

## OLD MICHIGAN ISLAND LIGHTHOUSE

### Chronology of Alterations and Use

#### *Original Construction*

The Old Michigan Island Lighthouse was constructed in 1856, at a cost of \$12,000 (triple the original budget) and was put into service in June, 1857. Original plans for the building reflect the building much as it is today. Variations in the interior layout are fairly minor and probably represent builder preferences as well as later reconfigurations. Of note is the one-story, shed-roofed room at the north end of the quarters, called out as the “laundry” on the 1856 plans. Although there is some discussion in extant documentation about its enclosure, early photographs record this portion of the quarters as an enclosed structure. Physical evidence indicates that its most recent use was as the kitchen.

After operating only one year, the lighthouse was abandoned until the late 1860s when it was relit to support increased shipping traffic. During this period of neglect, the quarters and tower fell into disrepair and were the targets of scavengers. Reestablishing the Lighthouse required extensive rehabilitation that included new windows, doors and trim and repairs to interior finishes. Although it appears that sometime during the ensuing years, the tower’s wood, circular staircase was replaced by cast iron, there is no further record of alteration until 1914, when dormers were added to the east and west elevations of the second floor.

In 1929, the light was decommissioned permanently when the new, Second Tower was erected and put into service. The quarters, however, shared in the site’s transformation and experienced its second major rehabilitation as it became the home for the Assistant Keeper. The 1929 rehabilitation drawings show elevations for an extension of the kitchen’s shed roof to provide shelter for the exterior kitchen stairs (unknown if it was built) as well as changes to the floor plan with the installation of an interior bath in the watch room (Historic Drawings MI-07 and 08).

A 1904, circa 1910, and a 1913 photo each show the Old Lighthouse without dormers and document the Shed and Privy (Historic Image MI-01, 02, and 03). A 1913 photo shows a board and batten boathouse and dock in the foreground with the tower and quarters in the background. The boathouse and dock no longer exist (Historic Image MI-04). A 1975 photo reveals the windows without shutters, suggesting they were being rehabilitated at this time or had been removed (Historic Image MI-15). A 1976 photo shows the shutters back on and in-use, as the house currently looks to most visitors. The shutters are most likely in-kind replacements (Historic Image MI-16).

#### *Significant Alterations / Current Condition*

Significant alterations to the Old Michigan Island Lighthouse consist of: the work that occurred in the late 1860s after it had been abandoned for a number of years (described in the 1869 Letter from W.F. Reynolds, Lighthouse Engineer, to Rear Admiral W. B. Shubrick); in 1914 when the dormers on the east and west elevations were installed (construction drawings from the APIS Archives); and in 1929 when the Second Tower and Keepers Quarters were completed. The 1929 alterations included a modernization of the kitchen appliances and new cabinetry, the installation of new base trim (the same used in the Keepers Quarters) and the addition of linoleum flooring and possibly carpet flooring. These alterations were made for the building’s new residents, the assistant keeper, and his family.

The majority of the mechanical systems were installed during the 1929 remodel with additional work to the sewer and septic system completed in 1932.

1  
2 Electrical wiring and equipment was retrofitted into the building in 1929 when the building was remodeled.  
3 Code compliance would have been regulated by the National Electrical Code of 1928. The National  
4 Electrical Code has changed over the years, and although the provisions of the NEC of 1928 were followed,  
5 most system requirements have changed significantly since then.  
6

7 Between 1998 and 2009, the Historic Structure Preservation Team of the Park Service rehabilitated the Old  
8 Michigan Island Lighthouse by trying to mitigated the bat infestation (unfortunately, bats are still  
9 inhabiting the structure), repairing deteriorated sections of the roof and soffits, installing caps on the  
10 chimneys, adding basement ventilation louvers, and reparging and painting the exterior masonry tower  
11 section.  
12

13 The Old Michigan Island Lighthouse is in stable condition. There are areas in the second floor ceiling  
14 finish that are deteriorated or missing and the attic is visible. Some of this damage is due to the bat  
15 infestation that is still a problem. The moisture levels in the first floor framing were measured above 30%  
16 and this will lead to deterioration of the wood.  
17  
18  
19

## 1 Summary of Documented Work on the Building

Date	Work Described	Source of Information
Annual Report of 1869	"The light here, discontinued and abandoned since 1858, was put in operation again on the 15th of September last. The repairs required amounted to but little less than rebuilding it."	"1869 Annual Report of the Lighthouse Board," Michigan Island Light in annual reports 1850–1920
c.1869 (stated in March)	New "summer kitchen" added to Quarters	1869 Letter of Alterations
c.1869 (stated in March)	New "wood-shed" added to Quarters	1869 Letter of Alterations
c.1869 (stated in March)	New doors and windows	1869 Letter of Alterations
c.1869 (stated in March)	Privy built	1869 Letter of Alterations
c.1869 (stated in March)	Roof fitted with projecting eaves and new shingles	1869 Letter of Alterations
c.1869 (stated in March)	New wooden sash for tower windows	1869 Letter of Alterations
c.1869 (stated in March)	Wooden Tower stair repaired	1869 Letter of Alterations
c.1869 (stated in March)	New lantern installed with 14-foot-diameter cast iron deckplate	1869 Letter of Alterations
1881	Sidewalks laid from the Lighthouse to the Privy	1881 District Engineer Letter
1914	Dormers added to east and west elevations	1914 Michigan Island Elevations
1927, April 18	"Repaired walls with plaster in Assistant's room and hallway."	E. Lane, MI Log, Nov 23, 1926–Aug 19, 1936
1927, June 24	"Repaired Tower window frame, and put in three panes of glass. All was broken when window was torn from Tower [due to storm]"	E. Lane, MI Log, Nov 23, 1926–Aug 19, 1936
1927, August 25	"Varnished Tower stairway, and repaired walk at back of house."	E. Lane, MI Log, Nov 23, 1926–Aug 19, 1936
1928, May 1	"Painted in Lantern. Whitewashed dwelling; painted window blinds, doorstep; and varnished linoleum in hallway."	E. Lane, MI Log, Nov 23, 1926–Aug 19, 1936
1928, May 24	"Laid floor in Assistant's place. Put on screen doors and windows; and painted window sills."	E. Lane, MI Log, Nov 23, 1926–Aug 19, 1936
1929	Second Tower and Keepers Quarters completed, Old Quarters altered for Assistant Keeper with new asbestos shingle roofing, new gutters and raising of the Kitchen shed's floor and ceiling	Floor Plan Alterations, c.1929
1929	New kerosene water heater installed in the kitchen to supply hot water to the bath and kitchen	Floor Plan Alterations, c.1929
1930, Sept 4	"Putting asbestos covering on pipes in Assistant's dwelling [Old Lighthouse Quarters]..."	E. Lane, MI Log, Nov 23, 1926–Aug 19, 1936
1932, August	Aug 18: "Worked in Assistant Keeper's dwelling putting in sewer and finished job this evening."	E. Lane, MI Log, Nov 23, 1926–Aug 19, 1936
1933, May 8	"Replaced four frames of glass in First Assistant's dwelling."	E. Lane, MI Log, Nov 23, 1926–Aug 19, 1936
1933, Oct 24	"Snow broke eaves on Assistant's house. Repaired same."	E. Lane, MI Log, Nov 23, 1926–Aug 19, 1936
1974	Shutters installed on Old Lighthouse	APIS/NPS Business Office File D3423
1975	Stabilization of Old Lighthouse	APIS/NPS Business Office File D3423
1976	Repair drainage at Old Lighthouse	APIS/NPS Business Office File D3423
1976, August 12	Whitewashed Lighthouse	From "Excerpts from Michigan Island

Date	Work Described	Source of Information
		Volunteer Logs- 1978–1999,” page 1
1979	Repoint and paint exterior wall of the Old Lighthouse	APIS/NPS Business Office File D3423
1981, August 12	“The roofing is continuing to move right along.” (Sue Osman with Chris Vetta)	From “Excerpts from Michigan Island Volunteer Logs- 1978–1999,” page 3
1984, August 22	Fan in basement of Quarters installed	From “Excerpts from Michigan Island Volunteer Logs- 1978–1999,” page 6
1985, June 14	Mention of “‘Dickson Meter’ humidity observation system” (Terry Blomberg, VIP)	From “Excerpts from Michigan Island Volunteer Logs- 1978–1999,” page 7
1988, June 27	...4 archeologists arrived. They are digging to find if the water (moisture) mitigation team will do any damage to the archeological history of the 1857 Lighthouse.” (Hazel Keller, VIP)	From “Excerpts from Michigan Island Volunteer Logs- 1978–1999,” page 12
1988–1989	Moisture mitigation	From “Excerpts from Michigan Island Volunteer Logs- 1978–1999,” page 14
1991, July 1	Basement has 4” of standing water	From “Excerpts from Michigan Island Volunteer Logs- 1978–1999,” page 18
1994, September 1-2	Asbestos crew removes asbestos in basement of Keepers Quarters and Old Quarters	From “Excerpts from Michigan Island Volunteer Logs- 1978–1999,” page 22
1998, July to 1999, August	Exterior of quarters and tower painted and rehabilitated; interior cleaned and all equipment and material removed	HSPT Reports, 2009 and From “Excerpts from Michigan Island Volunteer Logs- 1978–1999,” pages 24-25

### Notable Actions with Unknown Dates

Date Range	Work Described
1856-1869	Six windows with 12 lites each, 8” by 10” dimension, stone headers and sills, installed in Lighthouse
1856-1869	6’ by 3’ door with stone header and threshold, installed in Lighthouse
1856-1869	Sewer installed
1856-1869	Lightning rod of ½” copper, extended 4’ above the lantern and 4’ into the ground
1998–2009	Mitigated bat infestation
1998–2009	Repaired deteriorated sections of roof and soffits
1998–2009	Capped chimneys
1998–2009	Added basement ventilation louvers

### General Physical Description

The Old Michigan Island Lighthouse is a one-and-a-half story masonry building with a gable roof, two gable dormers on either side of the ridge and two brick chimneys at the north end on either side of the ridge, and a single story shed roof at the north end with the light tower on the south end, closest to the lake. There are three rooms on the first floor and two rooms on the second floor.

### Physical Description – Architecture

#### Architecture – Roof

The existing roofing consists of asbestos shingles, 9” wide × 7” exposure, and metal, possibly galvanized, flashing c. 1929. The 1929 alteration drawings specify asbestos shingles by Ambler Asbestos Slate and Sheathing Company. These drawings also call for “felt roofing” at the north Shed (possibly due to the shallower roof pitch), however, it appears that the same asbestos shingles were installed throughout. There

1 is a curved trim piece at the ridge of the main gable and dormers. There is also a step flashing at the  
 2 chimneys and metal flashing at the valleys of the dormers. There is no flashing visible at the dormer  
 3 wall/roof juncture, but it could be concealed beneath wall shingles (MI-OLH-06).

