

KEEPERS QUARTERS

Chronology of Alterations and Use

Original Construction

The Michigan Island Keepers Quarters was built in 1929 as part of the Light Station upgrades associated with the Second Tower. It was built as the living quarters for the keeper and his family.⁴²

The front porch of the building was once screened-in, as seen in an historic image from c.1939 (Historic Image MI-08). According to Robert E. Parker, Senior, whose father had a fish camp nearby, the porch was screened-in when the Quarters was completed in 1929.⁴³ A 1974 photo shows the east elevation of the Keepers Quarters with three covered windows and the covered east entry door (Historic Image MI-10). Currently, the house is being used for seasonal employees and all of the windows and doors are uncovered. Interior photos from 1975 show the living room and dining room in what appears to be good condition (Historic Images MI-11 and 12).

The 1929 construction plans for the Keepers Quarters show the porch with no screening (Historic Drawing MI-09 and 10).

Significant Alterations / Current Condition

Significant alterations to the Keepers Quarters consist of the 2004 rehabilitation of the main floor that involved the removal and replacement in-kind of rotten floor joists and subflooring and the refinishing of the interior floors. Between 1998 and 2009, the Historic Structure Preservation Team of the Park Service completed the rehabilitation of the foundation drainage, rebuilt the basement stairway, and painted the exterior woodwork.

The mechanical systems in the Keepers Quarters have been upgraded to modern standards to allow for seasonal housing for park employees and volunteers.

Electrical wiring and equipment was installed in 1929 when the building was built. There is evidence that upgrades have been performed including replacement of some luminaires with more modern fixtures. There is some evidence of a previous direct current power system for the building including battery racks and two liquid filled battery cells. How this system was utilized in the building is unknown. Electrical systems added in the recent past appear to follow current NEC requirements.

The kitchen entry and its associated exterior stairs were part of the original construction, though they appear to be an addition, as evidenced in the historic drawings.

The Keepers Quarters are currently in good condition.

⁴² List of Classified Structures, National Park Service, 2009.

⁴³ Michigan Island Light Station Record Book, Volume II, Hazel Keller entry, July 23, 1988.

1 Summary of Documented Work on the Building

Date	Work Described	Source of Information
1930-Unknown	Maintenance each year: installed screens on Keepers Quarters porch in the early spring	E. Lane, MI Log, Nov 23, 1926–Aug 19, 1936
1975	Stabilization of Keepers Quarters	APIS/NPS Business Office File D3423
1976	Repair drainage at Keepers Quarters	APIS/NPS Business Office File D3423
1977	Repair and paint exterior walls of Keepers Quarters	APIS/NPS Business Office File D3423
1979	Emergency stabilization of Keepers Quarters brick at porch and northeast stoop	APIS/NPS Business Office File D3423
1981	Asbestos roofing installed	APIS/NPS Business Office File D3423
1985, August 21	Finished installation of “burglar-smoke alarm system” (Terry Blomberg)	From “Excerpts from Michigan Island Volunteer Logs- 1978–1999,” pages 7 and 8
1987, June 17	New kitchen floor and sink plumbing installed	From “Excerpts from Michigan Island Volunteer Logs- 1978–1999,” page 10
1987, September 9	Large propane tank hooked-up, kitchen cabinets installed	From “Excerpts from Michigan Island Volunteer Logs- 1978–1999,” page 11
1994, July 15	“Next Wednesday they will take asbestos wrapping insulating ducts in basement away. A specialist will do this...” (Darlene Wahl, VIP)	From “Excerpts from Michigan Island Volunteer Logs- 1978–1999,” page 21
1994, September 1-2	Asbestos crew removes asbestos in basement	From “Excerpts from Michigan Island Volunteer Logs- 1978–1999,” page 22
1995, August 21	Disconnected burglar alarms, placed them in cabinets	From “Excerpts from Michigan Island Volunteer Logs- 1978–1999,” page 23
2004	Removal and replacement in-kind of rotten floor joists and subflooring	LCS, 2009 and HSPT Reports, 2009
2004	Partial repainting of interior	HSPT Reports, 2009
2004	Sanding and refinishing of interior floors	HSPT Reports, 2009
2008	Interior painted	Susan Mackreth, Volunteer Supervisor in 2008
2008	Basement I-beams reinforced	Randy Ross, Facility Manager, 2010

4 Notable Actions with Unknown Dates

Date Range	Work Described
Post-1929	Upgraded plumbing fixtures at the bath
Post-1929	HVAC ductwork dismantled
Post-1987	Propane heaters and appliances installed
Post-1987	Connected to nonpotable domestic supply tank at the Power House
Pre-1998	Rehabilitated foundation drainage
1998–2009	Rebuilt basement stairway

7 General Physical Description

The building is a 1 ½-story brick residential structure with a full basement, gable roof, two gable dormers, and an entry porch on the south elevation as well as an enclosed kitchen entry at the northeast corner. The main entry faces south toward the lake and the site tram stairway. The first floor has three rooms; the second floor has three as well.

Physical Description – Architecture

Architecture – Roof

The roof consists of the original asbestos shingle roofing, 9" wide × 7" exposure, and curved ridge caps attached to the main gable. The flashing appears to be the copper that is noted on the original construction drawings. The sheathing is solid (i.e. not spaced) consistent with the original asbestos application. The eave, extending 2' at the main roof and 1'6" at the dormers, consists of exposed rafter tails and tongue and groove sheathing with a shaped 1x fascia, a 1x frieze board with a quarter-round closure trim, all wood painted white.

Architecture – Gutters and Downspouts

The original ogee style gutters and rectangular fluted downspouts are extant. The downspouts drain into a clay tile pipe underground system which day-lighted to the bluff, per the original drawings. The downspouts are 4¼" wide by 2¾" deep. The gutter is 4" tall 5" wide at the top, and 3" wide at the bottom (MI-KQ-06, 07, 08, and 09). The original construction drawings called for 22-gauge gutters and 24-gauge downspouts.

Architecture – Chimney

The chimney is red brick with a double clay flue and a sloped, cast concrete cap. The chimney is yellow brick at the interior.

Architecture – Exterior Walls

The walls are red brick masonry, running bond, with a soldier course at the base. The bricks are 8⅞" long, 2⅜" wide, and 3⅝" deep. There are stone sills and wall caps as well. There is painted wood lap siding and 1x wood trim at the northeast wall, matching the adjacent Assistant Keepers Quarters and Workshop.

A mortar sample taken indicates that the composition of the mortar is about five parts lime to seven parts sand. The mortar is gray colored, moderately soft, and the sand has a typical coarseness.

