A10	**FOUNDATIONS**					
Level 3 Code	Description	0	Unit	$ -	$0	
Level 3 Code	Clean Exist Wood Piles And Fill With Epoxy	16	Ea	$ 150.00	$2,400	
Level 3 Code	Install Protective Cap On Piles	16	Ea	$ 200.00	$3,200	
Level 3 Code	Description	0	Unit	$ -	$0	
	SUBTOTAL FOUNDATIONS	**1**	**VALUE**	**$ 5,600.00**	**$5,600**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
B10	**SUPERSTRUCTURE**					
Level 3 Code	Description		Sum		$0	
Level 3 Code	Rebuild East Exterior Stair	60	Sf	$ 15.00	$900	
Level 3 Code	Rebuild East Ramp - Extend Length For ABA Access	386	Sf	$ 15.00	$5,790	
Level 3 Code	Connect Ramp To Stair For Ada Access	100	Sf	$ 15.00	$1,500	
Level 3 Code	Paint Stair, Ramp, Connector	546	Sf	$ 1.00	$546	
Level 3 Code	Handrails At Ramp, Connector	42	Lf	$ 75.00	$3,150	
Level 3 Code	Replace Damaged Wood At Launchway	881	Sf	$ 7.50	$6,609	assume 75%
Level 3 Code	Clean And Coat Exist Rails	128	Lf	$ 15.00	$1,920	
Level 3 Code	Add 4x4 Kicker To Attic Framing Floor Beam	60	Lf	$ 10.00	$600	
Level 3 Code	Description	0	Unit	$ -	$0	
	SUBTOTAL SUPESTRUCTURE	**1**	**VALUE**	**$ 21,015.38**	**$21,015**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
B20	**EXTERIOR CLOSURE**					
Level 3 Code	Paint Fascia Boards	196	Lf	$ 3.00	$588	
Level 3 Code	Replace Damaged Siding Shingles	619	Sf	$ 10.00	$6,188	allow for 25%

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PMIS Number:	**152048**	**Date:**	11/28/16

Summary Item 2 **Boathouse and Launchway** **Total Cost:** $197,421

Level 3 Code	Replace Damaged Siding Shingles From Abatement	495	Sf	$ 10.00	$4,950	allow for 20%
Level 3 Code	Paint Exterior Siding Shingles / Ext Trim	2475	Sf	$ 1.50	$3,713	
Level 3 Code	Remove And Replace Glazing Compound @ Windows	9	Ea	$ 100.00	$900	
Level 3 Code	Paint Windows	9	Ea	$ 75.00	$675	
Level 3 Code	Rebuild Ext Door 101 And Paint	1	Ea	$ 1,200.00	$1,200	
Level 3 Code	Clean, Oil, Rebalance Overhead Doors 105, 106	2	Ea	$ 750.00	$1,500	
Level 3 Code	Paint Exterior Overhead Doors	3	Ea	$ 250.00	$750	
Level 3 Code	Clean, Oil, Repl Water Damaged Wood Panels - Door 107	1	Ea	$ 1,500.00	$1,500	
Level 3 Code	Add New Opng To Provide Ventilation To Under Flr Space	1	Sum	$ 1,250.00	$1,250	allowance
Level 3 Code	Scaffolding / Equipment	1	Sum	$ 5,000.00	$5,000	
Level 3 Code	Description	0	Unit	$ -	$0	
SUBTOTAL EXTERIOR CLOSURE		**1**	**VALUE**	**$ 28,213.00**	**$28,213**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
C10	**INTERIOR CONSTRUCTION**					
	New Restrooms					
Level 3 Code	Add Three Single User Restrooms At South Side	147	Sf	$ 75.00	$11,025	allowance, verify
Level 3 Code	Description	0	Unit	$ -	$0	
SUBTOTAL INTERIOR CONSTRUCTION		**1**	**VALUE**	**$ 11,025.00**	**$11,025**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
C30	**INTERIOR FINISHES**					
	Door 102					
Level 3 Code	Repair Water Damage At Bottom Of Door, Repaint	1	Ea	$ 480.00	$480	
	Room 101					
Level 3 Code	Replace Timbers Between Rails	250	Sf	$ 8.00	$2,000	
Level 3 Code	Refinish Exist Wood Flooring	360	Sf	$ 5.00	$1,800	
Level 3 Code	Add Guardrails As Required By Code	40	Lf	$ 85.00	$3,400	allowance, verify

United States Department of the Interior
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PMIS Number:	**152048**	**Date:**	11/28/16

Summary Item 2 **Boathouse and Launchway** **Total Cost:** $197,421

	Rooms 102, 103					
Level 3 Code	Refinish Exist Wood Flooring	61	Sf	$ 5.00	$305	
Level 3 Code	Remove Plywd On Walls Replace W/ Other Finish	360	Sf	$ 7.50	$2,700	allowance, verify
	Room 104					
Level 3 Code	Refinish Exist Wood Flooring	530	Sf	$ 5.00	$2,650	
Level 3 Code	Remove Flooring/ceiling, Replace W/ Other Finish	1060	Sf	$ 10.00	$10,600	allowance, verify
	Room 105					
Level 3 Code	Remove Flooring/ceiling, Replace W/ Other Finish	328	Sf	$ 10.00	$3,280	allowance, verify
	Room 202				$0	
Level 3 Code	Remove Organic Growth And Apply Biocide To Structure	380	Sf	$ 6.00	$2,280	
Level 3 Code	Add Roof Vents For Ventilation	6	Ea	$ 175.00	$1,050	allowance
Level 3 Code	Description	0	Unit	$ -	$0	
	SUBTOTAL INTERIOR FINISHES	**1**	**VALUE**	**$ 30,545.00**	**$30,545**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
D20	**PLUMBING**					
Level 3 Code	New ABA Fixtures At Restrooms	6	Ea	$ 2,500.00	$15,000	
Level 3 Code	Description	0	Unit	$ -	$0	
	SUBTOTAL PLUMBING	**1**	**VALUE**	**$ 15,000.00**	**$15,000**	

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Summary Item 2 **Boathouse and Launchway** **Total Cost:** $197,421

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
D40	**Fire Protection**					
Level 3 Code	Description		gsf		$0	
Level 3 Code	Run Water Service From Ls Bldg To Boathouse	250	Lf	$ 50.00	$12,500	
Level 3 Code	Fire Sprinkler System	2321	Gsf	$ 6.00	$13,926	
Level 3 Code	Description	0	Unit	$ -	$0	
	SUBTOTAL FIRE PROTECTION	**1**	**VALUE**	**$ 26,426.00**	**$26,426**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
D50	**ELECTRICAL**					
Level 3 Code	Description		Sum		$0	
Level 3 Code	Electrical For New Restrooms	147	Sf	$ 20.00	$2,940	
Level 3 Code	Description	0	Unit	$ -	$0	
	SUBTOTAL ELECTRICAL	**1**	**VALUE**	**$ 2,940.00**	**$2,940**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
F20	**SELECTIVE BUILDING DEMOLITION**					
Level 3 Code	Prep Lead Paint On Fascia Boards	196	Lf	$ 5.00	$980	
Level 3 Code	Prep Lead Paint On Exterior Siding Shingles / Trim	2475	Sf	$ 6.00	$14,850	
Level 3 Code	Remove Exist Stair / Ramp At East Exterior	255	Sf	$ 5.00	$1,275	
Level 3 Code	Remove Damaged Wood At Launch Ramp	881	Sf	$ 1.50	$1,322	
Level 3 Code	Abate Lead Paint On Windows	9	Ea	$ 100.00	$900	
Level 3 Code	Abate Lead Paint On Exterior Doors	435	Sf	$ 20.00	$8,700	3 overhead, 1 man door
Level 3 Code	Description	0	Unit	$ -	$0	
	SUBTOTAL SELECTIVE BUILDING DEMOLITION	**1**	**VALUE**	**$ 28,026.88**	**$28,027**	

United States Department of the Interior
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PMIS Number:	**152048**	**Date:**	11/28/16

Summary Item 2 **Boathouse and Launchway** **Total Cost:** $197,421

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
G10	**SITE PREPARATION**					
Level 3 Code	Description	0	Unit	$ -	$0	
Level 3 Code	Lead Soil Remediation	53	Cy	$ 210.00	$11,130	includes sampling
Level 3 Code	Description	0	Unit	$ -	$0	
	SUBTOTAL SITE PREPARATION	**1**	**VALUE**	**$ 11,130.00**	**$11,130**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
G30	**SITE CIVIL/MECHANICAL UTILITIES**					
Level 3 Code	Description	0	Unit	$ -	$0	
Level 3 Code	Run Sanitary Sewer, Water Lines To Boathouse From LS	500	Lf	$ 35.00	$17,500	
Level 3 Code	Description	0	Unit	$ -	$0	
	SUBTOTAL SITE CIVIL/MECHANICAL UTILITES	**1**	**VALUE**	**$ 17,500.00**	**$17,500**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
TOTAL COST - Boathouse and Launchway		**1**	**VALUE**	**$ 197,421.25**	**$197,421**	

United States Department of the Interior
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Park:	**Pictured Rocks National Lakeshore**	**Date:**	11/30/2016 - V 1.1
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PMIS Number:	**152048**	**Date:**	11/28/16
Summary Item 2	**Oil House**	**Total Cost:**	$1,680

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
B20	**EXTERIOR CLOSURE**					
Level 3 Code	Paint Exterior Oil House, Remove Rust	210	Sf	$ 2.00	$420	
Level 3 Code	Description	0	Unit	$ -	$0	
	SUBTOTAL EXTERIOR CLOSURE	**1**	**VALUE**	**$ 420.00**	**$420**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
F20	**SELECTIVE BUILDING DEMOLITION**					
Level 3 Code	Prep Lead Paint Exterior Of Oil House	210	Sf	$ 6.00	$1,260	
Level 3 Code	Description	0	Unit	$ -	$0	
	SUBTOTAL SELECTIVE BUILDING DEMOLITION	**1**	**VALUE**	**$ 1,260.00**	**$1,260**	

Uniformat II WBS Code	Description	Quantity	Unit	Cost/Unit	Total Cost	Remarks
TOTAL COST - Oil House		**1**	**VALUE**	**$ 1,680.00**	**$1,680**	

Appendix E. Historic Drawings

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SAND POINT

Suggested Site For Lookout Tower

U.S.C.G. DWELLING

Proposed Site for Dwelling

Proposed Site for Boathouse

Suggested Site for Lookout

N

SCALE ~ 1" = 40'

Plot Plan Traced From Drawing Submitted By The Office Of The Asso. C.E. C.G.R. Milwaukee, Wis. Dated March 1932

7.11 ACRES
PART OF LOT 3, SEC. 19, T. 47 N. R. 18 W.

SOUTH BAY
MUNISING BAY

Retaining Bulkhead

Boathouse

Ramp

Driveway

Driveway

138'-6" Launchway

Landing Wharf

PROFILE ON LINE A-A
Scale-1"=40'

PROFILE ON LINE B-B
Scale-1"=40'

PROFILE ON LINE C-C
Scale-1"=40'

Present Water Level-March 3,1932

Present Water Level-March 3,1932

Present Water Level-March 3,1932

Trail Boundary

N-S ¼ OF SEC. 19, T. 47 N. R. 18 W.

WHEN TO FINISH 15"

66330

1 OF 10

U.S. COAST GUARD
PLOT PLAN FOR
BUILDINGS AT MUNISING STATION
11-TH DIST. MICH.

S.J.L.M. ~ R.A.R. ~ R.C.

6-2-9

100247

Plan of slab, plant below & setting of tanks &c.

ELEC. PLANT ROOM

Metal Coal Chute

22"x 32" F.D.

4'-8" Pilaster

2'-6" Opening

Concrete Footing

2" Planking

COAL BIN

Tank

Boiler

Jack

2'-6" Opening

3" ϕ Pipe Column Concrete Filled

Concrete Ledge

6" Concrete Floor Slab

2'-4" Hand Rail

4"x4" Posts

Shelf

Pressure Tank

35 cc. 9 B. 27# w 3/4" V.

LAUNDRY

Laundry Trays

Pump

4" Soil Stock

6" T.C. to Septic Tank

Manhole

4" I.C.

4" C.I.

PROVISIONS ROOM

STORM CLOTHES

35 cc. 9 B. 27# w 3/4" V. 14'-0"

4'-6" Pilaster

4" Soil Stock

BASEMENT PLAN

Scale 1/4"=1'-0"

Concrete Drip

ENTRY

Warmscot Trim 1"x4 1/2"

chair rail Trim 1"x4 1/2"

KITCHEN

Sink

Range

Cupboard

(H W)

4 Shelves

PANTRY

4" Stack

Copboard

MESS ROOM

SPARE BED ROOM

chairrail Trim 1/4"x4 1/2"

Wood Hand Rail

PORCH

O-IN C. BED ROOM

O-IN C. TOILET

Chart Case

O-IN C. OFFICE

4" Stack

Concrete Drip

FIRST FLOOR PLAN

Scale 1/4"=1'-0"

297-28

U.S. COAST GUARD

DWELLING FOR

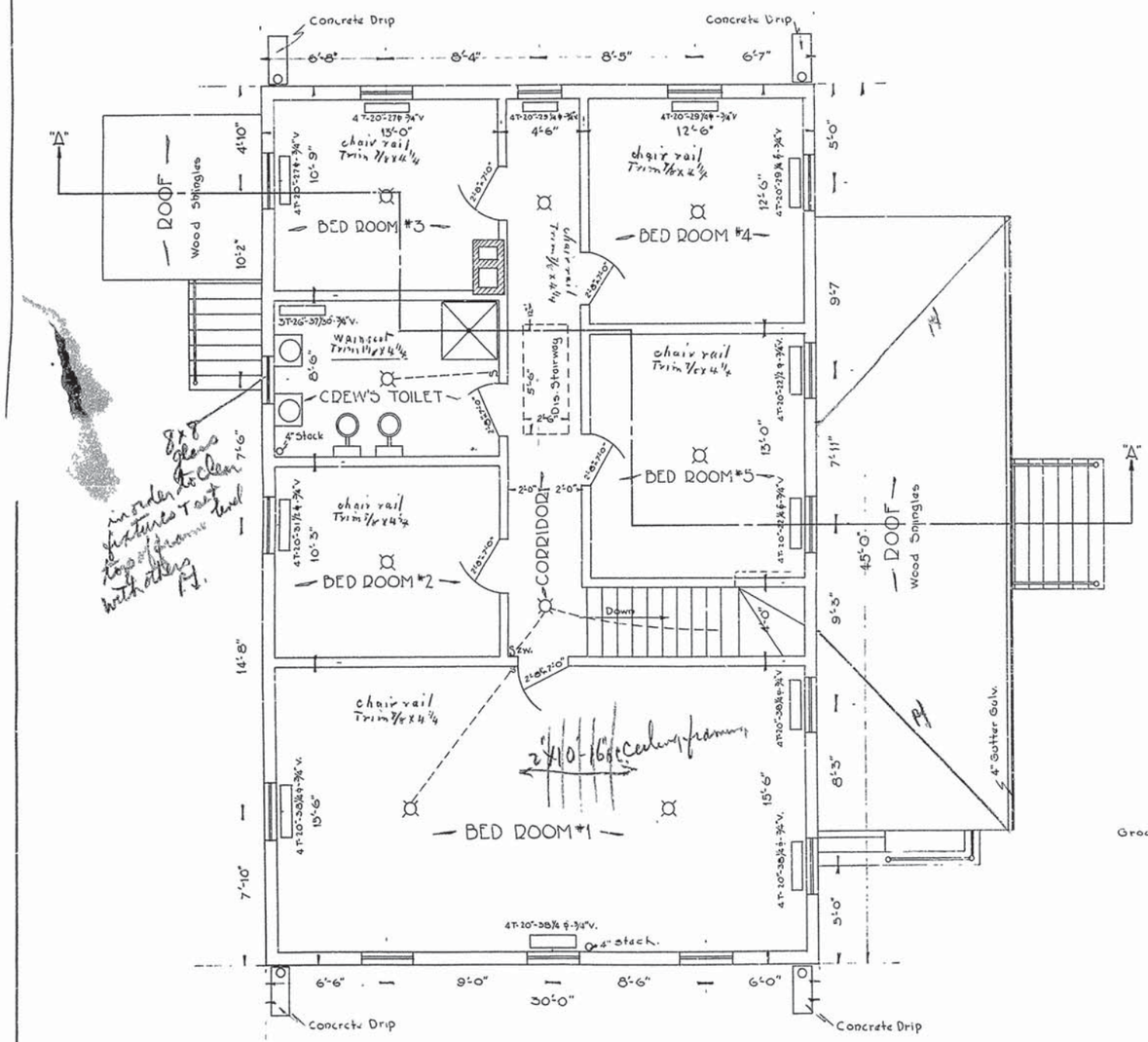
MUNISING STATION

11th DIST. MICH.

2/10

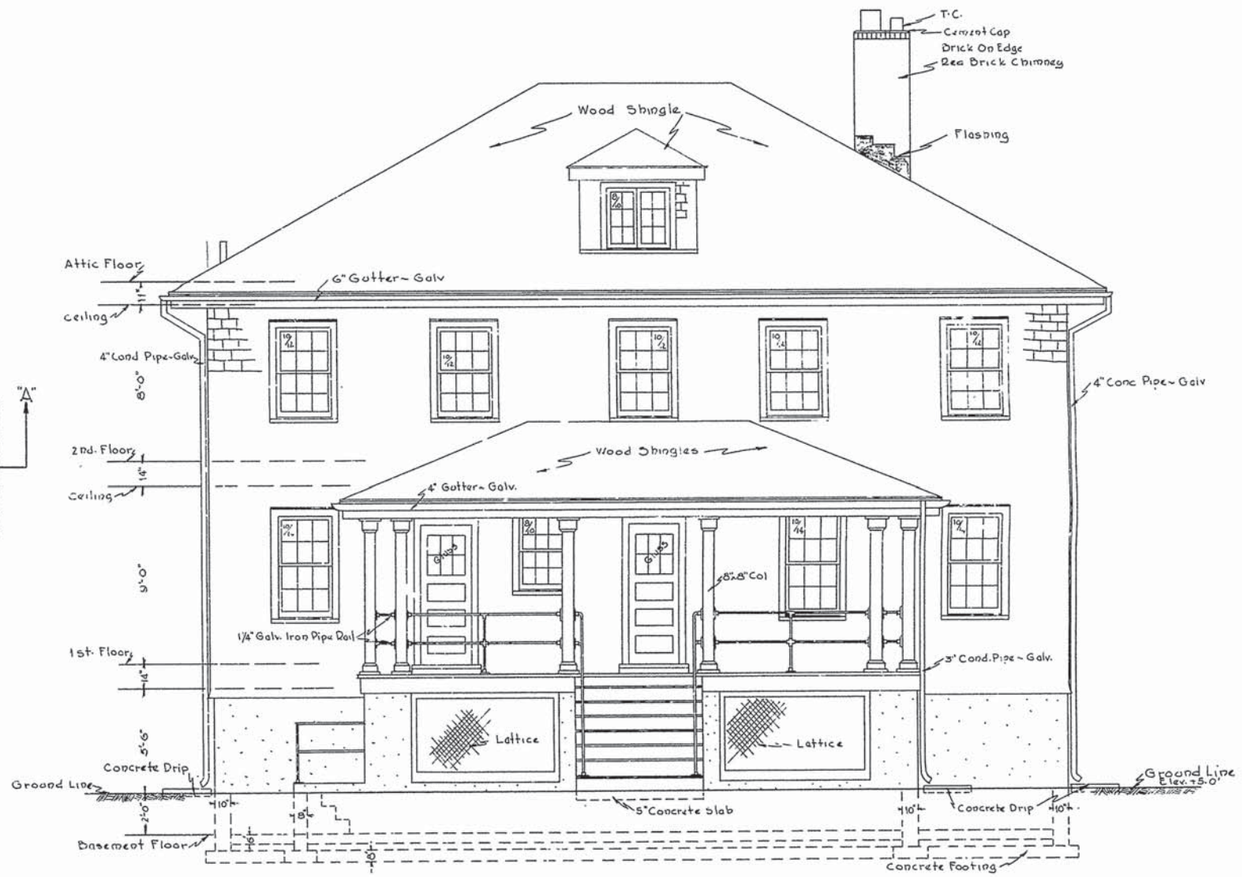
66314

J.T.L.M. & E.A.R.