5 The original roofing was likely wood shingle due to the use of open-spaced sheathing (now filled in with  
 6 blocking) and as visible in photos as early as circa 1900.

8 The eave wood trim consists of raked soffit extending  $\pm 1'2''$  at the main roof,  $\pm 8''$  at the dormers and shed  
 9 roof, with a 1x fascia and frieze board, all painted. Records from the park indicate soffit repair work within  
 10 the past 11 years. Two paint samples were taken at the frieze boards – one from the main gable roof and the  
 11 other from the kitchen shed roof. The main gable roof trim has six layers of paint, the oldest having  
 12 separated from the wood substrate, while the shed roof trim has only two layers of latex paint, like the  
 13 shutters. Rehabilitation of the trim may have occurred around the time of the installation of the shutters in  
 14 1974.

#### 17 *Architecture – Gutters and Downspouts*

18 No gutter and downspout system currently exists, however historic photos circa 1904, 1910 and after the  
 19 dormer construction of 1914, indicate a Yankee gutter at least on the west facing roof (Historic Images  
 20 MI-01, MI-02, and MI-05). The Yankee gutter slopes to dump into the east side cistern. The 1929 alteration  
 21 drawings called for a new galvanized box gutter and downspout system to drain into a clay pipe underdrain.  
 22 An undated color photo shows a gutter and downspout, so it is assumed the gutter system was installed,  
 23 although it is unknown if the underdrain was installed.

#### 26 *Architecture – Chimneys*

27 There are two original brick chimneys flanking either side of the ridge of the main gable. The east chimney  
 28 may have had a parge coating applied at the time as it is a whitish color versus the clear red brick coloration  
 29 of the west chimney. There are bricks located in the west second floor bedroom near the west chimney that  
 30 suggest recent masonry work. A cap of galvanized sheet metal and what appears to be one of the composite  
 31 replacement roof shingles have been installed at both chimneys (MI-OLH-06).

#### 34 *Architecture – Exterior Walls*

35 The original exterior walls are rubble stone with a white-washed parge coat finish. The north one-story  
 36 shed has brick “quoins” at corners, north door, and east window openings (not at west window). In 1998,  
 37 the exterior of the tower was repainted with Liquitex previous paint layers, which were not stripped.  
 38 Additionally, an alternate test patch of coating (stain) was documented and applied by the park staff and  
 39 appears to be holding up better than the Liquitex paint. The walls in general have peeling paint and staining at  
 40 the base, which is partly due to no control of the roof drainage. The interior humidity may also be contributing  
 41 to masonry damage at the Lighthouse Tower.

#### 44 *Architecture – Dormers*

45 There are two wood-framed gable dormers at the second floor level projecting from the roof plane - one  
 46 facing west, the other facing east. The dormers' exterior walls on the north and south appear to be asbestos  
 47 shingles. The shingles above the windows are wood that appear to be a contemporary treatment. The  
 48 dormers are not original, but are historic as they were added to the house in 1914 (MI-OLH-06, 07, 08, and  
 49 09).

*Architecture – Windows*

**Six-Over-Six Lites, Double Hung.** These windows are located on the first floor of the Lighthouse quarters (excluding the kitchen). This window type appears to have a replaced sash with reused original panes (where available). The profile of the muntins is very simple – shallow bevel with no detail. There is no evidence of original hardware. The windows have wood shutters at the exterior (two panels each), 3” wood sills, and segmented brick arch headers. (A paint sample was taken of the wood shutters and the results indicate that the shutters are not original as both layers of paint are latex.) The 1x exterior trim is painted green, while the interior trim is painted white. The interior trim matches the original, decorative interior door trim. Wood sills are 1” wood with simple 1x5 skirts. There is roller shade hanger hardware at most of the windows and some roller shades located in the window seat on the second floor. The typical dimension of these double hung windows is 2’10” × 4’6”.

**Four-Over-Four Lites, Double Hung.** These windows are located on the first floor, in the kitchen, and on the second floor in the north and south walls. This type of window appears to have a replaced sash with reused original panes (where available). The profile of the muntins is very simple – shallow bevel with no detail. There is no evidence of original hardware. The windows have wood shutters at the exterior (two panels each), 3” wood sills, and segmented brick arch headers. The 1x exterior trim is painted green, while the interior trim is painted white. Wood sills are 1” wood with simple 1x5 skirts. There is roller shade hanger hardware at most of the windows and some roller shades located in the window seat on the second floor. The typical dimension for these double hung windows is 2’0” × 4’6”.

**Eight-Over-One Lites, Double Hung (Paired).** These windows are located on the second floor in the 1914 addition dormers. The muntins have a shaped profile. Operation is controlled by sash cord and pulleys. One window has the original thumb-turn latch at the meeting rail. The windows have plywood panels covering the exterior, painted green. They also have 1x exterior trim painted green, while the interior trim is painted white. The interior trim is 1x. Interior sills are 1” with 1x5 skirts. There is roller shade hanger hardware at most of the windows and some roller shades located in the window seat on the second floor. The typical dimension of a pair is 2’6” × 3’0” (MI-OLH-29 and 31).

**Two Leaf, Three-Lite Casements.** These windows are located in the Lighthouse Tower and have metal frames with wood sash. This window type appears to have replacement sash with reused original panes (where available). The sash has a simple beveled profile at the muntins. The interior trim and frame is painted. The typical dimension for a pair is 2’2” by 3’0”. (A paint sample from the window was taken and reveals multiple layers of whitewash, like the tower walls) (MI-OLH-34).

*Architecture – Exterior Doors*

**Main Entry Door.** This door is a four panel wood door with a two-lite transom. Both are deeply recessed into the exterior wall set at the plane of the interior of the wall. The masonry opening is arched. Hardware is comprised of the original knob with integral key on a mortised plate at the interior face, separate dead bolt keyed on the exterior/ thumb turn at the interior face, and three hinges. The exterior trim of the door and transom are 1x wood and the interior trim is decorative (an ogee profile with beaded edge, 5½” wide). The door and transom are painted green on the exterior and white on the interior. There is evidence of a possible screen door (notches and hardware holes), which is seen in a historic photo circa 1914. The cast concrete sill is sloped toward the exterior and the 1x threshold is beveled wood. The door is 2’8” × 6’9” × 1¾” (MI-OLH-12).

**Kitchen Entry Door.** This door is a four-panel wood door deeply recessed into the exterior wall. The upper panels are original glass. Hardware is comprised of the original knob with integral key on a mortised plate at the interior face, separate dead bolt that is keyed on the exterior/ thumb turn at the interior face, and

three hinges. The exterior mortised plate is decorative with raised “BLW” initials. There is a padlock on the door. The exterior trim is 1x wood with a decorative, shaped, 1x stop at the door face. The exterior trim is green while the exterior frame, door, and interior door and trim is white. The interior trim is  $\frac{3}{4}$ ” by  $4\frac{1}{2}$ ”. The sill is 4x full width and depth and the threshold is 1x wood (beveled). There are three wood steps up to the door (MI-OLH-13).

#### *Architecture – Exterior Trim*

Refer to roof section.

#### *Architecture – Tower Walk, Railing, Roof, and Finial*

The walkway is 3” to  $3\frac{1}{2}$ ” wide plate metal. The top rail of the railing is  $\frac{5}{8}$ ”  $\times$   $1\frac{3}{4}$ ” bar stock at 34” above the walk. The bottom rail is  $\frac{3}{8}$ ”  $\times$   $2\frac{1}{4}$ ” bar stock at  $9\frac{1}{2}$ ” above the walk. The metal posts are  $1\frac{1}{4}$ ” in diameter with ball finials. The entire assembly is painted black. The roof structure is constructed of segmented cast iron sections, with fascia and a simple ball finial. The finial has air vents which, in combination with the wall openings, provide ventilation at the lantern (MI-OLH-38 and 42).

#### *Architecture – Tower Lantern*

The lantern has a 10-sided base of 3’7” high plate metal. Each segment has recessed panels in a Gothic arch configuration. The typical segment is 2’4” wide and is secured by a  $1\frac{3}{8}$ ”  $\times$  1” triangular stop that is screwed into the 1”  $\times$  2” triangular metal framing member at the interior. The interior finish is 1”  $\times$   $4\frac{1}{2}$ ” tongue and groove wood, oriented vertically, and painted. The glazing continues 3’3” up to the base of the roof and is modern, “Viracon Tempered 16 CFR 1201 11 SGCC 1404  $\frac{1}{4}$ ” U Ansi Z97.1 1984.” The floor of the lantern is cast iron. There are a series of drilled holes of unknown origin. However, they likely currently facilitate the ventilation. There are five openings for the original intake vents but none of the cap controls at the interior are extant (MI-OLH-37).

#### *Architecture – Interior Doors*

**Four-Panel Door (Typical Interior Door).** This door type is four panel, wood, painted, and original (or early) to the building. The trim is also original and is the same as the base trim used in the main rooms. The base trim is  $\frac{7}{8}$ ”  $\times$  5” with a  $2\frac{3}{4}$ ” ogee profiled trim piece overlaid  $\frac{1}{2}$ ” beyond the edge of the base trim. The trim is painted. Hardware is comprised of a metal knob with mortised lockset, and typically includes two hinges. The typical dimensions for this door are 2’-8”  $\times$  6’-7”  $\times$   $1\frac{1}{4}$ ”. The door to the basement is 2’4”  $\times$  6’4”  $\times$   $1\frac{1}{4}$ ” and the second floor bedroom doors are 2’3”  $\times$  6’4”  $\times$   $1\frac{1}{4}$ ”. The opening to the first to second floor stairs is 2’3”  $\times$  6’4” above step, and it has the original trim.

**Five-Panel Door.** These doors are five-panel wood doors with raised panels. The painted trim is also original and is the same as the base trim. It is built-up  $\frac{3}{4}$ ”  $\times$   $4\frac{1}{4}$ ” with rounded edges and the overlay at the outside edge is an L-shaped trim piece (1”  $\times$   $1\frac{1}{8}$ ”  $\times$   $\pm\frac{1}{4}$ ”). Both sides of each door have mortise plates and each door has two ball hinges. The opening between the living room and the dining room has trim that matches this type of door. The entry closet’s door dimensions are 2’0”  $\times$  6’7”  $\times$   $1\frac{1}{4}$ ”. The watch room/bath door is 2’6”  $\times$  6’7”  $\times$   $1\frac{1}{4}$ ”. The second floor closet doors are 2’0”  $\times$  6’4”  $\times$   $1\frac{1}{4}$ ”.

**Metal Door between Light Tower and Quarters.** This plate metal door is original to the building and was at one time painted white. The door is reinforced by  $\frac{1}{2}$ ”  $\times$   $1\frac{1}{2}$ ” bar frame which is riveted to the door. It has a thumb press/lever lift set in a metal angle frame. The door also has two heavy pin hinges. The door is 3’0”  $\times$  7’0”  $\times$   $\pm\frac{1}{8}$ ”.

