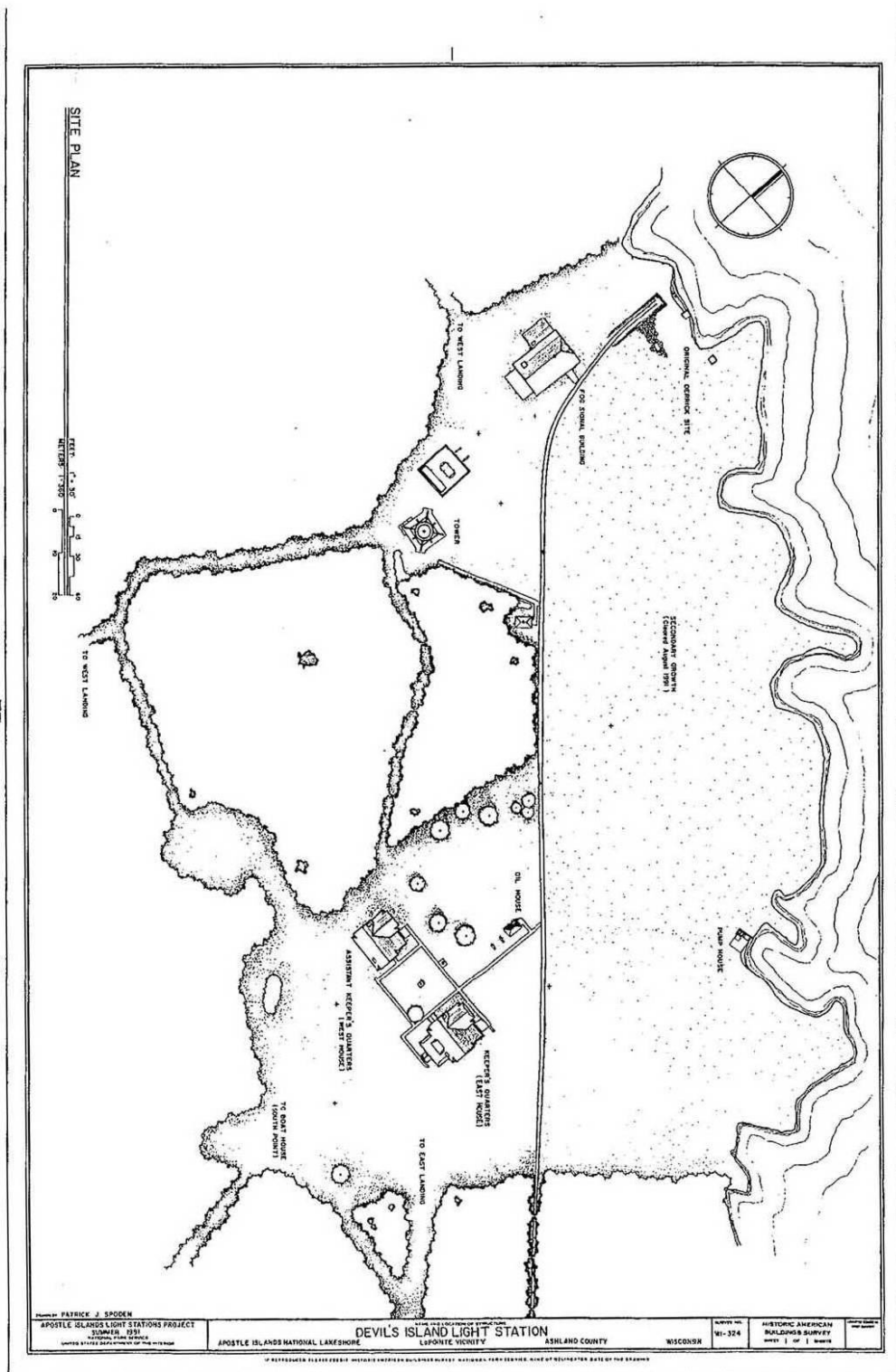
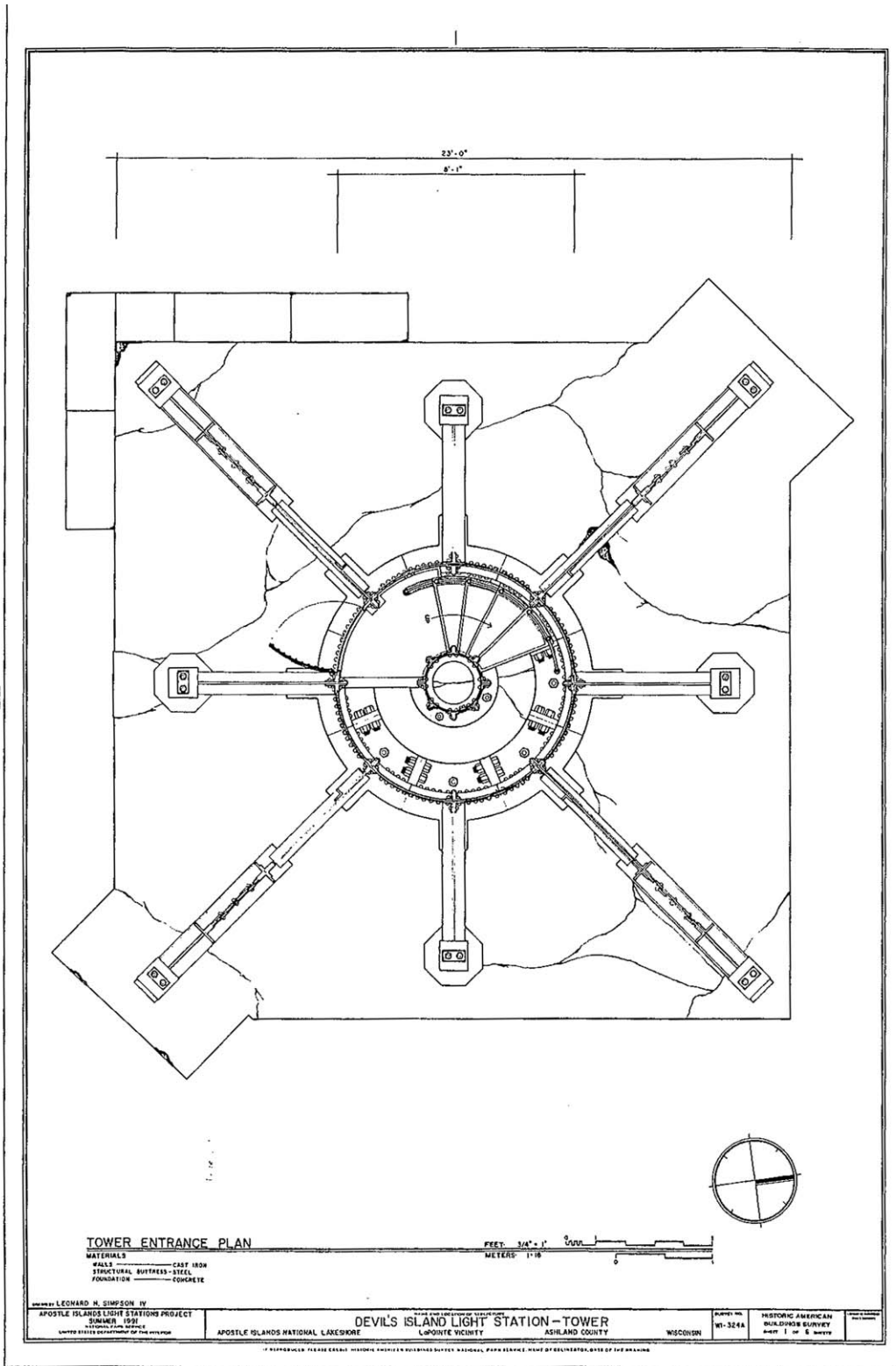
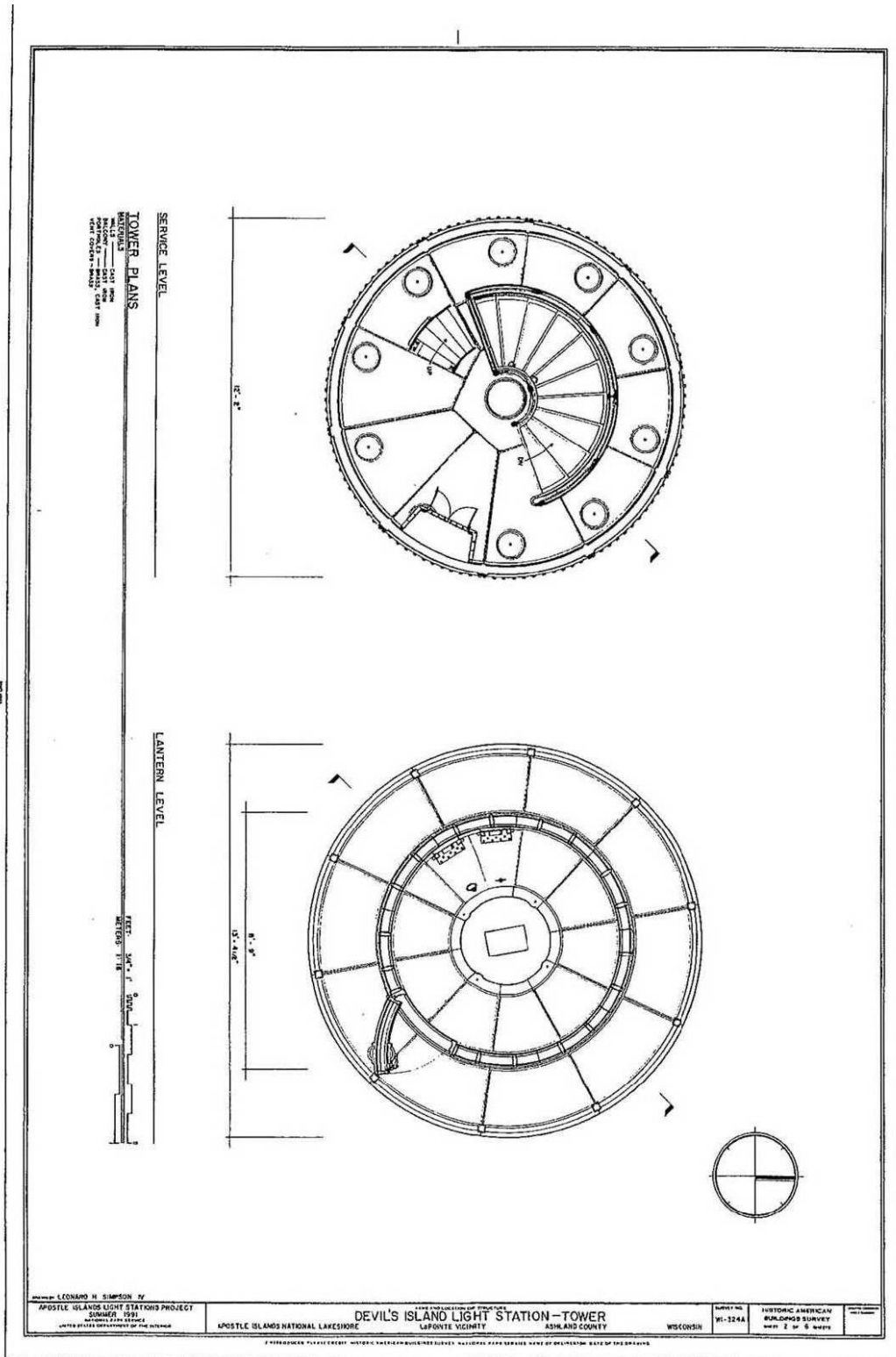
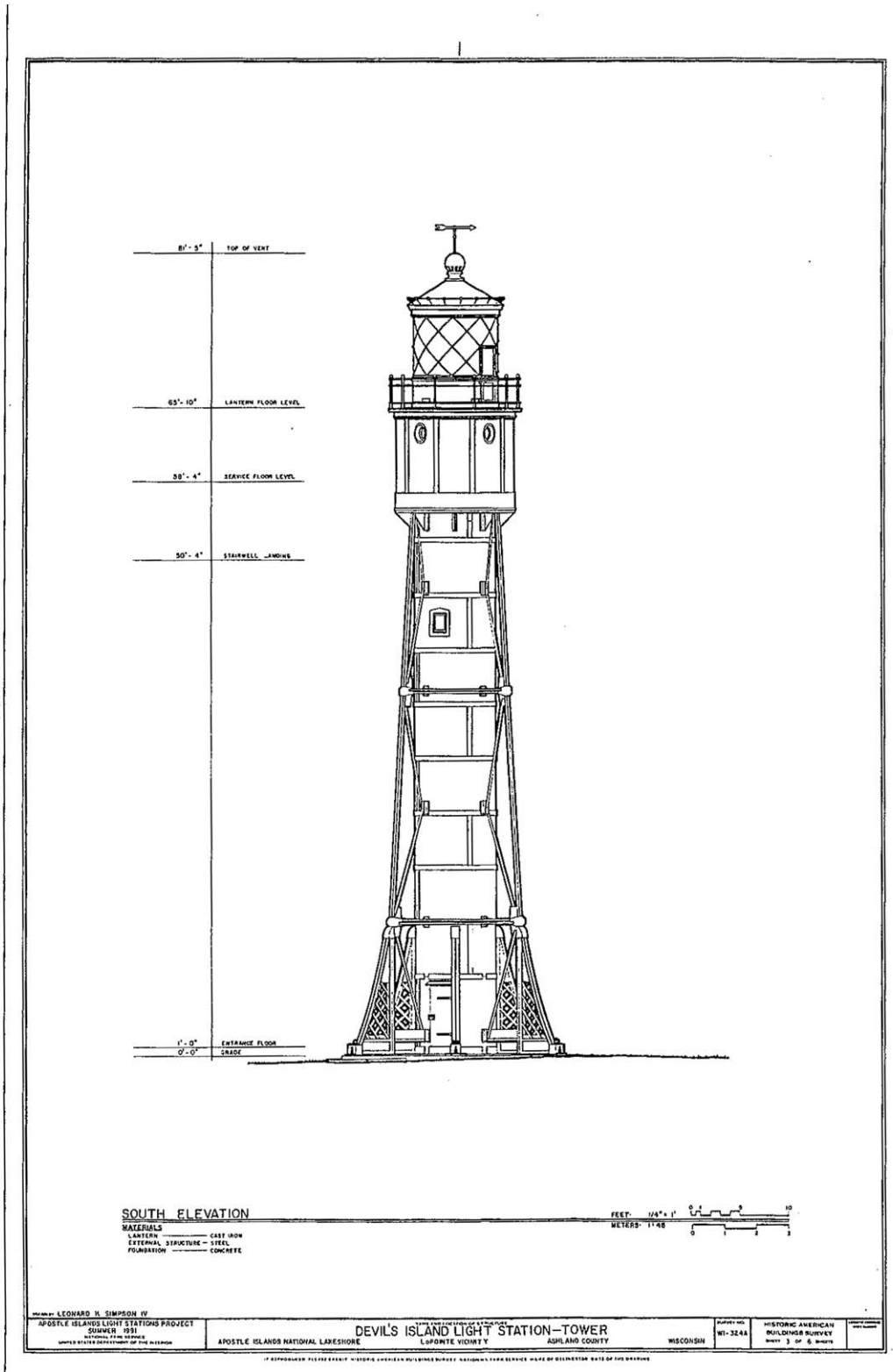