SECOND FLOOR PLAN

Scale ~ 1/4" = 1'-0"



FRONT ELEVATION

Scale ~ 1/4" = 1'-0"

297-28

U.S. COAST GUARD

DWELLING FOR

MONITSING STATION

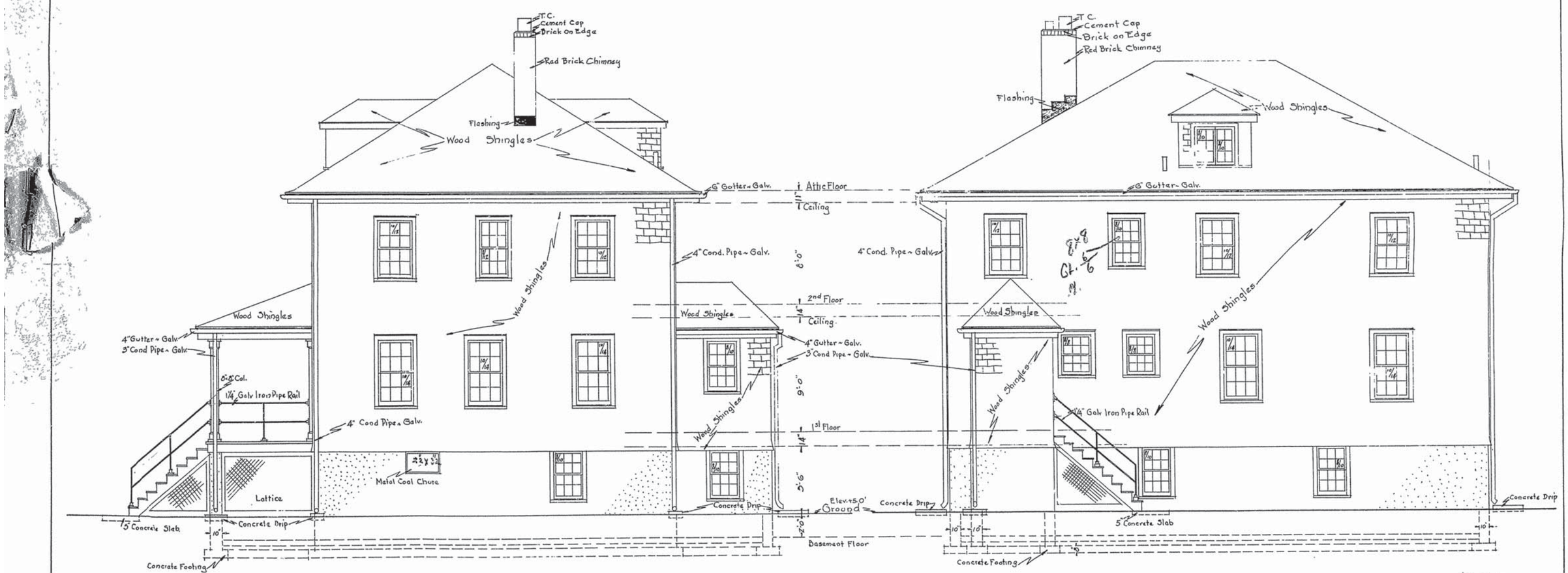
11-TH DIST. MICH.

S.J.L.M ~ R.W.D. ~ R.C.

3 / 10

66315

4-84



SIDE ELEVATION

Scale ¼" = 1'-0"

REAR ELEVATION

Scale ⅛" = 1'-0"

297-28

DWELLING
MUNISING ST
11th DIST

66316

S. J. L. M. & R. A. P. & R. C.

4/10

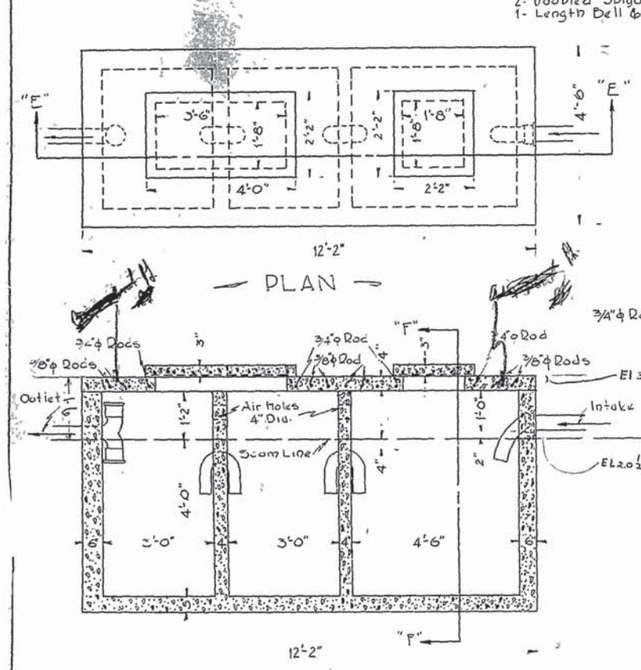
4.8#

CONCRETE (4.85 CO. YDS.)

Portland Cement — 28 Bags.
Sand — 2.8 Co. Yds.
Gravel or Crushed Stone 4.30 Co. Yds.

CAST IRON FITTINGS & PIPE

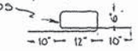
(Standard Weight, Uncoated)
1 - ⅛ Bend, 4" Dia.
1 - Doubled Quarter Bend, 4" Dia.
2 - Doubled Spigot Return Bends, 4" Dia.
1 - Length Bell & Spigot Pipe, 4" Dia., 5" Long.



— PLAN —

STEEL REINFORCEMENT

18 - ¼"ø Rods Plain, 2'-0" Long.
5 - ¼"ø Rods, Plain, 3'-9" Long
8 - ⅜"ø Rods, Deformed, 4'-0" Long
4 - ¾"ø Rods, Deformed, 4'-0" Long.
2 - ¾"ø Rods, Deformed, 11'-6" Long
4 - Cover Handles (2 For Each Cover) Made of ¾"ø Plain Rods Bent Thus



— SECTION ~ "E-E" —

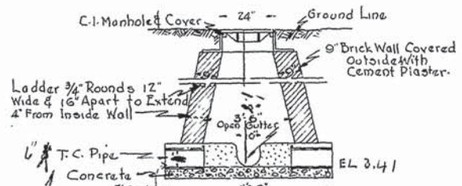
— SECTION ~ "F-F" —

NOTE:

Reinforce Covers With ¼"ø Plain Steel Rods ~ 6" O.C. In Two Directions.
Reinforce Top Slab With ⅜"ø Deformed Steel Rods 6" O.C. In One Direction, Except Where ¾"ø Rods Are Shown.
All Concrete to be 1-2-4 Mix.
Disposal Field to be as Required For Character Of Soil For The Particular Location.

— SEPTIC TANK —

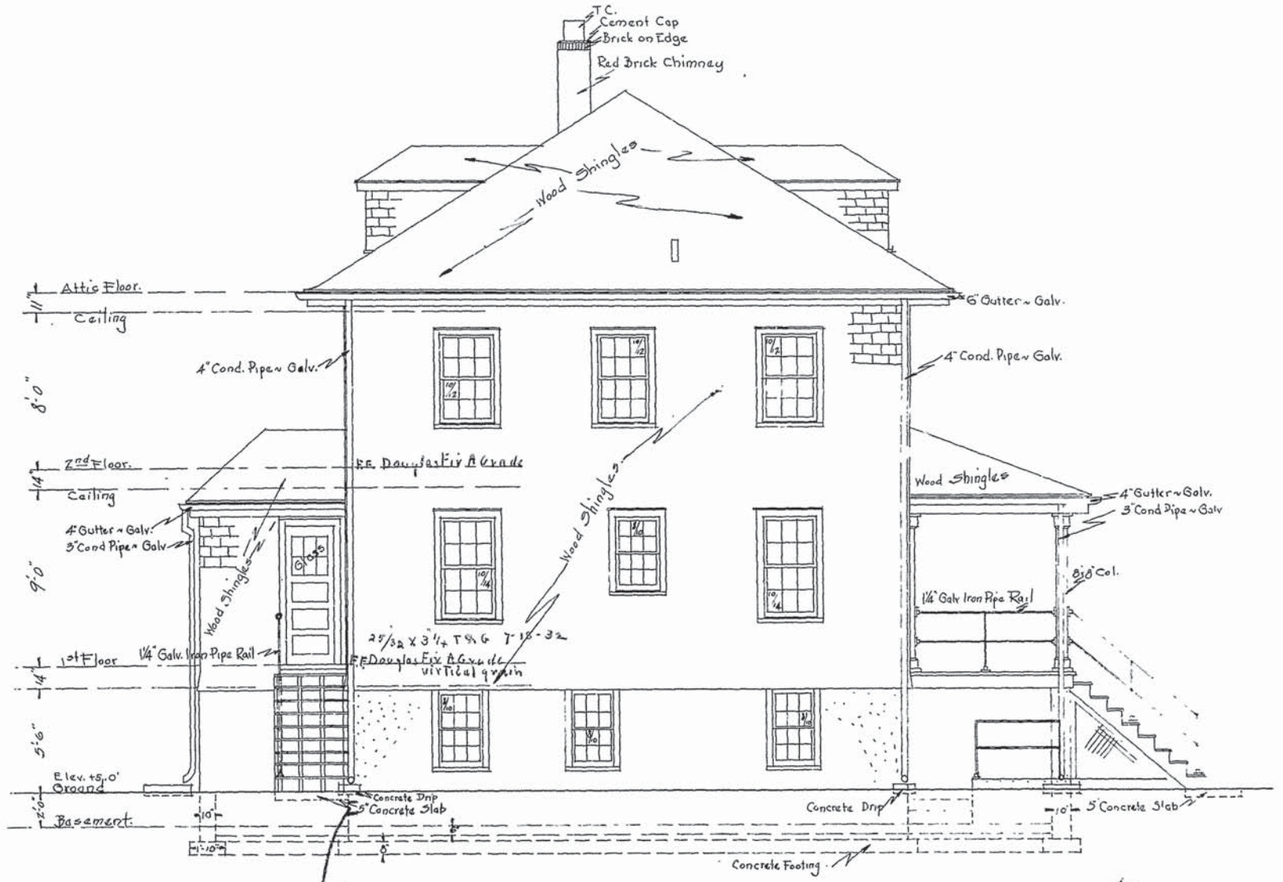
— Scale ~ ½" = 1'-0" —



— SECTION THRU MANHOLE —

— Scale ~ ⅜" = 1'-0" —

All manhole on basement plan for property PK.



— SIDE ELEVATION —

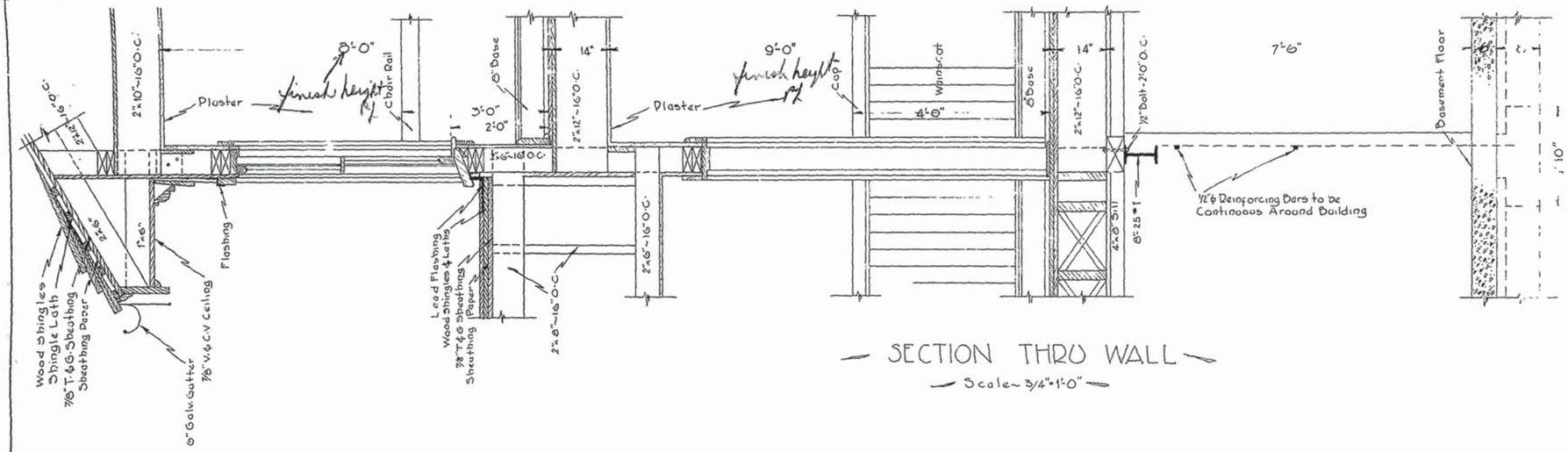
— Scale ~ ¼" = 1'-0" —

Sleeve in wall 1' below grade for soil pipe to lead to manhole pf.

297-28

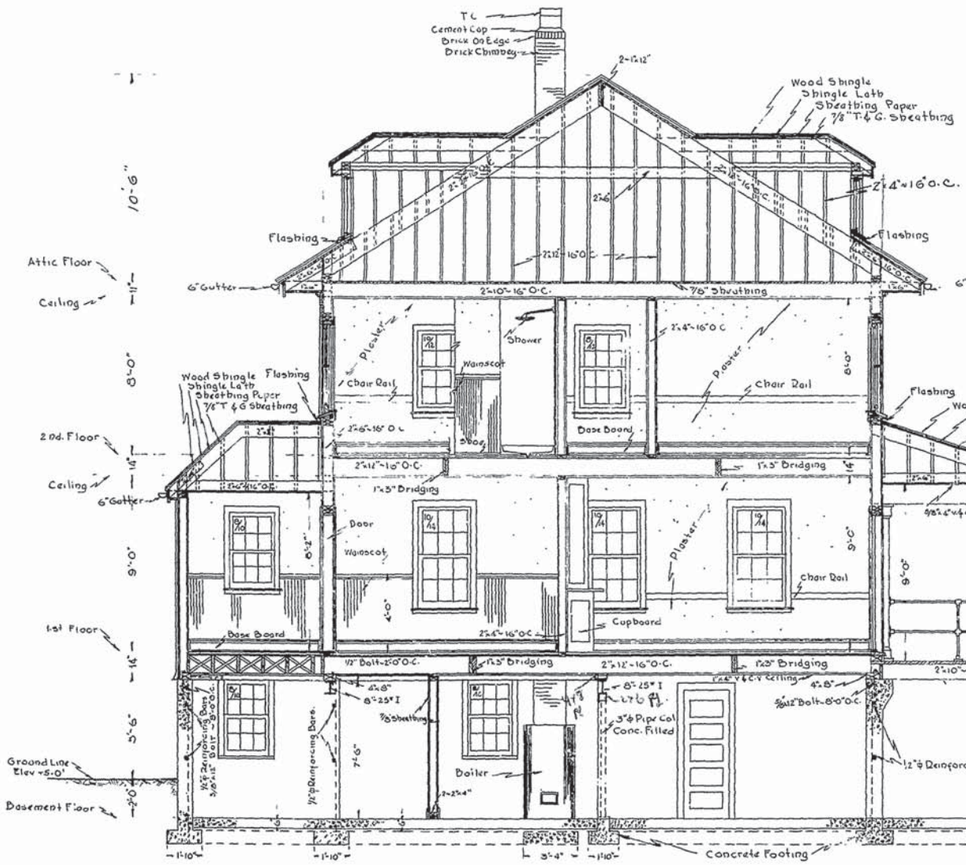
5/10

66317



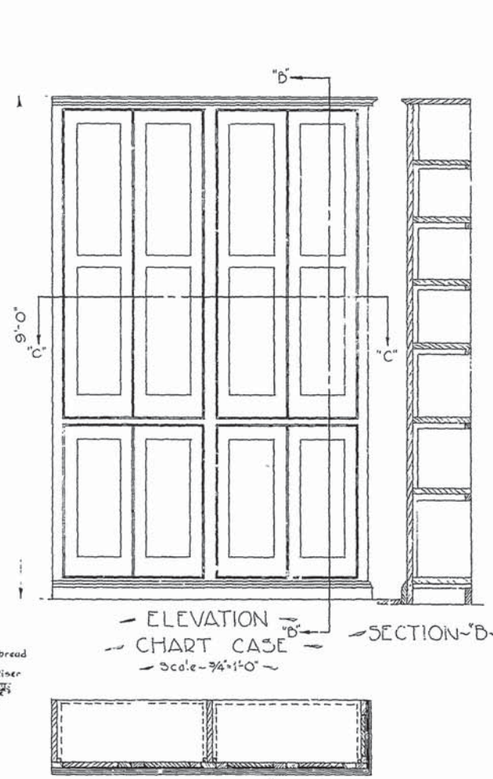
— SECTION THRU WALL —

— Scale ~ 3/4"=1'-0" —

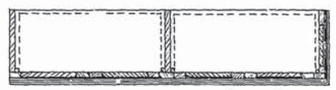


— SECTION ON LINE "A-A" —

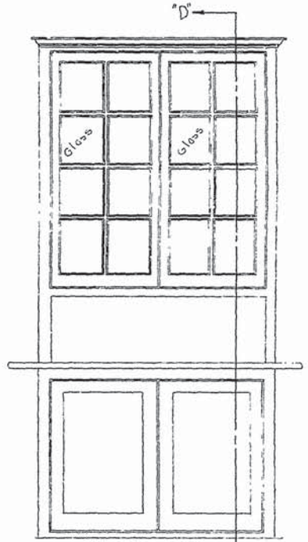
— Scale ~ 1/4"=1'-0" —



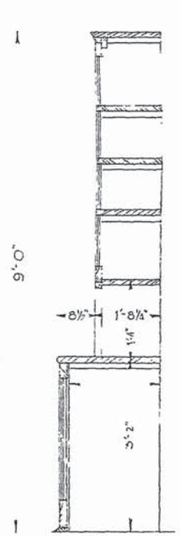
— ELEVATION —
— CHART CASE —
— Scale ~ 3/4"=1'-0" —



— SECTION ~ "C-C" —

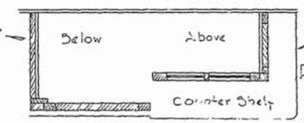


— ELEVATION —



— SECTION ~ "D-D" —

— SECTION ~ "B-B" —



— PLAN —

— MESS ROOM CUPBOARD —
— PANTRY CUPBOARD SIMILAR —
— Scale ~ 3/4"=1'-0" —

397-28

— U.S. COAST GUARD —
— DWELLING FOR —
— MONISING STATION —
— 11-TH. DIST. MICH. —

6/10

66318

S.J.M.~R.A.R.~R.C

4.28

Total Length of Bulkhead on one Side Launchway = 129'-0"

Total Length Boat House = 55'-0"

PLAN OF BOATHOUSE AND LAUNCHWAY.
Scale 1/4" = 1'-0"

TYPICAL SECTION 'A-A'. (BENT #9) 1/4" Scale.