Architecture – Windows

Typical Windows. These windows are three-over-one, double hung, paired or single. This type of window has thumb turn locks, two finger sash lifts, sash cord and pulleys intact, and removable stops. The windows are painted white on the exterior and varnished wood on the interior. The interior trim matches the newer door trim at the Old Michigan Island Lighthouse, but the windows have ogee-shaped sills and skirts at the base. The muntins have an ogee profile. The exterior sills are wood over stone with a drip edge. Each window has a two-lite wood screen, mounted to the exterior with screen hooks. The screens are black. The typical dimensions for the windows are 2'6" × 4'9" (MI-KQ-18 and 41). The windows in the kitchen and bath have dimensions of 2'6" × 3'5".

Basement Windows. The original basement windows are two- or three-lite metal casements. The northeast basement window is a contemporary wood vent with a wood screen (MI-KQ-20).

Architecture – Exterior Doors

Basement Entry, Main Entry, and Kitchen Entry Doors. This type of door is a six-lite over two vertical panels, made of wood, and is original to the building. Each door has its original "Yale" knob hardware with integral lock that is keyed on the exterior, thumb turn on the interior face, and two ball-tipped hinges. The exterior trim is 1x5 wood and the interior trim for the main and basement entries is built-up ¾" × 4¼"

wood with rounded edges. The overlay at the outside edge is an L-shaped trim piece ($1'' \times 1\frac{1}{8}'' \times \pm\frac{1}{4}''$) (MI-KQ-16 and 23). The interior trim for the kitchen entry is a simple $\frac{3}{4}'' \times 3\frac{5}{8}''$ wood trim. This door also has a stone sill, while the other two entry doors have cast stone sills (MI-KQ-17). This type of door is $2'8'' \times 7'0'' \times 1\frac{3}{4}''$.

Screen Doors for Basement Entry, Main Entry, and Kitchen Entry Doors. This type of door is original to the building and is wood-framed with four vertical screen panels with one horizontal panel at mid-height. There are springs at the interior and an inset, rounded profile at the rails and stiles. There is a contemporary lever/latch, chain governor, and three ball-tipped hinges for each door. These doors are $2'8'' \times 7'0'' \times 1\frac{1}{8}''$ (MI-KQ-15 and 33).

Architecture – Exterior Trim

The exterior trim consists of 1x corner boards and belly band trim at the wood sided portion of the building. This trim at the northeast corner matches the corner trim of the Assistant Keepers Quarters and Workshop.

Architecture – Porch

The porch has a painted beadboard ceiling with a sloping concrete floor to drain. There appears to have been a separate pour for the topping slab at the porch and steps. Integral cast concrete drains are at the face of the south wall though the sloping drainage may be suspect as witnessed by the previous pointing work on the south wall. The porch was screened in at one time, though the original drawings do not indicate screens.

Architecture – Interior Doors

Five Panel Door (First and Second Floors). These original doors are five panel, wood doors (pine) with raised panels, wood trim, and varnished finish (except for the kitchen face of the dining room double-swing door and the basement door, which are painted white. These doors are the interior doors for the first and second floors with the exception of the first floor living room to dining room double doors. The trim is built-up $\frac{3}{4}'' \times 4\frac{1}{4}''$ with rounded edges. The overlay trim at the outside edge is an L-shaped piece ($1'' \times 1\frac{1}{8}'' \times \pm\frac{1}{4}''$). Both sides of each door have typical knobs and mortise plates and each door has two ball-tipped hinges. The widths of the doors vary, but the stile width is consistent, $\frac{4}{8}''$, so doors were custom. The typical door dimension for this type is $2'4''$ to $2'8'' \times 7'0'' \times 1\frac{1}{4}''$.

Living Room to Dining Room Double Doors. These 15-lite, paired wood French doors are original to the building and are varnished. The doors have inset rounded profiles at the muntins, two ball-tipped hinges, one throw bolt each at the top of the door, and no other hardware. The trim 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 ($1'' \times 1\frac{1}{8}'' \times \pm\frac{1}{4}''$). Each door is $26'' \times 7'0'' \times 1\frac{1}{4}''$ (MI-KQ-27).

Broom Closet Door. This is a single wood panel broom closet door, painted, and it is original to the building. It has a brass push button catch knob, (possibly “Handy Catch” by Keil, New York), the same knob that is in the kitchen cabinet at the Old Michigan Island Lighthouse. The trim 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 ($1'' \times 1\frac{1}{8}'' \times \pm\frac{1}{4}''$). The door is $1'0'' \times 7'0'' \times 1\frac{1}{8}''$ (MI-KQ-31 and 32).

Architecture – Wall Finishes

The typical wall finish in this building is the original plaster over lath. The basement walls are red brick and the kitchen entry wall finishes are exterior brick on the south wall and horizontal $1\frac{5}{8}''$ beadboard painted white on the north, east, and west walls.

A paint sample from the kitchen reveals that the original paint color was a rich yellow. A sample from the second floor hall ceiling revealed three layers, the oldest being a warm yellow color. A paint sample from the second floor bath also revealed three layers, the oldest being pink in color.

A plaster sample from the second floor hall closet indicates that it is a mixture of gypsum and sand as opposed to lime and sand. The plaster is off-white in color and has surprisingly coarse sand. A plaster sample from the stair is very similar to the hall's plaster, except it has a very thin white skim coat.

Architecture – Ceiling Finishes

The typical ceiling finish in this building is the original plaster over lath. The basement has no ceiling finish as the floor framing is exposed. The kitchen entry has 1 $\frac{5}{8}$ " beadboard, painted white, as the ceiling finish.

Architecture – Interior Trim

The type of trim in the building is stained or painted wood 8" base with an ogee profile at the top and a simple base shoe. This trim is original to the building, and is the same as the base trim in the Old Michigan Island Lighthouse's kitchen and living room, c.1929 remodel work.

The living and dining room have wood picture rails, about 2" from the ceiling, stained. These moldings appear to be original (MI-KQ-24). The second floor south bedrooms also have picture rails, but only about 1" from the ceiling and with an almost cove-shaped profile, unlike the more traditional "S" shaped profiles for picture rails. These are also stained wood and appear to be contemporary (MI-KQ-43, 44, and 45).

Architecture – Floor

The typical floor is 2 $\frac{1}{4}$ " wood tongue and groove boards, recently refinished. The kitchen closet's floor has not been refinished and the original wood condition and stain are visible. The kitchen entry's floor is concrete as is the basement flooring.