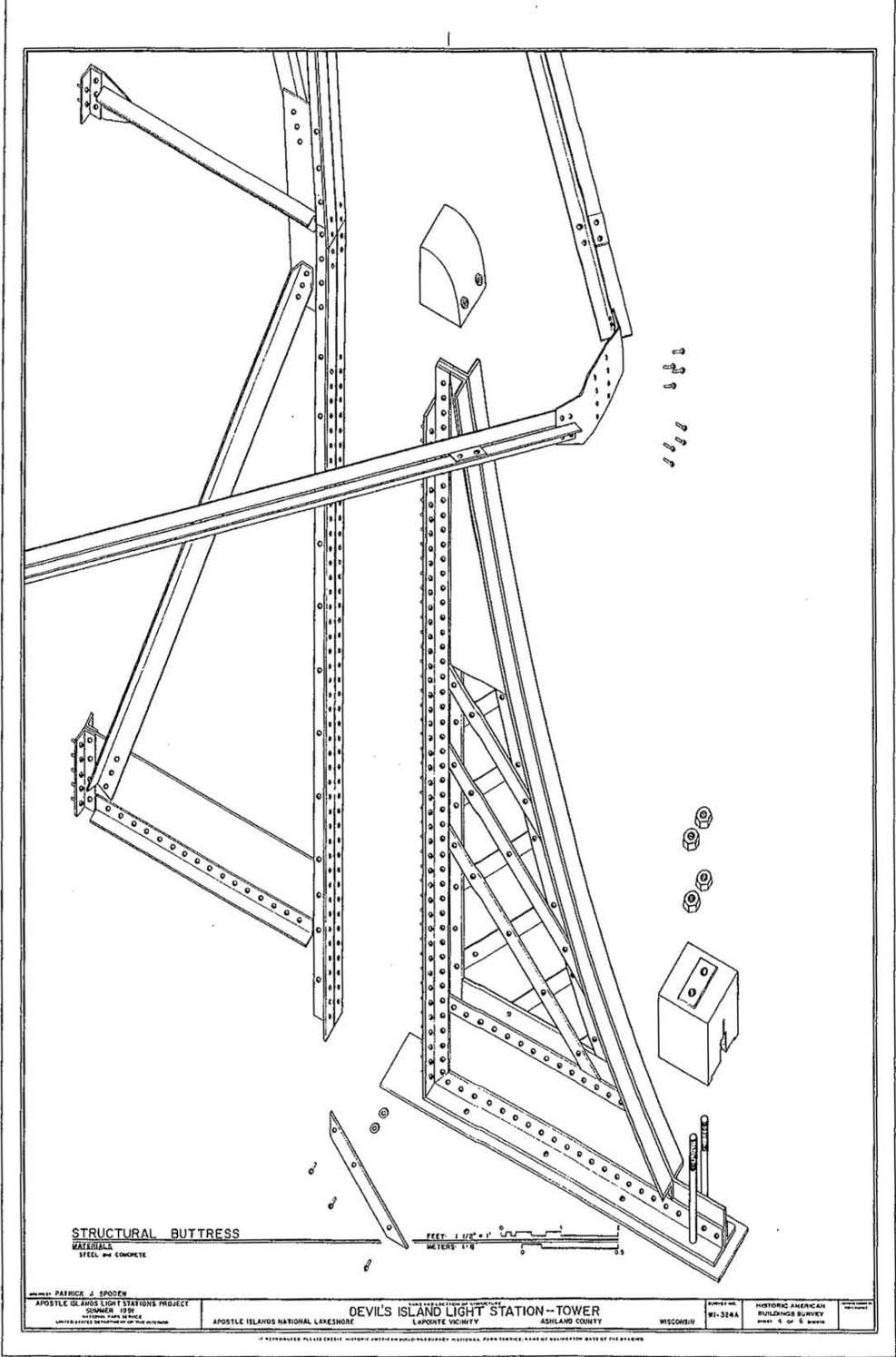
Typically, utilitarian buildings are not included in the HABS survey. In September of 2009, the architects and historic preservation specialists from Andrews and Anderson Architects, PC surveyed the Fog Signal Building, Oil House #1 (east) and Oil House #2 (west) on Devils Island. These measured drawings have been included following the HABS drawings.