TYPICAL SECTION 'B-B'. (BENT #5) 1/4" Scale.

SECTION 'C-C'. Scale.

Total Length of Launchway outside Boathouse = 128'-6"

48'-0" Outer Launchway to be Sloped @ 1½" per foot

80'-0" Inner Launchway to be sloped @ 3/4" per foot

SECTION ON CENTER OF LAUNCHWAY
Scale 1/4" = 1'-0"

ELEVATION OF BOATHOUSE
Scale 1/4" = 1'-0"

NOTE: Data on present ground line, taken from letter D.K.R. dated March 8, 1921, sheet #5

RHL 1015434

U. S. COAST GUARD
BOATHOUSE LAUNCHWAY
MUNISING STATION.
11th DISTRICT — MICHIGAN

8/10

Appendix F. Wood Species Identification Results

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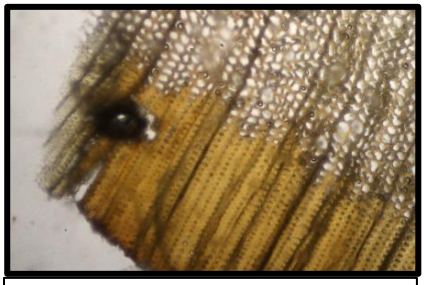
Daniel E. Cooke, PE 1380 Round Bottom Rd Mountain View, Arkansas

Wood Species Identification Results

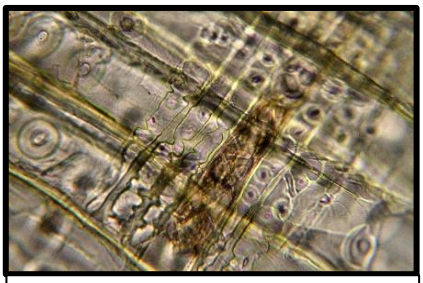
Sample: 1 Identification Date: 06.20.16

Project Name:	Pictured Rocks Life Saving Station	Resin Canals:	Yes, Sparse
Project Location:	Munising, Michigan	Cross-Field Pitting:	Pinoid
Year Constructed:	App 1930	Spiral Thickenings:	No
Sample from:	1st Floor 2x12	Ray Tracheids:	Dentate

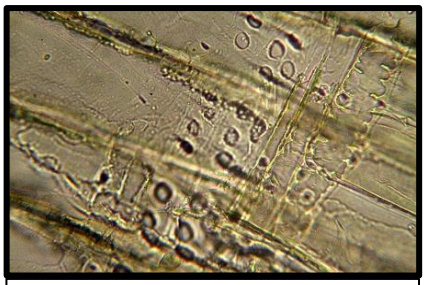
Microscopic Characteristics used for Identification:



Resin Canal in Cross Section



Dentate Ray Tracheids



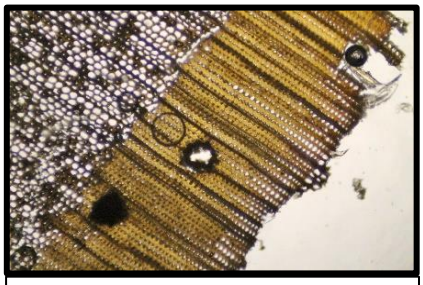
Pinoid Cross Field Pitting

Species Identification: Hard Pine, Southern Yellow or Western species groups (*Pinus spp.*)

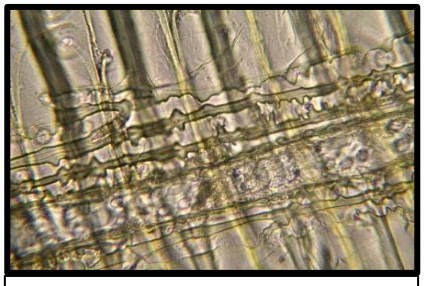
Sample: 2 Identification Date: 06.20.16

Project Name:	Pictured Rocks Life Saving Station	Resin Canals:	Yes, Frequent
Project Location:	Munising, Michigan	Cross-Field Pitting:	Pinoid
Year Constructed:	App 1930	Spiral Thickenings:	No
Sample from:	2x12 Roof Rafter	Ray Tracheids:	Dentate

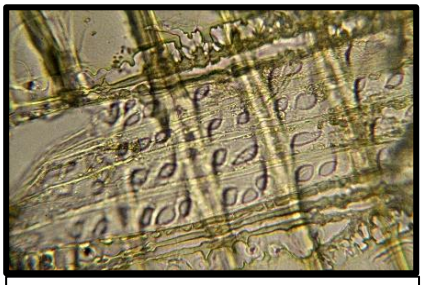
Microscopic Characteristics used for Identification:



Resin Canal in Cross Section



Dentate Ray Tracheids



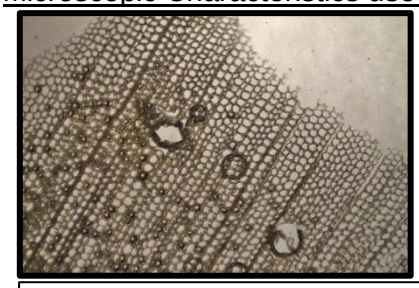
Pinoid Cross Field Pitting

Species Identification: Hard Pine, Southern Yellow or Western species groups (*Pinus spp.*)

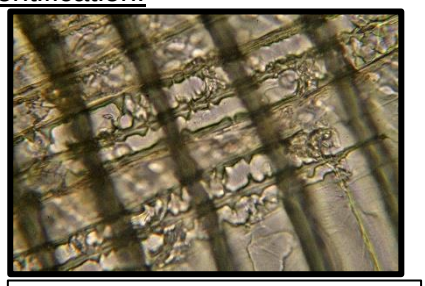
Sample: 3 Identification Date: 06.20.16

Project Name:	Pictured Rocks Life Saving Station	Resin Canals:	Yes, Frequent
Project Location:	Munising, Michigan	Cross-Field Pitting:	Pinoid
Year Constructed:	App 1930	Spiral Thickenings:	No
Sample from:	Boat House 7x7 Post	Ray Tracheids:	Dentate

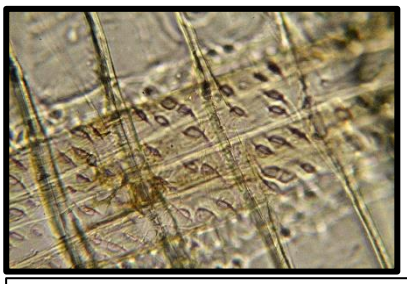
Microscopic Characteristics used for Identification:



Resin Canal in Cross Section



Dentate Ray Tracheids



Pinoid Cross Field Pitting

Species Identification: Hard Pine, Southern Yellow or Western species groups (*Pinus spp.*)

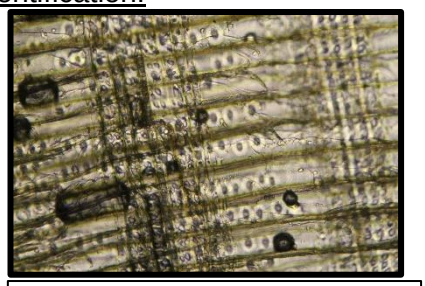
Sample: 4 Identification Date: 06.20.16

Project Name:	Pictured Rocks Life Saving Station	Resin Canals:	Yes, Frequent
Project Location:	Munising, Michigan	Cross-Field Pitting:	Pinoid
Year Constructed:	App 1930	Spiral Thickenings:	No
Sample from:	Boat House 2x8 Rafter	Ray Tracheids:	Dentate

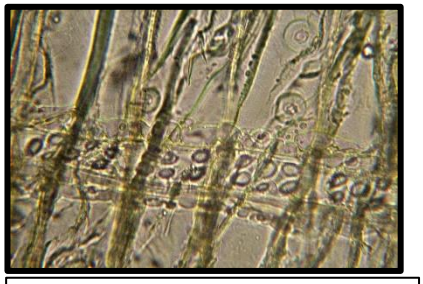
Microscopic Characteristics used for Identification:



Resin Canal in Cross Section



Dentate Ray Tracheids



Pinoid Cross Field Pitting

Species Identification: Hard Pine, Southern Yellow or Western species groups (*Pinus spp.*)

Appendix G. Paint Sample Analysis

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BUILT ENVIRONMENT EVOLUTION

PRESERVING THE PAST TRANSFORMING TOMORROW

Sand Point/Munising USCG Life Saving Station
Pictured Rocks National Lakeshore, Munising, MI



PAINT MICROSCOPY ANALYSIS REPORT

Prepared for

Anderson Hallas

AUGUST 3, 2016

BUILT ENVIRONMENT EVOLUTION

PO BOX 21433 BOULDER, CO 80308 303.562.5872

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(for printing using double sided pages)

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Paint has been used for millennia to beautify and protect both interior and exterior surfaces of structures. The mixes, binders, pigments, solvents and techniques have evolved over time. Knowledge of these changes informs the investigation process when analyzing a structure, and when analyzing paint.

COMMON TERMS AND DEFINITIONS

- Oil – binds the pigment together, affects gloss, and dry time. Common oils used in structural coatings include linseed oil, Tung oil, in some areas fish oil, etc.
- Distemper – pigment, casein or animal glue, water.
- Milk Paint – milk (casein binder), lime, pigment.
- Calcimine – pigment, lime, water, animal glue or casein.
- Lime wash, Color wash – water and lime, with pigment added for colors.
- Encaustic – hot wax painting.
- Tempera – water and pigment, egg yolk can be added.
- Turpentine, - originally distilled from the resign of the terebinth or turpentine tree, found in the Mediterranean. Later distilled from various pines.
- Mineral spirits – distilled from petroleum.
- Varnish – Dammar Varnish from Dammar gum.
- Metal coatings – such as alkyd enamels, exposure to oxygen polymerizes the binder.
- Modern Paints
  - Latex – water-borne sub-micrometer polymer particles (rubber latex is not a component)
  - Epoxies and Polyurethanes – cures via catalyzed polymerization forming a hard plastic surface
  - Powder coatings – little or no solvent used, applied to a surface that has been treated with an electrostatic application of dry powder and heated.
  - May contain additives – can affect surface tension, improve flow, control skinning, fight bacterial growth, etc.

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PERFORMANCE

Paint has been used to protect both interior and exterior surfaces, and to express the style of the time and the tastes of the owner. Using paint as a protective coating can help prevent moisture penetration of the substrate, prevent deterioration of the substrate from ultra violet light, and can also prevent scuffs and abrasive damage. It is easy to maintain paint coatings and cheap to use for this purpose. Color has been part of paint from the earliest signs of its use. Used to express the style of the period, paint has been used to decorate for millennia. Often it is used as an indication of important space, a public space, or a sacred space. Expense of the paint treatment is related to the pigments included in the paint, and the techniques employed.

A BRIEF HISTORY OF PAINT

As paint has developed over time, so have the formulas. The search for pigments that have lasting color continues today. Some of the first pigments were earth, clay, and plant products. The Egyptians were the first recorded to use ground glass as pigments. White lead and red lead have been used for over four thousand years. Distant travel to the Far East and the Americas yielded new pigments made from items such as semi-precious gemstones, and insects. The industrial revolution yielded new colors and pigments, but the most radical changes came during and after WWII as the world embraced chemistry and changed paint formulas and pigments. With the knowledge of paint history, it can be possible to identify the time of the paint application from the pigments, the binders, and the colors that were used.

PAINT ANALYSIS AND USES

Paint Analysis can allow a conservator to understand the original paint scheme, identify newer materials and/or additions to a structure, and the correct identification of the various layers can tell the history and care of the space. Once the paint has been sampled, it is viewed through the microscope, and the original treatment of the substrate becomes clear. Sampling of the structure is critical to correctly identify the paint scheme. Sampling in areas with the least exposure to causes of deterioration, such as sunlight, the elements, smoke, and abrasions, yields the most intact and informative samples. Knowledge of the style of the period informs the sampling process, instructing the conservator as to where it is most likely to find color changes or decorative painting. Items that seem out of place

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can be sampled to see where the paint layers match or diverge. The number of paint layers can indicate the approximate age of an element, and show where new materials have been introduced. The layers of paint can also show periods of neglect and deterioration, fading or darkening due to UV or smoke, and it can show a change in what type of paint was used.

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PROJECT SPECIFICS AND RESULTS

Thirty-one paint samples were sent to the BEE laboratories for cross section microscopy. The samples included interior and exterior samples from the Munising Life Saving Station, the exterior of the Boathouse, and the Oil House. The samples showed various areas of deterioration. Deterioration of paint layers can often indicate a lack of attention to maintenance, but this project appears to have deterioration in specific areas that may or may not be caused by extreme weather.

Munising Life Saving Station

The exterior of the main building of PIRO Station is a warm white for the major elements of the exterior, such as the siding, with the earliest trim colors showing two different extremely dark green colors, one followed by another. The current exterior colors are similar, but with a bright, neutral white color for the siding, and much brighter green for the trim color. Exterior elements showed between 1 and 12 layers of paint. The most common number of layers was between 4-5 layers of paint. Areas with one or two layers of paint indicated an element of the structure that was replaced or stripped. The porch showed the most layers of paint, on the ceiling, columns and railing. The railing sample was deteriorated with a mixing of layers of paint, making sequence and color identification difficult to impossible. This deterioration indicates a fair amount of wear between paint coats, with little other maintenance. Weather and atmospheric condition may also have contributed to the deterioration.

The interior of the front room of the main building shows the plaster elements sampled to be all a warm peach color, for the first three layers of paint, with slight variations in the colors between paint campaigns. The wood elements are all a warm white that is slightly lighter and more neutral than the white color on the exterior. The interior sampling was not as thorough as the exterior, but can give an idea of the style found in the interiors.

Boathouse

The exterior of the boathouse shows the same warm white as was found on the exterior of the main building. The boat door, garage door, pedestrian door, and window sash were a dark green color. Although the dark green was close to the greens found on the main building, it did not match.

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Oil House

Two samples came from the Oil House, one from the exterior wall, and another from the soffit. Both showed deterioration that made it impossible to determine the sequencing of the layers and get a true match on the colors, but the exterior wall appeared to have several layers of brown that would have matched with an almost black soffit, followed by red soffit.

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CHART OF FIRST PAINT LAYERS

Sample #	Location	1st layer (Original)	2nd layer	3rd	Total # of layers
1	Shingle Siding beneath Porch	Almost Cream 5Y 9/2	White N8.75/ 73.4%R	White N8.75/ 73.4%R	4
2	Ext Window Casing at Edge	Almost Cream 5Y 9/2	White N8.75/ 73.4%R	White N8.75/ 73.4%R	4
3	2nd Floor, Ext Window Sash (near fire escape)	Green			1
4	1st Floor, Ext Window - "Cross Rail" Window 101	Moss Black 7.5GY 2/2	Spring Green Black 2.5G 2/4	Almost Cream 5Y 9/2	5
5	Front Door - Exterior	Moss Black 7.5GY 2/2	Spring Green Black 2.5G 2/4	Almost Cream 5Y 9/2	5
6	Front Door - Interior	Light Beige 5Y 8.5/1	White N8.75/ 73.4%R	White N8.75/ 73.4%R	4
7	Front Room, Interior North Wall Chair Rail, Rm 101	Light Beige 5Y 8.5/1	White N8.75/ 73.4%R	White N8.75/ 73.4%R	4
8	Front Room, Interior E. Wall Baseboard, Rm 101	Light Beige 5Y 8.5/1	White N8.75/ 73.4%R	White N8.75/ 73.4%R	4
9	Front Room, Interior North Wall Plaster beneath wainscot, Rm 101	Bright Medium Peach 7.5YR 7/6	Medium Peach 7.5YR 7/4	Deep Bright Peach 7.5YR 5/6	11

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10	Front Room, Interior North Wall Plaster above Wainscot, Rm 101	Bright Medium Peach 7.5YR 7/6	Medium Peach 7.5YR 7/4	Deep Bright Peach 7.5YR 5/6	11
11	Front Room, Interior Door Casing, North Wall	Light Beige 5Y 8.5/1	Deep Bright Peach 7.5YR 5/6	White N8.75/ 73.4%R	11
12	Porch Column - "shaft"	Almost Cream 5Y 9/2	Almost Cream 5Y 9/2	Almost Cream 5Y 9/2	6
13	Porch Beam Porch interior	Almost Cream 5Y 9/2	Almost Cream 5Y 9/2	Almost Cream 5Y 9/2	6
14	Porch Column Capital	Almost Cream 5Y 9/2	Almost Cream 5Y 9/2	Almost Cream 5Y 9/2	6
15	Porch Ceiling	Thin, White, Deteriorated 5Y 8.5/2(?)	Moss Black 7.5GY 2/2	Spring Green Black 2.5G 2/4	12
16	Porch Column Plinth	Almost Cream 5Y 9/2	White N8.75/ 73.4%R	White N8.75/ 73.4%R	12
17	West Elevation Foundation	Almost Cream 5Y 9/2	Gray N7/43.1%R	Gray N7/43.1%R	5
18	Railing @ West End of Porch @ Grade	Metallic Paint - Silver Color no match	Almost Cream 5Y 9/2	Blue Gray	9
19	Bulkhead at Porch West Side	White N8.75/ 73.4%R	Almost Cream 5Y 8.5/2	Cream 2.5Y 9/4	15

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20	West Elevation, Exterior Storm Window "Southern Most Window"	Almost Cream 5Y 8.5/2	Moss Black 7.5GY 2/2	Green	3
21	Downspout, NW Corner	White N8.75/ 73.4%R	Gray		2
22	West Elevation Shingle Siding	Almost Cream 5Y 8.5/2	White N8.75/ 73.4%R	White N8.75/ 73.4%R	4
23	Oil House Ext Wall (all layers deteriorated)	Brown	Dark Brown	Red	11
24	Oil House Roof - Soffit	Black Pea 5Y 2/1	Black Orange Red 2.5YR 2/4	Bright Yellow 7.5Y 8/8	7
25	Boathouse N Elev Siding	Almost Cream 5Y 8.5/2	White N8.75/ 73.4%R	White N8.75/ 73.4%R	4
26	Boathouse N Elev Window Trim	Almost Cream 5Y 8.5/2	White N8.75/ 73.4%R	White N8.75/ 73.4%R	4
27	Boathouse N Elev Window Sash	Dark Green 7.5G 3/4	Green		2
28	Boathouse W Elev Boat Door	Orange Metal Primer	Dark Green 7.5G 3/4	White N8.75/ 73.4%R	5
29	Boathouse W Elev Boat Door Casing	Almost Cream 5Y 8.5/2	White N8.75/ 73.4%R	White N8.75/ 73.4%R	4
30	Boathouse E Elev Garage Door	Almost Cream 5Y 8.5/2	Dark Green 7.5G 3/4	Warm Gray 10Y 4/1	4
31	Boathouse E Elev Pedestrian Door	Almost Cream 5Y 8.5/2	Dark Green 7.5G 3/4	Warm Gray 10Y 4/1	4

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Gloss Levels	
High Gloss	Gloss Level 7
Traditional Gloss	Gloss Level 6
Traditional Semi-gloss	Gloss Level 5
'Satin-like' Finish	Gloss Level 4
Traditional 'eggshell-like' Finish	Gloss Level 3
Sheen Flat 'velvet-like' Finish	Gloss Level 2
Traditional Matte Finish - flat	Gloss Level 1

Gloss levels on the analysis forms are visual estimates.