Architecture – Stairs

Exterior South (Front Porch) Stairs. These stairs are concrete with six risers at 6" high, except the first riser, which is 8 $\frac{1}{4}$ " high. The stair treads are 5'11 $\frac{1}{2}$ " deep, except the bottom tread which is 7'11 $\frac{1}{2}$ ". The side cheek walls are 1'2" wide cast concrete capping brick. The entry to the porch is 5'3" wide, and the distance from the edge of the stairs to the door is 6'6". The stairs are original to the building (MI-KQ-13 and 14).

Exterior East (Kitchen Entry) Stairs. These concrete stairs have a brick base, five risers to a concrete landing and then one more riser at the door threshold. The bottom riser is 10 $\frac{1}{2}$ " high, the other four risers are 7 $\frac{1}{4}$ " high, and the riser at the door is 5" high. The four treads are 12" deep, 4'1" wide, and have a 1" nosing. The door threshold is 2'7" wide. The steel pipe railing, painted red, has a 1 $\frac{1}{2}$ " diameter with three posts and two rails. The top rail is 2'8" from the stair nosing to the center of the rail, and the lower rail is 1'4" from the nosing to the center of the rail. The railing is 3'9" from its center to the exterior wall. These stairs are original to the building (MI-KQ-11 and 12).

Basement to First Floor Stairs. These stairs have two flights of wood stairs connected by a landing which is the entry for the basement door. The lower flight, to the basement, is an open riser made of unfinished wood. This flight has seven risers at 8 $\frac{1}{2}$ " high with treads 9 $\frac{1}{2}$ " deep and 3'2" wide. There is no handrail in this portion. The landing is 3'6" long by 2'9" wide and is wood board painted gray. The upper flight of these stairs has five risers at 7 $\frac{1}{2}$ " high and treads are 10" deep and 3'0" wide. This set is made of wood,

1 painted gray, and has closed risers and rubber tread mats in the center of the treads. The upper flight also
 2 does not have any handrails. The upper flight and landing are original to the building, but the lower flight
 3 of unfinished wood is most likely a recent set of stairs (MI-KQ-21 and 22).

5 **First Floor to Second Floor Stairs.** These stairs are stained wood with two risers to a landing and then 14
 6 risers to the second floor. The riser height is 7½” with the bottom tread width of 3’2” and the other treads
 7 are 3’0” wide. The depth of the treads is 11” and they all have a 1” nosing. The landing is 3’0½” long by
 8 3’2” wide. There are no handrails. These stairs are original to the building (MI-KQ-38 and 39).

11 *Architecture – Casework*

12 **Entry and Living Room Closets.** The closets have painted boards for hooks.

14 **Kitchen Entry.** The kitchen entry has a built-in cabinet made with beadboard, painted white, which is the
 15 length of the west wall. There are two large two-door cabinets on the top with three shelves in the interior
 16 each, one large two-door cabinet on the bottom, and one open-out hinged door, possibly for trash, on the
 17 bottom. This cabinet is very similar to the cabinet in the kitchen of the Old Michigan Island Lighthouse,
 18 including the door hardware. The knobs on the doors are brass push button catch knobs, (possibly “Handy
 19 Catch” by Keil, New York) and the cabinet has surface-mounted butterfly hinges (each door has two). This
 20 cabinet has a slide out wood cutting board, painted white (MI-KQ-34 to 37).

22 **Second Floor Hall Closet.** The Hall closet has four built-in wood shelves on the north wall, painted white,
 23 and two simple wood hook boards (2¾” wide), painted white, on the east and west walls. There are no
 24 existing hooks. The shelving system appears to be historic, possibly original.

26 **Second Floor Southeast Bedroom and Closet.** The closet has two stained hook boards. There is an attic
 27 access hatch in this closet, trimmed with simple wood casing, stained. The hatch is made of beadboard,
 28 stained as well.

30 **Second Floor Southwest Bedroom and Closet.** The closet has a modern metal rod with wood blocks for
 31 support.

33 **Second Floor Northwest Bedroom Closet.** This closet has a simple painted wood board.

36 *Architecture – Accessibility*

37 The building is currently not accessible. The main entry door opening is 2’8” clear with a grade to finished
 38 floor elevation change of 3’5¼”. The kitchen entry door opening is 2’8” clear with a grade to finish floor
 39 elevation change of 3’8¾”. The basement entry door opening is 2’8” clear with a grade to finished floor
 40 elevation change of 3’1½”. Within the building, there have been no upgrades to mitigate accessibility. The
 41 basement and upper level are not accessible.

44 *Physical Description – Structural*

45 *Structural – Foundation*

46 The perimeter foundation system consists of brick masonry. The interior foundations are concrete footings
 47 in the basement. The concrete footings below the adjustable steel columns were added in 2004.

50 *Structural – Floor Framing*

51 The basement floor is a concrete slab-on-grade.

The first floor framing was measured to be 2x10 joists spaced at about 16'. The joists span approximately 12'. The joists were installed in 2004 and are graded No. 1 or No. 2 Douglas Fir – Larch. The joists are supported on the perimeter foundation walls and 10" deep steel beams. The beams span approximately 3', 7', and 11'. The beams are supported on the perimeter foundation walls and three 3" diameter adjustable steel columns that bear on concrete footings. The columns were added in 2004. The subfloor over the joists is plywood or 1x diagonal sheathing. The plywood was installed in 2004.

The second floor framing was not accessible and could not be measured. The joists are supported on wood-framed partition walls and wood-framed exterior walls.

Structural – Roof Framing

The roof framing was measured to be 2x6 rafters spaced at about 16'. The rafters span approximately 14'. The rafters are supported on the exterior walls. The rafters are sheathed with solid wood underlayment.

The roof framing of the front and back porches could not be observed but is believed to be wood framing. The roofs span approximately 6'. The rafters are supported on the exterior walls and two masonry columns at the front.

Structural – Ceiling Framing

The ceiling framing of the second floor was measured to be 2x6 joists spaced at about 16". The joists span approximately 14'. The ceiling joists are supported on the exterior walls and the interior partition walls.

Structural – Wall Framing

The exterior walls are constructed of wood framing with a brick masonry veneer. The framing of the interior walls could not be observed but was shown to be wood framing on the 1929 drawings (Historic Drawing MI-03).

Structural – Lateral System

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

Structural – Load Requirements

The required floor load capacity is 40 psf. The required attic live load capacity is 10 psf (no storage allowed). The required roof snow load capacity is 50 psf.

Physical Description – Mechanical

Mechanical – Plumbing Systems

A nonpotable domestic water supply enters the building below grade in the basement with copper distribution piping to the first floor kitchen and second floor bath. There is no hot water in the building.