**Hatch in the Lantern Floor.** This is a metal plate floor hatch original to the Lighthouse Tower. There is a hinged metal catch and two heavy brass hinges. The hatch is 2'0" × 4'0" × 1/4" (MI-OLH-40).

**Access Door to Walkway.** This original door is plate metal with recessed panels in a Gothic arch configuration. The door is painted, has a handle operated with a throw bolt, and has two heavy duty hinges. The door is 2'0" × 2'10" × 1/2" (MI-OLH-41).

#### *Architecture – Wall Finishes*

The typical wall finish in this building is the original plaster over lath, except for the basement which has unpainted masonry walls. The wall finishes for the kitchen, entry to the tower, and the tower itself have plaster over masonry. The entry to the tower has wood board wainscot painted white. The interior recessed doorways in the kitchen have wood bead board framing the entire opening. A paint sample from the tower wall shows that, like the tower windows, the walls have multiple whitewash layers.

A plaster sample from the kitchen indicates that the plaster is a mixture of gypsum and sand, as opposed to lime and sand. The sand is relatively fine and the plaster is very soft.

A plaster sample from the watch room/bath is similar to the plaster mixture from the kitchen with an added very thin skim coat.

A mortar sample from the Lighthouse Tower indicates the mortar was composed of natural cement and sand. The plaster is a tan color, moderately hard, with very fine sand.

A plaster sample from the entry closet plaster is almost identical to the watch room/bath plaster.

#### *Architecture – Ceiling Finishes*

The typical ceiling finish for this building is the original plaster over lath. The kitchen's plaster over lath ceiling finish may have been added after the building was constructed. The finished ceiling was dropped and would have been added when this room's function was changed to a year-round kitchen (MI-OLH-21 and 22). The basement has no ceiling finish as the floor framing for the first floor is exposed. The tower's ceiling finish is the underside of its metal ten-sided roof with its center vent (MI-OLH-39).

#### *Architecture – Interior Trim*

There are three primary types of trim in this building. The most elaborate type is in the entry, dining room, watch room/bath, and the second floor bedrooms. The base trim is 7/8" × 8 1/4" with a 2 3/4" ogee profile at top. The base shoe is rectangular. The door and six-over-six window casings feature the same 2 3/4" ogee profile molding atop a simple rectangular casing. This trim is original to the building (MI-OLH-17).

The second type of trim is a less-elaborate, painted, 8" base with an Ogee profile at the top and a simple quarter-round base-shoe. This trim is in the living room and the kitchen. This trim is most likely not original to the building, but historic as it is the same as the trim in the Keepers Quarters and therefore dates to 1929 (MI-OLH-19).

The third type of trim is the simplest as it is a painted board with base-shoe. The living room closet has this type of trim and it is 8" high. The second floor hall also has this style, but the trim is 4 1/2" high. This type of trim is not historic. The Lighthouse Tower has remnants of a base trim around the floor and along the stairs. These trim remnants may be coated with coal tar, as seen at the Outer Island Tower and mentioned in the "Floor" section below.



A paint sample of the tower trim reveals multiple layers of black paint over multiple layers of whitewash. There are no definitive test results regarding the use of coal tar at this location.

A paint sample from the living room trim revealed 18 layers of paint, all in various shades of white, gray, and green. A paint sample of the newer trim in the living room only revealed one paint layer.

#### *Architecture – Floor*

The visible floors in this building are 2¼” wood flooring, most likely installed at the time of the bath addition in 1929. The original wood floor, however, is constructed of 5½” wide planks, painted gray. This flooring is seen under the second floor window seat in the west bedroom (MI-OLH-30). There is a linoleum square extant in the kitchen and adhesive residue from linoleum or carpeting in the living room and dining room. The living room, dining room, and entry have carpet nail holes in the base-shoes. The basement floor is poured concrete with a gutter composed of rubble and wood boards lining the edges. The tower floor is also poured concrete with remnants of a black, thick-paint substance (possibly coal tar, see Outer Island Tower, Interior Trim for more details) painted on the floor and as a base trim.

#### *Architecture – Stairs*

**Exterior North (Kitchen) Stairs.** These stairs are painted wood with four open risers, 8½” high for bottom three risers and 6” high for top riser. The treads are 11¼” wide and 2’11¼” long. There is no handrail. It is unknown if these stairs are original to the building or historic.

**First Floor to Basement Stairs.** These stairs are painted wood with ten, 8” high risers and 12” wide treads that are 2’-8½” long. The nosing protrusion is 1¼” and there is no handrail. The landing from the first floor door to the first tread is 2’2” long and 2’8½” wide. These stairs are original to the building (MI-OLH-15).

**First Floor to Second Floor Stairs.** These are painted wood stairs with thirteen 8” high risers and 10¼” wide treads that are 2’10” long. The nosing protrusion is 1”. There is a partial handrail located on the second floor with a middle horizontal rail but no spindles. This railing is 2’6” tall and 2’1½” long with the top rail dimensions of 2½” (wide) × 4” (tall) and the middle rail dimensions of 1” × 2”. The distance from the floor to the top of the middle rail is 1’2”. The landing from the first floor to the start of the stairs is 2’3” wide and 3’2½” long. These stairs are original to the building (MI-OLH-27).

**Tower Stairs.** These stairs are cast iron. There are 24 treads to the first landing (½ circle), 18 treads to the second landing (¾ circle), and 15 treads to the lantern level. The risers are 8” high. The tread width goes from 1½” to 11½” and the tread length is 3’3½”. The center pole has a 4” diameter. There are no handrails. These stairs are original to the Lighthouse Tower (MI-OLH-33 and 36).

#### *Architecture – Casework*

**Entry and Closet.** The entry has a painted wood board with hooks. The closet has a wood shelf and rod and a painted hook rack.

**Living Room Closet.** This closet has three existing wood shelves, all painted.

**Kitchen.** The kitchen has a large wood cabinet with a two-door cabinet, two drawers, and a garbage chute on the lower portion and two two-door cabinets on the upper portion. The cabinet was once attached to the north wall but no longer is. Its doors are made of bead board. The cabinet is painted white. The knobs on the doors are brass push button catch knobs, (possibly “Handy Catch” by Keil, New York) and the cabinet has butterfly hinges (each door has two) (MI-OLH-24).

**Dining Room and Closet.** The dining room has a painted wood board between the windows. The closet has a painted wood board and a 9½" wide × 6½" deep unpainted wood shaft in the northeast corner, which is modern.

**Lighthouse Tower.** The Tower has two wood vertical panel doors, painted white, connected by a hollow passage inside the wall to another smaller opening below. This was used for the clock mechanism that rotated the lens (MI-OLH-35). There is also a wood cabinet with two doors, painted white, made of vertical board, with the stamp, "Danger, Alcohol Storage, Do Not Light."

**Second Floor Hall Closet.** The hall closet has a 3" stained wood hook board.

**Second Floor West Bedroom and Closet.** This bedroom has two 2" painted wood boards.

**Second Floor East Bedroom.** This bedroom has one 2" painted wood board.

#### *Architecture – Accessibility*

The building is currently not accessible. The west door opening (main entry) is 2'7¾" clear with a grade to finished floor elevation change of 1'0" and consists of one step. The north door opening (kitchen entry) is 2'7" clear with a grade to finish floor elevation change of 2'7¾" and consists of four steps. Within the building, the first floor elevation is consistent to the kitchen due to the 1928–1929 remodel. The opening between the living and dining rooms allows accessibility. It appears that the bathroom door is not wide enough for accessibility. The basement, upper level and tower are not accessible.

#### *Physical Description – Structural*

##### *Structural – Foundation*

The perimeter foundation system consists of stone masonry. The interior foundations are covered by a concrete slab-on-grade in the basement and the lighthouse and could not be observed.

##### *Structural – Floor Framing*

Where accessible, the first floor framing of the main building was measured to be full-sawn (FS) 2x10 joists spaced at about 16'. The joists span approximately 12½' and are sheathed with solid wood subflooring. The joists are supported on the perimeter foundation walls and FS 10x10 beams. The 10x10 beams span approximately 6', 9', and 11'. The beams are supported on the perimeter foundation walls and on two 8" diameter timber columns that bear on 2x wood plates placed directly on the concrete floor slab.

Where accessible, the second floor framing was measured to be FS 2x8 joists spaced at about 16'. The joists span approximately 12½' and are sheathed with solid wood subflooring. The joists are supported on wood-framed partition walls that are primarily framed with FS 2x4 studs and the exterior masonry walls.

The original stepped down floor framing of the kitchen could not be measured at the only access point in the basement, but appeared to be FS joists spaced at about 16'. The joists span approximately 11'. The joists are supported on the perimeter foundation and are sheathed with one layer of 1x solid wood subflooring and one layer of 1x solid wood flooring. The original stepped down floor is over-framed with 2x wood joists spaced at about 16" that may have been added in 1929. The joists bear directly on the original floor and appear to be sheathed with solid wood subflooring.

1 The floor of the lighthouse lantern is constructed of cast iron plates that are bolted together. The plates are  
2 supported on the masonry walls of the tower. The floor is accessed via a spiral cast iron stair from the first  
3 floor of the main building.

4  
5  
6 *Structural – Roof Framing*

7 The roof framing of the main building was measured to be FS 2x6 rafters spaced at about 16". The rafters  
8 span approximately 11'. The rafters are supported on the exterior masonry walls, second floor interior  
9 partition walls and FS 8x6 beams approximately midway between the ridge and eaves. The rafters are  
10 sheathed with spaced solid wood underlayment. The spaces between the solid wood underlayment have  
11 been filled with wood blocking. This was probably done in the past when new roofing was installed.

12  
13 The roof framing of the Kitchen was measured to be FS 3x5 rafters spaced at about 25". The rafters span  
14 approximately 11'. The rafters are supported on the exterior masonry walls and the masonry wall between  
15 the main building and the kitchen. The rafters are sheathed with solid wood underlayment.

16  
17 The roof of the lighthouse lantern is constructed of cast iron panels that are bolted together. The panels are  
18 supported on the walls of the lantern.

19  
20  
21 *Structural – Ceiling Framing*

22 The ceiling framing of the second floor was measured to be FS 2x4 joists spaced at about 16". The joists  
23 span approximately 16'. The ceiling joists are supported on the roof rafters and the interior partition wall.

24  
25 The ceiling framing of the kitchen was measured to be FS 2x4 joists spaced at about 20". The joists span  
26 approximately 11'. The joists are supported on the exterior masonry walls and the masonry wall between  
27 the main building and the kitchen.