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PAINT ANALYSIS FORMS

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BUILT ENVIRONMENT EVOLUTION

PRESERVING THE PAST TRANSFORMING TOMORROW

PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 1			
Shingle Siding beneath Porch			
Substrate:	Wood	Top Color:	White

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	Almost Cream	5Y 9/2	2	
2	White	N8.75/ 73.4%R	2	
3	White	N8.75/ 73.4%R	2	
4	White			
5				
6				
7				
8				



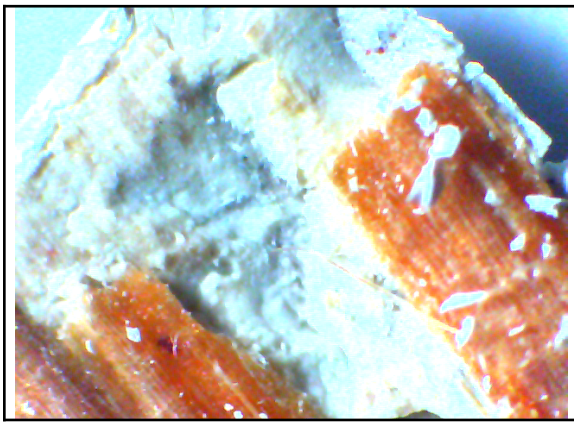
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PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 2			
Ext Window Casing at Edge			
Substrate:	Wood	Top Color:	White

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	Almost Cream	5Y 9/2	2	
2	White	N8.75/ 73.4%R	2	
3	White	N8.75/ 73.4%R	2	
4	White			
5				
6				
7				
8				



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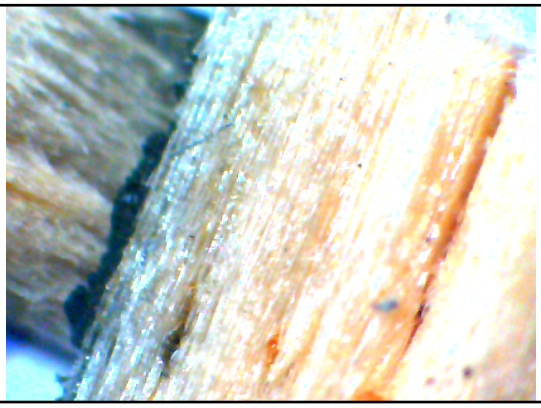
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PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 3			
2nd Floor, Ext Window Sash			
(near fire escape)			
Substrate:	Wood	Top Color:	Green

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	Green			only one layer,
2				indicates a new
3				element
4				
5				
6				
7				
8				



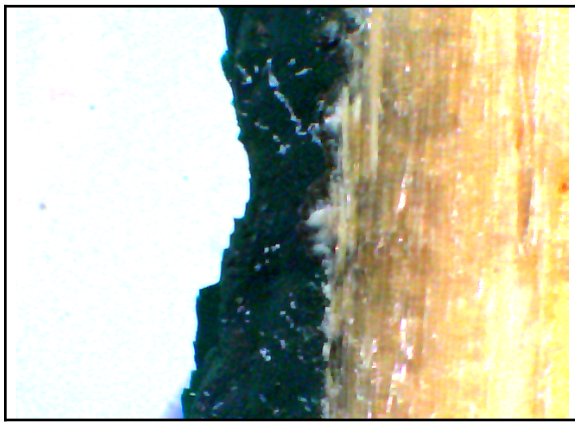
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PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 4			
1st Floor, Ext Window - "Cross Rail"			
Window 101			
Substrate:	Wood	Top Color:	Green

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	Moss Black	7.5GY 2/2	1	
2	Spring Green Black	2.5G 2/4	2	
3	Almost Cream	5Y 9/2	2	
4	Green			
5	Green			
6				
7				
8				



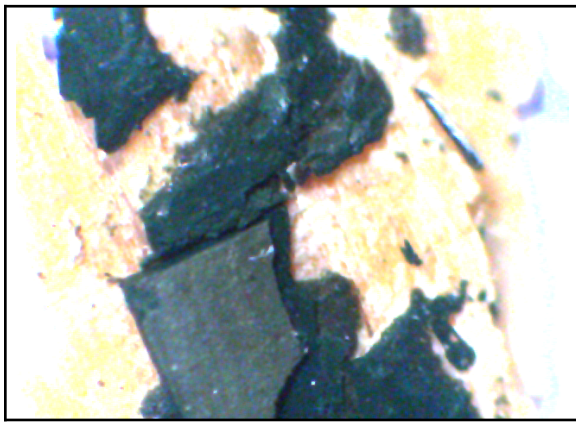
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PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 5			
Front Door - Exterior			
Substrate:	Wood	Top Color:	Green

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	Moss Black	7.5GY 2/2	1	
2	Spring Green Black	2.5G 2/4	2	
3	Almost Cream	5Y 9/2	2	
4	Green			
5	Green			
6				
7				
8				



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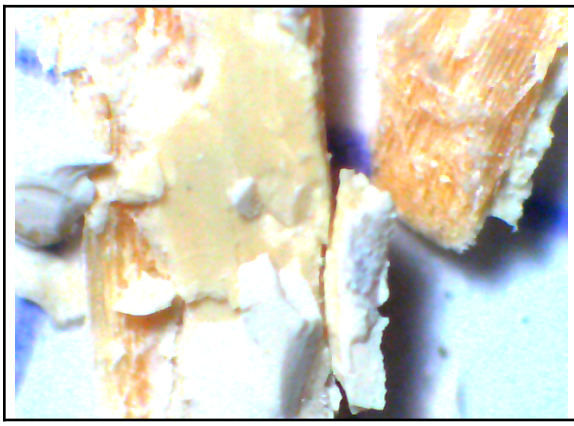
PRESERVING THE PAST TRANSFORMING TOMORROW

PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 6			
Front Door - Interior			
Substrate:	Wood	Top Color:	White

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	Light Beige	5Y 8.5/1	2	
2	White	N8.75/ 73.4%R	2	
3	White	N8.75/ 73.4%R	2	
4	White			
5				
6				
7				
8				



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BUILT ENVIRONMENT EVOLUTION

PRESERVING THE PAST TRANSFORMING TOMORROW

PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 7			
Front Room, Interior			
North Wall Chair Rail, Rm 101			
Substrate:	Wood	Top Color:	White

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	Light Beige	5Y 8.5/1	2	
2	White	N8.75/ 73.4%R	2	
3	White	N8.75/ 73.4%R	2	
4	White			
5				
6				
7				
8				



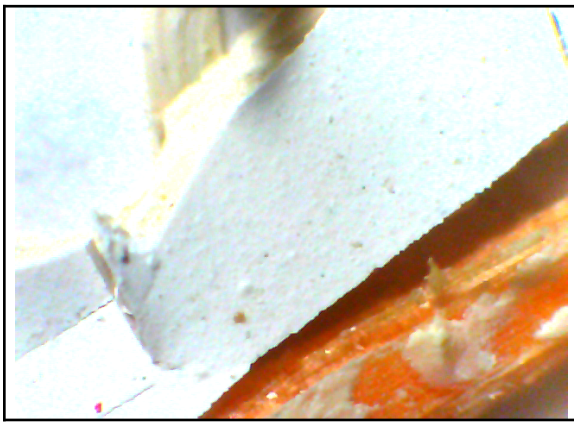
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PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 8			
Front Room, Interior			
E. Wall Baseboard, Rm 101			
Substrate:		Top Color:	

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	Light Beige	5Y 8.5/1	2	
2	White	N8.75/ 73.4%R	2	
3	White	N8.75/ 73.4%R	2	
4	White			
5				
6				
7				
8				



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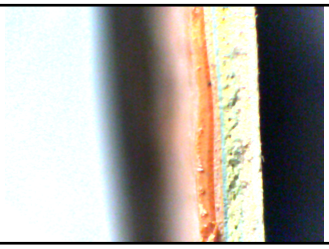
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PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 9			
Front Room, Interior			
North Wall Plaster beneath wainscot, Rm 101			
Substrate:	Plaster	Top Color:	White

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	Bright Medium Peach	7.5YR 7/6	2	
2	Medium Peach	7.5YR 7/4	2	
3	Deep Bright Peach	7.5YR 5/6	2	
4	Light Mustard			
5	Pale Yellow			
6	Light Tan			
7	Mint			
8	Salmon			
9	White			
10	White			
11	White			



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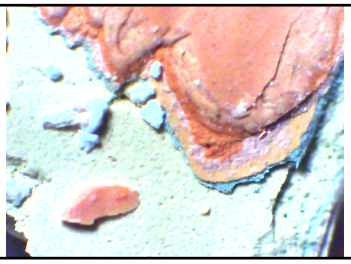
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PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 10			
Front Room, Interior			
North Wall Plaster above Wainscot, Rm 101			
Substrate:	Plaster	Top Color:	White

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	Bright Medium Peach	7.5YR 7/6	2	
2	Medium Peach	7.5YR 7/4	2	
3	Deep Bright Peach	7.5YR 5/6	2	
4	Light Mustard			
5	Pale Yellow			
6	Light Tan			
7	Mint			
8	Salmon			
9	White			
10	White			
11	White			



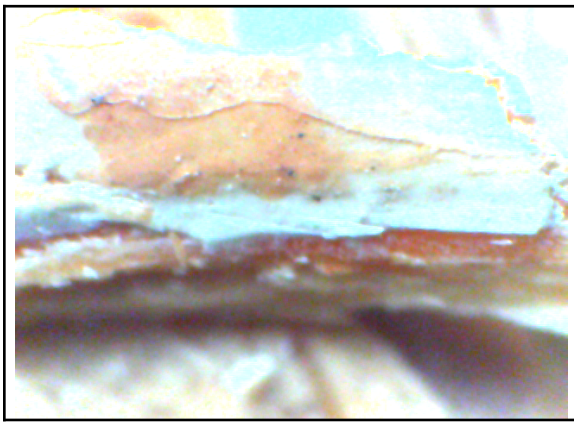
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PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 11			
Front Room, Interior			
Door Casing, North Wall			
Substrate:	Wood	Top Color:	White

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	Light Beige	5Y 8.5/1	2	
2	Deep Bright Peach	7.5YR 5/6	2	
3	White	N8.75/ 73.4%R	2	
4	Light Tan			
5	Mint			
6	Salmon			
7	White			
8				



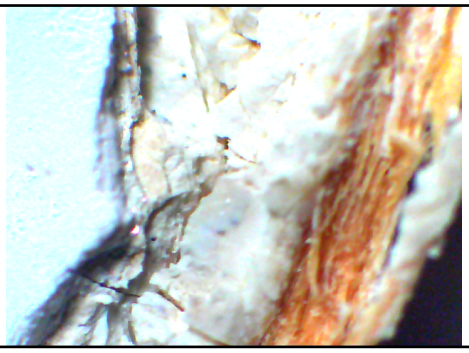
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PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 12			
Porch Column - "shaft"			
Substrate:	Wood	Top Color:	White

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	Almost Cream	5Y 8.5/2	2	
2	Almost Cream	5Y 8.5/2	2	
3	Almost Cream	5Y 8.5/2	2	
4	White			
5	White			
6	White			
7				
8				
9				



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PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 13			
Porch Beam			
Porch interior			
Substrate:	Wood	Top Color:	White

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	Almost Cream	5Y 8.5/2	2	
2	Almost Cream	5Y 8.5/2	2	
3	Almost Cream	5Y 8.5/2	2	
4	White			
5	White			
6	White			
7				
8				
9				



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PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 14			
Porch Column			
Capital			
Substrate:	Wood	Top Color:	White

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	Almost Cream	5Y 8.5/2	2	
2	Almost Cream	5Y 8.5/2	2	
3	Almost Cream	5Y 8.5/2	2	
4	White			
5	White			
6	White			
7				
8				
9				



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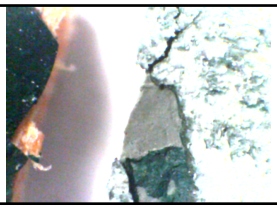
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PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 15			
Porch Ceiling			
Substrate:	Wood	Top Color:	White

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	Thin, White, Deteriorated	5Y 8.5/2(?)	2	
2	Moss Black	7.5GY 2/2	2	
3	Spring Green Black	2.5G 2/4	2	
4	White			
5	Green			
6	White			
7	Gray			
8	White			
9	Gray			
10	White			
11	Gray			
12	White			



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BUILT ENVIRONMENT EVOLUTION

PRESERVING THE PAST TRANSFORMING TOMORROW

PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 16			
Porch Column			
Plinth			
Substrate:	Wood	Top Color:	White

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	Almost Cream	5Y 8.5/2		
2	White	N8.75/ 73.4%R		
3	White	N8.75/ 73.4%R		
4	Gray			
5	Gray			
6	Gray			
7	Gray			
8	White			
9	Gray			
10	White			
11	White			
12	Gray			



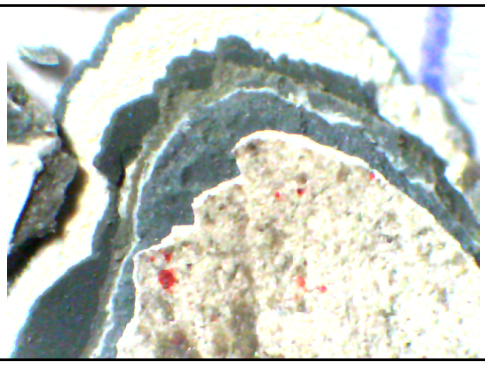
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PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 17			
West Elevation Foundation			
Substrate:	Concrete	Top Color:	Gray

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	Almost Cream	5Y 8.5/2		No Substrate
2	Gray	N7/43.1%R		
3	Gray	N7/43.1%R		
4	White			
5	Gray			
6				
7				
8				
9				



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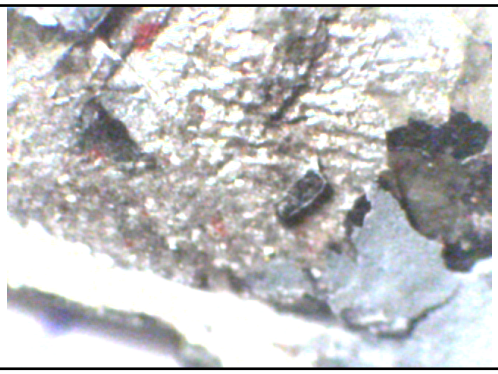
PRESERVING THE PAST TRANSFORMING TOMORROW

PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 18			
Railing @ West End of Porch			
@ Grade			
Substrate:	Metal	Top Color:	Black

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	Metallic Paint - Silver Color	no match	3	all layers show
2	Almost Cream	5Y 8.5/2	2	deterioration
3	Blue Gray		3	and are
4	Rust Red		3	intermixed
5	Black		7	
6	Yellow			
7	Gray			
8	Black		7	
9	Black		7	



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PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 19			
Bulkhead at Porch			
West Side			
Substrate:	Wood	Top Color:	Gray

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	White	N8.75/ 73.4%R	2	Intermixed layer -
2	Almost Cream	5Y 8.5/2	2	#2 is first color
3	Cream	2.5Y 9/4	2	
4	White			
5	Warm White			
6	White			
7	Green Moss			
8	Black			
9	Gray	10G 5/1		
10	Almost Cream	5Y 8.5/2		
11	Gray			
12	Gray			
13	Gray			
14	Gray			
15	Gray			

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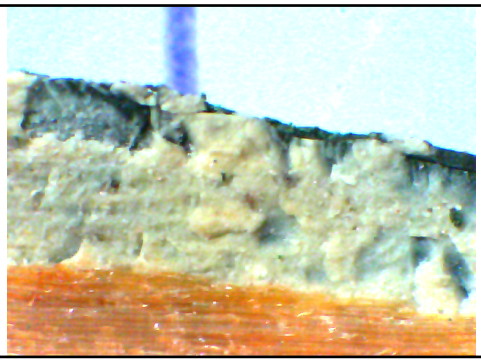
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PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 20			
West Elevation, Exterior Storm Window			
"Southern Most Window"			
Substrate:	Wood	Top Color:	Green

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	Almost Cream	5Y 8.5/2	2	
2	Moss Black	7.5GY 2/2	2	
3	Green			
4				
5				
6				
7				
8				
9				



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BUILT ENVIRONMENT EVOLUTION

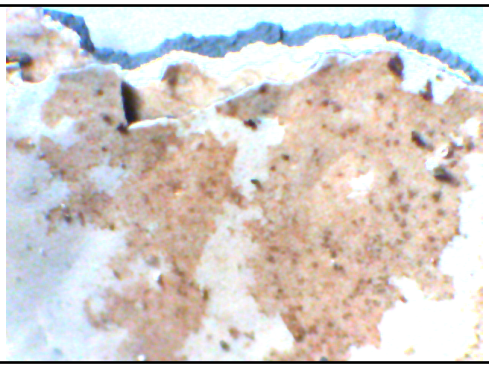
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PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 21			
Downspout, NW Corner			
Substrate:	Metal	Top Color:	Gray

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	White	N8.75/ 73.4%R	2	
2	Gray			
3				
4				
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8				
9				



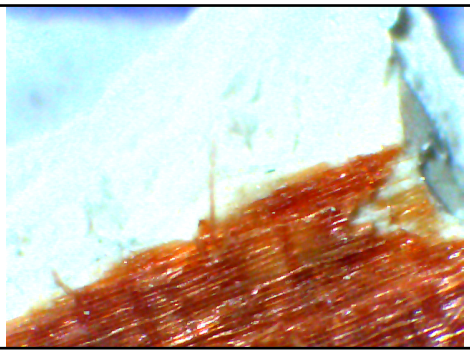
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PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 22			
West Elevation			
Shingle Siding			
Substrate:	Wood	Top Color:	White

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	Almost Cream	5Y 8.5/2	2	
2	White	N8.75/ 73.4%R	2	
3	White	N8.75/ 73.4%R	2	
4	White			
5				
6				
7				
8				
9				



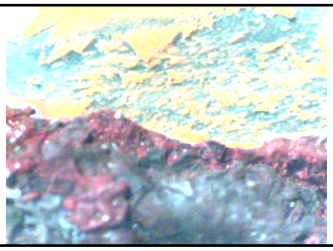
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PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 23			
Oil House			
Ext Wall			
Substrate:	Concrete	Top Color:	White

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	Brown			mixing of colors,
2	Dark Brown			all deteriorated,
3	Red			no id possible for
4	White			original colors
5	Yellow			
6	Dark Yellow			
7	Orange			
8	White			
9	Gray			
10	White			
11	White			



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PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 24			
Oil House			
Roof - Soffit			
Substrate:	Wood	Top Color:	Red

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	Black Pea	5Y 2/1	1	Intermixing of 1st
2	Black Orange Red	2.5YR 2/4	1	and 2nd colors
3	Bright Yellow	7.5Y 8/8	2	
4	Orange			
5	Gray			
6	White			
7	Red			
8				
9				



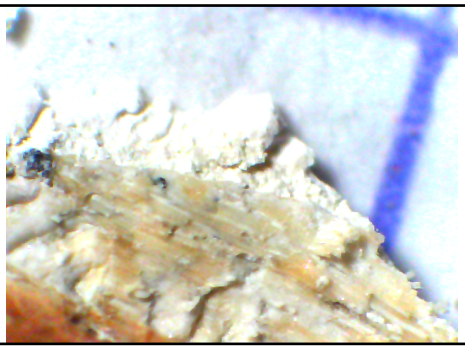
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PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 25			
Boathouse			
N Elev Siding			
Substrate:	Wood	Top Color:	White

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	Almost Cream	5Y 8.5/2	2	
2	White	N8.75/ 73.4%R	2	
3	White	N8.75/ 73.4%R	2	
4	White			
5				
6				
7				
8				
9				



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PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 26			
Boathouse			
N Elev Window Trim			
Substrate:	Wood	Top Color:	White