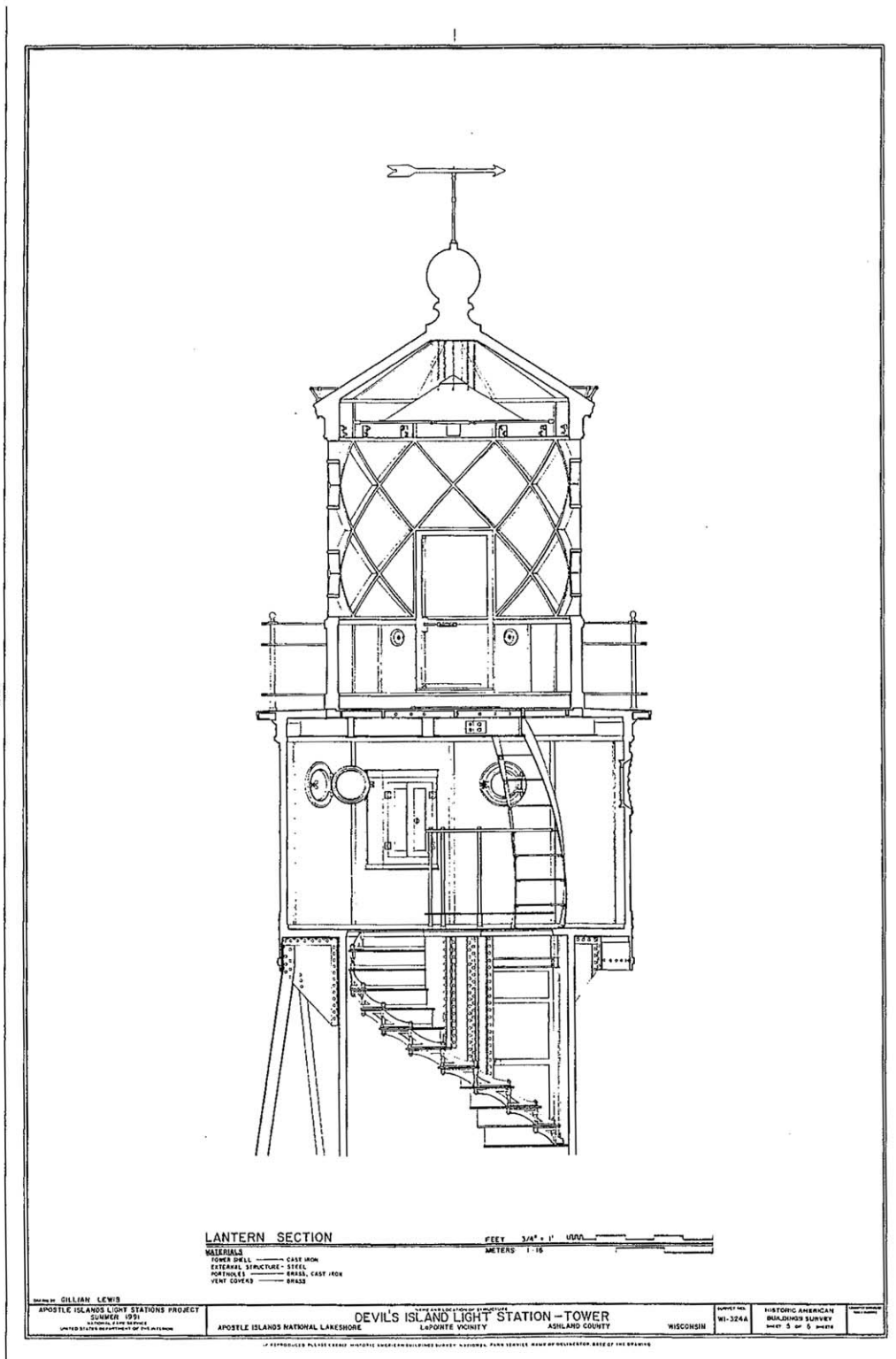


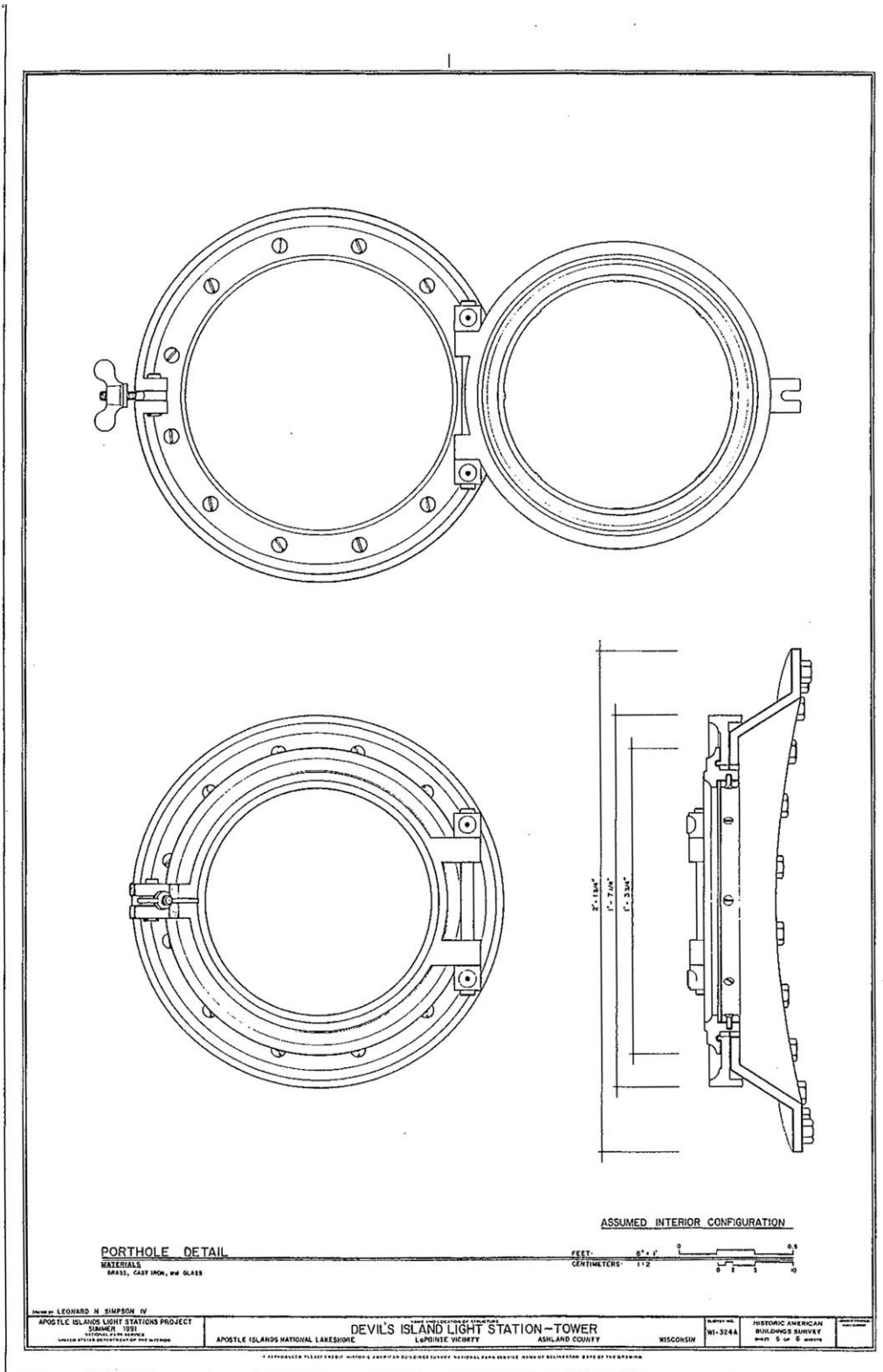


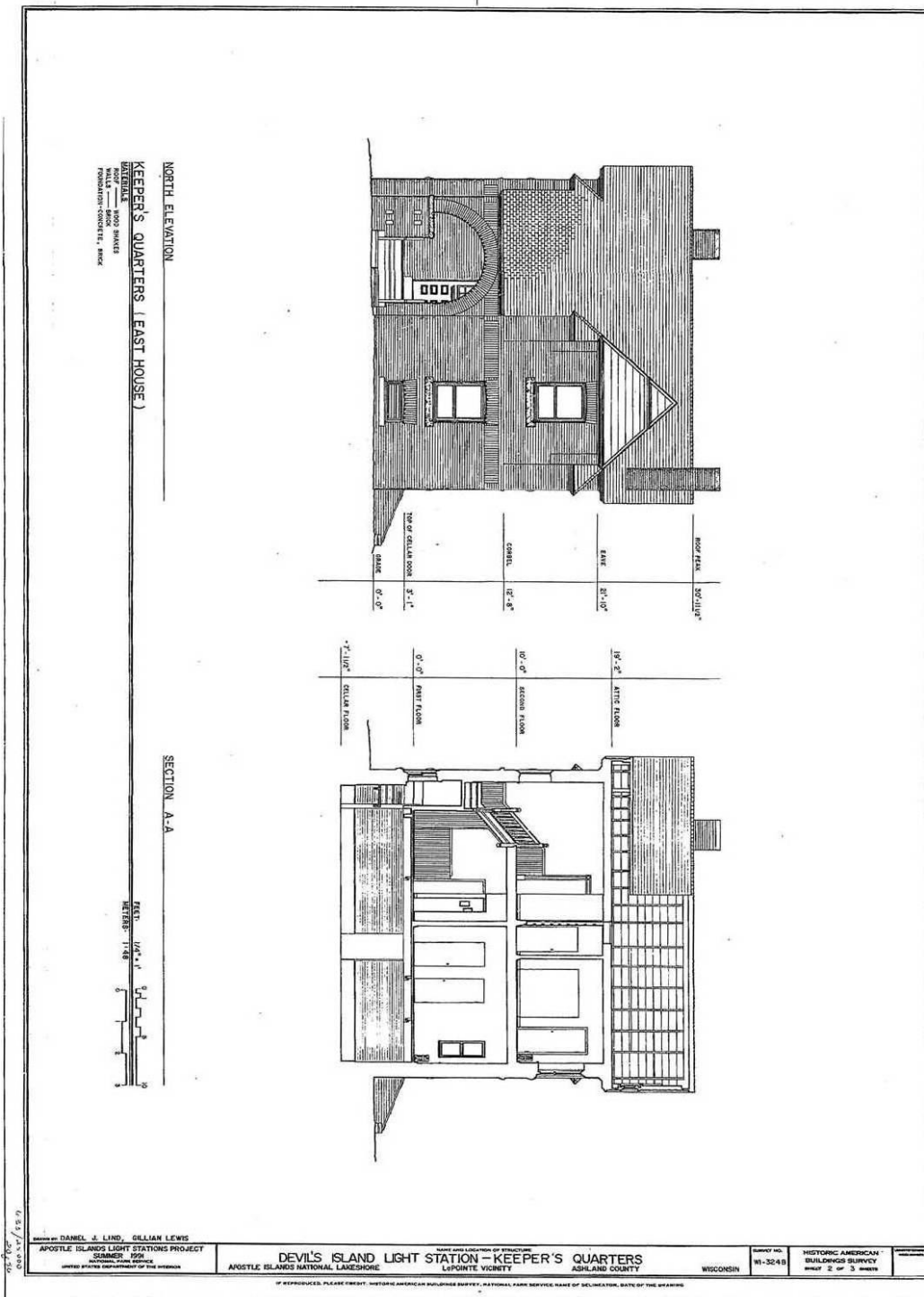


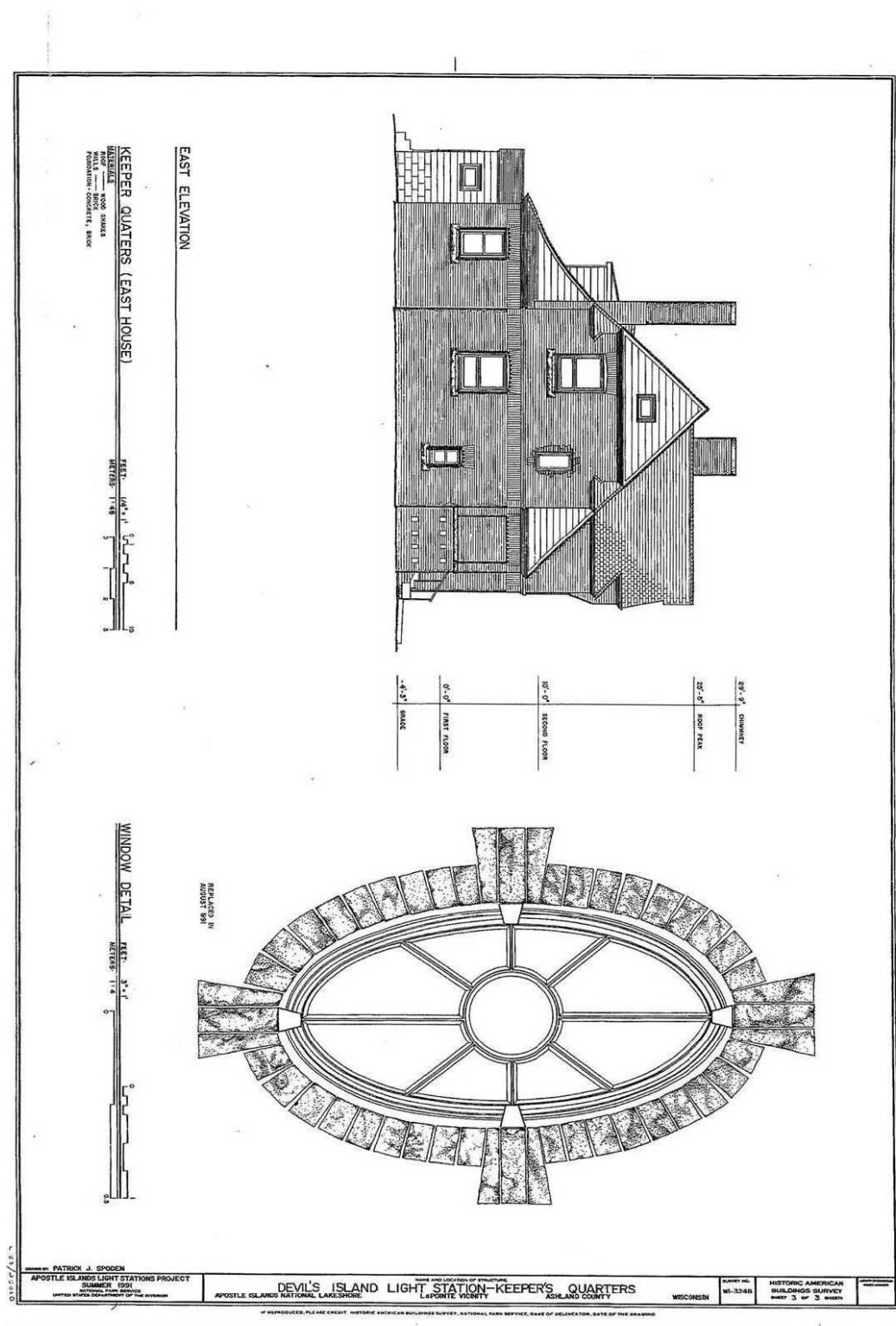


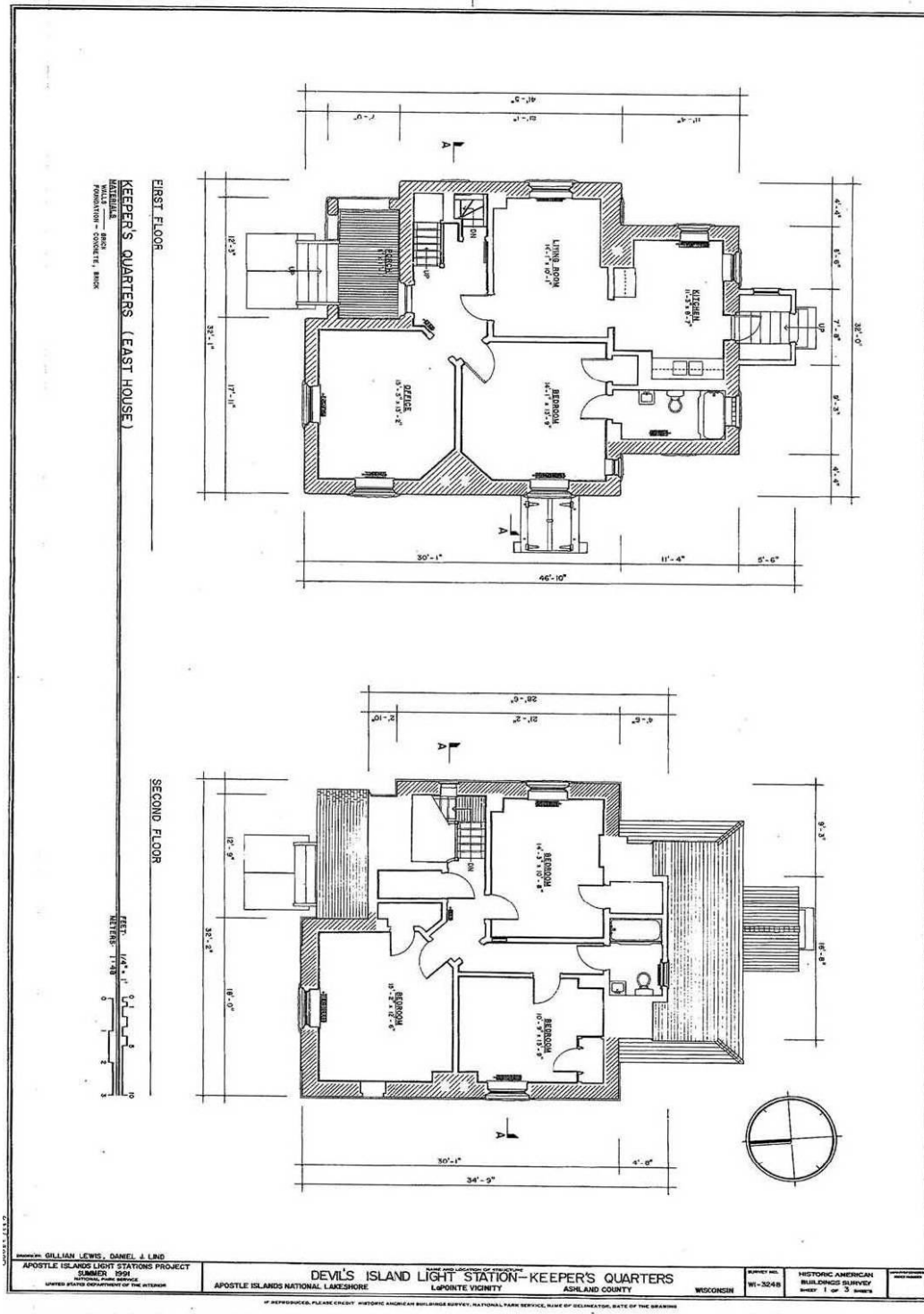


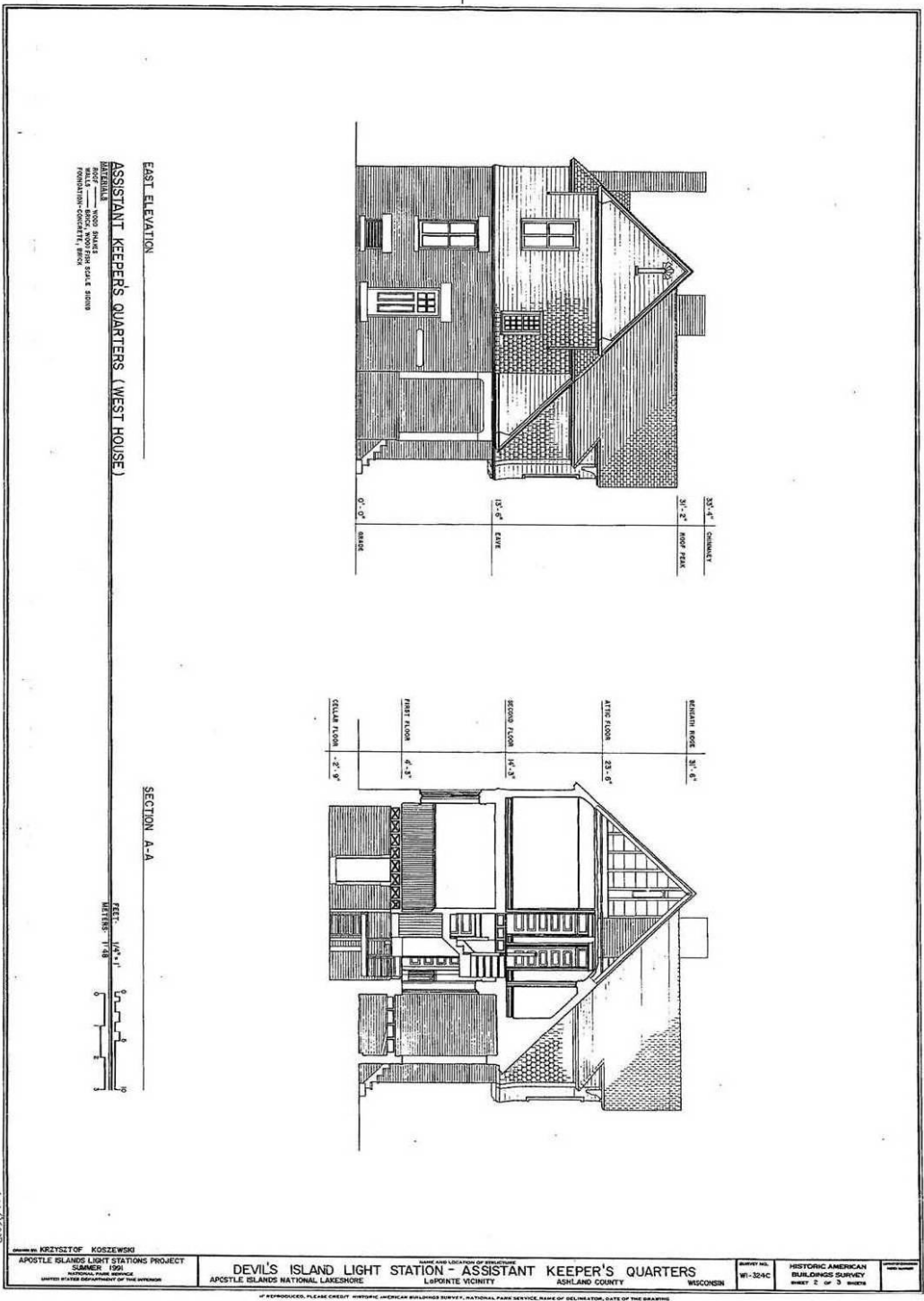


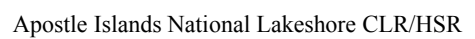


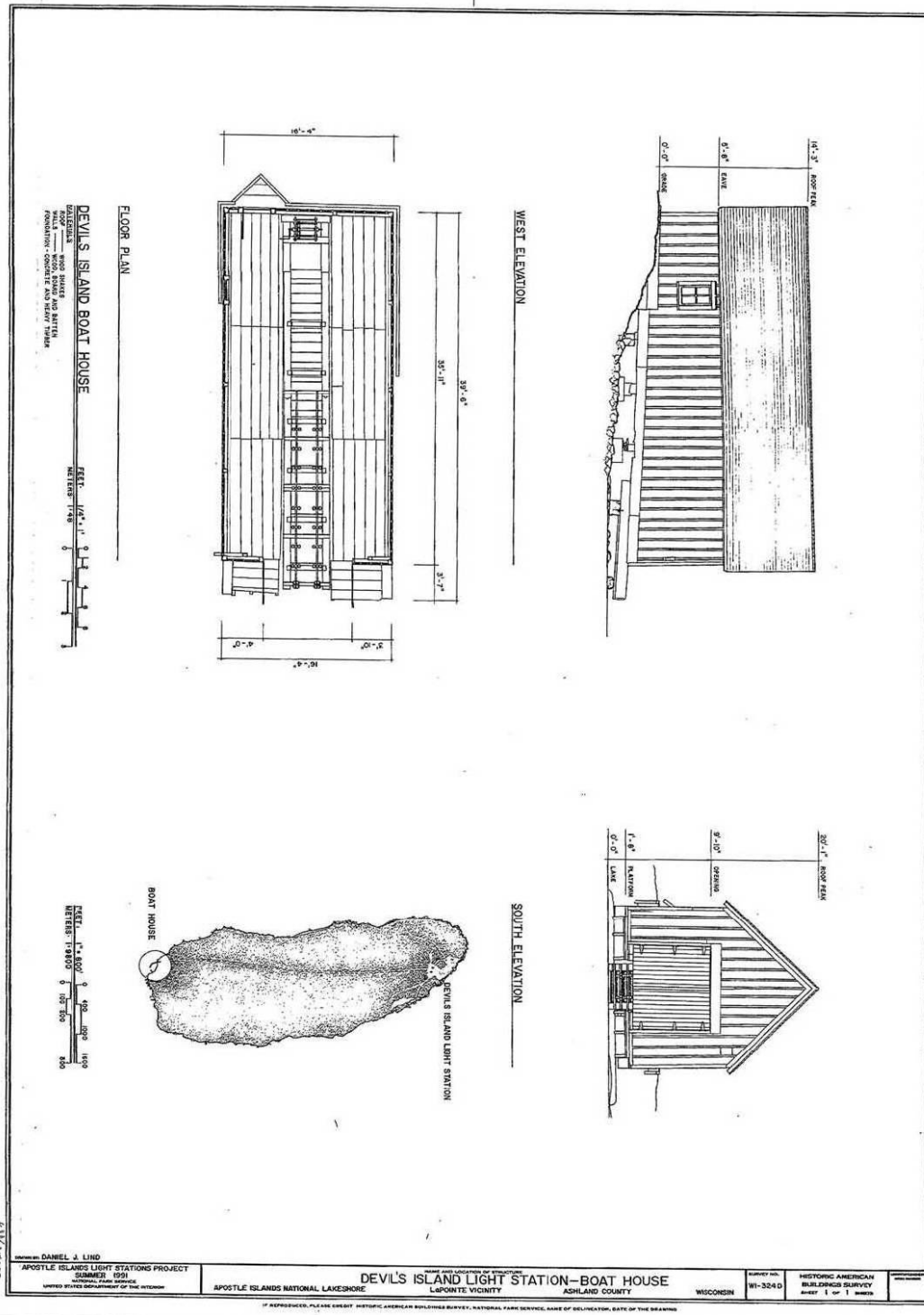


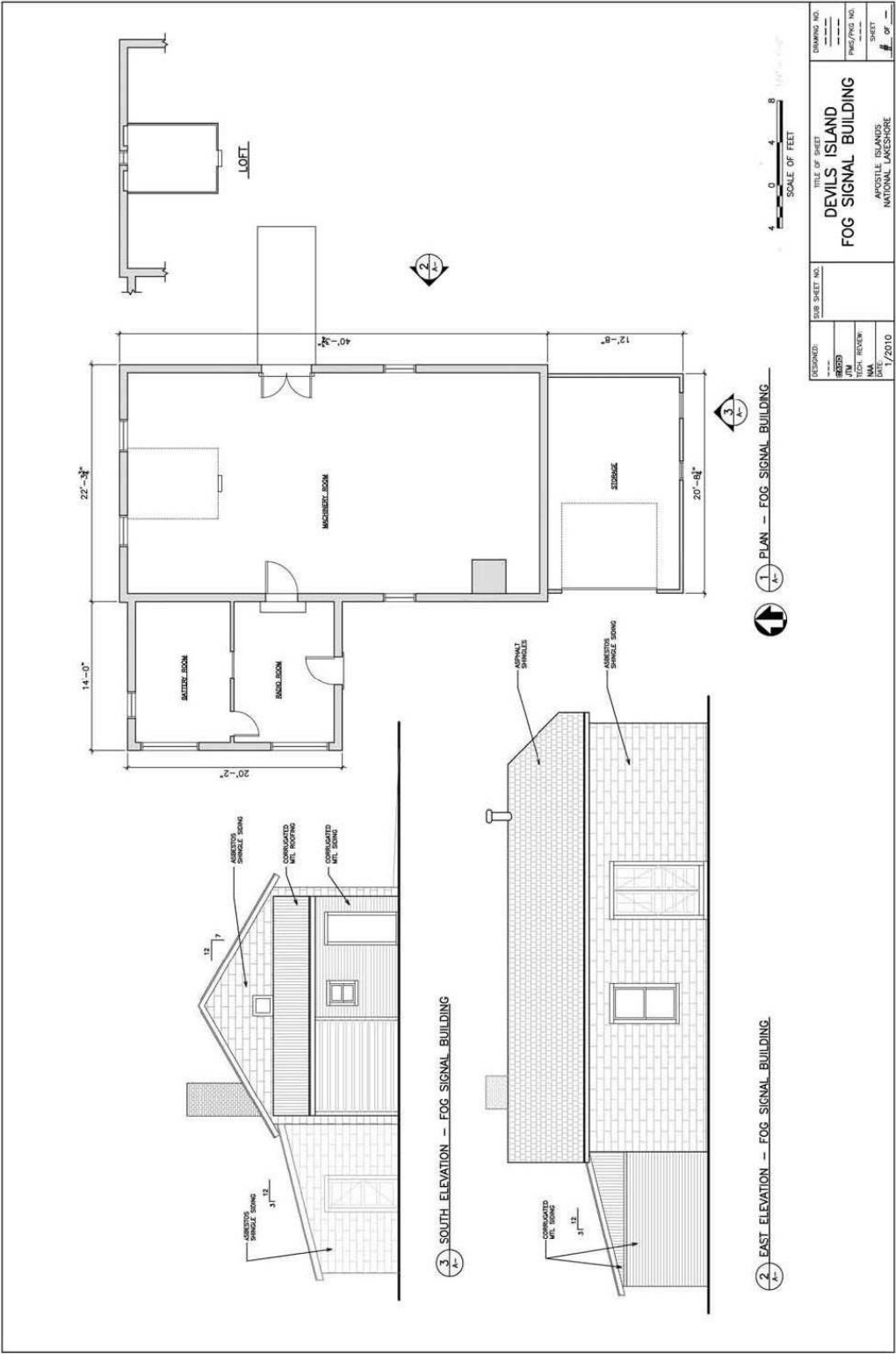


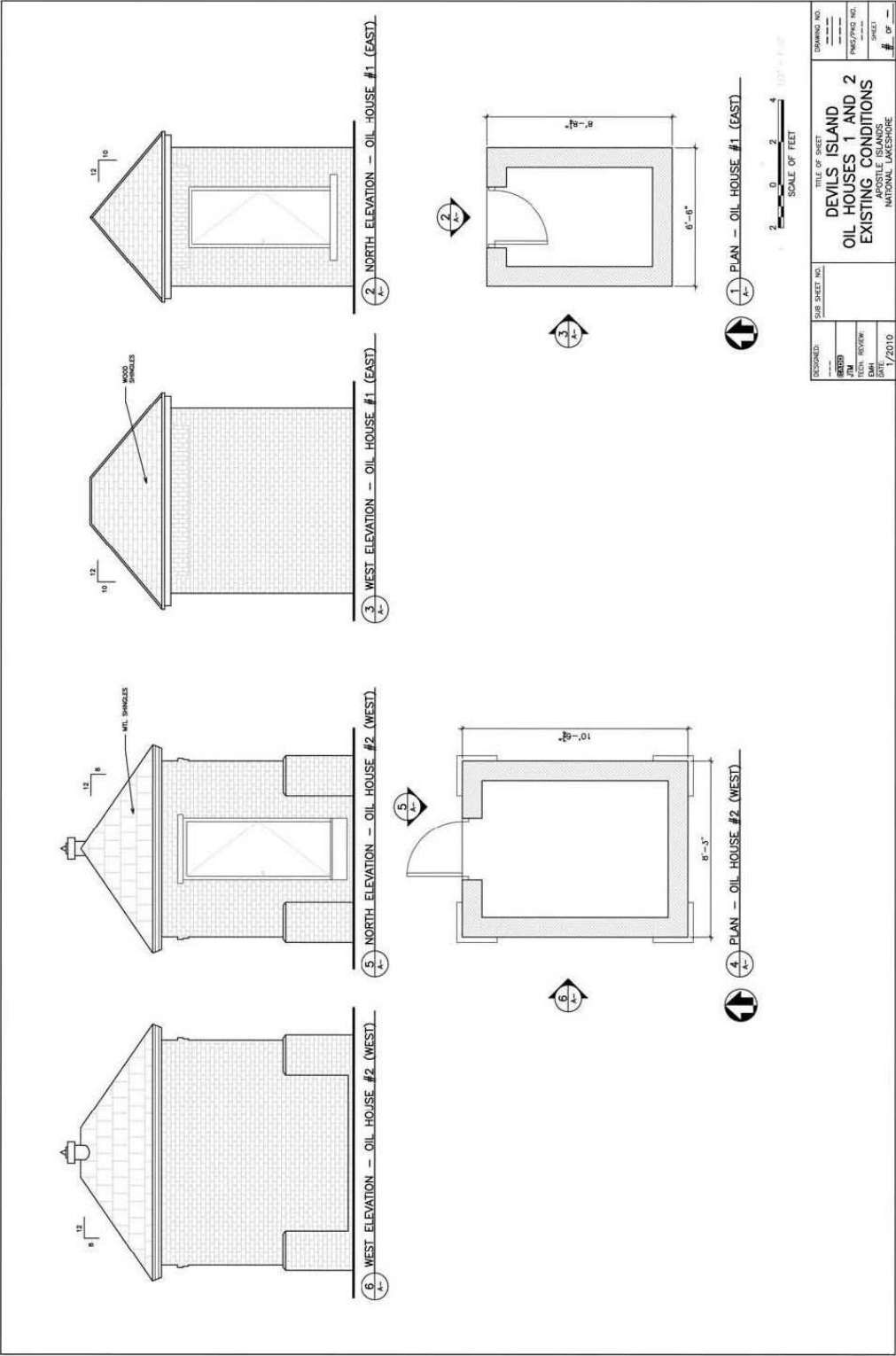












LIGHT STATION TOWER

Chronology of Alterations and Use

Original Construction

The Devils Island Light Station Tower was built off site in sections and shipped to the island and constructed in 1898. The Tower is 82' tall and was erected as a cylindrical structure without the extensive framework seen today. In 1915, the skeletal metal bracing was added to provide additional support and was designed to match the character of the existing braces so as to appear original. A third order Fresnel lens was installed and put into service in 1901 and is currently mounted in the lantern, though it is no longer lit. By 1941, Devils Island had been converted to electricity but the Fresnel lens was used until 1989.²⁷

Historic drawings include an undated elevation of the Tower without bracing, a list of parts for the Lantern (1896); an 1899 detail of the lens; the Tower stairs and buttressing details and elevations (no date); the construction documents for the 1913 steel support additions to the Tower (approved on August 28, 1913 but installed in 1915); and, the winter light construction drawing of 1937. (Historic Drawings DI-01, 14 to 16) The Tower stairs and buttressing details were most likely drawn for the 1915 addition of the steel supports. The winter light elevation was created to show how fuel would reach the lantern through 8mm tubing. The winter light was an automated light developed for the winters when the keepers would not be present. The light automatically turned on when the temperature dropped to a certain amount, suggesting night or bad weather, and then turned itself off when the temperature rose. (Historic Drawing DI-16)

Significant Alterations / Current condition