The building waste lines are mainly cast iron with a PVC (polyvinyl chloride) drain connection at the kitchen sink. These lines connect to a 4" cast iron sewer main that exits the building in the basement. This 4" line connects to a 6" clay sewer pipe that runs to the southwest and into a septic tank located to the southwest of the Power House that serves the entire building complex. Two basement floor drains also connect to the 6" clay sewer.

Plumbing fixtures have been upgraded since the 1929 installation with a two-compartment stainless steel sink in the first floor kitchen and bathroom fixtures on the second floor. The bathroom fixtures consist of a wall mounted enameled cast iron lavatory and a tank type toilet (MI-KQ-48, 49, and 50).

Mechanical – HVAC

The original heating system consisted of a 1929 coal-fired International Heater Company No. 4824 furnace in the basement. The furnace is still located in the basement, but the distribution ductwork has been disconnected. Many of the original wall and floor grilles are still in place. A new Empire 25,000 British thermal unit per hour (btuh) console-type propane room heater has been installed in the first floor living room. The 4" aluminum flue pipe from the propane heater has been installed inside the original chimney stack. Two propane tanks are located to the west of the building. The copper propane piping enters the building on the west side with a pressure regulator located on the exterior wall and copper distribution piping through the basement up to the first floor. The propane piping serves the heater and kitchen stove. A second abandoned propane entry exists on the east side of the building and is still connected to the copper propane distribution piping with a locked-out valve.

Basement ventilation consists of a 24" × 30" ground level louver on the west side of the building with a wire mesh screen.

Mechanical – Fire Suppression

None in the building.

Physical Description – Electrical

Electrical – System Configuration

Alternating current power to the building originally came from the Power House via underground cable. The original underground feeder to the building has been removed. A 20 amp underground feed for PV power was installed within the past 10 years to connect very limited lighting in the building to the PV system in the Power House.

Electrical – Conductor Insulation

Conductors and cable within the building are generally of corrugated armor, rubber insulated construction, type BX. Existing BX cable is concealed in walls and ceilings on upper floors and exposed in basement and attic. Several lighting fixtures have been removed. Some of the original armored cable has been replaced with more modern NM (nonmetallic sheathed) type cable for the few light fixtures and receptacles that are now connected to the central photovoltaic system inverter. According to the Park Service, wiring in walls has been replaced with type NM cable. Newer electrical installations appear to conform to later versions of the NEC.

Electrical – Overcurrent Protection

Overcurrent protection was originally provided via a two pole 30 amp disconnect switch feeding a four circuit screw-in fuse box located in the basement. The disconnect remains in place. Fuses are still in place, but the box and connections have been disconnected from the building's circuits. Overcurrent protection for PV powered devices in the building is via a 1 pole circuit breaker located in the dc load center in the Power House.

Electrical – Lighting Systems

Original lighting systems inside of the building are incandescent lamp type. Luminaires are typical of the late 1920s era and consist of various ornamental surface mounted types, including drums, and pendants. Original switching was via wall mounted toggle switches. Fluorescent strip lights located in the kitchen area are powered from the photovoltaic system. Switching for newer PV powered lighting is via wall mounted toggle switches.

Electrical – Telecommunications

None in the building.

Electrical – Fire Alarm System

The building is equipped with several battery powered smoke detectors, but no centralized system or fire department signal connection exists.

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 along the peak of the roof, at the peak of each dormer, and on the chimney.

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. Gray Granular plaster between slats in wall interiors.

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. Ceiling Insulation (Black matting or felt paper observed above ceilings, this suspect ACM may also be present in wall interiors),
3. Adhesives (Multiple varieties of miscellaneous adhesives were seen on heater components, under remnant flooring applications, and around windows),
4. 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.),
5. Roofing Materials (Roofing felt, tar, and shingles were observed that may contain asbestos),
6. 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),
7. Brick and Block Filler (The exterior of the structure is brick and has the potential to have a block filler or grout that is potentially asbestos containing),
8. Caulk (Caulking was observed around window and door penetrations, which can also include gasket applications between the window assembly and the structure), and,

9. 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 good condition, and the assumed ACMs were observed to be in fair condition, except isolated areas of plaster that were in poor condition.

Hazardous Materials – Lead Containing Paint

The LCP inspection included a visual inspection of the structure. A previous inspection and testing for LCP was conducted using an 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 Sash (Wood substrate of various colors),
2. Window Trims (Wood substrate of various colors),
3. Doors (Wood and metal substrates of various colors),
4. Door Trims (Wood substrate of various colors),
5. Walls (Various substrates of various colors), and,
6. Ceilings (Various substrates of various colors).

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

1. Interior Painted Surfaces (Based on testing in the kitchen, living room, den, bathroom, and bedrooms LCP is assumed to be present on painted surfaces throughout the structure which, based on NPS testing is non-LCP), and,
2. Exterior Painted Surfaces (Based on testing of the trim by NPS LCP exists on exterior painted surfaces).

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 LCP was observed to be in fair condition, and the assumed LCP was observed to be in fair condition.

Loose/flaking LCP is not identified on the exterior walls of the structure. Paint chip debris is not noted on localized areas of surface soils surrounding the Keepers Quarters.

Hazardous Materials – Lead Dust

Surface wipe-sampling was conducted in the Keepers Quarters. A three wipe composite was collected from the living room, upstairs bedroom, and upstairs bathroom.

1. Laboratory analysis showed 119 micrograms of lead per square foot of floor space ($\mu\text{g}/\text{ft}^2$).

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 not 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 taken 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 160 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.

Character-Defining Features

Mass/Form. A simple brick gable bungalow with a hipped-roof brick porch, brick chimney, a large centered gable dormer on the front and a smaller offset gable dormer on the back balanced by a one story wood-framed shed roof appurtenance with a concrete-topped brick landing and stair to grade.

Layout of Space. The arrangement of rooms is a more contemporary approach with separate circulation areas; all of the bedrooms are separate without connecting openings.

Exterior Materials. Red brick with stone sills, painted white wood trim, painted wood siding and an asbestos shingle roof.

Openings. Typically three-over-one wood double hung windows; Doors are six lite over two panel, wood painted.

Interior Materials. Wood floor, stained wood trim, panel doors, painted plaster walls and ceilings, brass mechanical damper control.

General Condition Assessment

In general, the Michigan Island Keepers Quarters is in good condition. The original interior finishes are in remarkably good condition, besides the alligatored stained floors on the second floor and the few instances of water infiltration into plaster. The original windows and doors are also in good condition, as is the historic casework.

Structurally, the Keepers Quarters is in good condition. The brick masonry below the landing at the back door needs further attention. The roof needs to be strengthened to support the required snow load.