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	Almost Cream	5Y 8.5/2	2	
2	White	N8.75/ 73.4%R	2	
3	White	N8.75/ 73.4%R	2	
4	White			
5				
6				
7				
8				
9				



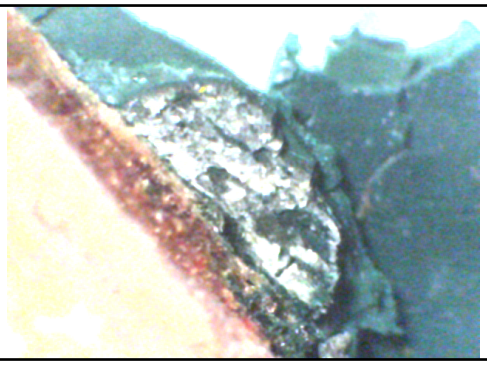
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PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 27			
Boathouse			
N Elev Window Sash			
Substrate:	Wood	Top Color:	Green

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	Dark Green	7.5G 3/4	2	
2	Green			
3				
4				
5				
6				
7				
8				
9				



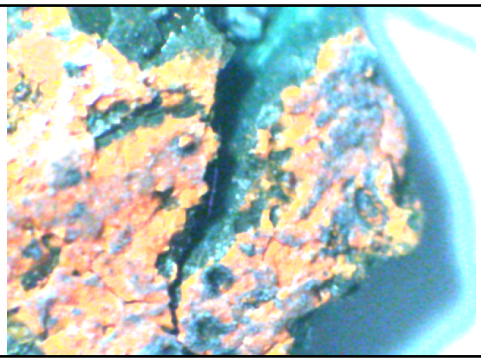
PO BOX 21433 BOULDER, CO 80308 303.562.5872

PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 28			
Boathouse			
W Elev Boat Door			
Substrate:	Metal	Top Color:	Green

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	Orange	Metal Primer	1	
2	Dark Green	7.5G 3/4	2	
3	White	N8.75/ 73.4%R	2	
4	Green			
5	Gray			
6				
7				
8				
9				



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BUILT ENVIRONMENT EVOLUTION

PRESERVING THE PAST TRANSFORMING TOMORROW

PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 29			
Boathouse			
W Elev Boat Door Casing			
Substrate:	Wood	Top Color:	White

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	Almost Cream	5Y 8.5/2	2	
2	White	N8.75/ 73.4%R	2	
3	White	N8.75/ 73.4%R	2	
4	White			
5				
6				
7				
8				
9				



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BUILT ENVIRONMENT EVOLUTION

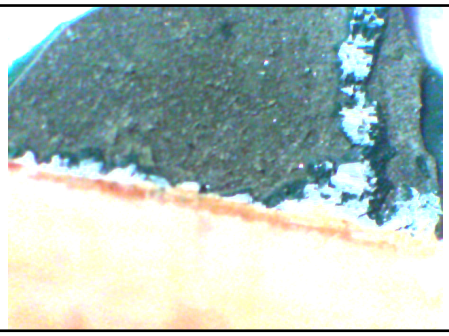
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PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 30			
Boathouse			
E Elev Garage Door			
Substrate:	Wood	Top Color:	Green

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	Almost Cream	5Y 8.5/2	2	
2	Dark Green	7.5G 3/4	2	
3	Warm Gray	10Y 4/1	2	
4	Green			
5				
6				
7				
8				
9				



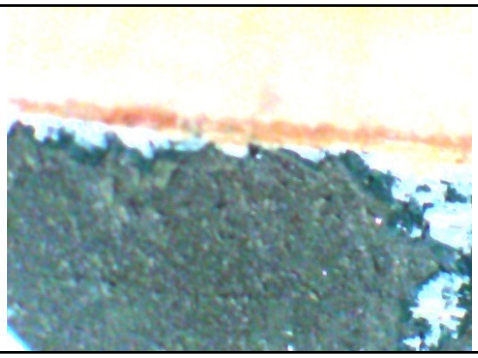
PO BOX 21433 BOULDER, CO 80308 303.562.5872

PAINT ANALYSIS FORM

Project Name:	Munising Life Saving Station		
Project Location:	NPS Pictured Rocks National Lakeshore		
Sampled by:	AH		
Analyzed by:	BEE		

Sample Description: 31			
Boathouse			
E Elev Pedestrian Door			
Substrate:	Wood	Top Color:	Green

LAYER #	COLOR DESCRIPTION	MUNSELL #	GLOSS LEVEL	NOTES
1	Almost Cream	5Y 8.5/2	2	
2	Dark Green	7.5G 3/4	2	
3	Warm Gray	10Y 4/1	2	
4	Green			
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9				



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Appendix H. Hazardous Materials Evaluation

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LANDMARK
ENVIRONMENTAL, INC.

June 24, 2016

Ms. Tina Bishop
Mundus Bishop
2601 Blake Street, Suite 300
Denver, Colorado 80205
tina@mundusbishop.com

Subject: **Report of Hazardous Material Survey at Sand Point/Munising USCG Life Saving Station, Pictured Rocks National Seashore, Munising, Michigan. Landmark Project No. 16032.001.001**

Dear Ms. Bishop:

Landmark Environmental, Inc. (Landmark) has completed a non-destructive-level survey of asbestos containing materials (ACM) and lead-containing paint (LCP) at the above-referenced site. The field work was conducted on June 7 and 8, 2016. The methodology and findings for each task are provided below.

ACM Survey

Sampling was conducted in accordance with U.S. Environmental Protection Agency (EPA) Asbestos Hazard and Emergency Response Act (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. Asbestos inspection activities were conducted by AHERA and State of Michigan Department of Licensing and Regulatory Affairs Asbestos Program accredited personnel. Bulk samples of accessible suspect ACMs were collected in a representative manner as determined by the inspector. Bulk material samples were collected by taking a composite core that included all layers within the suspect ACM. Sampling was limited to materials that were visible and readily accessible to the inspector.

The bulk suspect ACM samples were submitted to Reservoirs Environmental, Inc. (REI), located in Denver, Colorado. REI is a National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory, which is also accredited by the American Industrial Hygiene Association (AIHA). The samples were analyzed using Polarized Light Microscopy (PLM) to determine asbestos type and percent using "positive-stop" progressive analysis. Applicable regulations require that if any one sample of a homogenous material contains greater than one percent asbestos, the entire homogenous material is considered asbestos-containing.

Asbestos Regulatory Criteria

Applicable asbestos regulations define ACM as material containing greater than one percent asbestos by weight, volume or surface area, and also distinguish 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.

Asbestos Survey Findings

Landmark collected 21 bulk samples from a total of 11 different types of suspect ACMs. Of the 11 suspect ACMs that were sampled and analyzed, samples from 4 materials resulted in concentrations of greater than one percent (positive for asbestos). Detailed information such as homogeneous material description, estimated quantities, friability, condition, sample number, sample location description and percent type of asbestos for each homogeneous material listed below is presented in Attachment A.

Confirmed ACMs in Life Saving Station

1. Red Floor Tile – The 9" X 9" red floor tiles in first floor file room/pantry room are confirmed ACM.

2. Plaster and White Skim Coat – The plaster and white skim coat located throughout the structure is confirmed ACM.

3. Pink Sink Undercoating – The pink sink undercoating located on the underside of the sink in the basement conference room is confirmed ACM.

4. Hot Water Expansion Tank Insulation – The hot water expansion tank insulation located in the basement above the ceiling is confirmed ACM.

Identified Non-ACMs in Life Saving Station

1. Brown Linoleum with Burlap Backing – Brown linoleum, burlap backing and associated black adhesive sample combination located on the main level was found to be non-detect for asbestos.

2. Tan and Brown Sheet Vinyl – Tan and brown sheet vinyl located in the bathrooms of the main and second level was found to be non-detect for asbestos.

3. Green Linoleum with Burlap Backing – Green linoleum, burlap backing associated black adhesive sample combinations on the second level was found to be non-detect for asbestos.

4. Drywall and Joint Compound – The drywall and associated joint compound on the main and second level were found to be non-detect for asbestos.

5. White Window Glazing Compound – White window glazing compound associated with windows was found to be non-detect for asbestos.

Identified Non-ACM's in Boat House

1. White Window Glazing – White window glazing associated with windows was found to be non-detect for asbestos.

2. Exhaust Manifold Insulation – White exhaust manifold insulation located on the winch motor was found to be non-detect for asbestos.

Presumed Asbestos Containing Materials Life Saving Station and Boat House

1. Roofing Materials – Roofing materials were not sampled as part of this survey, and are presumed to be ACM.

Projected ACM Abatement Costs

Estimated costs for abatement of identified ACM are presented in the cost spreadsheet included in Attachment A. These estimates are strictly preliminary in nature, are based on Landmark's industry experience, and were not obtained through the solicitation of written bids.

LCP Survey

Bulk paint chip samples of suspect LCP were collected in a representative manner as determined by the inspector based on identified testing combinations where the surface color, substrate or building component were visibly different. The paint chip samples were submitted to REI, which is an Environmental Lead Laboratory Accreditation Program (ELLAP) accredited laboratory that uses procedures developed in compliance with the guidelines established by the National Institute of Occupational Safety and Health (NIOSH) Method 7420. The samples were analyzed by Atomic Absorption (AA)/Inductively Coupled Plasma (ICP) protocol to determine lead content. The total lead concentration reported is the average of all layers in the sample. Lead content results are reported as a percent by weight.

LCP Regulatory Criteria

The EPA and Department of Housing and Urban Development (HUD) regulate lead-based paint (LBP) abatement activities in target housing and child occupied facilities. Childcare facilities fall under this definition. OSHA regulates worker exposure to lead for coatings with any detectable

lead. The EPA and HUD regulations related to LBP abatement do not apply to the project site unless abatement activities occur (specifically designed to permanently remove LBP/LBP hazards). LBP is defined as paint containing 0.5% lead by weight or 1.0 milligram per cubic centimeter by both the EPA and HUD.

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 (RRP Rule). This rule requires that firms performing renovation, repair, and painting projects that disturb LBP in homes, child care facilities and pre-schools built before 1978 have their firm certified by EPA (or an EPA authorized state), use certified renovators who are trained by EPA-approved training providers and follow lead-safe work practices.

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 (AL) of 30 micrograms per cubic meter (30 µg/m3) over an 8-hour time weighted average. The OSHA standard applies to all construction activities that may impact LCP (any detectable lead).

The state of Michigan has established screening levels/cleanup criteria for lead in soils based on direct contact in both the residential and non-residential scenarios. The levels are 400 milligrams per kilogram (mg/kg) and 900 mg/kg, respectively.

Paint Sampling Findings

For this inspection, bulk paint samples are correlated to testing combinations using substrate, component, and color. The substrate is the material from which the component is fabricated. Substrates are classified as brick/masonry, concrete, drywall, metal, plaster, or wood. A component is defined as a particular item, such as a door, a wall, or a cabinet.

Twenty-five samples were collected from suspect LCP testing combinations. Twenty-four of these samples resulted in detections of lead in the paint, and nineteen of the samples resulted in measured lead concentrations above 0.5 percent by weight (LBP).

Life Saving Station

Laboratory analysis identified lead concentrations above 0.5 percent by weight in the following samples:

- LBP-1 collected from gray multi layered paint on exterior concrete foundation 1.1 percent.
- LBP-2 collected from the gray paint on exterior walls and floor porch 0.96 percent.

- LBP-3 collected from white paint on exterior wood shingles 6.1 percent.
- LBP-4 collected from green paint on exterior wood window 3.4 percent.
- LBP-5 collected from gray and white paint on exterior metal downspouts 2.8 percent.
- LBP-6 collected from black paint on exterior metal handrail 2.7 percent.
- LBP-9 collected from white paint on interior wood 1.8 percent.
- LBP-12 collected from white paint on interior metal shower 2.7 percent.
- LBP-13 collected from white paint on interior concrete foundation 24.9 percent.
- LBP-15 collected from white/yellow/brown paint on interior metal beam 17.2 percent.

Boat House

Laboratory analysis identified lead concentrations above 0.5 percent by weight in the following samples:

- LBP-1 collected from white multi layered paint on the exterior siding 8.8 percent.
- LBP-2 collected from green paint on exterior metal doors 4.6 percent.
- LBP-3 collected from green paint on exterior wood door 5.5 percent.

Oil House

Laboratory analysis identified lead concentrations above 0.5 percent by weight in the following samples:

- LBP-1 collected from white multi layered paint on the exterior 16.7 percent.
- LBP-2 collected from the red paint on roof 10.8 percent.

A summary of lead results and the analytical can be found in Attachment B.

Lead in Soils Sample Findings

Four soil grab samples were also collected to determine if lead was present at concentrations above applicable regulatory screening levels in soils at the drip line of the Life Saving Station and Boat House. Lead in soil results were reported by the lab in mg/kg. The state of Michigan has established screening levels/cleanup criteria for lead in soils based on direct contact in both the

residential and non-residential scenarios. The levels are 400 mg/kg and 900 mg/kg, respectively. The results of analysis of soil samples were as follows:

Life Saving Station

- LBP-16 collected from north exterior soils 929 mg/kg.
- LBP-17 collected from south exterior soils 7,268 mg/kg.

Boat House

- LBP-5 collected from soils on the north perimeter 1,196 mg/kg.
- LBP-6 collected from soils on the south perimeter 201 mg/kg.

It should be noted that paint chips were visible in soils adjacent to each structure.

Projected Cost to Remediate Lead in Soil

The extent of lead concentrations exceeding 400 mg/kg in soil is estimated to extend outward from each building perimeter to a maximum of 10 feet and a depth of no more than 6 inches. The excavation of this material would result in the generation of roughly 100 cubic yards of solid waste. The cost of remediating this material, and completing confirmatory sampling and reporting would likely range from $13,500 to $21,000. This is based on an excavation, transportation and disposal charge of $75 to $150 per cubic yard and $6,000 in environmental consulting costs. This projected cost is strictly preliminary in nature, is based on Landmark's industry experience, and was not be obtained through the solicitation of written bids. This cost also assumes that the soil would be classified as solid waste and is not characteristically toxic.

Additional Lead Observations

During visual observations for LCP, lead flashing associated with window headers, lead flashing associated with roofing, and lead window counter weights were observed in the Boat House and Life Saving Station. If impacted, these will need to be handled by OSHA trained workers and disposed of or recycled accordingly.

Conclusions and Recommendations

The identified floor tile, sink undercoating, and hot water expansion tank insulation should be removed according to Local, State, and Federal Regulations if renovation activities will disturb these materials or if demolition is planned for the structure.

The plaster is also defined as ACM. Sample 060716-PL01-01 collected from the wall in the pantry room had an additional layer identified as a white compound that contains greater than one percent asbestos. The remaining set of plaster samples did not contain the white compound layer. The white compound found in sample 060716-PL01-01 suggests that this may be an area that was patched and may not be homogeneous with the remaining wall and ceiling plaster throughout the structure. Further delineation and sampling of the plaster may limit the extent of ACM and reduce the quantity of material eventually requiring abatement.

Renovation activities that will impact LBP and LCP will require OSHA trained workers and safety programs. PPE will be required to handle these items until negative exposure assessment is completed that shows work activities do not result in exposures above the OSHA permissible exposure limit (PEL). Additionally, an appropriate waste management plan should be developed for the disposal of these materials.

Limitations

It should be noted that no destructive investigation of wall interiors and below grade structures was performed. Roofing materials were not included in the survey. In the event of demolition or renovation, asbestos could be discovered that was not identified during this investigation. Limited destructive investigation of building materials to be impacted by renovation or demolition is recommended prior to conducting such work.

This document is not intended to be used as a bid document for the removal, repair, encapsulation, enclosure, or Operations and Maintenance (O&M) of asbestos-containing materials. Quantities of identified asbestos-containing materials should be field verified by the contractor prior to bidding on any and all work associated with this inspection report. Landmark can prepare a scope of work/project design, bid documents, removal and repair methods/procedures, specifications and O&M plans if desired by the Customer. These documents, if requested, will be prepared by EPA accredited and state certified individuals.

Any estimated costs for future abatement provided in this report are solely for financial planning purposes. Such estimates are preliminary in nature, based on Landmark's industry experience, and were not obtained through the solicitation of written bids. Preliminary estimates do not constitute a proposal to perform the work.

Landmark performed asbestos response services in a manner consistent with the level of care and expertise exercised by members of the asbestos inspection and assessment profession. Landmark does not imply or guarantee that every suspect ACM/LCP on or in the building has been identified or sampled.

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.

Greg Estes
Michigan Asbestos Inspector
Accreditation Number: A48980

Charles D. Senz
Senior Project Manager

Attachment A - ACM Sample Information & Analytical Results
Attachment B - Lead Containing Paint Sample Information & Analytical Results

Attachment A

ACM SAMPLE INFORMATION & ANALYTICAL RESULTS

ASBESTOS BULK SAMPLE LOCATION LOG Boat House			
PROJECT NAME:	Boat House	**LANDMARK PROJECT NUMBER:**	16032.001.001
ADDRESS:	Pictured Rocks National Seashore; Munising, Michigan	**INSPECTOR:**	Greg Estes
CLIENT:	Mundus Bishop	**DATE:**	June 7 and 8, 2016

Sample ID	Homogenous Material Description	Sample Location	Material Category	Material Condition	Approximate Quantity	Laboratory Analytical Results (Report #) 352446-1
060816-WG01-01	Window glazing associated with window panes	South window at entrance	Category II Non-friable	Good	350 LF	ND
060816-TSI-01	Exhaust manifold blanket	Winch exhaust manifold	Thermal Friable	Fair	5 LF	ND

DEFINITIONS:

ND = Non-detect for asbestos content by Polarized Light Microscopy (PLM) analysis
PC = Point Count Analysis- required for samples resulting in TR (less than 1% asbestos) by PLM
TR = Trace amounts of asbestos or less than 1% by PLM- Point Count analysis required
NA = Not Applicable
Presumed = Material is a suspect asbestos containing material and is presumed to contain asbestos at a concentration greater than 1%
Friable = Material when dry that may be crumbled, pulverized or reduced to powder by hand pressure and must be removed prior to renovation or demolition
Non-friable = Material may remain in place during demolition if they remain in a non-friable state
Surfacing = Material that is sprayed on, troweled on, or otherwise applied to surfaces
Thermal = Material that is used for applications where high heat conditions exist
Category I = Non-friable, means packing's, gaskets, resilient floor coverings and asphalt roofing products
Category II = Non-friable, means any material, excluding category I

ASBESTOS BULK SAMPLE LOCATION LOG
Life Saving Station

PROJECT NAME:	Life Saving Station	**LANDMARK PROJECT NUMBER:**	16032.001.001
ADDRESS:	Pictured Rocks National Seashore; Munising, Michigan	**INSPECTOR:**	Greg Estes
CLIENT:	Mundus Bishop	**DATE:**	June 7 and 8, 2016

Sample ID	Homogenous Material Description	Sample Location	Material Category	Material Condition	Approximate Quantity	Laboratory Analytical Results (Report #) 352444-2R
060716-SVF01-01	Brown linoleum with burlap backing, black adhesive, under carpet	First floor, lobby and secretary office	Friable	Good	950 SF	ND
060716-SVF01-02	Brown linoleum with burlap backing, black adhesive, under carpet	First floor hallway	Friable	Good	950 SF	ND
060716-FT01-01	Red 9"x 9" floor tile with black adhesive, under carpet	First floor file room / pantry	Category I Non-friable	Good	50 SF	Tile- 9% Chrysotile Mastic- ND
060716-SVF02-01	Tan and brown sheet vinyl flooring over brown linoleum	First floor bathroom and second floor bathroom	Friable	Good	150 SF	ND
060716-SVF02-02	Tan and brown sheet vinyl flooring over brown linoleum	First floor bathroom and second floor bathroom	Friable	Good	150 SF	SAMPLE NOT COLLECTED
060716-SVF03-01	Green linoleum with burlap backing, black adhesive, under carpet	Second floor hallway	Friable	Good	950 SF	ND
060716-SVF03-02	Green linoleum with burlap backing, black adhesive, under carpet	Second floor office	Friable	Good	950 SF	ND