28  
29  
30 *Structural – Wall Framing*

31 The exterior walls of the tower, main building and kitchen are constructed of stone masonry. The kitchen  
32 walls are accented with brick masonry. The original interior walls are framed with FS 2x4 studs. Interior  
33 walls added during renovations are framed with 2x4 studs.

34  
35 The walls of the lighthouse lantern are cast iron panels that are bolted together. The panels bear directly on  
36 the floor of the lantern.

37  
38  
39 *Structural – Lateral System*

40 Lateral stability for the building is provided by the exterior masonry walls.

41  
42  
43 *Structural – Load Requirements*

44 The required floor load capacity of the watch room and Lighthouse quarters is 40 pounds per square foot  
45 (psf), the required lantern floor load capacity is 50 psf. The required ceiling live load capacity is 10 psf (no  
46 storage is allowed).

## ***Physical Description – Mechanical***

### ***Mechanical – Plumbing Systems***

A galvanized steel domestic water supply pipe from a surface water system enters the building at the basement level with distribution piping in the basement and crawlspace to the bath and kitchen above. The water system in the building is no longer active. The 1929 remodel provided a kerosene water heater in the kitchen to supply hot water to the bath and kitchen sink. The water heater is no longer in place. However, galvanized steel piping stubs remain through the floor of the kitchen. An abandoned cistern is located to the northeast of the building. The 5' × 8' × 8' cistern was installed in 1881. The cistern has been filled with old asbestos shingles.

The building waste lines are cast iron and connect to a 4" cast iron sewer main that exits the building below grade at the southeast corner of the basement. This 4" line connects to a 6" clay sewer pipe that runs to the west and into a septic tank and leach field located to the southwest of the Power House that serves the entire building complex. The septic tank capacity is approximately 500 gallons.

The plumbing fixtures that remain include a pedestal sink in the kitchen and an enameled cast iron bath tub in the bath. Galvanized steel hot and cold water piping is still in place to the bath tub with shutoff valves in the piping risers. The bath tub faucet is also in place, but the handles have been removed (MI-OLH-46). Galvanized steel hot and cold water piping extends up the wall behind the kitchen sink. The piping has been disconnected from the sink and the faucet for the sink has been removed. The wall mounted bathroom lavatory and tank type toilet have been removed.

### ***Mechanical – HVAC***

The original heating for the building completed in 1856 would likely have been coal burning stoves. All that remains from this era are two brick chimney stacks at the north end of the main house and three circular vent stack openings in the north wall of the first and second floor. The heating system installed in 1929 consists of a cast-iron coal burning Contento No. 6W boiler manufactured by the National Radiator Corporation and located in the living room with galvanized steel piping to cast iron hot water radiators in the dining room, bath, entry hall, and upstairs bedrooms. The system operated as a hot water convection circulation system with a thermal expansion tank located on the second floor (MI-OLH-47). Radiators have been removed in the bath and entry hall. A majority of the heating water distribution piping is still in place. The 6" flue vent from the boiler extends into the west chimney stack. The heating system is no longer active.

Basement ventilation consists of a 15" × 26" louver on the west side of the building. There are no other ventilation systems in the main building. The Lighthouse Tower ventilation consists of passive vents at the top of the tower.

### ***Mechanical – Fire Suppression***

There is no fire suppression system in the building.

## ***Physical Description – Electrical***

### ***Electrical – System Configuration***

Power to the building originally came from the power plant building via underground cable. The underground cable has been abandoned and is no longer observable. At present, there is no power to the building. Service entrance to the building was via a four circuit fuse box located in the basement. There is no main building disconnecting means.

*Electrical – Conductor Insulation*

Branch circuit wiring is of the armored cable construction Type “BX” which is a classification of flexible steel armored outer tube with individual copper conductors insulated with rubber and covered with a cotton braided sheath. Type BX cable was primarily used from the late 1920s until present. In this case, the BX cable does not have a separate grounding conductor. The BX cable is run concealed in walls and ceilings and is run on the surface, where exposed in the basement. Many receptacles have been removed. Remaining receptacles are of the two wire ungrounded type. Most outlet boxes have bare wires exposed.

*Electrical – Overcurrent Protection*

Overcurrent protection was originally by screw-in fuse elements. The fuses have been removed.

*Electrical – Lighting Systems*

Lighting systems inside of the building were originally incandescent lamp type. Most lighting fixtures have been removed. Lighting fixtures that remain are typical of the late 1920s era and consist of various surface mounted types, including drums, and ornamental types.

*Electrical – Telecommunications*

None in building.

*Electrical – Fire Alarm System*

None in building.

*Electrical – Lightning Protection*

Lightning protection consists of brass air terminals and brass or copper down-cables that appear to be terminated on buried ground rods. Air terminals are located at the peak of the roof, on the peak of each dormer, on each chimney, and at the top of the tower.

***Physical Description – Hazardous Materials***

Landmark Environmental collected 12 bulk samples from a total of 12 different types of suspected Asbestos Containing Materials (ACMs) at Michigan Island. Of the 12 suspect ACMs that were sampled and analyzed, a total of 2 samples collected from 2 suspect ACMs resulted in concentrations of greater than 1% (positive for asbestos).

*Hazardous Materials – Asbestos*

Asbestos is confirmed to be present at the following homogeneous materials/areas:

1. Heater Component Adhesive,
2. Roofing materials on the structure and in the abandoned cistern.

The following suspected ACMs were not sampled due to inaccessibility or park limitations regarding potential for damage to structures. Asbestos is assumed to be present at the following locations:

1. Wall and Ceiling Plaster,
2. Wall and Ceiling Interiors (Gray granular plaster was observed in exposed wall interiors between wood slats. This suspect ACM is similar in appearance to confirmed ACM identified in the Keepers Quarters),

3. Ceiling Insulation (Black matting or felt paper observed above ceilings, this suspect ACM may also be present in wall interiors),
4. Adhesives (Multiple varieties of miscellaneous adhesives were seen on heater components, under remnant flooring applications, and around windows),
5. Thermal System Insulation (TSI) (Was not observed and asbestos is commonly present in insulation on water pipes, metal ducting for heating systems, behind floor registers, steam piping, etc.),
6. Roofing Materials (Roofing felt, tar, and shingles were observed that may contain asbestos),
7. Subflooring (Suspect ACMs in flooring applications were not observed and asbestos is commonly present in vapor barrier felts and tar-papers used in subflooring applications),
8. Brick and Block Filler (The exterior of the structure is stone and has the potential to have a block filler or grout that is potentially asbestos containing),
9. Caulk (Caulking was observed around window and door penetrations, which can also include gasket applications between the window assembly and the structure), and,
10. Asbestos-cement (Piping, wall-board, wall interior panels, roof flashing and roofing applications can be constructed of asbestos-cement. This type of application was not observed at the structure but may be present).

The confirmed ACM was observed to be in fair condition, and the assumed ACM was observed to be in fair condition, except isolated areas of plaster that were in poor condition.

#### *Hazardous Materials – Lead Containing Paint*

The Lead Containing Paint (LCP) inspection included a visual inspection of the structure. A previous inspection and testing for LCP was conducted using an x-ray fluorescence (XRF) detector coupled with bulk paint sampling and laboratory analysis. The XRF inspection was conducted by NPS staff in 1993. The findings of this study are incorporated into this report by reference.

Detectable lead in paint was confirmed for the following testing combinations:

1. Window Sashes - Wood substrate with beige paint,
2. Window Trim - Wood substrate with beige paint,
3. Doors - Wood and metal doors of various colors, and,
4. Door Trim - Wood and metal doors of various colors.

Detectable lead in paint is assumed to be present at the following locations:

1. Interior Painted Surfaces (Based on testing in the kitchen, bathroom, living room, den, and upstairs bedroom LCP is assumed to be present on painted surfaces throughout the structure except in the basement which, based on the NPS testing, was determined to be a non-LCP white-wash),
2. Exterior Painted Surfaces (Exterior surfaces were stone with white paint except at windows which had wood shutters with a dark green paint), and,
3. Tower Surfaces (The tower appeared to be stone construction with white paint as the exterior layer).

Based on the estimated dates of construction of the various structures and the available testing data LCP is assumed to be present throughout the structure. The confirmed LCP was observed to be in poor condition and the assumed LCP was observed to be in poor condition.

Loose/flaking LCP is identified on the exterior walls of the structure. Paint chip debris is noted on localized areas of surface soils surrounding the tower but was not readily observable around the Old Lighthouse Keepers Quarters.

*Hazardous Materials – Lead Dust*

Surface wipe-sampling for lead dust analysis was not conducted in the Old Michigan Island Lighthouse because lead dust was assumed to be present in concentrations above applicable standards due to the poor condition of the confirmed and assumed LCP.

*Hazardous Materials – Lead in Soils*

Historical paint maintenance activities such as manual scraping, power-washing, sanding, abrasive blasting or the general poor and peeling condition of exterior LCP may have created the potential to impact the surrounding soil. Areas of the surface soils adjacent to the structure were observed to have LCP debris and additional areas may exhibit LCP debris or lead-contaminated soils, but are not observable due to vegetative cover surrounding the structure. Preliminary lead-in-soil sampling was performed to assess whether these near-structure soils contain lead concentrations above applicable soil standards.

One four-aliquot soil sample was collected from ground-surface soils at the roof (drip-line), approximately 3' from the foundation wall. One sample aliquot was collected from each side of the structure and these aliquots are composited together for analysis.

1. Analysis of the composite drip-line soil sample resulted in 163.6 milligrams of lead per kilogram of soil (mg/kg).

*Hazardous Materials – Mold*

Inspections of the structure were performed to identify the readily ascertainable visual extent of mold growth. Moisture testing in building materials was not performed nor was sampling of building materials performed for microbial analysis.

Mold was visually identified at the following locations:

1. Throughout the structure
  - a. A musty odor was noted throughout the structure.

Guano was observed throughout the structure. The guano was more concentrated on the stairs and second floor room.

## Character-Defining Features

**Mass/Form.** A conical masonry tower attached to a one-and-a-half story gable structure with a gable dormer and brick chimney on each side of the roof slope and a one story shed roof appendage on the opposite end.

**Layout of Space.** The tower is connected to the quarters; the upper floor has two separate bedrooms accessed from the hall and stair. The 1928–1929 renovations changed the original layout by creating new openings between rooms – creating more of an open plan between the living and dining rooms.

**Exterior Materials.** Whitewashed masonry with brick accents, wood trim and dormers painted dark green and asbestos roofing shingles.

**Openings.** Wood windows typically six over six or four over four (eight over eight at the dormers only) with casement style shutters all painted dark green at the house portion of the structure; Wood casement style three lite windows painted black at the tower portion of the structure.