Significant alterations to the Devils Island Light Station Tower consist of the 1915 addition of the skeletal bracing to stabilize the Tower, installation of the winter light in 1937, the 1941 conversion of the Tower and its surrounding buildings to electricity, and a rehabilitation initiative in 2003 when the NPS maintenance personnel completed lead paint abatement and the interior was repainted by an outside paint contractor. In 1989, the USCG removed the Fresnel lens from the Tower and replaced it with a VEGA VRB-25 optic mounted on the lantern railing.²⁸ A lawsuit ensued and it was returned to the structure in 1992. Note that the lens sits approximately 18" lower than the original installation because the mounting standards were not installed and are currently in the park museum. In May of 2009, an LED-powered beacon was installed in the Tower.

The only mechanical components in the Tower are round, metal, passive air vents in the lantern.

There were never any alternating current electrical systems inside the Tower.

The Tower is currently in fair condition.

²⁷ Busch, Jane C. "People and Places: A Human History of the Apostle Islands; Historic Resource Study of Apostle Islands National Lakeshore" Bayfield: Apostle Islands National Lakeshore. 2008; and, N. Howk, January 2010

²⁸ N. Howk, January 2010

1 Summary of Documented Work on the Building

Date	Work Described	Source of Information
Annual Report of 1896	<i>“Devils Island, Lake Superior, Wisconsin. – The amount of the award for this island, \$1,600, was paid in August, 1895... A design was made for an iron tower.”</i>	“1896 Annual Report of the Lighthouse Board,” Devils Island listings in Lighthouse Establishment Annual Reports 1890-1914
Annual Report of 1897	<i>“Devils Island, Lake Superior, Wisconsin...Plans and specifications for a cylindrical tower are being prepared.”</i>	“1897 Annual Report of the Lighthouse Board,” Devils Island listings in Lighthouse Establishment Annual Reports 1890-1914