Sample ID	Homogenous Material Description	Sample Location	Material Category	Material Condition	Approximate Quantity	Laboratory Analytical Results (Report #) 352444-2R
060716-PL01-01	Plaster and Lathe with white skim coat walls and ceilings throughout	First floor office/pantry	Friable	Good	16,000 SF	White Compound-Chrysotile PC-1.75
060716-PL01-02	Plaster and Lathe with white skim coat walls and ceilings throughout	First floor lobby and secretary office	Friable	Good	16,000 SF	ND
060716-PL01-03	Plaster and Lathe with white skim coat walls and ceilings throughout	First floor Ranger office	Friable	Good	16,000 SF	ND
060716-PL01-04	Plaster and Lathe	Second floor hallway	Friable	Good	16,000 SF	ND
060716-PL01-05	Plaster and Lathe	Second floor Admin. Office	Friable	Good	16,000 SF	ND
060716-PL01-06	Plaster and Lathe	Second floor Chief of Interpretation	Friable	Good	16,000 SF	ND
060716-PL01-07	Plaster and Lathe	Basement chimney wall	Friable	Good	16,000 SF	ND
060716-DWT01-01	Drywall and joint compound first and second floor	Second floor office	Friable	Good	500 SF	ND
060716-SUC01-01	Pink sink undercoating	Basement conference room	Category II Non-friable	Good	1 each	15% Chrysotile

Sample ID	Homogenous Material Description	Sample Location	Material Category	Material Condition	Approximate Quantity	Laboratory Analytical Results (Report #) 352444-2R
060716-WC01-01	Window glazing, exterior	Basement / first floor West side window	Friable	Fair	1,200 LF	ND
060716-WC01-02	Window glazing, exterior	Basement / first floor North side window	Friable	Fair	1,200 LF	ND
060716-TSI01-01	Hot water expansion tank insulation	Basement	Friable	Fair	10 SF	80% Chrysotile
NA	Roofing felt, shingles are cedar wood	Roof	Category I Non-friable	Fair	1,100 SF	Presumed

DEFINITIONS:

ND = Non-detect for asbestos content by Polarized Light Microscopy (PLM) analysis
PC = Point Count Analysis- required for samples resulting in TR (less than 1% asbestos) by PLM
TR = Trace amounts of asbestos or less than 1% by PLM- Point Count analysis required
NA = Not Applicable
Presumed = Material is a suspect asbestos containing material and is presumed to contain asbestos at a concentration greater than 1%
Friable = Material when dry that may be crumbled, pulverized or reduced to powder by hand pressure and must be removed prior to renovation or demolition
Non-friable = Material may remain in place during demolition if they remain in a non-friable state
Surfacing = Material that is sprayed on, troweled on, or otherwise applied to surfaces
Thermal = Material that is used for applications where high heat conditions exist
Category I = Non-friable, means packing's, gaskets, resilient floor coverings and asphalt roofing products
Category II = Non-friable, means any material, excluding category I

Projected Costs for Asbestos Abatement

Location	ACM Description	Category	Quantity	Units	Unit $ Low	Unit $ High	Extended $ Low	Extended $ High
First floor file room / pantry	Red 9"x 9" floor tile with black adhesive, under carpet	Category I Non-friable	50	ft2	$4	$6	$200	$300
Throughout(1)	Plaster and lathe with white skim coat walls and ceilings throughout	Friable	16,000	ft2	$10	$12	$160,000	$192,000
Basement Conference Room	Sink undercoating, pink	Category II Non-friable	1	each	$75	$150	$75	$150
Basement	Hot water expansion tank insulation	Friable	10	ft2	$750	$1,200	$7,500	$12,000

1) Further sampling and delineation of this material may reduce the quantity of material eventually requiring abatement.

All estimates are preliminary in nature and are solely for financial planning purposes. Estimates were not obtained through the solicitation of written bids.

REI LAB **Reservoirs Environmental, Inc.**

June 20, 2016

Subcontract Number:	**NA**
Laboratory Report:	**RES 352444-2R**
Project # / P.O. #	**16032.001.001**
Project Description:	**Pictured Rock National Park Head Quarters, Munising Michigan Life Guard Station**

Greg Estes
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 352444-2R 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,

Elisa Mari for

Jeanne Spencer
President

RESERVOIRS ENVIRONMENTAL INC.

NVLAP Lab Code 101896-0

TABLE: PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number: **RES 352444-2R**
Client: **Landmark Environmental, Inc.**
Client Project Number / P.O.: **16032.001.001**
Client Project Description: **Pictured Rock National Park Head Quarters, Munising Michigan Life Guard Station**
Date Samples Received: **June 09, 2016**
Method: **EPA 600/R-93/116 - Point Count, Bulk**
Turnaround: **6 Hour**
Date Samples Analyzed: **June 18, 2016**

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 (%)
060716-SVF01-01	EM 1646107	A	Yellow adhesive	3		**ND**	0	100
		B	Brown adhesive	4		**ND**	0	100
		C	Brown sheet vinyl w/ tan fibrous woven backing material	93		**ND**	25	75
060716-SVF01-02	EM 1646108	A	Brown adhesive	2		**ND**	0	100
		B	Yellow adhesive	5		**ND**	0	100
		C	Brown sheet vinyl w/ tan fibrous woven backing material	93		**ND**	25	75
060716-FT01-01	EM 1646109	A	Yellow adhesive	5		**ND**	0	100
		B	Brown adhesive	5		**ND**	0	100
		C	Black felt	10		**ND**	80	20
		D	Brown tile	80	**Chrysotile**	**9**	0	91
060716-SVF02-01	EM 1646110	A	Tan sheet vinyl w/ off white fibrous backing material & yellow adhesive	100		**ND**	20	80
060716-SVF02-02	EM 1646111		Sample Not Received.					

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 352444-2R**
Client: **Landmark Environmental, Inc.**
Client Project Number / P.O.: **16032.001.001**
Client Project Description: **Pictured Rock National Park Head Quarters, Munising Michigan Life Guard Station**
Date Samples Received: **June 09, 2016**
Method: **EPA 600/R-93/116 - Point Count, Bulk**
Turnaround: **6 Hour**
Date Samples Analyzed: **June 18, 2016**

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 (%)
060716-SVF03-01	EM 1646112	A	Yellow adhesive	2		**ND**	0	100
		B	Black felt w/ brown adhesive	18		**ND**	80	20
		C	Green sheet vinyl w/ tan fibrous woven backing material	80		**ND**	25	75
060716-SVF03-02	EM 1646113	A	Yellow adhesive	3		**ND**	0	100
		B	Brown felt	20		**ND**	80	20
		C	Green sheet vinyl w/ tan fibrous woven backing material	77		**ND**	25	75
060716-PL01-01	EM 1646114	A	Off white/multi-colored paint	10		**ND**	0	100
		B	White compound	15	**Chrysotile**	**3**	0	97
					Point Count	**1.75**		
		C	Off white plaster	30		**ND**	0	100
		D	Off white granular plaster	45		**ND**	TR	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 352444-2R**
Client: **Landmark Environmental, Inc.**
Client Project Number / P.O.: **16032.001.001**
Client Project Description: **Pictured Rock National Park Head Quarters, Munising Michigan Life Guard Station**
Date Samples Received: **June 09, 2016**
Method: **EPA 600/R-93/116 - Point Count, Bulk**
Turnaround: **6 Hour**
Date Samples Analyzed: **June 18, 2016**

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 (%)
060716-PL01-02	EM 1646115	A	Off white granular plaster	30		**ND**	0	100
		B	White/multi-colored paint	30		**ND**	0	100
		C	White plaster	40		**ND**	0	100
060716-PL01-03	EM 1646116	A	Tan/multi-colored paint	40		**ND**	0	100
		B	White plaster w/ off white granular plaster	60		**ND**	0	100
060716-PL01-04	EM 1646117	A	Light blue/multi-colored paint	30		**ND**	0	100
		B	White plaster w/ off white granular plaster	70		**ND**	0	100
060716-PL01-05	EM 1646118	A	White/multi-colored paint	20		**ND**	0	100
		B	White plaster w/ off white granular plaster	80		**ND**	0	100
060716-PL01-06	EM 1646119	A	Off white/multi-colored paint	15		**ND**	0	100
		B	White plaster w/ off white granular plaster	85		**ND**	0	100
060716-PL01-07	EM 1646120	A	White/multi-colored paint	30		**ND**	0	100
		B	Off white granular plaster w/ white plaster	70		**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 352444-2R**
Client: **Landmark Environmental, Inc.**
Client Project Number / P.O.: **16032.001.001**
Client Project Description: **Pictured Rock National Park Head Quarters, Munising Michigan Life Guard Station**
Date Samples Received: **June 09, 2016**
Method: **EPA 600/R-93/116 - Point Count, Bulk**
Turnaround: **6 Hour**
Date Samples Analyzed: **June 18, 2016**

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 (%)
060716-DWT01-01	EM 1646121	A	White tape	15		**ND**	95	5
		B	White compound w/ white paint	20		**ND**	0	100
		C	White joint compound	20		**ND**	0	100
		D	Tan/gray drywall	45		**ND**	60	40
060716-SUC01-01	EM 1646122	A	Lavender sink undercoating	100	**Chrysotile**	**15**	0	85
060716-WC01-01	EM 1646123	A	Tan glazing w/ green paint	100		**ND**	0	100
060716-WC01-02	EM 1646124	A	Tan glazing w/ green paint	100		**ND**	0	100
060716-TSI01-01	EM 1646231	A	Off white fibrous material	100	**Chrysotile**	**80**	5	15

TEM Analysis recommended for organically bound material (i.e. floor tile) if PLM results are <1%.

David E. Monagle
Analyst

Liu Wenlong
Analyst / Data QA

Due Date: 6-14-16
Due Time: 11:35

REI LAB Reservoirs Environmental, Inc.

RES 352444

Pager : 303-509-2098

INVOICE TO: (IF DIFFERENT)

Company:	Landmark Environmental, Inc.
Address:	7881 Shaffer Parkway Littleton, CO 80127
Project Number and/or P.O. #:	16032.001.001
Project Description/Location:	Pictured Rock National Park Head Quarters, Munising Michigan Life Guard Station NP Headquarters

Company:	Same
Address:	

CONTACT INFORMATION:

Contact:	Greg Estes
Phone:	
Fax:	
Cell/pager:	970-373-7928
Final Data Deliverable Email Address:	sdavis@landmarkenviro.com gestes@landmarkenviro.com

Contact:	
Phone:	
Fax:	
Cell/pager:	

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 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: +/-, 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 060716 - SVF01-01	X																				1646107
2 - SVF01-02																					8
3 - FT01-01																					9
4 - SVF02-01																					10
5 - SVF02-02																					1
6 - SVF03-01																					2
7 - SVF03-02																					3
8 - PL01-01																					4
9 - PL01-02																					5
# - PL01-03																					6

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: 19 (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: Greg Estes 6-9-16 Date/Time: 11:40

Laboratory Use Only
Received By: Emily Davis Date/Time: 6/9/16 1135am Carrier: hand

Sample Condition: On Ice Yes / No; Sealed Yes / No; Intact Yes / No
Temp. (F°) ____

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 # 352444 Page 2 of 2

Submitted by: Landmark Environmental, Inc

Client sample ID number (Sample ID's must be unique)		REQUESTED ANALYSIS																			VALID MATRIX CODES					LAB NOTES:
		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	060716-PL01-04	X																							144617
12	-PL01-05																								8
13	-PL01-06																								9
14	-PL01-07																								10
15	-DWT01-01																								11
16	-SUC01-01																								12
17	-WC01-01																								13
18	-WC01-02																								14
19	-TSI01-01																								15
20																									
21																									
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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**

Reservoirs Environmental, Inc.

June 18, 2016

Subcontract Number: **NA**
Laboratory Report: **RES 352446-1**
Project # / P.O. # **16032.001.001**
Project Description: **Pictured Rock National Park**
Head Quarters Munising
Michigan Boat House

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 352446-1 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,

Gina Vettraino for

Jeanne Spencer
President

RESERVOIRS ENVIRONMENTAL INC.

NVLAP Lab Code 101896-0

TABLE: PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number: **RES 352446-1**
Client: **Landmark Environmental, Inc.**
Client Project Number / P.O.: **16032.001.001**
Client Project Description: **Pictured Rock National Park Head Quarters Munising Michigan Boat House**
Date Samples Received: **June 09, 2016**
Method: **EPA 600/R-93/116 - Short Report, Bulk**
Turnaround: **3-5 Day**
Date Samples Analyzed: **June 18, 2016**

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 (%)
060816-WG01-01	EM 1646103	A	White glazing w/ green paint	100		**ND**	0	100
060816-TSI-01	EM 1646104	A	White insulation	100		**ND**	98	2

TEM Analysis recommended for organically bound material (i.e. floor tile) if PLM results are <1%.

David E. Monagle
Analyst / Data QA

Due Date: 6-14-16
Due Time: 11:35

REI LAB Reservoirs Environmental, Inc.

RES 352446

Pager : 303-509-2098

INVOICE TO: (IF DIFFERENT)

Company:	Landmark Environmental, Inc.
Address:	7881 Shaffer Parkway Littleton, CO 80127
Project Number and/or P.O. #:	16032.001.001
Project Description/Location:	Pictured Rock National Park Head Quarters, Munising Michigan Boat House

Company:	Same
Address:	

CONTACT INFORMATION:

Contact:	Greg Estes
Phone:	
Fax:	
Cell/pager:	970-373-7928
Final Data Deliverable Email Address:	sdavis@landmarkenviro.com gestes@landmarkenviro.com

Contact:	
Phone:	
Fax:	
Cell/pager:	

ASBESTOS LABORATORY HOURS: Weekdays: 7am - 7pm

PCM / 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	**Prior notification is required for RUSH turnarounds.**
RCRA 8 / Metals & Welding Fume Scan / TCLP	___ RUSH ___ 5 day ___10 day	
Organics	___ 24 hr. ___ 3 day ___5 Day	

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

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

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: +/-	E.coli O157:H7: +/-	Listeria: +/-	Aerobic Plate Count: +/- or Quantification	E.coli: +/- or Quantification	Coliforms: +/- or Quantification	S.aureus: +/- or Quantification	Y & M: +/- or Quantification	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 060816-WG01-01	X																				1644163
2 -TSI-01	X																				4
3																					
4																					
5																					
6																					
7																					
8																					
9																					
#																					

Number of samples received: 2 (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: Greg Estes 6-9-16 Date/Time: 11:38

Laboratory Use Only
Received By: Cindy Casey Date/Time: 6/9/16 1135am Carrier: hand

Sample Condition: On Ice Yes / No — Sealed Yes / No — Intact Yes / No
Temp. (F°) ____

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

Attachment B

LEAD CONTAINING PAINT SAMPLE INFORMATION & ANALYTICAL RESULTS

LEAD CONTAINING PAINT LOG Boat House						
PROJECT NAME:	Boat House	**LANDMARK PROJECT NUMBER:**				16032.001.001
ADDRESS:	Pictured Rocks National Seashore; Munising, Michigan	**INSPECTOR:**				Greg Estes
CLIENT:	Mundus Bishop	**DATE:**				June 7 and 8, 2016
Sample ID	**Sample Location**	**Component**	**Substrate**	**Condition**	**Color**	**Laboratory Analytical Results (% Pb) (Report #) 352447-1**
LBP-1	Exterior	Cedar Shingle	Wood	Poor	White	8.8
LBP-2	Exterior	ing	Metal	Fair	Green	4.6
LBP-3	Exterior	Doors	Wood	Fair	Green	5.5
LBP-4	Exterior	Door Sill	Wood	Fair	Gray	0.064
LBP-5	Exterior	Soils- North	NA	n/a	Tan	1196 [mg/kg]
LBP-6	Exterior	Soils- South	NA	n/a	Tan	201 [mg/kg]

DEFINITIONS:

BRL = Below laboratory Reporting Limit
LBP = Results above 0.5% are considered Lead Based Paint
LCP = Any result above BRL is considered Lead Containing Paint
[mg/kg] = Milligrams Per Kilogram

NOTES:

Lead flashing associated with window headers
Lead flashing associated with roofing
Lead window counter weights in sill pocket
Lead paint chips are evident in soils around perimeter of boat house
To preserve historic value; the boat, the boat winch, and rope wagon were excluded from the lead based paint sampling

LEAD CONTAINING PAINT LOG
Life Saving Station

PROJECT NAME:	Life Saving Station	**LANDMARK PROJECT NUMBER:**	16032.001.001
ADDRESS:	Pictured Rocks National Seashore; Munising, Michigan	**INSPECTOR:**	Greg Estes
CLIENT:	Mundus Bishop	**DATE:**	June 7 and 8, 2016

Sample ID	Sample Location	Component	Substrate	Condition	Color	Laboratory Analytical Results (% Pb) (Report #) 352448-1
LBP-1	Exterior	Foundation	Concrete	Poor	Gray	1.1
LBP-2	Exterior	Wall / Floor	Wood	Good	Gray	0.96
LBP-3	Exterior	Cedar siding	Wood	Poor	White	6.1
LBP-4	Exterior	Window	Wood	Poor	Green	3.4
LBP-5	Exterior	Downspouts	Metal	Fair	Gray and White	2.8
LBP-6	Exterior	Handrail	Metal	Good	Black	2.7
LBP-7	Interior	Radiant heater	Metal	Good	Silver	0.330
LBP-8	Interior	Wall	Plaster	Good	White	0.13
LBP-9	Interior	Wall (wood)	Wood	Good	White	1.8
LBP-10	Interior	Wall	Plaster	Good	Eggshell	0.0038
LBP-11	Interior	Wall	Drywall	Good	White	BRL
LBP-12	Interior	Shower stall	Metal	Good	White	2.7
LBP-13	Interior	Foundation	Concrete	Good	White	24.9
LBP-14	Interior	Ceiling (wood)	Wood	Good	Brown	0.13
LBP-15	Interior	Metal beam	Metal	Good	White / yellow / brown	17.2
LBP-16	Exterior	Soils - North	NA	NA	Tan	929 [mg/kg]
LBP-17	Exterior	Soils - South	NA	NA	Tan	7,268 [mg/kg]

DEFINITIONS:

BRL = Below laboratory Reporting Limit
LBP = Results above 0.5% are considered Lead Based Paint
LCP = Any result above BRL is considered Lead Containing Paint
{mg/kg]= Milligrams Per Kilograms

NOTES:

Lead flashing associated with window headers
Lead flashing associated with roofing
Lead window counter weights in sill pocket
Lead paint chips are evident in soils around perimeter of boat house

LEAD CONTAINING PAINT LOG Oil House						
PROJECT NAME:	Oil House		**LANDMARK PROJECT NUMBER:**		16032.001.001	
ADDRESS:	Pictured Rocks National Seashore; Munising, Michigan		**INSPECTOR:**		Greg Estes	
CLIENT:	Mundus Bishop		**DATE:**		June 7 and 8, 2016	
Sample ID	**Sample Location**	**Component**	**Substrate**	**Condition**	**Color**	**Laboratory Analytical Results (% Pb) (Report #) 352445-1**
LBP-1	Exterior	Door	Metal	Fair	White	16.7
LBP-2	Exterior	Roof	Metal	Fair	Red	10.8

DEFINITIONS:

BRL = Below laboratory Reporting Limit
LBP = Results above 0.5% are considered Lead Based Paint
LCP = Any result above BRL is considered Lead Containing Paint

Projected Costs for Lead Soil Remediation

Building	Length (L) in ft.	Width (W) in ft.	L soil in ft.	W soil in ft.	Area Soil in ft2	Depth in ft	Soil Vol in ft3	Soil Vol in yds3
Life Saving	50	35	70	55	2100	0.5	1050	39
Boat House	60	40	80	60	2400	0.5	1200	44
								83
						x fluff factor 1.2		100

Excavation, Transportation and Tipping

Volume	Unit cost high	Unit Cost Low	Extended cost low	Extended cost high
100	75	150	$7,500	$15,000
		Consulting/sampling	$6,000	$6,000
			$13,500	**$21,000**

REI LAB **Reservoirs Environmental, Inc.**

June 15, 2016

Laboratory Code:	**RES**
Subcontract Number:	**NA**
Laboratory Report:	**RES 352445-1**
Project # / PO #:	**16032.001.001**
Project Description:	**Pictured Rock National Park Head Quarters Munising Michigan Oil House**

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 American Industrial Hygiene Association, Lab ID 101533 - Accreditation Certificate #480. The laboratory is currently proficient in both IHPAT & ELPAT programs respectively.