Mechanically, the upgraded systems in the Keepers Quarters are generally in good condition.

Electrically, the equipment within this building is in fair condition considering its age. However, much of the existing equipment and equipment locations do not meet current installation codes and are past their serviceable lives. Except for the newer NM wiring and newer fluorescent luminaires, the electrical system for this building is not salvageable.

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 roofing is in poor condition. It appears to be nearing its end of serviceable life and yellow algae exists pervasively. The eave and associated trim is in fair condition with several areas of damage and peeling paint.

1 *Architecture – Gutters and Downspouts*

2 Condition: *Poor*

3 Overall, the gutters and downspouts are in poor condition. The gutters have failure at joints, and the areas
4 that have rusted through have resultant damage to masonry and trim. There is also a gutter missing at the
5 eastern portion of the north elevation. The underdrain system's condition is unknown, but it is suspect.

8 *Architecture – Chimney*

9 Condition: *Good*

10 The chimney is in good condition.

13 *Architecture – Exterior Walls*

14 Condition: *Good*

15 Generally, the walls are in good condition with a few exceptions at the porch and rear stoop. Both locations
16 have open cracks/joints at the brick. Materials testing indicate that the mortar is a gray, moderately soft
17 lime, with a sand composition. At the concrete landing of the kitchen entry, moisture appears to have
18 entered behind the stem wall resulting in spalling and efflorescence. The north wall adjacent to the missing
19 gutter has also been damaged.

22 *Architecture – Windows*

23 Condition: *Good*

24 The typical double hung windows have some cracked and missing glazing putty, a few cracked panes, paint
25 peeling on the exterior, and alligatored interior trim varnish. A few of the screens are missing screen stops
26 and there are two patched screen areas. Overall, however, the windows in this building are in good
27 condition.

30 *Architecture – Exterior Doors*

31 Condition: *Fair*

32 **Basement Entry, Main Entry, and Kitchen Entry Doors.** These doors are in fair condition as they have
33 peeling paint and the lower rails for the basement and kitchen entry doors are deteriorating from rain and
34 sun exposure.

36 **Screen Doors for Basement Entry, Main Entry, and Kitchen Entry Doors.** These doors are in good
37 condition besides minor peeling paint.

40 *Architecture – Exterior Trim*

41 Condition: *Fair*

42 The trim is generally in fair condition with a few exceptions where the gutters have failed. The trim at the
43 northeast matches the adjacent Assistant Keepers Quarters and Workshop.

46 *Architecture – Porch*

47 Condition: *Good*

48 The porch is generally in good condition but there is cracking at the porch topping slab. The south wall's
49 masonry shows signs of previous repair, possibly due to the slope of the porch floor and its built-in drains.

Architecture – Interior Doors

Condition: *Good*

Five Panel Door (First Floor and Second Floor). These doors are in good condition with the exception of some missing knobs.

Living Room to Dining Room Double Doors. This set of doors is in good condition with the exception of the alligatored varnish.

Broom Closet Door. This door is in good condition.

Architecture – Wall Finishes

Condition: *Good*

The general state of the plaster walls is in good condition, with minor cracks and peeling of the paint. There are some areas in which the plaster wall finish is in poor condition. There are cracks in the plaster, missing plaster, and areas of moisture infiltration visible in the second floor hall and main stairway. The southeast second floor bedroom and closet have some plaster issues. The closet has some holes in the plaster. The kitchen entry's wall finishes are also in fair condition as there is minor board separation on the beadboard walls.

Architecture – Ceiling Finishes

Condition: *Good*

Overall, the original plaster ceiling finishes are in good condition with limited instances of cracks and peeling paint. The second floor hall and stairway have poor ceiling finishes, however, as these areas have heavy peeling, cracking, and obvious moisture issues. The southwest bedroom has a crack in the plaster running east to west with evident repair work. There is also a section of plaster missing at the southwest corner of the sloped roof line where sealant was applied in 2008 to cover the lath (S. Mackreth's recollection as volunteer's supervisor). The kitchen entry's ceiling finish of beadboard is in fair condition with some board separation.

Architecture – Interior Trim

Condition: *Good*

Overall, the base is in good condition. The trim on the first floor has minor wear and tear. The second floor trim has prevalent examples of poor stain jobs that have created the alligatored appearance of the stain.

The first and second floor picture rails are in good condition.

Architecture – Floor

Condition: *Fair*

The first floor wood flooring is in good condition with minor wear and tear and stains. The kitchen closet's floor that has not been refinished is also in good condition. Beginning at the stairwell to the second floor, the recent stain was applied poorly and the stain in all of the second floor rooms, hall, and stairwell are alligatored and unevenly stained. The alligatoring of the floor finish appears to be due to a too thick layer of finish applied. The second floor bath has poor wood floor finish as the stain is alligatored, there are paint and water stains, and the paper remnants and glue from previous flooring are sealed to the floor. The second floor north bedroom also has small water stains on the floor.

1 *Architecture – Stairs*

2 Condition: *Fair*

3 **Exterior South (Front Porch) Stairs.** These concrete stairs are in good condition, but they do not have a
4 handrail and there are some minor cracks on the treads.

5
6 **Exterior East (Kitchen Entry) Stairs.** This concrete stair and railing are in poor condition as the brick
7 base of the stairs is deteriorating. The mortar is too hard, and as a result, is disintegrating and the bricks are
8 loosening and falling out. There is also a horizontal crack in the concrete landing that is associated with the
9 brick foundation failing.

10
11 **Basement to First Floor Stairs.** These stairs are overall in good condition but neither flight has handrails.

12
13 **First Floor to Second Floor Stairs.** These stairs are in good condition although there are no handrails and
14 the finish is badly alligatored.

15
16
17 *Architecture – Casework*

18 Condition: *Good*

19 In general, the casework is in good condition. The registers are in good condition. The kitchen entry's
20 cabinet is in fair condition as the paint is peeling badly and cracking, the hinges are rusted, and upper
21 cabinets' doors are misaligned.

22
23
24 *Architecture – Accessibility*

25 Condition: *Poor*

26 This building is not accessible.

27
28
29 **Condition Assessment – Structural**

30 *Structural – Foundation*

31 Condition: *Good*

32 The foundation system appears to be in good condition. There are a few small areas of brick deterioration
33 that appear to have been caused by freeze/thaw damage.

34
35
36 *Structural – Floor Framing*

37 Condition: *Good*

38 The first floor framing is in good condition having been repaired in 2004. Floor joists that bear above
39 windows are not properly supported on lintels. The second floor framing could not be observed, thus its
40 condition is unknown. No obvious signs of distress or damage were observed.