Annual Report of 1898	<i>“Devils Island, Lake Superior, Wisconsin... A contract was made for the construction, delivery, and erection of the light tower. In September the site for the foundation of the tower was begun. A contract for the third order lantern was made. In June, 1898, structural metal work of the tower, under contract, was completed, inspected, and shipped to the light station.”</i>	“1898 Annual Report of the Lighthouse Board,” Devils Island listings in Lighthouse Establishment Annual Reports 1890-1914
Annual Report of 1899	<i>“Devils Island, Lake Superior, Wisconsin. – The construction, delivery, and erection of this light tower by contract were completed on October 17, 1898. The hoisting engine was repaired and 160 feet of steel hoisting rope was provided.”</i>	“1899 Annual Report of the Lighthouse Board,” Devils Island listings in Lighthouse Establishment Annual Reports 1890-1914
Annual Report of 1901	<i>“Devils Island, Lake Superior, Wisconsin. – The illuminating apparatus for the new light was received in April at the light-house depot... and the work of installing the third-order flashing lens in the new tower was commenced. This work is being paid for from the unexpended balance of the appropriation for Devils Island (Wisconsin) light-station.”</i>	“1901 Annual Report of the Lighthouse Board,” Devils Island listings in Lighthouse Establishment Annual Reports 1890-1914
1915	Addition of steel skeletal bracing (drawings dated 1913)	Historic Drawing DI-14, and LCS, 2009
1928	Diesel-powered electric generator for the radio beacon installed	J. Busch, 2008, and N. Howk, Jan 2010
1937	Acetylene-powered Winter Light installed	Historic Image DI-15
1941	Converted to electricity	LCS, 2009
1952, July-August	July 1: “Painting inside lantern.” July 3: “Painting light tower.” July 10: “Scraped black on tower, painted white on inside.” August 6: “Painted overhang on light tower, inside of pump house.” August 12: “...painting light tower, roof of spare parts locker.” (one of the oil houses, also referred to as “gear locker”) August 15: “Painted light tower, paint locker, and inside of fog signal.”	USCG Log, summarized by Bob Mackreth, 2004