Reservoirs has analyzed the following sample(s) using Atomic Absorption Spectroscopy (AAS) / Atomic Emission Spectroscopy - Inductively Coupled Plasma (AES-ICP) per your request. Reported sample results were not blank corrected. The analysis has been completed in general accordance with the appropriate methodology as stated in the analysis table. Results have been sent to your office.

RES 352445-1 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 authorized by the client. The results described in this report only apply to the samples analyzed. 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 should have any questions about this report, please feel free to call me at 303-964-1986.

Sincerely,



Jeanne Spencer
President

RESERVOIRS ENVIRONMENTAL, INC.

5801 Logan St., Suite 100
Denver CO 80216

TABLE ANALYSIS: LEAD IN PAINT

RES Job Number:	**RES 352445-1**
Client:	**Landmark Environmental, Inc.**
Client Project Number / P.O.:	**16032.001.001**
Client Project Description:	**Pictured Rock National Park Head Quarters Munising Michigan Oil Hou**
Date Samples Received:	**June 9, 2016**
Analysis Type:	**USEPA SW846 3050B / AA (7420)**
Turnaround:	**3-5 Day**
Date Samples Analyzed:	**June 13, 2016**

Client ID Number	Lab ID Number	Reporting Limit (%)	LEAD CONCENTRATION (%)
LBP-1	EM 1646105	0.0017	16.7
LBP-2	EM 1646106	0.0022	10.8

*** Unless otherwise noted all quality control samples performed within specifications established by the laboratory.**

Analyst / Data QA: Renee A. Cortez

BRL = Below Reporting Limit

Due Date: 6-14-16
Due Time: 11:30

Reservoirs Environmental, Inc.

RES 352445

Pager : 303-509-2098

INVOICE TO: (IF DIFFERENT)

Company:	Landmark Environmental, Inc.
Address:	7881 Shaffer Parkway
	Littleton, CO 80127
Project Number and/or P.O. #:	16032.001.001
Project Description/Location:	Pictured Rock National Park Head Quarters, Munising Michigan Oil House

Company:	Same
Address:	

CONTACT INFORMATION:

Contact:	Greg Estes
Phone:	
Fax:	
Cell/pager:	970-373-7928
Final Data Deliverable Email Address:	sdavis@landmarkenviro.com
	gestes@landmarkenviro.com

Contact:	
Phone:	
Fax:	
Cell/pager:	

ASBESTOS LABORATORY HOURS: Weekdays: 7am - 7pm

PLM / PCM / TEM ___ RUSH (Same Day) ___ PRIORITY (Next Day) ___STANDARD
(Rush PCM = 2hr, TEM = 6hr.)

CHEMISTRY LABORATORY HOURS: Weekdays: 8am - 5pm

Metal(s) / Dust ___ RUSH ___ 24 hr. X 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 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) Lead, RCRA 8, TCLP, Welding Fume, Metals Scan	ORGANICS - METH	MICROBIOLOGY: Salmonella: +/-	E.coli O157:H7: +/-	Listeria: +/-	Aerobic Plate Count: +/- or Quantification	E.coli: +/- or Quantification	Coliforms: +/- or Quantification	S.aureus: +/- or Quantification	Y & M: +/- or Quantification	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 LBP-1					X																	1646105
2 LBP-2					X																	5
3																						
4																						
5																						
6																						
7																						
8																						
9																						
#																						

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: 2 (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: Greg Estes 6-9-16 Date/Time: 11:30

Laboratory Use Only
Received By: Emily Dewey Date/Time: 6/9/16 1130am Carrier: hand

Sample Condition: On Ice Yes / No Sealed Yes / No Intact Yes / No
Temp. (F°) _____

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

REI LAB **Reservoirs Environmental, Inc.**

June 15, 2016

Laboratory Code:	**RES**
Subcontract Number:	**NA**
Laboratory Report:	**RES 352447-1**
Project # / PO #:	**16032.001.001**
Project Description:	**Pictured Rock National Park Head Quarters Munising Michigan Boat House**

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 American Industrial Hygiene Association, Lab ID 101533 - Accreditation Certificate #480. The laboratory is currently proficient in both IHPAT & ELPAT programs respectively.

Reservoirs has analyzed the following sample(s) using Atomic Absorption Spectroscopy (AAS) / Atomic Emission Spectroscopy - Inductively Coupled Plasma (AES-ICP) per your request. Reported sample results were not blank corrected. The analysis has been completed in general accordance with the appropriate methodology as stated in the analysis table. Results have been sent to your office.

RES 352447-1 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 authorized by the client. The results described in this report only apply to the samples analyzed. 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 should have any questions about this report, please feel free to call me at 303-964-1986.

Sincerely,



Jeanne Spencer
President

RESERVOIRS ENVIRONMENTAL, INC.

5801 Logan St., Suite 100
Denver CO 80216

TABLE ANALYSIS: LEAD IN PAINT

RES Job Number:	**RES 352447-1**
Client:	**Landmark Environmental, Inc.**
Client Project Number / P.O.:	**16032.001.001**
Client Project Description:	**Pictured Rock National Park Head Quarters Munising Michig**
Date Samples Received:	**June 9, 2016**
Analysis Type:	**USEPA SW846 3050B / AA (7420)**
Turnaround:	**3-5 Day**
Date Samples Analyzed:	**June 13, 2016**

Client ID Number	Lab ID Number	Reporting Limit (%)	LEAD CONCENTRATION (%)
LBP-1	EM 1646097	0.0035	8.8
LBP-2	EM 1646098	0.0044	4.6
LBP-3	EM 1646099	0.0024	5.5
LBP-4	EM 1646100	0.0027	0.064

*** Unless otherwise noted all quality control samples performed within specifications established by the laboratory.**

Analyst / Data QA:_____ Renee A. Cortez

BRL = Below Reporting Limit

RESERVOIRS ENVIRONMENTAL, INC.

5801 Logan St., Suite 100
Denver CO 80216

TABLE ANALYSIS: LEAD IN SOIL

RES Job Number: **RES 352447-1**
Client: **Landmark Environmental, Inc.**
Client Project Number / P.O.: **16032.001.001**
Client Project Description: **Pictured Rock National Park Head Quarters Munising Michigan Boat House**
Date Samples Received: **June 9, 2016**
Analysis Type: **USEPA SW846 3050B / AA (7420)**
Turnaround: **3-5 Day**
Date Samples Analyzed: **June 13, 2016**

Client ID Number	Lab ID Number	Reporting Limit (mg/kg)	LEAD CONCENTRATION (mg/kg)
LBP-5	EM 1646101	18.2	1,196
LBP-6	EM 1646102	15.9	201

*** Unless otherwise noted all quality control samples performed within specifications established by the laboratory.**

Analyst / Data QA: Renee A. Cortez

BRL = Below Reporting Limit

Due Date: 6-14-16
Due Time: 11:30

Reservoirs Environmental, Inc.

REI LAB

RES 352447

Pager : 303-509-2098

INVOICE TO: (IF DIFFERENT)

Company:	Landmark Environmental, Inc.
Address:	7881 Shaffer Parkway
	Littleton, CO 80127
Project Number and/or P.O. #:	16032.001.001
Project Description/Location:	Pictured Rock National Park Head Quarters, Munising Michigan Boat House

Company:	Same
Address:	

CONTACT INFORMATION:

Contact:	Greg Estes
Phone:	
Fax:	
Cell/pager:	970-373-7928
Final Data Deliverable Email Address:	sdavis@landmarkenviro.com, gestes@landmarkenviro.com

Contact:	
Phone:	
Fax:	
Cell/pager:	

ASBESTOS LABORATORY HOURS: Weekdays: 7am - 7pm

PLM / PCM / TEM ___ RUSH (Same Day) ___ PRIORITY (Next Day) ___STANDARD (Rush PCM = 2hr, TEM = 6hr.)

CHEMISTRY LABORATORY HOURS: Weekdays: 8am - 5pm

(Metals) / Dust ___ RUSH ___ 24 hr. X 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 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) Lead 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: +/-, 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 LBP-1					X																1646097
2 -2																					8
3 -3																					9
4 -4																					100
5 -5																					1
6 -6																					2
7																					
8																					
9																					
#																					

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: 6 (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: Greg Estes 6-9-16 Date/Time: 11:30

Sample Condition: On Ice Yes / No; Sealed Yes / No; Intact (Yes) / No

Temp. (F°) _____

Laboratory Use Only

Received By: [illegible] Date/Time: 6/9 1135am Carrier: hand

Results:				Date	Time	Initials				Date	Time	Initials
	Contact	Phone	Email	Fax				Contact	Phone	Email	Fax			
	Contact	Phone	Email	Fax				Contact	Phone	Email	Fax			

REI LAB **Reservoirs Environmental, Inc.**

June 15, 2016

Laboratory Code:	**RES**
Subcontract Number:	**NA**
Laboratory Report:	**RES 352448-1**
Project # / PO #:	**16032.001.001**
Project Description:	**Pictured Rock National Park Head Quarters, Munising Michigan Life Saving Station NP Headquarters**

Greg Estes
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 American Industrial Hygiene Association, Lab ID 101533 - Accreditation Certificate #480. The laboratory is currently proficient in both IHPAT & ELPAT programs respectively.

Reservoirs has analyzed the following sample(s) using Atomic Absorption Spectroscopy (AAS) / Atomic Emission Spectroscopy - Inductively Coupled Plasma (AES-ICP) per your request. Reported sample results were not blank corrected. The analysis has been completed in general accordance with the appropriate methodology as stated in the analysis table. Results have been sent to your office.

RES 352448-1 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 authorized by the client. The results described in this report only apply to the samples analyzed. 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 should have any questions about this report, please feel free to call me at 303-964-1986.

Sincerely,



Jeanne Spencer
President

RESERVOIRS ENVIRONMENTAL, INC.

5801 Logan St., Suite 100
Denver CO 80216

TABLE ANALYSIS: LEAD IN PAINT

RES Job Number: **RES 352448-1**
Client: **Landmark Environmental, Inc.**
Client Project Number / P.O.: **16032.001.001**
Client Project Description: **Pictured Rock National Park Head Quarters, Munising Michi**
Date Samples Received: **June 9, 2016**
Analysis Type: **USEPA SW846 3050B / AA (7420)**
Turnaround: **3-5 Day**
Date Samples Analyzed: **June 13, 2016**

Client ID Number	Lab ID Number	Reporting Limit (%)	LEAD CONCENTRATION (%)
LBP-1	EM 1646125	0.0024	1.1
LBP-2	EM 1646126	0.0033	0.96
LBP-3	EM 1646127	0.0017	6.1
LBP-4	EM 1646128	0.0024	3.4
LBP-5	EM 1646129	0.0017	2.8
LBP-6	EM 1646130	0.0030	2.7
LBP-7	EM 1646131	0.0023	0.33
LBP-8	EM 1646132	0.0014	0.13
LBP-9	EM 1646133	0.0039	1.8
LBP-10	EM 1646134	0.0019	0.0038
LBP-11	EM 1646135	0.0041	BRL
LBP-12	EM 1646136	0.0028	2.7
LBP-13	EM 1646137	0.0042	24.9
LBP-14	EM 1646138	0.0049	0.13
LBP-15	EM 1646139	0.0035	17.2

*** Unless otherwise noted all quality control samples performed within specifications established by the laboratory.**

Analyst / Data QA: Renee A. Cortez

BRL = Below Reporting Limit

RESERVOIRS ENVIRONMENTAL, INC.

5801 Logan St., Suite 100
Denver CO 80216

TABLE ANALYSIS: LEAD IN SOIL

RES Job Number:	**RES 352448-1**
Client:	**Landmark Environmental, Inc.**
Client Project Number / P.O.:	**16032.001.001**
Client Project Description:	**Pictured Rock National Park Head Quarters, Munising Michigan Life Sa**
Date Samples Received:	**June 9, 2016**
Analysis Type:	**USEPA SW846 3050B / AA (7420)**
Turnaround:	**3-5 Day**
Date Samples Analyzed:	**June 13, 2016**

Client ID Number	Lab ID Number	Reporting Limit (mg/kg)	LEAD CONCENTRATION (mg/kg)
LBP-16	EM 1646140	9.3	929
LBP-17	EM 1646141	14.1	7,268

*** Unless otherwise noted all quality control samples performed within specifications established by the laboratory.**

Analyst / Data QA: Renee A. Cortez

BRL = Below Reporting Limit

Due Date: 6-14-16
Due Time:

Reservoirs Environmental, Inc.

REI LAB

RES 352448

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:	Greg Estes
Phone:	
Fax:	
Cell/pager:	970-373-7928

Contact:	
Phone:	
Fax:	
Cell/pager:	

Project Number and/or P.O. #: 16032.001.001

Project Description/Location: Pictured Rock National Park Head Quarters, Munising Michigan Life Saving Station HP Headquarters

Final Data Deliverable Email Address: sdavis@landmarkenviro.com
gestes@landmarkenviro.com

ASBESTOS LABORATORY HOURS: Weekdays: 7am - 7pm

PLM / PCM / TEM ___ RUSH (Same Day) ___ PRIORITY (Next Day) ___STANDARD
(Rush PCM = 2hr, TEM = 6hr.)

CHEMISTRY LABORATORY HOURS: Weekdays: 8am - 5pm

Metal(s) / Dust ___ RUSH ___ 24 hr. X 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

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) Lead	RCRA 8, TCLP, Welding Fume, Metals Scan	ORGANICS - METH	MICROBIOLOGY: Salmonella: +/-	E.coli O157:H7: +/-	Listeria: +/-	Aerobic Plate Count: +/- or Quantification	E.coli: +/- or Quantification	Coliforms: +/- or Quantification	S.aureus: +/- or Quantification	Y & M: +/- or Quantification	Mold: +/-, Identification, Quantification	SAMPLER'S INITIALS OR OTHER NOTES
				X												

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:

Client sample ID number (Sample ID's must be unique)	Sample Volume (L) / Area	Matrix Code	# Containers	Date Collected mm/dd/yy	Time Collected hh/mm a/p	EM Number (Laboratory Use Only)
1 LBP-1						164025
2 -2						6
3 -3						7
4 -4						8
5 -5						9
6 -6						30
7 -7						1
8 -8						2
9 -9						3
# -10						4

Number of samples received: 17 (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: Greg Estes 6-9-16 Date/Time: 11:30

Laboratory Use Only
Received By: Date/Time: 6/9/16 1135am Carrier: hand

Sample Condition: On Ice Yes / No | Sealed Yes / No | Intact Yes / No
Temp. (F°) ____

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

Appendix I. Live Load Capacity Table

Pictured Rocks: Approximate Floor Live Load Capacities – SYP No. 1					
Building	Floor	Existing Condition		If 1st Floor Joists Sistered	
		Live Load Capacity (psf)	Governing Limitation	Live Load Capacity (psf)	Governing Limitation
Life Saving Station	Attic, Porch Side (l = 11'-4")	0	Posted Load	0	Posted Load
	Attic, Other Side (l = 11'-9")	0	Posted Load	0	Posted Load
	2nd Floor, Porch Side (l = 16'-0")	55	Capacity of 1st Floor Joists on other side of joist	80	Deflection, L/360
	2nd Floor, Other Side (l = 11'-9")	55	Capacity of 1st Floor Joists on other side of joist	80	Capacity of 2nd Floor Joists on Porch side
	1st Floor, Porch Side (l = 13'-10")	100	Public Loading	100	Public Loading
	1st Floor, Other Side supported by interior partition wall (l = 13'-11")	100	Public Loading	100	Public Loading
	1st Floor, Other Side, not supported by interior partition wall (l = 13'-11")	55	Deflection, L/360	100	Public Loading
	Porch (l = 11'-0")	145	Deflection, L/360		
Boat House	Loft Framing – 17' span	95	Deflection, L/240		
	Loft Framing – 21'-6" span	70	Deflection, L/240		

Wood Species Comparison						
Wood Species	Grade	Bending: Fb (psi)	Shear parallel to grain: Fv (psi)	Compression perpendicular to grain: Fc (psi)	Modulus of Elasticity: E (psi)	Specific Gravity: G
Southern Yellow Pine (SYP)	Select Structural	2,850	175	565	1,800,000	0.55
	No. 1	1,850	175	565	1,700,000	0.55
Eastern White Pine	Select Structural	1,250	135	350	1,200,000	0.36
	No. 1	775	135	350	1,100,000	0.36
Spruce Pine Fir (SPF)*						
	No. 1/No.2	875	135	425	1,400,000	0.42

*Assumed by Integrated Design analysis

Appendix J. Bibliography

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Alger County Historical Society
Pictured Rocks National Lakeshore Archive Files