**Interior Materials.** Painted plaster at walls and ceilings, painted wood trim and tongue and groove wood floors.

## General Condition Assessment

In general, the Old Michigan Island Lighthouse is in fair condition on the exterior and in poor condition on the interior. Most of the ceiling and wall finishes are in the process of deteriorating. The original plaster and lath has not held up well with the moisture issues that have been developing in the building. The bats inhabiting the attic also have caused damage. The attached Lighthouse Tower is in good condition.

Structurally, the Old Michigan Island Lighthouse is in good condition with the exception of the basement. This level needs to be dried out to reduce the moisture content of the first floor framing. The high moisture content of the framing could promote decay of wood.

Mechanically, the majority of the systems in the building are in poor condition with portions of the system missing or in disrepair.

Electrically, the equipment and systems within the building are in poor to deteriorated condition. Equipment in the basement is severely corroded. Wiring systems in the building are well beyond their useful life and do not meet current codes. In general, the electrical systems for this building are not salvageable. All wiring, boxes, fixtures, receptacles, and lightning protection are nonfunctional and unusable.

The following section is a discipline-by-discipline, component-by-component condition assessment of the building. Refer to Volume I, Chapter 2: Methodology for definitions of the condition ratings.

## Condition Assessment – Architecture

### *Architecture – Roof*

#### Condition: Poor

The roof is overall in poor condition. The shingles have substantial moss build-up at the shaded north roof areas. There are also yellow algae throughout. Several shingles are missing at the west-facing slope near the ridge. There has been recent repair work within the last few years due to loose and/or missing shingles.



*Architecture – Chimneys*

Condition:      *Good*

The chimneys are in good condition. Newer repointing work appears to have been performed on the west chimney but the upper course of the east chimney needs repointing. There are two types of brick at the west chimney, which may be due to recent repair work.

*Architecture – Exterior Walls*

Condition:      *Fair*

The condition of the exterior walls is fair due to the roof not having a gutter and downspout system, resulting in the drainage contributing to the deterioration of the exterior walls. This is especially evident at the base of the walls and at the splash area of the stoop at the north door. The parging is coming loose at the tower's upper northwest quadrant.

*Architecture – Dormers*

Condition:      *Fair*

Overall, the dormers are in fair condition. The wood wall shingles are cupping badly while the asbestos wall shingles are performing well. The north side of the east dormer has moss growth and there is newer white caulking also at the east dormer. There is a hornet's nest at the eave of the west dormer.

*Architecture – Windows*

Condition:      *Fair*

**Six-Over-Six Lites, Double Hung.** The sash and frame of these windows are in fair condition due to fair wood and paint finish condition. They generally do not operate (upper sash is nailed shut at exterior). The glazing is also in fair condition as it is gapped in some areas.

**Four-Over-Four Lites, Double Hung.** The sash and frame of these windows are in fair condition due to fair wood and paint finish condition. They generally do not operate (upper sash is nailed shut at exterior). The glazing is also in fair condition as it is gapped in some areas.

**Eight-Over-One Lites, Double Hung (Paired).** The sash and frame of these windows are in fair condition due to fair wood and paint finish condition. They generally do not operate (upper sash is nailed shut at exterior). The glazing is also in fair condition as it is gapped in some areas.

**Two Leaf, Three-Lite Casements.** These windows are in fair condition as their throw bolt hardware is missing, the metal frames are rusted at the interior, and the interior trim paint is badly alligatored. All glazing is in fair condition as it is gapped in some areas.

*Architecture – Exterior Doors*

Condition:      *Fair*

**Main Entry Door.** This door is in good condition with the exception of the hardware. The knob is loose and the deadbolt sluggish. The skeleton key is missing and the hinges are rusted. Also, the paint is peeling on the interior face of the door.

**Kitchen Entry Door.** The door is in fair condition with peeling paint, rusted hardware and knobs, and the door barely latches. There is a divot out of the front face of the sill, a crack in the glass pane, and the wood steps have no railing, are steep (8½"x 11"), and are rotting.

*Architecture – Exterior Trim*

Condition:      *Good*

The trim appears to be in good condition with areas of peeling paint, including one area on the soffit at the east elevation.

*Architecture – Tower Walk, Railing, Roof, and Finial*

Condition:      *Fair*

The Lighthouse Tower walk, railing, roof, and finial are in fair condition. The walkway paint is peeling and the underlying metal is rusted. The caulk is missing at the horizontal walk joints, but the caulk at the base of the wall and deck has held up well. The ball of the finial has a previous crack and there is one  $\pm\frac{3}{8}$ " diameter rusted through hole at the northeast quadrant.

*Architecture – Tower Lantern*

Condition:      *Good*

The lantern is in good condition.

*Architecture – Interior Doors*

Condition:      *Fair*

**Four Panel Door (Typical Interior Door).** These doors are generally in fair condition as they have peeling paint and most of the knobs are missing.

**Five Panel Door.** This type of door is generally in fair condition with missing knobs. The entry closet door has scraped the floor.

**Metal Door between Light Tower and Quarters.** This door is in fair condition as it is badly rusted and most of the white paint has disappeared. It is still operable.

**Hatch in the Lantern Floor.** The metal hatch is in good condition.

**Access Door to Walkway.** This metal door is in good condition.

*Architecture – Wall Finishes*

Condition:      *Poor*

In general, the wall finishes are in poor condition. The plaster and lath have high instances of moisture infiltration seen by peeling paint, cracks and deflection in the plaster, plaster falling off the lath and masonry and separation at joints with other walls and ceiling. The bat inhabitation of the attic also has caused further damage to the second floor wall finishes. The wood board wainscot in the entry to the tower is in fair condition as the paint is peeling and there are gouges in the wood. The bead board finish in the kitchen's recessed doorways is in fair condition as the west doorway has peeling paint while the east doorway is in good condition. The tower's plaster is in fair condition as there are rust stains from the stairs and some peeling paint and flaking plaster. The basement's masonry walls are in good condition but there is efflorescence on the lower  $\pm 1'0"$  of stone. Condensation within the building due to poor ventilation is contributing to the overall poor condition.

1 *Architecture – Ceiling Finishes*

2 Condition: *Poor*

3 The plaster over lath ceiling finishes are in poor condition due to moisture issues. Most of the rooms have  
4 missing sections of plaster. The plaster is cracked and its paint is peeling. In the areas of missing plaster on  
5 the second floor, holes in the lath and deterioration of lath has left the attic visible (MI-OLH-28). Bats  
6 living in the attic have furthered the process of deterioration. The tower's ceiling is in fair condition due to  
7 paint deterioration and rust.

10 *Architecture – Interior Trim*

11 Condition: *Fair*

12 The three types of base trim are generally in fair condition in this building. The most elaborate trim is in  
13 fair condition except for the trim in the dining room as there are segments missing. The less elaborate trim  
14 is also in fair condition as the kitchen's base-shoe is warped, especially on the east wall near a water stain.  
15 The simplest trim (wood board) is also in fair condition.

18 *Architecture – Floor*

19 Condition: *Fair*

20 The wood floors are generally in fair condition as there are water and adhesive stains, fading, wear,  
21 warping, and some board separation. The linoleum in the kitchen is in poor condition. The closet wood  
22 floors tend to be in good condition due to their relatively less exposure to wear than the more public rooms.  
23 The original wood flooring seen inside the second floor west bedroom's window seat appears to be in fair  
24 condition. The concrete floor in the basement and the Lighthouse Tower are both in fair condition with  
25 typical stains and wear associated with more industrial spaces. The tower's black paint has all but  
26 disappeared.

29 *Architecture – Stairs*

30 Condition: *Fair to Good*

31 **Exterior North (Kitchen) Stairs.** These exterior stairs are in fair condition as the wood stairs are starting  
32 to rot in places and the paint is peeling. This is most likely due to the roof draining onto these stairs. There  
33 is no handrail.

35 **First Floor to Basement Stairs.** These stairs are in fair condition as they are heavily worn, especially in  
36 the centers, and do not have a handrail.

38 **First Floor to Second Floor Stairs.** These stairs are in fair condition as the stair walls have badly peeling  
39 paint and a handrail needs to be added to the rest of the stairs.

41 **Tower Stairs.** These stairs are in good condition but lack handrails.

44 *Architecture – Casework*

45 Condition: *Fair to Good*

46 In general, the casework is in fair condition with some missing elements and some visible mold growth.  
47 The kitchen cabinet is in fair condition as the knobs and shelving are in good condition while the paint is  
48 faded and stained and the hinges are rusted. Every drawer and door is operational. The three wood cabinets  
49 in the tower are in good condition. The passage for the clockwork mechanism's weight chains is clear and  
50 the oil storage cabinet is in good condition.

*Architecture – Accessibility*

Condition:      *Poor*

This building is not accessible.

***Condition Assessment – Structural***

*Structural – Foundation*

Condition:      *Good*

The perimeter foundation walls are in good condition. The interior and exterior foundations are covered by a concrete slab-on-grade and could not be observed, thus their condition is unknown. No obvious signs of distress or damage were observed.

*Structural – Floor Framing*

Condition:      *Fair*

The first floor framing in the main building is in fair condition. Floor joists that are located above the windows and the floor joists at the stairway are not properly supported on lintels or headers (MI-OLH-43 and 44). The moisture levels in the framing were above 30% and this is causing deterioration of the wood. The basement windows have been replaced with louvers to increase the ventilation but this does not appear to be enough. Further investigation is needed. The original stepped floor framing and the newer floor framing of the kitchen could not be observed, thus their condition is unknown. No obvious signs of distress or damage were observed. Most of the second floor framing could not be observed, thus its condition is unknown. No obvious signs of distress or damage were observed. The floor of the lantern is in good condition.

*Structural – Roof Framing*

Condition:      *Good*

The wood roof framing is in good condition. The roof of the lantern could not be observed, thus its condition is unknown. The joints between the roof panels had been sealed (MI-OLH-45). This suggests structural movement that needs further investigation.

*Structural – Ceiling Framing*

Condition:      *Good*

The ceiling framing of the second floor and kitchen is in good condition.

*Structural – Wall Framing*

Condition:      *Good*

The exterior walls are in good condition.

*Structural – Lateral System*

Condition:      *Good*

Lateral stability of the building is good.

*Structural – Load Requirements*

Condition:      *Good*

The roof, ceiling, first and second floor framing have adequate capacity to support the required loads.

**Condition Assessment – Mechanical**

*Mechanical – Plumbing Systems*

Condition: Fair to Poor

There are portions of the domestic water distribution piping remaining in the basement and crawlspace. The kerosene water heater, originally located in the kitchen, has been removed. The remaining galvanized steel piping is in poor condition. The abandoned cistern outside the building is filled with sediment and vegetation.

The cast iron waste lines within the building are in fair condition. The condition of the buried 6” clay sewer pipe that runs to the west and into the septic tank could not be determined.

The wall mounted bathroom lavatory and toilet have been removed. The remaining kitchen pedestal sink and enameled cast iron bath tub are in fair to poor condition and have been disconnected from the plumbing systems.