1952, September	September 11: “Painted bottom of light tower black.” September 12: “Painted ‘derrick, outside black on latern[sic] walk.”	USCG Log, summarized by Bob Mackreth, 2004
1952, September	September 10: “Painting watch room of tower.” September 21: “Painted deck in lens room of tower.” September 28: “Repairing concrete base of light	USCG Log, summarized by Bob Mackreth, 2004

Date	Work Described	Source of Information
	tower.”	
1954, May 17	“Started breaking loose old cement around base of light tower and laying forms.”	USCG Log, summarized by Bob Mackreth, 2004
1954, September 23	“Finished laying cement at base of tower.”	USCG Log, summarized by Bob Mackreth, 2004
1955, May 21	“Replaced red glass shade on main light.”	USCG Log, summarized by Bob Mackreth, 2004
1957, July 30	“Painting bottom of tower spruce green.”	USCG Log, summarized by Bob Mackreth, 2004
1987	Installed chimney cap on Tower	APIS/NPS Business Office File # D3423 – Devils
1989	USCG removes Fresnel lens, VEGA VRB-25 optic installed	“A Devil’s Home Coming,” APIS Newspaper, 1992
1992	Fresnel lens reinstalled without clockwork or pedestals, resulting in the lens +/-18” lower than the original installation	“A Devil’s Home Coming,” APIS Newspaper, 1992
1994	NPS replaced lock at Tower	APIS/NPS Business Office File # D3423 – Devils
2003	Lead abatement and painted	LCS, 2009
2004	Interior painted	HSPT Reports, 2009
2009, May	SABIK 350 2-tier LED beacon installed on Tower walkway	NPS Records, 2009
2010, Sept - Nov	Emergency repairs of the lens and lantern include removing and replacing lantern glazing, repairing door, replacing door window and repairs to ventilator system.	Perini Management Services, Inc. Treatment Plan dated 9/17/2010

General Physical Description

The conical Tower is constructed of metal panels that are bolted together and are supported by a concrete foundation and braced on the exterior with a steel skeletal frame. It has an interior cast iron stair and a metal door on the southwest elevation. The original Fresnel lens is in the lantern, though missing its pedestals, and a modern optic, mounted on the railing of the walkway, is used as the light.