41
42
43 *Structural – Roof Framing*

44 Condition: *Good*

45 The roof framing of the main building is in good condition. The calculated snow load capacity is
46 approximately 30 psf which is 20 psf less than the required snow load. The roof framing of the porches
47 could not be observed, thus its condition is unknown.

Structural – Ceiling Framing

Condition: *Good*

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

Structural – Wall Framing

Condition: *Fair*

The exterior walls are in good condition with the exception of the masonry walls under the landing at the back door which are in poor condition. The walls at the landing are severely deteriorated. The concrete landing slab has cracked and is in fair condition. The damage to the bricks at the landing needs further investigation (MI-KQ-51 and 52). The framing of the interior walls could not be observed, thus their condition is unknown. No obvious signs of structural damage were observed.

Structural – Lateral System

Condition: *Good*

Lateral stability of the Keepers Quarters is good.

Structural – Load Requirements

Condition: *Fair*

The roof framing can support about 30 psf of snow which is less than the required load capacity. The second floor ceiling and first floor framing have adequate capacity to support the required loads. The capacity of the second floor framing is unknown.

Condition Assessment – Mechanical

Mechanical – Plumbing Systems

Condition: *Good*

The copper nonpotable domestic water distribution piping to the first floor kitchen and second floor bath is in good condition.

The cast iron building waste lines and PVC drain connection at the kitchen sink are in good condition. While the fixture drain and two basement floor drains are in good condition, the condition of the buried 6" clay sewer pipe that runs into the septic tank could not be determined.

The stainless steel kitchen sink, bathroom fixtures, and faucets are in good condition.

Mechanical – HVAC

Condition: *Good*

The original 1929 coal-fired furnace in the basement is in poor condition. The distribution ductwork has been disconnected. Many of the original wall and floor grilles are still in place and are in fair condition. The new Empire propane heater and associated flue vent are in good condition. However, the existing chimney stack is not adequately lined and does not meet current mechanical and building codes. The propane building entry, outside pressure regulator, and copper distribution piping through the basement up to the first floor are also in good condition.

The basement ventilation louver is in fair condition, but does not provide adequate ventilation for the space.

1 *Mechanical – Fire Suppression*

2 Condition: N/A

5 ***Condition Assessment – Electrical***

6 *Electrical – System Configuration*

7 Condition: Poor

8 The underground power feed to the building has been removed. The existing power disconnect and fusing
9 system is in poor condition and is beyond its serviceable life. The underground feed for PV power from the
10 Pump House is in good condition.

13 *Electrical – Conductor Insulation*

14 Condition: Poor

15 The original conductors and cable within the building are in poor condition, and are well beyond their
16 serviceable life. Type BX branch circuit cable is in poor condition. At 70 years old, insulation is suspect
17 and potentially very fragile. Existing cables are two wire only and do not contain a separate ground wire.
18 The integrity of remaining connections cannot be assured.

21 *Electrical – Overcurrent Protection*

22 Condition: Poor

23 Fuses are still in place, but the box and connections have been disconnected from the building's circuits.

26 *Electrical – Lighting Systems*

27 Condition: Fair

28 Lighting systems inside of the building appear to be in fair condition. Nevertheless, after 70 years of
29 service in a humid environment, the integrity of connections cannot be assured. In addition, newer
30 underwriter's requirements for fixture grounding have made these fixtures obsolete. Fluorescent strip lights
31 that are powered from the photovoltaic inverter system are relatively new and are in good condition.

34 *Electrical – Telecommunications*

35 Condition: N/A

38 *Electrical – Fire Alarm System*

39 Condition: Fair

40 Existing single station smoke detectors are in fair condition, but were not tested.

43 *Electrical – Lightning Protection*

44 Condition: Fair

45 Lightning protection systems are intact and appear to be in fair condition, however over time, connections
46 deteriorate and components corrode. The integrity of the system cannot be assured.

1 ***Condition Assessment – Environmental***

2 Refer to “Physical Description – Environmental” for detailed descriptions of locations and conditions of
3 hazardous materials.
4

Ultimate Treatment and Use

This building operated as a residence from 1929 to 1943 when the Second Tower was automated and the keeper and assistants were no longer needed.

The building is currently used as guided visitor access with artifacts on the main level for visitors to review. The upper level is used for seasonal staff/volunteer housing. The proposed use for the building will remain as is with guided visitor access to the lower level and seasonal staff/volunteer housing on the upper level. The intent of the park is to rehabilitate the building to 1929 condition while providing required upgrades for the housing function.

Rehabilitation is the recommended treatment for the building.

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 in kind with an asphalt shingle roof of 9” wide by 7” high exposure in keeping with 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: *Severe*

Replace the existing ogee style 22-gauge gutter and 24-gauge fluted downspout system in kind. Verify/provide new attachments at sound substrate.

Architecture – Chimney

Priority: *Low*

No recommendations at this time.

Architecture – Exterior Walls

Priority: *Moderate*

Repair damaged masonry at the porch, rear stoop and north wall adjacent to the missing gutter. Utilize the mortar analysis to guide the mortar composition and color. Mortar joint tooling shall match the original.

Clean all masonry with a mild detergent. Scrape, sand, and repaint the areas of wood siding and trim using the paint analysis to guide the color selection.

Architecture – Windows

Priority: *Low*

Repair select windows with damaged glazing. Replace cracked panes of glass. Scrape, sand, and repaint exterior of windows and frame. Scrape sand and revarnish interior of windows and frame.

Architecture – Exterior Doors

Priority: *Moderate*

Repair lower rails exhibiting damage. Scrape, sand, and repaint the doors. Repair existing hardware as required to allow smooth operation.

Architecture – Exterior Trim

Priority: *Low*

Scrape, sand, and repaint the areas of wood trim at siding using the paint analysis to guide the color selection.

Architecture – Porch

Priority: *Low*

Scrape, sand, and repaint the porch using the paint analysis to guide the color selection. Monitor the topping slab cracking.

Architecture – Interior Doors

Priority: *Low*

Scrape, sand, and revarnish interior doors with alligatored finish. Replace missing knobs with finish to match original.

Architecture – Wall Finishes

Priority: *Moderate*

Repair damaged plaster and repaint using the paint analysis to guide the color selection.

Architecture – Ceiling Finishes

Priority: *Moderate*

Repair damaged plaster repaint using the paint analysis to guide the color selection.

Architecture – Interior Trim

Priority: *Low*

No recommendations at this time.

Architecture – Floor

Priority: *Moderate*

Refinish existing wood floor. Coordinate with enhanced ventilation of building.