*Mechanical – HVAC*

Condition: Fair

Although not functional, the “Contento” boiler located in the first floor living room is in fair condition. The cast iron radiators, associated piping, and the thermal expansion tank on the second floor are intact and in fair condition. The radiators in the first floor bath and entry hall have been removed.

The basement ventilation louver is in fair condition. However, this does not provide adequate ventilation for the space. The passive air vents at the top of the tower are in poor condition and do not provide adequate ventilation to prevent condensation.

*Mechanical – Fire Suppression*

Condition: N/A

**Condition Assessment – Electrical**

*Electrical – System Configuration*

Condition: Poor

At present, there is no power to the building. The original underground power feeder to the building has been abandoned and is no longer observable. Electrical equipment and conduits located in the basement are badly corroded. Lighting and receptacle boxes in the rooms of the structure are in very poor condition.

*Electrical – Conductor Insulation*

Condition: Poor

Type BX branch circuit cable is in poor condition. At 70 years old, insulation is suspect and potentially very fragile. Existing cables are two wire only and do not contain a separate ground wire. The integrity of remaining connections is suspect.

Many receptacles have been removed. Remaining receptacles are of the two wire ungrounded type and are no longer usable. Most outlet boxes have bare wires exposed.

*Electrical – Overcurrent Protection*

Condition: *Poor*

Fuses are missing and the fuse box and connections are badly corroded.

*Electrical – Lighting Systems*

Condition: *Poor*

Most fixtures have been removed. Those remaining are not serviceable and do not meet current code.

*Electrical – Telecommunications and Fire Alarm System*

Condition: *N/A*

*Electrical – Lightning Protection*

Condition: *Fair to Poor*

Lightning protection systems are intact, however over time, connections deteriorate and components corrode. The integrity of the system cannot be assured.

***Condition Assessment – Hazardous Materials***

Refer to “Physical Description – Hazardous Materials” for detailed descriptions of locations and conditions of hazardous materials.

## Ultimate Treatment and Use

This building operated as a lighthouse and primary residence from 1856 to 1857 and from the late 1860s to 1929 when the Second Tower became operational and the Keepers Quarters was completed. The building was renovated and modernized in 1929 for continued use as a residence for the Assistant Keeper.

The building is currently used as guided visitor access with no remaining furnishings or Fresnel lens in the tower.

The recommended treatment of this structure is rehabilitation for visitor use (interpretation). However, the exterior will be 'restored' to a period of significance matching site rehabilitation objectives (refer to the CLR) for Michigan Island Light Station.

## Requirements for Treatment

Compliance requirements for treatment currently include laws, regulations, and standards as outlined by the Park Service and listed in Volume I, Administrative Data section of this report.

The recommended treatments are tailored to the preferred alternative as the outcome of the Value Analysis/CBA for the project. As individual buildings are rehabilitated, specific alternatives will present themselves during design and construction. The following section is a discipline-by-discipline, component-by-component description of the treatments proposed for the rehabilitation of the building. Refer to Volume I, Chapter 2: Methodology for the priority rating definitions.

## Treatment Recommendations – Architecture

### Architecture – Roof

Priority: Severe

Remove the existing asbestos shingle roof and replace with a composite shingle roof of 9" wide × 7" high exposure to match the dimensions of the roofing of the 1929 era. Verify/provide proper underlayment and flashings at all eaves, rakes, valleys and intersections. Scrape, sand, and repaint the wood trim at the eave, soffit, fascia, and frieze using the paint analysis to guide the color selection.

### Architecture – Gutters and Downspouts

Priority: Moderate

Provide and install a new galvanized box gutter and downspout system to slope and drain away from the foundation. Study discharging to the east in keeping with the previous cistern location.

### Architecture – Chimneys

Priority: Low

Repoint the upper portion of the east chimney. Perform material testing of mortar to determine a match of mortar composition and color. Perform tooling of mortar joints to match original.

### Architecture – Exterior Walls

Priority: Moderate

Remove all loose parging. Examine substrate below and perform moisture readings prior to repair work. Coordinate exterior repair work with increased ventilation at the interior and controlling roof drainage.

1 Repair damage at the exterior rubble and masonry walls and repoint. Recoat with a suitable masonry  
2 coating to allow moisture permeability.

5 *Architecture – Dormers*

6 Priority: *Moderate*

7 The dormers shall remain, however they are planned to be concealed from the interior. Remove and replace  
8 in kind the cupping wood shingles above the windows. Verify proper valley flashing is installed at the time  
9 of the reroofing. Scrape, sand, and repaint.

12 *Architecture – Windows*

13 Priority: *Moderate*

14 Remove all window sashes. Remove the glazing compound and salvage all glass. Scrape, sand, and repaint  
15 the sash, frame, and shutters using the paint analysis to guide the color selection. Reinstall the salvaged  
16 glass and reglaze each pane. Replace missing hardware in kind. Verify proper operation of each sash and  
17 shutter. Investigate secure means for enhancing the basement window openings for seasonal ventilation.

20 *Architecture – Exterior Doors*

21 Priority: *Severe*

22 Coordinate with the accessibility work and investigate retrofitting the existing east exterior door and  
23 masonry opening/wood frame to enlarge to provide a 32” clear opening. Scrape, sand, and repaint. Provide  
24 new lever-style hardware, hinges, and locking mechanisms to match the existing finish.

26 Repair the kitchen door and sill. Replace the cracked pane of glass. Reglaze all lites of the door. Epoxy  
27 stabilize divot at sill. Provide new hardware to match original finish.

30 *Architecture – Exterior Trim*

31 Priority: *N/A*

32 Refer to roof section.

35 *Architecture – Tower Walk, Railing, Roof, and Finial*

36 Priority: *Moderate and Severe (Railing)*

37 Remove peeling paint. Patch and clean areas of rust. Repair the crack and hole at the finial. Verify all  
38 ventilation components are operational. Scrape, sand, and repaint. Investigate alternatives to discretely  
39 upgrade the existing railing to become a code compliant guard rail.

42 *Architecture – Tower Lantern*

43 Priority: *Low*

44 Provide five new brass intake vent cap controls. Continue to monitor sealant at roof panels.

47 *Architecture – Interior Doors*

48 Priority: *Moderate*

49 Scrape, sand, and repaint all interior doors. Replace missing hardware in kind. Verify/provide proper  
50 operation at all doors. Add a security gate at the base of the tower stair.



1  
2 *Architecture – Wall Finishes*

3 Priority:        *Severe*

4 Repair damaged plaster and replace in kind at areas where 1929 openings and walls are restored. Patch  
5 previous penetrations of piping and conduit where removed. Repaint using the paint analysis to guide the  
6 color selection.

7  
8  
9 *Architecture – Ceiling Finishes*

10 Priority:        *Severe*

11 Repair damaged plaster and replace in kind at areas where 1929 openings, walls and ceilings are restored.  
12 Patch previous penetrations of piping and conduit where removed. Repaint using the paint analysis to guide  
13 the color selection.

14  
15  
16 *Architecture – Interior Trim*

17 Priority:        *Moderate*

18 Remove the 1929 era base, casing as applicable at areas where 1929 openings and walls are restored to  
19 their original configurations. Replace in kind with the earlier profiles and trim. Repair as needed due to  
20 adjacent plaster repair work. Scrape, sand, and repaint using the paint analysis to guide the color selection.

21  
22  
23 *Architecture – Floor*

24 Priority:        *Low*

25 Remove linoleum at kitchen. Remove the 2¼” boards c. 1929 throughout the building and repair and  
26 refinish the 5¼” flooring below.

27  
28  
29 *Architecture – Stairs*

30 Priority:        *Severe*

31 Provide new exterior stair and hand/guard rails at the kitchen exit to meet code.

32  
33 Add code compliant handrails to the basement stairs (wood), and tower (metal). Provide portions of  
34 handrail to the first floor. Infill areas on the second floor stair where the handrail is missing.

35  
36  
37 *Architecture – Casework*

38 Priority:        *Low*

39 Remove the 1929 era casework. Retain earlier casework. Scrape, sand, and repaint using the paint analysis  
40 to guide the color selection.

41  
42  
43 *Architecture – Accessibility*

44 Priority:        *Severe*

45 The existing west door wood frame shall be enlarged approximately ¼” to allow for a 32” clear opening at  
46 the door. Remove the existing step by providing a freestanding 1:12” max slope ramp with code compliant  
47 handrails to this door to accommodate the approximate 1’0” of elevation change. The accessible route  
48 would include the entire first floor with possible modifications to widen door openings.

49  
50 Provide accessible bermed walk with lawn blended with existing lawn to door on west side of the  
51 Lighthouse. Add exhibits on the first floor to make the second floor and tower programmatically accessible.  
52

***Treatment Recommendations – Structural***

*Structural – Foundation*

Priority:            *Low*

No recommendations at this time.

*Structural – Floor Framing*

Priority:            *Severe; Low*

The first floor framing of the main building is in serious danger of decay. The moisture levels in the wood should be reduced below 15%. The basement should be dried out and ventilation should be added below the kitchen floor.

The first floor joists located above windows and the floor joists at the stairway should be properly supported on lintels or headers.

*Structural – Roof Framing*

Priority:            *Unknown*

Rust-jacking is causing the roof panels of the lantern to separate. Further investigation is required to determine the extent of the corrosion to the cast iron panels and/or the fasteners. Sealants and coatings should be used to protect the cast iron from further deterioration. The extent of the damage should be checked at least annually and corrective action taken if the damage continues.

*Structural – Ceiling Framing*

Priority:            *Low*

No recommendations at this time.

*Structural – Wall Framing*

Priority:            *Low*

No recommendations at this time.

*Structural – Lateral System*

Priority:            *Low*

No recommendations at this time.

***Treatment Recommendations – Mechanical***

*Mechanical – Plumbing Systems*

Priority:            *Low*

The existing plumbing fixtures and plumbing piping are no longer functional and are inconsistent with pre-1928 target time period. It is recommended that the plumbing fixtures and piping be removed. The clay sewer pipe serving the building should be capped below grade.

*Mechanical – HVAC*

Priority:            *Severe (Ventilation); Low (Heating)*

The humidity levels inside the structure need to be reduced to prevent further damage to the building. The addition of mechanical and passive ventilation is highly recommended.

The existing heating system consisting of a cast iron boiler, piping, and radiators are no longer functional and are inconsistent with pre-1929 target time period. It is recommended that the heating system and all associated components be removed.

*Mechanical – Fire Suppression*

Priority:            *N/A*

***Treatment Recommendations – Electrical***

*Electrical – System Configuration*

Priority:            *Severe*

The existing electrical systems are old, nonfunctional and noncode compliant. It is recommended that the existing electrical systems be removed. This recommendation is consistent with the recommended use of the building. A new, code compliant electrical distribution system for PV power for new ventilation equipment should be installed.