Physical Description -- Architecture

Architecture – Roof

The roof is composed of cast iron panels painted red with a ball ventilator at the center with a weather vane. Access to the roof was difficult; assessment relies on photo documentation. (DI-LS-14 and 15)

Architecture – Exterior Walls

The exterior walls of the lantern are cast iron, cylindrical panel segments bolted together.

Architecture – Windows

Five “Port-hole” Style Windows. These windows are brass-framed on the interior and are 1’-3” in diameter. They are original to the structure. (DI-LS-06)

Single-Hung Rectangular Windows. These windows are single-hung, wood framed sash, with an ogee profile, and steel frame on the exterior. They have spring pin catches and are 1'-3" x 1'-10". The windows are original to the structure.

Architecture – Doors

Hatch Door at Lantern. This hatch door is composed of two, pie-shaped, metal plate sections with wall mounted catches and heavy-duty brass hinges. The dimension for each section is 1'-9" x 2'-6". (DI-LS-09)

Door to Watch Room. This door is plate metal with a turn lever and is painted white. The dimensions for the door are 2'-5" x 6'-7" x 3/8". (DI-LS-08)

Entry Door at Base of Tower. This door is made of 1/8" metal plate with rivets, painted gray. The dimensions are 2'-4" x 6'-2" x 3/8" frame with 1/8" plate. (DI-LS-04 and 05)

Architecture – Walk and Railing

There is a diamond plate deck that is 2'-4" wide. Metal rails are located at 7", 2'-3", and 3'-0". The rails are 1/2" x 2" bar stock. Metal posts are 1 5/8" diameter with ball finials at 4'-0" on center. All metal is painted and original to the structure. (DI-LS-16)

Architecture – Lantern

Cast iron walls rise 3'-2 1/2" from the finished floor and are secured with screwed connections. The exterior panels are cast iron. Five 6 1/2" diameter intake vents in the walls are controlled by brass caps that open as they are turned. There is no evidence of any upper vents at the exterior wall. Glazing is 6'-0" high curved segments with curved brass cross members, 1" x 4", bolted together, forming a lattice 2'-0 1/2" on center. The glazing is unmarked and it is believed to have been replaced multiple times (this is consistent with the replacement glazing located in a closet in the second floor of the Assistant Keepers Quarters). Silicone sealant secures the interior. The glazing is held in-place with 1" wide heavy-duty brass stops at the exterior. The brass is bolted to the lattice frame at 6" on center. Brass handles are mounted onto the stops. A shallow, cone-shaped metal deflector, with a +/- 8" diameter vent hole at the center, is suspended +/- 18" below the roof. The lantern door is 2'-6" x 5'-5" x 4" with three heavy cast iron hinges. A cross brace was added at some point to the center panel. The entire assembly (with the exception of the glazing and the cross brace) is original to the structure and is painted. (DI-LS-10, 11 and 12)

Architecture – Ceiling Finish

The ceiling finish is sheet metal, painted white with a screened in center to allow ventilation to the exterior ball finial. (DI-LS-13)

Architecture – Floor

The Tower base is a concrete mat foundation.

Architecture – Stairs

The spiral staircase is cast iron, painted gray. There are 75 treads leading to a door at the watch room landing, another eleven treads leading to the landing, and finally a ladder with eight rungs leading to the lantern level. The metal railing is 3'8" above the stair nosing and is 1" in diameter. The ladder railing is 2' above the treads and has a 1" diameter. The stair risers are 8" and the tread depth widens from 3 1/2" to 6". (DI-LS-07 and 09)

Architecture – Accessibility

The building is currently not accessible. The south elevation, primary entry door opening is 2'2" clear with a grade to finished floor elevation change of 10 1/2" with one 2" tall step at the door and a 5" tall concrete base reached by a 3 1/2" tall concrete block step.

Physical Description -- Structural

Structural – Foundation

The foundation system consists of a concrete mat foundation under the Tower bracing and the center cylinder.

Structural – Floor Framing

The floor of the center cylinder is the concrete mat foundation.

The floors of the watch room and lantern are constructed of cast iron plates that are bolted together. The plates are supported on the center cylinder of the Tower. The watch room and lantern are accessed via a spiral cast iron stair in the center cylinder.

Structural – Roof Framing

The roof of the lantern is constructed of cast iron panels that are bolted together. The panels are supported on the walls of the lantern room.

Structural – Wall Framing

The walls of the center cylinder, center column and watch room are metal panels that are bolted together. The walls of the watch room are supported on the watch room floor and center cylinder. The walls of the center cylinder and center column are supported directly on the concrete mat foundation.

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

Structural – Lateral System

Lateral stability for the Tower is provided by eight sets of exterior braces and eight sets of interior braces. Four of the exterior braces were added in 1915 to stiffen the Tower. The 1915 braces extend to the watch room floor and are attached to the center cylinder and watch room floor. They are interconnected with horizontal bracing at the 1/4 point and 2/3 point of the center cylinder. The four original exterior braces extend to the 1/4 point of the center cylinder. The exterior braces are attached to the concrete mat foundation. The eight sets of interior braces run intermittently up the center cylinder connecting the exterior walls to the center column. The bracing is interrupted each time the stair passes through it.

Structural – Load Requirements

The required floor load capacity of the watch room is 40 psf, the required floor load capacity of the lantern is 100 psf and the required roof snow load capacity is 32 psf.

Physical Description -- Mechanical

Mechanical – Plumbing Systems

None in the building.

Mechanical – HVAC

The only mechanical components in the Tower are circular metal passive air vents in the walls and the ball ventilator at the top of the lantern.

Mechanical – Fire Suppression

None in the building.

Mechanical – Other

Two abandoned steel fuel storage tanks remain to the north of the Tower. A 1,000 gallon and a 2,000 gallon fuel storage tank are mounted on concrete saddle-type supports inside a 3' high concrete containment area that is lined with plastic cloth.

Physical Description -- Electrical

Electrical – System Configuration

The only electrical equipment in the Tower is the USCG's Light Beacon system. This consists of three 12 volt dc batteries that feed power to a LED powered beacon. The system employs a small photovoltaic array mounted on a frame attached to the base of the Tower at approximately 12' above grade. A second set of liquid filled batteries appears to provide power for a piece of weather-related instrumentation equipment in the Tower.

Electrical – Conductor Insulation

None in the building.

Electrical – Overcurrent Protection

None in the building.

Electrical – Lighting Systems

None in the building.

Electrical – Telecommunications

None in the building.

Electrical – Fire Alarm System

None in the building.

Electrical – Lightning Protection

There are no air terminals or down-cables associated with the Tower. However, each structural leg of the Tower is grounded at the base via a heavy gauge strap which appears to be connected to a buried ground rod or to the reinforcing in the Tower footings.

Physical Description -- Hazardous Materials

Landmark Environmental collected 12 bulk samples from a total of 12 different types of suspected asbestos containing materials (ACMs). Of the 12 suspect ACMs that were sampled and analyzed, a total of three suspect ACMs resulted in concentration of greater than one percent (positive for asbestos).

Hazardous Materials – Asbestos

The following suspect ACMs were not sampled due to inaccessibility or park limitation regarding potential for damage to structures. Asbestos is assumed to be present in:

1. Adhesives (Multiple varieties of adhesives were seen on windows and penetrations), and,
2. Caulk (Caulking was observed around window and door penetrations, which can also include gasket applications between the window assemblies and the structure).

The assumed ACMs were observed to be in good condition.

Hazardous Materials – Lead Containing Paint

It is reported by the NPS Historic Structure Preservation Team that lead abatement was completed by maintenance personnel on the Devils Island Tower in or about 2003. The LCP removal process is reported to have been accomplished using abrasive blasting techniques. Detail regarding the specific means and methods, engineering controls and surface preparation techniques are not presently available. Based on project experience at other sites, there remains a potential for remnant and detectable lead to be present on the exterior surfaces of the Tower.

Detectable lead is assumed to be present in:

1. Interior Painted Surfaces, and,
2. Exterior Painted Surfaces.

Paint chip debris was noted in soils surrounding the Tower.

Hazardous Materials – Lead Dust

Surface wipe-sampling for lead dust was not conducted in the Tower because it is a noninhabited structure.

Hazardous Materials – Lead in Soils

Historical paint maintenance activities such as manual scraping, power-washing, sanding, abrasive blasting or the historical 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, which may be sourced from historical operations or maintenance. Additional adjacent areas may also exhibit LCP debris or lead-contaminated soils, but are not observable.

Vegetative cover in the area is sparse and there exists a potential that this may be associated with lead-contamination in near-surface soils. Preliminary lead-in-soil sampling was performed to assess whether these near-structure soils contain lead concentrations above applicable soil standards.

1 One four aliquot soil sample was collected from ground surface adjacent to the concrete footings and a
2 second composite sample was collected approximately five feet from the footings of the Tower.

- 3 1. Analysis of the composite soil sample collected adjacent to the footings resulted in 8,379
4 milligrams of lead per kilogram of soil (mg/kg).
- 5 2. Analysis of the composite soil sample collected from approximately five feet from the footings
6 resulted in 8,615 mg/kg.