Architecture – Stairs

Priority: *Severe*

Repair the landing of the kitchen entry stairs, coordinated with the masonry repair. Verify/provide proper slope away from the wall. Add code compliant handrails at the front porch, kitchen entry, basement and first and second floor stairs; painted metal at exterior and wood stained at interior.

Architecture – Casework

Priority: *Low*

No recommendations at this time.

Architecture – Accessibility

Priority: *Low*

Accessibility to this building is not readily achievable. Program access will be achieved by interpretive wayside signage. Options discussed and dismissed included providing a limited route of accessibility to the Quarters include (1) adding a ramp to the west with a new opening in the porch low wall and landing at the front door; or (2) adding a ramp and increasing door opening widths (existing is 2'8") of the kitchen entry doors and interior path; or (3) investigating the addition of a PV/Battery operated mechanical lift at either location.

Treatment Recommendations – Structural

Structural – Foundation

Priority: *Low*

The cause of the freeze/thaw damage to the brick masonry should be investigated further.

Structural – Floor Framing

Priority: *Low*

The first floor joists at the windows should be supported on lintels or headers.

Structural – Roof Framing

Priority: *Low*

The roof framing should be investigated further to determine if it needs to be strengthened to support the required snow loads. The calculated capacity is 30 psf and the required capacity is 40 psf.

Structural – Ceiling Framing

Priority: *Low*

No recommendations at this time.

Structural – Wall Framing

Priority: *Low*

The damaged walls under the landing at the back door should be repaired or reconstructed and protected from future deterioration. The concrete landing slab should be replaced.

Structural – Lateral System

Priority: *Low*

No recommendations at this time.

Treatment Recommendations – Mechanical

Mechanical – Plumbing Systems

Priority: *Moderate*

It is recommended that the sewer and septic system be cleaned, tested, and inspected with repairs as necessary for an operational system.

Mechanical – HVAC

Priority: *Severe (Chimney Liner); Moderate (Ventilation and Piping)*

The existing chimney stack is not adequately lined and does not meet current mechanical and building codes. Installation of a chimney liner for the heater flue vent is highly recommended.

The existing basement ventilation louver does not provide adequate ventilation to prevent condensation and high humidity levels. The addition of mechanical and passive ventilation is recommended.

It is recommended that rusted propane piping at the pressure regulator be replaced and that all unused propane piping be removed.

Mechanical – Fire Suppression

Priority: *N/A*

Treatment Recommendations – Electrical

Electrical – System Configuration

Priority: *Moderate*

Electrical devices, lighting and wiring dating to the original 1929 installation are no longer connected to a source of power. These items should remain in place for historical context. Existing wiring in the building for PV powered systems is limited. It is recommended to expand the existing system with new wiring to provide power for new ventilation systems, new refrigerator, and new stove. All new electrical wiring and equipment shall be in accordance with the National Electrical Code.

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: Low

No recommendations at this time.

Electrical – Telecommunications

Priority: N/A

Electrical – Fire Alarm System

Priority: Moderate

Existing battery powered smoke detectors are old. It is recommended that new detectors replace existing, that additional detectors be added inside and outside rooms intended for sleeping, and that carbon monoxide sensors be added as required.

Electrical – Lightning Protection

Priority: Moderate

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 of suspect asbestos containing materials, including wall and ceiling plaster, ceiling insulation, adhesives, TSI, roofing materials, subflooring, brick and block filler, caulking, and asbestos cement. Removal and replacement of asbestos roofing is recommended.

Hazardous Materials – Lead-Containing Paint and Lead Dusts

Priority: Moderate

Recommend stabilization or abatement of Lead Containing Paint.

Hazardous Materials – Lead In Soils

Priority: Moderate

Recommend further soils characterization to confirm applicable regulatory requirements.

Hazardous Materials – Mold/Biological

Priority: Moderate

Recommend water intrusion and mold mitigation.

Hazardous Materials – Petroleum Hydrocarbons

Priority: Low

No recommendations at this time.

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Alternatives for Treatment

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

1. Careful study is needed for introducing an accessible entry to this building. An alteration on the front would be immediately visible to the visitors as they enter the site. An alteration (ramp or lift) to the kitchen entry would be difficult to conceal and visible from the main lawn of the 1929 site.

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. 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
2. Visitor access into former residence	Change in Use: Upgrades for code and safety may be required and may alter the historic fabric.	Integrate upgrades to minimize damage to historic fabric.	- Allows visitors to experience the cultural resource first hand - Improves safety for visitors and staff
3. Replace existing roof with new asphalt shingle	Removes original material.	Roof is at end of serviceable life. New exposure of shingles and coloration shall match original.	- Abates a hazardous material - New roof will aid in the preservation of the structure
4. Add code compliant handrails at the stairs	Adding a modern element may be visually disruptive.	Design a guardrail that blends well with the historic fabric.	- Improves visitor and staff safety

1 ***Keepers Quarters Photographs, 2009***



MI-KQ-01: Aerial, 2009 (Source: A&A DSC00609)

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MI-KQ-02: South elevation, 2009 (Source: A&A DSC00635)

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MI-KQ-03: East elevation, 2009 (Source: A&A DSC00636)

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MI-KQ-04: North elevation, 2009 (Source: A&A DSC006640)



MI-KQ-05: West elevation, 2009 (Source: A&A DSC00637)

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MI-KQ-06: East gutter and roof detail (Source: A&A IMGP2804)



MI-KQ-07: South roof, trim, gutter, and chimney detail (Source: A&A IMGP2826)



MI-KQ-08: Porch roof, gutters, downspouts, trim and eaves, looking northwest (Source: A&A IMGP2828)



MI-KQ-09: Downspout and underdrain detail (Source: A&A IMGP2829)