*Electrical – Conductor Insulation*

Priority:            *Moderate*

It is recommended that new conductor insulation be consistent with wiring methods for proposed PV systems. Conductor insulation shall be in accordance with the National Electrical Code, NPS and Federal Standards and Regulations.

*Electrical – Overcurrent Protection*

Priority:            *Moderate*

It is recommended that overcurrent protection for new PV system wiring be in accordance with the National Electrical Code, NPS and Federal Standards and Regulations.

*Electrical – Lighting Systems*

Priority:            *Moderate*

Existing lighting fixtures are nonfunctional and do not meet present codes. It is recommended that all remaining lighting fixtures be removed.

*Electrical – Telecommunications and Fire Alarm System*

Priority:            *N/A*

*Electrical – Lightning Protection*

Priority:            *Severe*

Existing lightning protection is old and its effectiveness has not been established. It is recommended that the existing lightning protection system be removed prior to roof replacement. It is recommended that a new LPI-175 compliant lightning protection system be installed after roof replacement.

***Treatment Recommendations – Hazardous Materials***

***Hazardous Materials – Asbestos***

***Priority: Moderate***

Recommend sampling suspect asbestos containing material, including wall and ceiling plasters, wall and ceiling interiors, ceiling insulation, adhesives, TSI, roofing materials, subflooring, brick and block filler, caulking, and asbestos cement. Recommend removal and replacement of asbestos roofing.

***Hazardous Materials – Lead-Containing Paint and Lead Dusts***

***Priority: Moderate***

Recommend stabilization or abatement of Lead-Containing Paint. Wipe sampling for lead dust is not recommended.

***Hazardous Materials – Lead In Soils***

***Priority: Moderate***

Recommend further soils characterization to confirm applicable regulatory requirements.

***Hazardous Materials – Mold/Biological***

***Priority: Moderate***

Recommend bat guano abatement and water intrusion/mold mitigation.

***Hazardous Materials – Petroleum Hydrocarbons***

***Priority: Low***

No recommendations at this time.

## Alternatives for Treatment

The following are several considerations of alternatives for the proposed treatments:

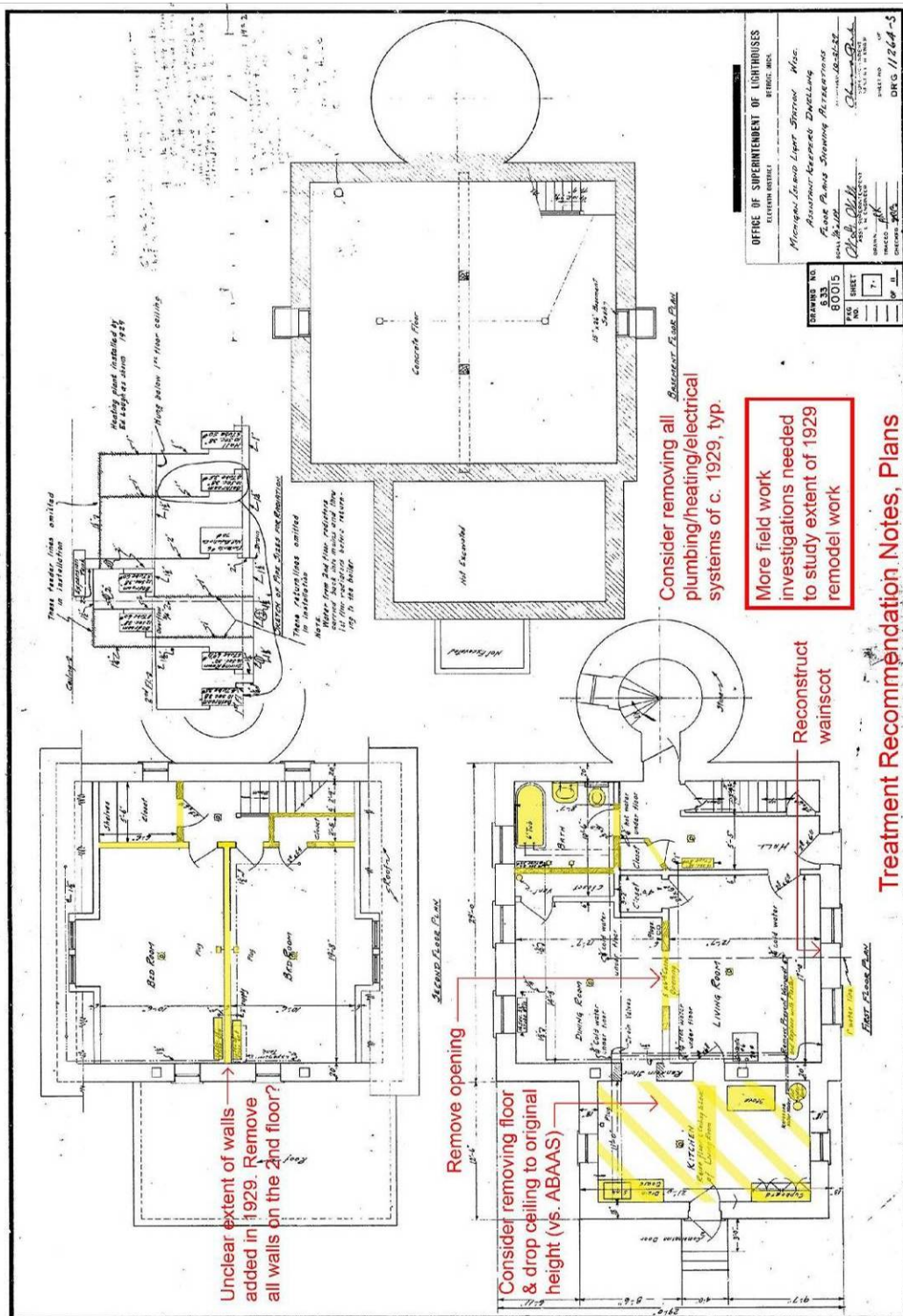
1. If it is decided to allow public access to the catwalk, careful study will be needed for introducing a code compliant guard rail at the Lighthouse walk that will not be visually disruptive to the historic character nor be a long term maintenance burden for park staff.
2. The current recommendations for the exterior of the building are reflective of the 1929 timeframe including a replacement for the asbestos shingles and adding a gutter system. Other alternatives could consider different materials if an earlier timeframe was agreed upon.
3. Consideration should be given of the possible deconstruction required to “restore” the walls and openings at the interior of the quarters to the pre 1900 condition. There are limited resources available to determine the extent of alterations which occurred in 1929 vs. those that occurred earlier. A careful on-site study with selective demolition would be required to further investigate this approach. (See following plan notes of the 1929 remodel drawings for a study of the possible extent of removal of features.)
4. An alternative could include leaving walls in situ and calling out the change of material(s) to the visitors.
5. The alternative of removing the dormers was discussed by the team and dismissed due to the concern of removal of existing historic fabric as it is within the stated period of significance.

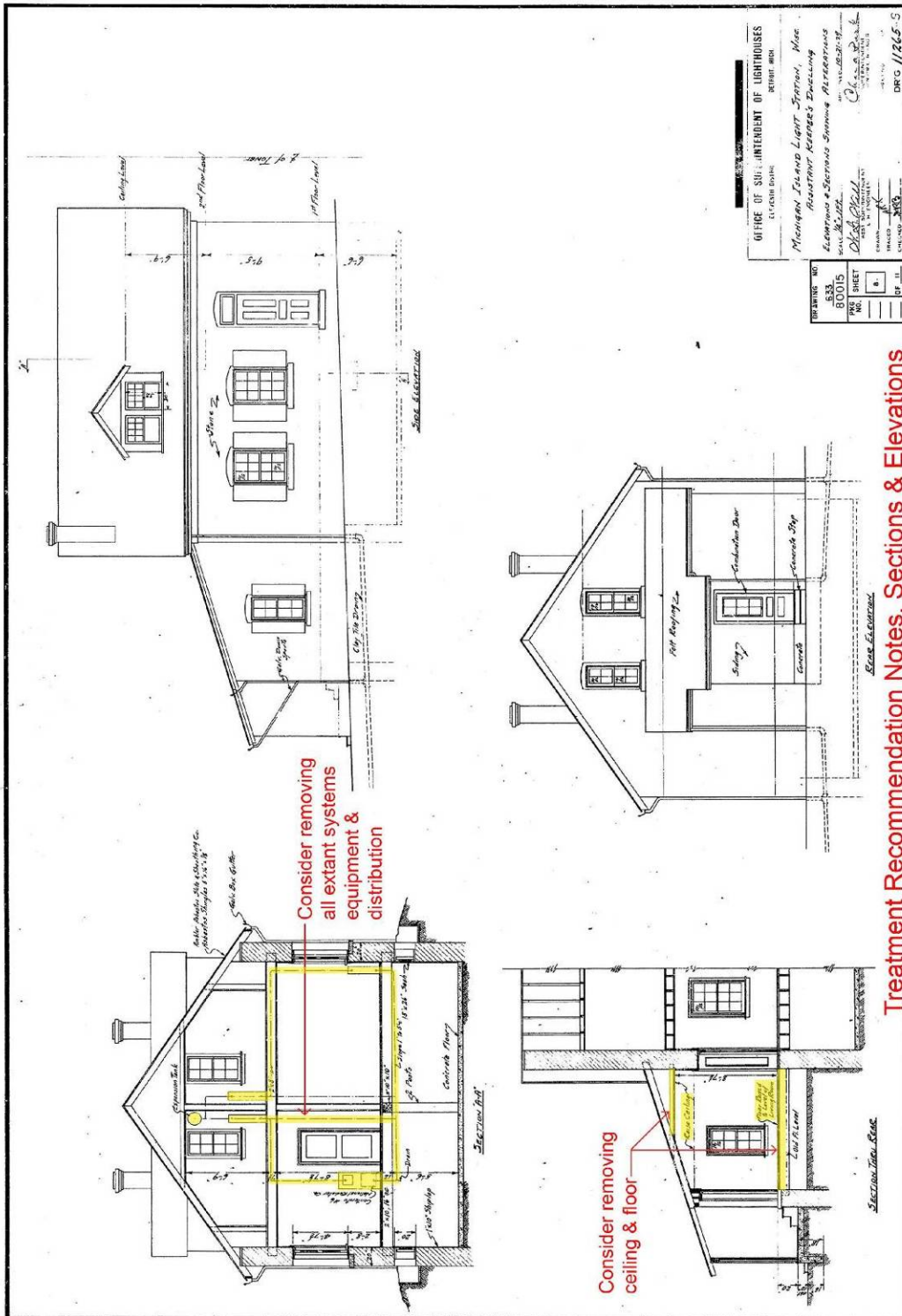
## Assessment of Effects for Recommended Treatments