Pictured Rocks National Lakeshore Archive Files
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Lands Files, Box 13, Folder 144.
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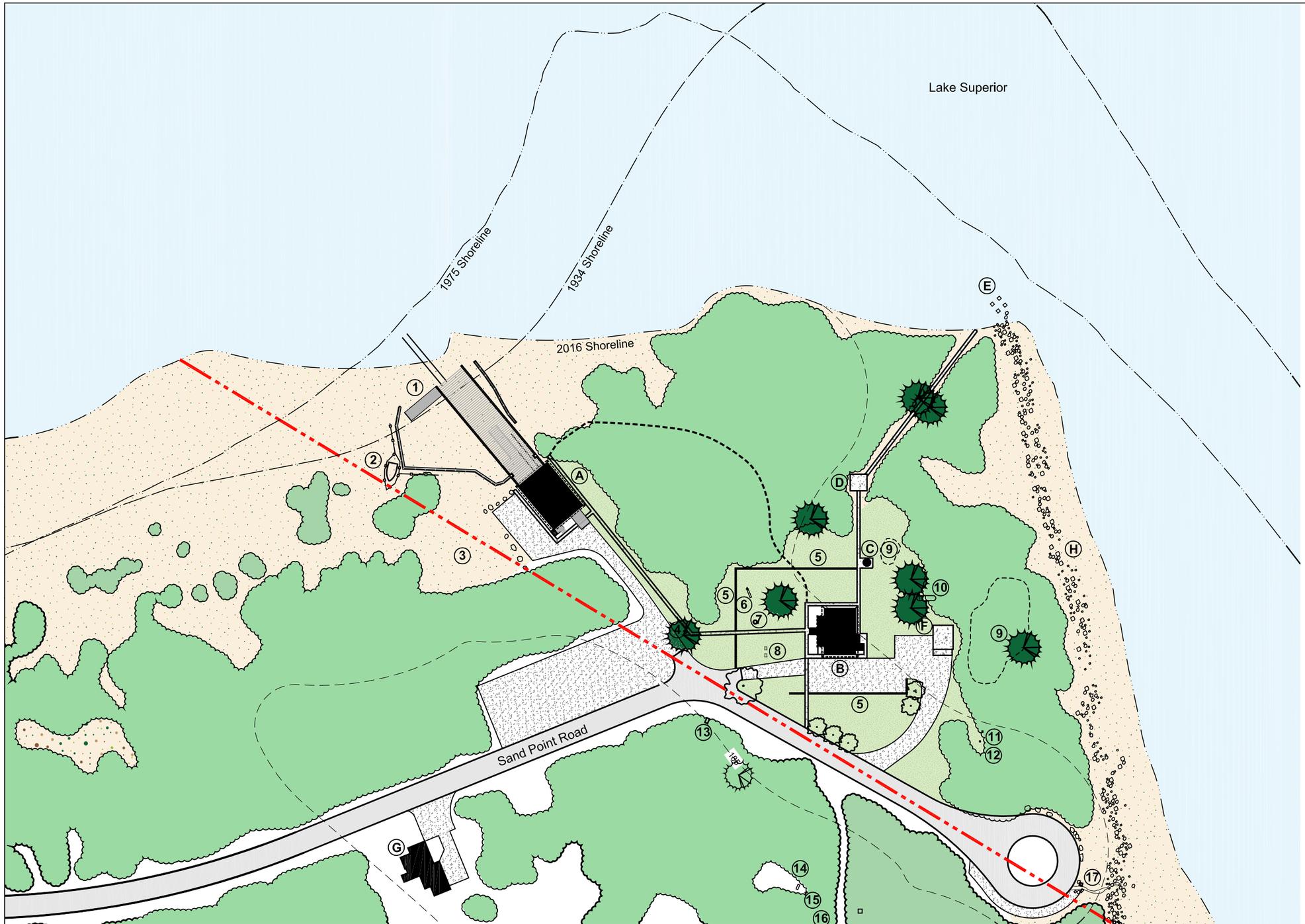
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Appendix K. Site Plans

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Buildings and Structures

- (A) Boathouse & Launchway (HS-08)
- (B) Munising Life Saving Station (HS-01)
- (C) Oil House (HS-02)
- (D) Communication Tower Foundation
- (E) Lookout Tower Foundation
- (F) Garage Foundation
- (G) Smuck Residence (HS-64)
- (H) Stone Revetment

Small Scale Features

- (1) Dock
- (2) Boat Hull
- (3) Current Septic Field
- (4) Interpretive Sign
- (5) Concrete Curb
- (6) Park Sign
- (7) Flagpole
- (8) Sign Remnants
- (9) Former Septic Field
- (10) Propane Tank
- (11) Electric Panel
- (12) Well
- (13) Concrete Pad
- (14) Satellite
- (15) Well
- (16) Remnant Stone Chimney
- (17) Interpretive Sign

W S N E

0 100

1" = 100'-0"

Sources:
Google Maps 2016, 1975 Sand Point Utilities as Maintained, 1984 Maritime Exhibit Sand Point, 1975 Site Analysis, USGS Maps, 2016 MB Field Investigation

DECEMBER 2016

UNITED STATES
DEPARTMENT OF THE INTERIOR
PICTURED ROCKS NATIONAL LAKESHORE
MUNISING, MICHIGAN

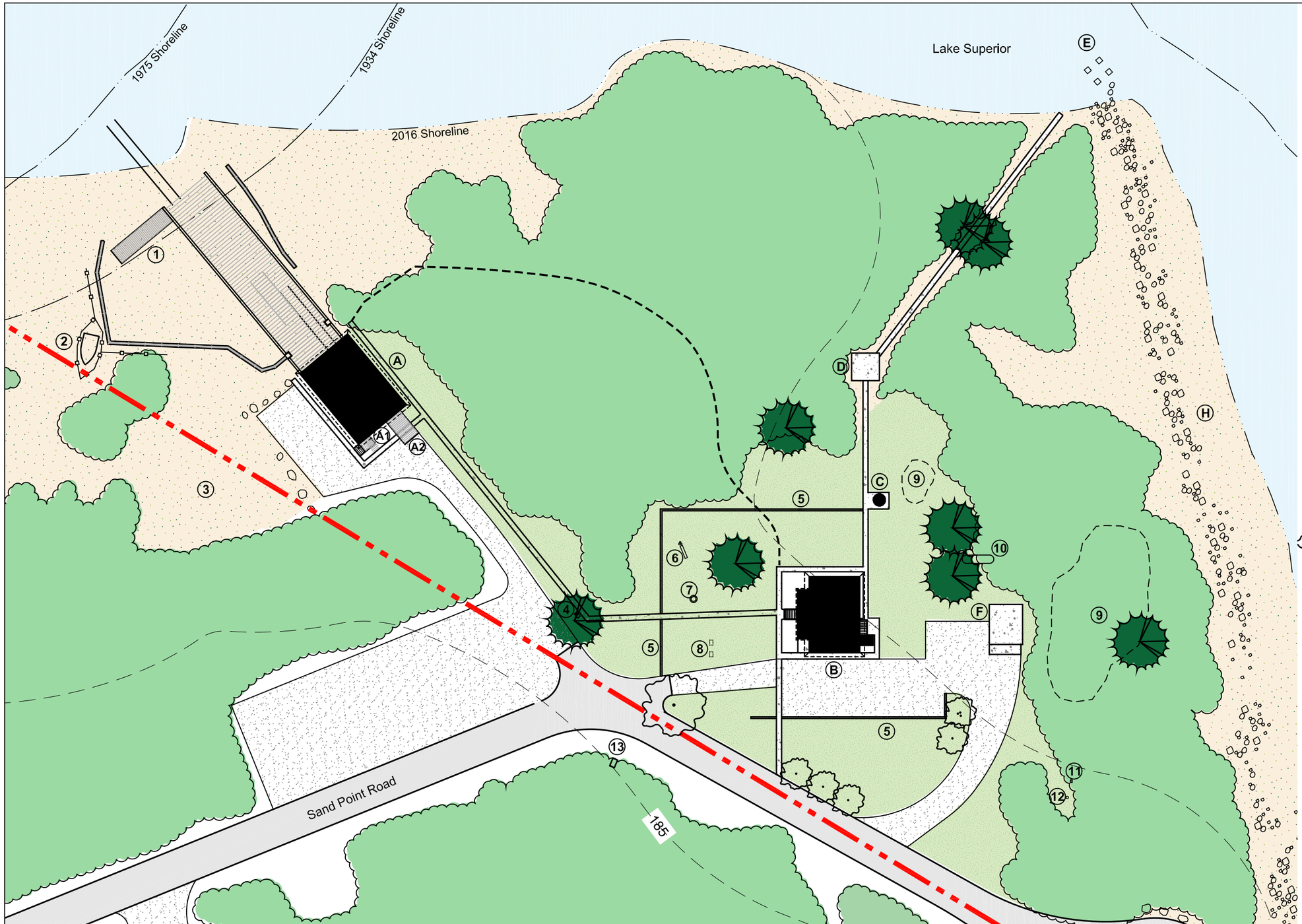
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TITLE OF PROJECT
CULTURAL LANDSCAPE REPORT
AND ENVIRONMENTAL ASSESSMENT

TITLE OF DRAWING
STUDY AREA EXISTING CONDITION PLAN

NAME OF PARK
SAND POINT/MUNISING USCG LIFE SAVING STATION

REGION MIDWEST | COUNTY ALGER | STATE MICHIGAN



LEGEND

- STUDY AREA/ USGC BOUNDARY
- 185 ONE FOOT TOPOGRAPHIC CONTOUR
- BUILDING
- ASPHALT PAVING
- CONCRETE PAVING
- CONCRETE CURB
- GRAVEL PAVING
- 1934 SHORELINE
- 1975 SHORELINE
- 2016 SHORELINE
- STONE REVETMENT
- REMNANT TRAIL
- BOARDWALK
- RAILS
- WOOD DECK
- SPLIT RAIL FENCE
- FLAGPOLE
- BOULDER EDGE
- CONIFER EXTANT FROM PERIOD OF SIGNIFICANCE
- DECIDUOUS TREE
- FOREST VEGETATION
- LAWN
- BEACH GRASS / DUNE VEGETATION

Sources:
Google Maps 2016, 1975 Sand Point Utilities as Maintained, 1984 Maritime Exhibit Sand Point, 1975 Site Analysis, USGS Maps, 2016 MB Field Investigation

Buildings and Structures

- (A) Boathouse & Launchway (HS-08)
  - (A1) Boathouse Stairs
  - (A2) Boathouse Ramp
- (B) Munising Life Saving Station (HS-01)
- (C) Oil House (HS-02)
- (D) Communication Tower Foundation
- (E) Lookout Tower Foundation
- (F) Garage Foundation
- (H) Stone Revetment

Small Scale Features

- (1) Dock
- (2) Boat Hull
- (3) Septic Field
- (4) Interpretive Sign
- (5) Concrete Curb
- (6) Park Sign
- (7) Flagpole
- (8) Sign Remnants
- (9) Former Septic Field
- (10) Propane Tank
- (11) Electric Panel
- (12) Well
- (13) Concrete Pad

W S N E

0 60

1" = 60'-0"

DECEMBER 2016

UNITED STATES
DEPARTMENT OF THE INTERIOR
PICTURED ROCKS NATIONAL LAKESHORE
MUNISING, MICHIGAN

625-135194

TITLE OF PROJECT
CULTURAL LANDSCAPE REPORT
AND ENVIRONMENTAL ASSESSMENT

TITLE OF DRAWING
USCG STATION EXISTING CONDITION PLAN

NAME OF PARK
SAND POINT/MUNISING USCG LIFE SAVING STATION

REGION	COUNTY	STATE
MIDWEST	ALGER	MICHIGAN

Appendix L. FMSS Tables

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FMSS Table

Historic Structure Report				FMSS						
Building	Feature Name	Feature Contribution	HS Number	IN FMSS?	Asset Code	Asset Number	Asset Name	Location Number	Location Name	Comments/Notes
Life Saving Station			HS-01	Y	4100-Building			29613	SP Sand Pt. Park Headquarters HS-01	
	Window	Contributing				1171369	Exterior Window, Fixed, Wood, 47.5IN, 23.5 IN, SP HS-01 Porch	29613	SP Sand PT. Park	
	Roof Drainage	Contributing				1175491	Drain, Other, Metal, 100.0 FT, Gutters & Downspouts	29613	SP San PT Park Headquarters	
	North Stairs	Contributing				1277778	Walkable Structure, 7.0LF, 6.0 FT, Back Stairs	29613	SP Sand Pt. Park Headquarters HS-01	
	Roofing	Contributing				358561	Roof Surface, Shingle-Cedar, HQ Roof Syst.	29613	SP Sand Pt. Park Headquarters HS-01	
	Window	Contributing				358568	Exterior Window, Double Hung, Wood, 54 IN, 64.75 IN, Historic Windows	29613	SP Sand Pt. Park Headquarters HS-01	
	Wall Finish	Non-contributing				358569	Interior Wall Finish-Plywood Paneling	26913	SP Sand Pt. Park Headquarters HS-01	
	Basement Floor	Contributing				358570	Interior Floor- Concrete	29613	SP Sand Pt. Park Headquarters HS-01	
	Door	Contributing				358572	Exterior Door, Wood, Solid, 83 IN, 35.75 IN, Historic Door	29613	SP Sand Pt. Park Headquarters HS-01	
	Wall Finish	Non-contributing				360812	Exterior Finish, Paint Oil Base, Historic	29613	SP Sand Pt. Park Headquarters HS-01	
	Window	Non-contributing				417615	Exterior Window, Sliding, Alum Frame Storm, 36 IN, 40.5 IN, Dormer Windows	29613	SP Sand Pt. Park Headquarters HS-01	
	Window	Contributing				417617	Exterior Window, Double Hung, Wood, 46 IN, 28 IN, Historic Windows	29613	SP Sand Pt. Park Headquarters HS-01	
	Window	Contributing				418326	Exterior Window, Double Hung, Wood, 38 IN, 28.5 IN, historic Windows	29613	SP Sand Pt. Park Headquarters HS-01	

Building	Feature Name	Feature Contribution	HS Number	IN FMSS?	Asset Code	Asset Number	Asset Name	Location Number	Location Name	Comments/Notes
	Window	Contributing				418335	Exterior Window, Double Hung, Wood, 54 IN, 28.5 IN, Historic Windows	29613	SP Sand Pt. Park Headquarters HS-01	
	Window	Contributing				418337	Exterior Window, Double Hung, Wood, 62.5 IN, 35 IN, historic Windows	29613	SP Sand Pt. Park Headquarters HS-01	
	Window	Non-contributing				418339	Exterior Window, Double Hung, Alum Frame Storm, 54 IN, 34.75 IN, Non Historic	29613	SP Sand Pt. Park Headquarters HS-01	
	Window	Non-contributing				418340	Exterior Window, Double Hung, Alum Frame Storm, 46 IN, 28 IN, Non Historic	29613	SP Sand Pt. Park Headquarters HS-01	
	Window	Non-contributing				418341	Exterior Window, Double Hung, Alum Frame Storm, 38 In, 28.5 IN, non Historic	29613	SP Sand Pt. Park Headquarters HS-01	
	Window	Non-contributing				418342	Exterior Window, Double Hung, Alum Frame Storm, 54 In, 28.5 IN, non Historic	29613	SP Sand Pt. Park Headquarters HS-01	
	Window	Non-contributing				418366	Exterior Window, Double Hung, Alum Frame Storm, 62.5 IN, 35 IN, Non Historic	29613	SP Sand Pt. Park Headquarters HS-01	
	Door	Contributing				418370	Interior Door, Wood	29613	SP Sand Pt. Park Headquarters HS-01	
	Door	Contributing				418372	Exterior Door, Wood, Standard, Solid, 86 IN, 32 IN, Historic Door	29613	SP Sand Pt. Park Headquarters HS-01	
	Door	Contributing				418378	Exterior Door, Wood, Standard, Solid, 76 IN, 35.5 IN, Historic Door	29613	SP Sand Pt. Park Headquarters HS-01	
	Door	Non-contributing				418394	Exterior Door, Aluminum, Storm, Solid, 86 IN, 32 IN, Non Historic	29613	SP Sand Pt. Park Headquarters HS-01	
	Door	Non-contributing				418422	Exterior Door, Aluminum, Storm, Solid, 83 IN, 35.75 IN, Non Historic	29613	SP Sand Pt. Park Headquarters HS-01	

Building	Feature Name	Feature Contribution	HS Number	IN FMSS?	Asset Code	Asset Number	Asset Name	Location Number	Location Name	Comments/Notes
	Door	Contributing				418430	Exterior Door, Wood, Other, Solid, 60 IN, 40 IN, Non Historic	29613	SP Sand Pt. Park Headquarters HS-01	
	Door	Contributing				418442	Exterior Door, Wood, Other, Solid, 60 IN, 40 IN, Historic Door	29613	SP Sand Pt. Park Headquarters HS-01	
	Chimney	Contributing					Chimney, Brick		SP Sand Pt. Park Headquarters HS-01	
	Soffits and Fascia	Contributing					Soffits and Fascia, Wood		SP Sand Pt. Park Headquarters HS-01	
	Foundation Walls	Contributing					Foundation Walls, Concrete		SP Sand Pt. Park Headquarters HS-01	
	Wall Finish	Contributing					Exterior Walls, Wood Shingle		SP Sand Pt. Park Headquarters HS-01	
	Exterior Trim	Contributing					Exterior Trim, Wood		SP Sand Pt. Park Headquarters HS-01	
	South Porch	Contributing					South Porch, Wood		SP Sand Pt. Park Headquarters HS-01	
	Interior Ceilings	Contributing					Interior Ceilings, Plaster		SP Sand Pt. Park Headquarters HS-01	
	Interior Walls	Contributing					Interior Walls, Plaster		SP Sand Pt. Park Headquarters HS-01	
	Interior Trim	Contributing					Interior Trim, Wood		SP Sand Pt. Park Headquarters HS-01	
	Wall Finish	Non-contributing					Interior Finish, Paint, Latex		SP Sand Pt. Park Headquarters HS-01	
	Stairs- 1st Floor to Ba	Contributing					Walkable Structure, Interior Stairs, Wood		SP Sand Pt. Park Headquarters HS-01	
	Stairs- 1st Floor to 2n	Contributing					Walkable Structure, Interior Stairs, Wood		SP Sand Pt. Park Headquarters HS-01	
	South Staris	Contributing					Walkable Structure, Front Stairs, Wood		SP Sand Pt. Park Headquarters HS-01	
	Ceiling Finish	Non-contributing					Interior Finish, Paint, Latex		SP Sand Pt. Park Headquarters HS-01	
Boathouse			HS-08	Y	4100 - Building			29614	SP Sand Pt. Boat House HS-08	
	Launchway	Contributing		Y	6300-Marina / Waterfront System	1180288	Traffic Surface, Surface, 28 FT, 40 FT, Boat Ramp	29625	SP Sand Pt. Beach Waterway Launch Area	
	Roofing	Contributing					Roof Surface, Wood		SP Sand Pt. Beach Waterway Launch Area	
	Soffits and Fascia	Contributing					Soffits and Fascia, Wood		SP Sand Pt. Beach Waterway Launch Area	
	Wall Finish	Contributing					Exterior Wall Finish, Shingle, Wood		SP Sand Pt. Beach Waterway Launch Area	
	East Ramp	Non-Contributing					Walkable Structure, Exterior Ramp, Wood		SP Sand Pt. Beach Waterway Launch Area	

Building	Feature Name	Feature Contribution	HS Number	IN FMSS?	Asset Code	Asset Number	Asset Name	Location Number	Location Name	Comments/Notes
	East Stair	Non-Contributing					Walkable Structure, Exterior Stair, Wood		SP Sand Pt. Beach Waterway Launch Area	
	Windows	Contributing					Exterior Windows, Double Hung, Wood, Historic		SP Sand Pt. Beach Waterway Launch Area	
	Door	Contributing					Exterior Door, Wood, Historic		SP Sand Pt. Beach Waterway Launch Area	
	Floor Finish	Contributing					Interior Flooring, Wood, Historic		SP Sand Pt. Beach Waterway Launch Area	
	Door	Contributing					Exterior Doors, Coiling, Metal, Historic		SP Sand Pt. Beach Waterway Launch Area	
	Door	Contributing					Exterior Doors, Overhead, Wood, Historic		SP Sand Pt. Beach Waterway Launch Area	
	Wall Finish	Non-Contributing					Exterior Finish, Paint, Latex		SP Sand Pt. Beach Waterway Launch Area	
Oil House		Contributing	HS-02	Y	4100 - Building			29614	SP Sand Pt. Oil House HS-02	
	Roofing	Contributing					Roof Structure, Metal, Historic		SP Sand Pt. Oil House HS-02	
	Exterior Walls	Contributing					Exterior Wall, Metal, Historic		SP Sand Pt. Oil House HS-02	
	Exterior Door	Contributing					Exterior Door, Metal, Historic		SP Sand Pt. Oil House HS-02	
	Wall Finish	Non- Contributing					Exterior Finish, Paint, Oil Based		SP Sand Pt. Oil House HS-02	
	Roof Finish	Non- Contributing					Exterior Finish, Paint, Oil Based		SP Sand Pt. Oil House HS-02	



SAND POINT/MUNISING USCG LIFE SAVING STATION, PICTURED ROCKS NATIONAL LAKESHORE
Historic Structure Report

2017