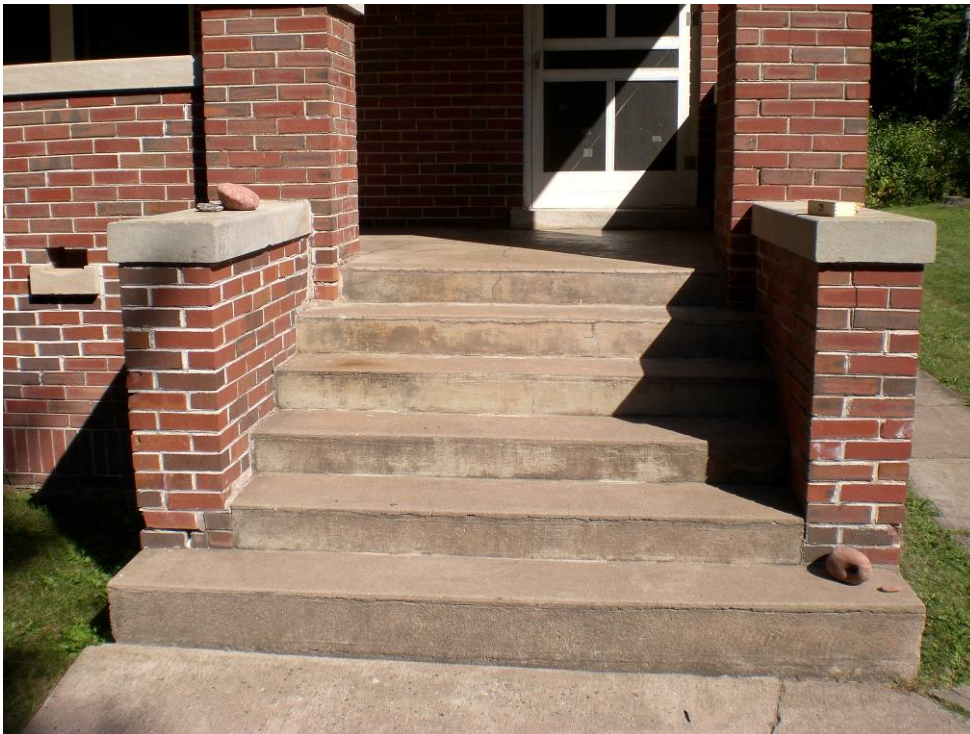
MI-KQ-10: North elevation downspout, eaves, and roof (Source: A&A IMGP2801)



MI-KQ-11: East porch (Source: A&A IMGP2797-A)



MI-KQ-12: East porch detail, north elevation (Source: A&A IMGP2798)



MI-KQ-13: Front porch detail (Source: A&A CIMG3644)



MI-KQ-14: Front porch detail, looking west (Source: A&A IMGP2795)



MI-KQ-15: South entry (primary) screen door (Source: A&A 100_9594)



MI-KQ-16: East entry screen and wood doors (Source: A&A 100_9606)



MI-KQ-17: North entry wood door (Source: A&A 100_9607)



MI-KQ-18: Typical exterior window (Source: A&A 100_9596)



MI-KQ-19: Attic window (Source: A&A 100_9598)



MI-KQ-20: Basement and window (Source: A&A CIMG3739)



MI-KQ-21: Basement stairs (Source: A&A DSC00841)



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2 *MI-KQ-22: Stairs from basement entry to kitchen (Source: A&A DSC00844)*
3



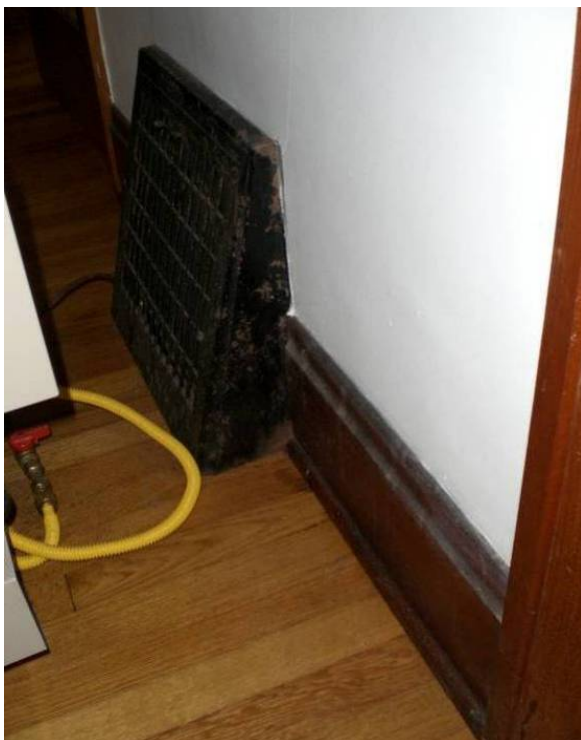
4
5 *MI-KQ-23: South entry door (primary) (Source: A&A 100_9593)*



MI-KQ-24: Living room south elevation (Source: A&A CIMG3678)



MI-KQ-25: Living room north elevation (Source: A&A CIMG3675)



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MI-KQ-26: Living room metal register on north wall and base trim (Source: A&A CIMG3682)



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MI-KQ-27: Living room double doors into dining room (Source: A&A 100_9616)



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2 *MI-KQ-28: Dining room early vent control system (Source: A&A CIMG3700)*
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5 *MI-KQ-29: Detail of vent control (Source: A&A 100_9614)*



MI-KQ-30: Kitchen north elevation (Source: A&A CIMG3705)



MI-KQ-31: Kitchen broom closet door, east wall (Source: A&A 100_9611)



MI-KQ-32: Kitchen broom closet latch (Source: A&A 100_9610)



MI-KQ-33: Kitchen wood door and screen to kitchen entry (Source: A&A 100_9608)



MI-KQ-34 and 35: Kitchen entry wood cabinet, south side (Source: A&A CIMG3733 and CIMG3732)



MI-KQ-36 and 37: Kitchen entry wood cabinet, north side (Source: A&A CIMG3734 and CIMG3735)



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2 *MI-KQ-38: Stairs from living room to second floor (Source: A&A DSC00830)*
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5 *MI-KQ-39: Stairs from living room to second floor (Source: A&A DSC00835)*



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2 *MI-KQ-40: Second floor hall, north elevation (Source: A&A DSC00717)*
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4
5 *MI-KQ-41: Southeast bedroom, south elevation (Source: A&A DSC00724)*



MI-KQ-42: Southeast bedroom, metal floor register, floor and base trim (Source: A&A DSC00731)



MI-KQ-43: Southwest bedroom, west elevation (Source: A&A DSC00743)



MI-KQ-44: Southwest bedroom ceiling, looking south (Source: A&A DSC00749)



MI-KQ-45: Southwest bedroom, south ceiling detail and picture rail profile (Source: A&A DSC00750)



MI-KQ-46: North bedroom, west elevation (Source: A&A DSC00763)



MI-KQ-47: Bath, east elevation (Source: A&A DSC00786)



MI-KQ-48: Bath, looking southeast (Source: A&A DSC00787)



MI-KQ-49: Bath, toilet detail (Source: A&A DSC00800)



MI-KQ-50: Bath, toilet detail (Source: A&A DSC00799)



MI-KQ-51: Masonry wall deterioration (Source: Martin/Martin)



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MI-KQ-52: Masonry wall deterioration (Source: Martin/Martin)

CHAPTER 4: HISTORIC STRUCTURE REPORT

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