The following table includes an analysis of the major treatment recommendations which affect Section 106 Compliance:

Recommended Treatment	Potential Effects	Mitigating Measures	Beneficial Effects
1. Visitor access into the former Lighthouse	Change in use: Upgrades for code safety and ABAAS will be required which will alter the historic fabric.	Integrate the upgrades to minimize damage to historic fabric and visual disruption.	- Improves safety for visitors and staff - Allows visitors to experience the Lighthouse first hand
2. Interpret the interior of the building at the pre-1928 era while the exterior is interpreted at the 1929+ era	Removal of historic fabric from the timeframe within the period of significance.	Further study is warranted to minimize the removal of historic fabric (see Treatment Recommendation Notes on p.176-7). Education and interpretation will be essential to relaying this to visitors.	- Will inform visitors of two important eras of the Light Station
3. Additional Hazardous Testing and Mitigation	Mitigation of hazardous material may require removal of historic materials.	Any mitigation will need to be evaluated for benefit and implemented sensitively to minimize damage to the resource.	- Improves safety for visitors and staff - Removes hazards from the cultural resource
4. Adding a security gate at the base of the light tower	Installation of security gate will be a modern element.	Design a gate that will be as unobtrusive as possible.	- Allows NPS better security over the resource - Improves safety for visitors
5. Adding a code compliant guardrail at the light tower	Visually disruptive to the historic integrity of the Lighthouse.	Design a guardrail to be as 'invisible' as possible as viewed from the ground.	- Improves safety for visitors and staff
6. Accessibility Upgrades	Altering the front entry (ramp) and door frame (width).	Study all of the alternatives.	- Allows universal access to the cultural resource
7. Removal of existing and replacement of roofing materials	Removes the existing material which dates to the period of significance.	The roofing material is asbestos and is at the end of its life. The new material will aim to match the existing in dimension and exposure.	- Removal mitigates a current HazMat management issue - A new roof will reduce maintenance for the next 20-30 years - A new roof will protect the resource

1 Old Michigan Island Lighthouse Treatment Recommendation Notes







1 *Old Michigan Island Lighthouse Photographs, 2009*



MI-OLH-01: Aerial, 2009 (Source: A&A DSC00604)

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MI-OLH-02: West elevation, 2009 (Source: A&A DSC00672)

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MI-OLH-03: North elevation, 2009 (Source: A&A DSC00673)

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MI-OLH-04: East elevation, 2009 (Source: A&A DSC00675)

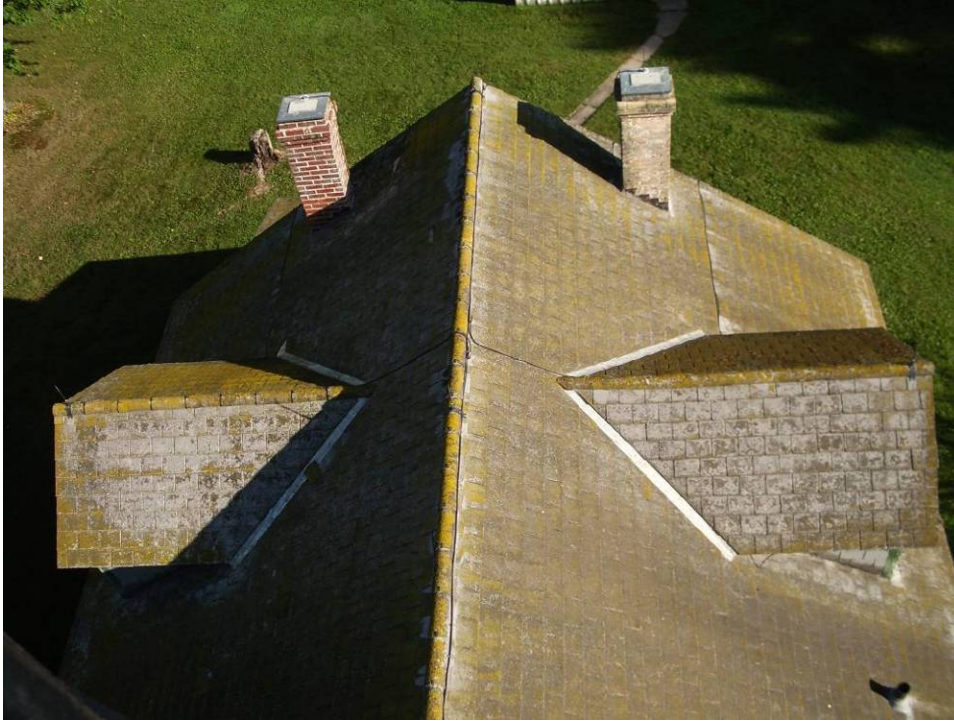
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MI-OLH-05: South elevation, 2009 (Source: A&A DSC00677)

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MI-OLH-06: Dormers, roof, and chimneys from the Tower, looking north (Source: A&A IMGP2761)



MI-OLH-07: East dormer, trim, chimney, and shutters (Source: A&A IMGP2764)





MI-OLH-08: East dormer siding, windows, and roof (Source: A&A IMGP2766)



MI-OLH-09: East dormer siding and exterior trim (Source: A&A IMGP2767)



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*MI-OLH-10: West dormer siding, chimney, windows, and exterior trim (Source: A&A IMGP2768)*



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*MI-OLH-11: West dormer siding, roof, trim, and Tower integration (Source: A&A IMGP2851)*





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2 *MI-OLH-12: West entry door (primary) (Source: A&A 102\_9512)*  
3



4  
5 *MI-OLH-13: North entry door (kitchen entrance) (Source: A&A 102\_9511)*



MI-OLH-14: Basement window I (Source: A&A CIMG3442)



MI-OLH-15: Basement stair (Source: A&A IMGP2818)



MI-OLH-16: Living room south elevation (Source: A&A CIMG3288)



MI-OLH-17: Entry, south wall door, and base trim, detail (Source: A&A CIMG3320)





MI-OLH-18: Living room north elevation (Source: A&A CIMG3292)



MI-OLH-19: Kitchen east elevation (Source: A&A CIMG3324)



MI-OLH-20: Kitchen southwest elevation (Source: A&A CIMG3328)



MI-OLH-21: Kitchen southeast door ceiling (Source: A&A CIMG3326)



MI-OLH-22: Kitchen southeast door ceiling detail (Source: A&A CIMG3327)



MI-OLH-23: Kitchen floor and c. 1920 base trim (Source: A&A CIMG3333)





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MI-OLH-24: Kitchen built-in cabinet on north wall (Source: A&A CIMG3335)



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MI-OLH-25: Dining room east elevation (Source: A&A CIMG3345)



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2 MI-OLH-26: Watch room/bath east elevation (Source: A&A CIMG3368)  
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4  
5 MI-OLH-27: First floor to second floor stairs, east view (Source: A&A IMGP2806)





MI-OLH-28: West bedroom north elevation (Source: A&A CIMG3457)



MI-OLH-29: West bedroom west elevation (Source: A&A CIMG3461)



MI-OLH-30: West bedroom window seat, view of wall, trim, and floor beneath (Source: A&A CIMG3470)



MI-OLH-31: East bedroom dormer window detail (Source: A&A 102\_9545)

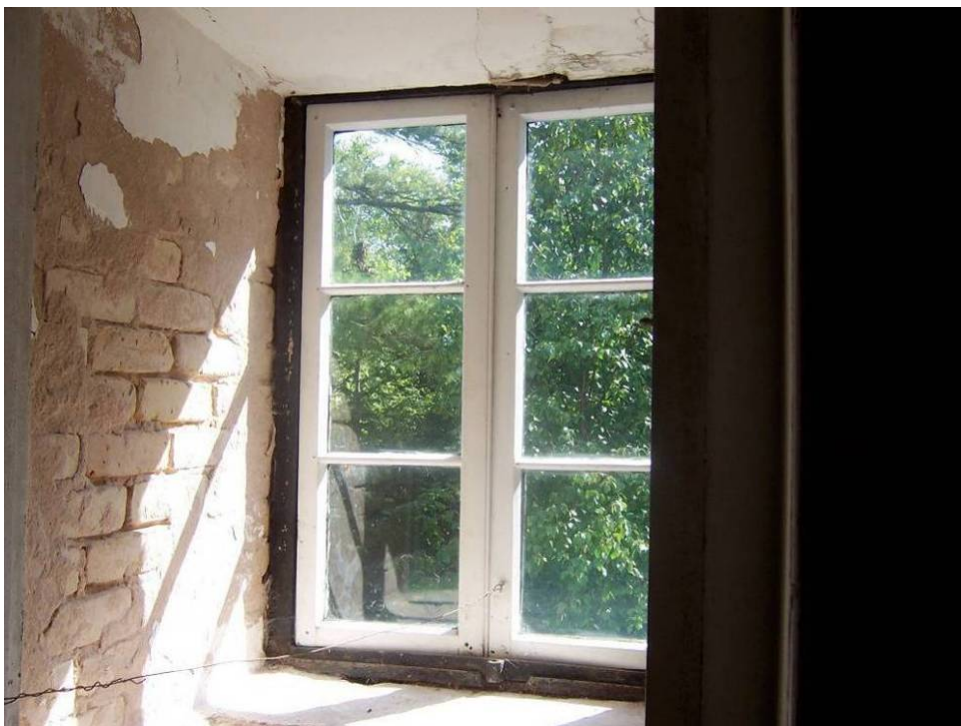


*MI-OLH-32: Aerial of Tower, 2009 (Source: A&A IMGP2781-A)*



*MI-OLH-33: Tower south elevation and door (Source: A&A CIMG3390)*





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2 *MI-OLH-34: Tower window 1 (Source: A&A 102\_9527)*  
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5 *MI-OLH-35: Tower cabinet, open, door is stamped "Danger, Alcohol Storage, Do Not Light" (Source: A&A CIMG3407)*



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2 MI-OLH-36: Tower stairs (Source: A&A IMGP2822)  
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5 MI-OLH-37: Lantern southwest elevation (Source: A&A 100\_9656)



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2 *MI-OLH-38: Lantern roof (Source: A&A IMGP2760)*  
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5 *MI-OLH-39: Lantern ceiling (Source: A&A 100\_9655)*





MI-OLH-40: Lantern floor and hatch (Source: A&A 100\_9654)



MI-OLH-41: Lantern door to walkway (Source: A&A 100\_9650)



MI-OLH-42: Lantern walkway railing (Source: A&A 100\_9647)



MI-OLH-43: Joist header above basement window (Source: Martin/Martin)





MI-OLH-44: Joists at stair (Source: Martin/Martin)



MI-OLH-45: Sealed joints in roof (Source: Martin/Martin)



MI-OLH-46: Cast iron bathtub in watch room/bath (Source: RMH)



MI-OLH-47: "Contento" Boiler in living room (Source: RMH)