7
8
9 *Hazardous Materials – Mold*

10 Inspections of the structure were performed to identify the readily ascertainable visual extent of the mold
11 growth. Moisture testing in building materials was not performed nor was sampling of building materials
12 performed for microbial analysis. Mold was not visually identified in the Tower.
13
14
15

Character Defining Features

Mass/Form. Cast iron conical Tower with exterior bracing, painted white with black accents and trim.

Exterior Materials. Cast iron panels.

Openings. A mix of small port hole openings, rectangular casements and diamond pattern glazing at the lantern.

Interior Materials. Exposed cast iron panels.

General Condition Assessment

In general, the Devils Island Light Station Tower is in good condition with the exception of the foundation (see structural assessment below).

Structurally, the Light Station Tower is in fair condition. The cracked mat foundation needs further investigation to determine if the cracks and deterioration are structurally significant.

Mechanically, the passive air vents at the top of the Tower are in fair condition.

Electrically, the Tower has no alternating current systems.

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: Good

The cast iron roof is in good condition with the exception of peeling paint.

Architecture – Exterior Walls

Condition: Good

The exterior cast iron wall panels and metal cylinder panels are in good condition.

Architecture – Windows

Condition: Good to Fair

Five “Port-hole” Style Windows. These windows are in good condition.

Single-Hung Rectangular Windows. These windows are painted shut. Also, the pins are heavily painted and sluggish.

Architecture – Doors

Condition: Good to Fair

Hatch Door at Lantern. This pair of doors has minor paint deterioration.

Door at Watch Level. This door has minor paint deterioration and minor rust.

Entry Door at Base of Tower. This door has minor paint deterioration, minor rust and is missing mortise hardware.

Architecture – Walk and Railing

Condition: *Fair*

The metal decking, rails, and posts are in fair condition with red paint appearing beneath the most recent white paint layer.

Architecture – Lantern

Condition: *Poor*

The lantern glazing was repaired in 2009. Paint is peeling from the lattice structure at the exterior and the lower level of the interior. Rust stains indicate that wind-driven rain or condensation has probably entered the base of the lattice structure and rusted the steel plates. One handle is missing and some screws on the exterior have been sheared off. The intake vents at the lantern level are no longer operational due to caulking.

Architecture – Ceiling Finish

Condition: *Good*

The sheet metal ceiling is in good condition though it has pulled away in several locations. This does not appear to be reflective of exterior issues but perhaps is due to the Fresnel lens reinstallation.

Architecture – Floor

Condition: *Fair*

The concrete floor is in fair condition as the base and steps have large cracks (see structural assessment of foundation).

Architecture – Stairs

Condition: *Good*

This spiral staircase is in good condition.

Architecture – Accessibility

Condition: *Poor*

This building is not accessible.

Condition Assessment -- Structural

Structural – Foundation

Condition: *Unknown*

The visible portion of the foundation is in poor condition. The top surface of the mat is heavily cracked and the surface has started to deteriorate (DI-LS-17 and 18).

1 *Structural – Floor Framing*

2 Condition: *Good*

3 The floor inside the center cylinder is in good condition. The floors of the watch room and lantern are in
4 good condition.

7 *Structural – Roof Framing*

8 Condition: *Good*

9 The roof of the lantern is in good condition.

12 *Structural – Wall Framing*

13 Condition: *Good*

14 The walls of the center cylinder, center column, watch room and lantern are in good condition.

17 *Structural – Lateral System*

18 Condition: *Fair*

19 Lateral stability of the Tower is fair. Cracking of the mat foundation could be affecting the performance of
20 the exterior braces.

23 *Structural – Load Requirements*

24 Condition: *Good*

25 The roof and floor framing have adequate capacity to support the required loads.

28 ***Condition Assessment -- Mechanical***

29 *Mechanical – Plumbing Systems and Fire Suppression*

30 Condition: *N/A*

33 *Mechanical – HVAC*

34 Condition: *Fair*

35 The passive air vents at the top of the Light Station Tower are in fair condition, but do not provide adequate
36 ventilation to prevent condensation.

39 *Mechanical – Other*

40 Condition: *Poor and Fair*

41 The two abandoned fuel storage tanks to the north of the Tower are in poor condition. The plastic lined fuel
42 containment system is in fair condition.

45 ***Condition Assessment -- Electrical***

46 *Electrical – System Configuration*

47 Condition: *Good*

48 There are no alternating current electrical systems inside the Tower, but the USCG-owned LED Beacon
49 Light equipment is in good condition.

Electrical – Conductor Insulation, Overcurrent Protection, Lighting Systems, Telecommunications, and Fire Alarm System

Condition: N/A

Electrical – Lightning Protection

Condition: Fair to Poor

Lightning protection systems for the Tower are intact and appear to be in fair condition, however over time, connections deteriorate and components corrode. The integrity of the system cannot be assured. One of the supplemental ground connections at one leg of the Tower appears to be loose.

Condition Assessment -- Hazardous Materials

Refer to 'Physical Description -- Hazardous Materials' for detailed descriptions of locations and conditions of hazardous materials.

Ultimate Treatment and Use

The Tower was constructed in 1898 and its skeletal steel bracing was added in 1915. The Fresnel lens was installed in 1901 and the light was automated in 1978. In 1989, the Fresnel lens was removed from the Tower by the USCG, but in 1992 it was reinstalled by the NPS.

The Tower is currently interpreted by guided visitor tours. The proposed use for the Tower is to continue this type of visitor access with an emphasis on rehabilitating the historic structure. Note that the park has recently completed an emergency stabilization project for the Fresnel lens and lantern.

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 NPS 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*

Scrape and prep areas of rust and repaint the roof. Clean the dirt and debris blocking the ball ventilator.

Architecture – Exterior Walls

Priority: *Moderate*

Scrape and prep areas of rust and repaint the walls. Maintain operation of all ventilation components.

Architecture – Windows

Priority: *Moderate*

Restore operation to the single-hung rectangular windows, which have been painted shut, to enhance ventilation within the Tower. Scrape, sand and repaint.

Architecture – Doors

Priority: *Moderate*

Install missing hardware in-kind at the entry door at the base of the Tower and remove the rust from the cast components. Repaint all doors. Verify operation of all ventilation components.

Architecture – Walk and Railing

Priority: *Moderate*

Repaint metal decking, rails and posts. Investigate alternatives to discretely upgrade the existing railing to become a code compliant guardrail.

Architecture – Lantern

Priority: *Low*

Remove rust and patch the wall as required. Maintain proper operation of all wall ventilation components.

The following is based on the 9/17/2010 Perini report and would require the lantern to be brought off site:

Remove astragals and clean by mechanical methods; remove glass panes; clean lantern frame by mechanical methods, vacuum putty; apply butyl tape to lantern frame; install new glass panes; apply a top layer of butyl tape; install astragals and seal using a wet silicone caulk; replace sheared and damaged fasteners; pressure test the lantern using water; replace Plexiglas indoors with cured glass pane; and, realign door and frame to allow proper operation and fit.

Architecture – Ceiling Finish

Priority: *Low*

No recommendations at this time.

Architecture – Floor

Priority: *Low*

No recommendations at this time.

Architecture – Stairs

Priority: *Low*

No recommendations at this time.

Architecture – Accessibility

Priority: *Low*

Provide program access through interpretive exhibits and waysides at the Visitor Center.

Treatment Recommendations -- Structural

Structural – Foundation

Priority: *Unknown*

Surface cracking of the mat foundation indicates that the concrete mat may be deteriorating. The cracking may also be leading to corrosion or loss of uplift capacity of the anchor bolts. The condition of the concrete and the anchor bolts should be evaluated further.

Structural – Floor Framing

Priority: *Low*

No recommendations at this time.

Structural – Roof Framing

Priority: Low

No recommendations at this time.

Structural – Wall Framing

Priority: Low

No recommendations at this time.

Structural – Lateral System

Priority: Low

Lateral stability of the Tower should be evaluated further due to the cracking of the mat foundation.

Treatment Recommendations -- Mechanical

Mechanical – Plumbing Systems and Fire Suppression

Priority: N/A

Mechanical – HVAC

Priority: Moderate

The existing passive air vents at the top of the Tower do not provide sufficient ventilation to prevent condensation and high humidity levels inside the structure. Additional passive ventilation is recommended. Remove and clean dirt and debris from the ball ventilator; reinstall.

Treatment Recommendations -- Electrical

Electrical – System Configuration

Priority: Low

No recommendations at this time.

Electrical – Conductor Insulation, Overcurrent Protection, Lighting Systems, Telecommunications, and Fire Alarm System

Priority: N/A

Electrical – Lightning Protection

Priority: Moderate

Existing lightning protection is old and its effectiveness has not been established. It is recommended that a LPI (Lightning Protection Institute) certified inspector perform an inspection of the lightning system and provide findings and recommendations in accordance with LPI-175.

Treatment Recommendations -- Hazardous Materials

Hazardous Materials – Asbestos

Priority: Low

Recommend sampling of suspect asbestos containing materials, including caulking and adhesives.

Hazardous Materials – Lead-Containing Paint and Lead Dust

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: *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 Tower walk that will not be visually disruptive to the historic character nor be a long term maintenance burden for park staff.
2. The park may want to reconsider having the public's contact with the fragile Fresnel lens area.
3. An alternative to be reviewed is to call for the installation of the missing pedestals to accurately portray the relationship of light: lantern heights. However, the complexity and cost associated with this should be weighed against the integrity of the interpretation.

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. Addition of ventilation elements	Intrusions to the historic character of the Light Station Tower.	Integrate additional louvers carefully to minimize damage to historic fabric.	- Improves ventilation in tower which helps preserve the historic elements from excessive moisture
3. Adding a code compliant guardrail at the Light Station 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
4. Removal of the lantern as outlined in the Perini report of 9/17/2010	Community will be concerned with the lantern/lens removal, even if for repairs. Concerns of possible damage during removal.	Evaluate all alternatives to determine if removal is required. If removal is needed, a strategy and schedule would need to be developed and vetted with park staff input.	-Removal would allow repairs in a controlled environment
5. Foundation mitigation	Investigating and installing new foundation elements and/or reinforcing existing will disturb the original historic fabric.	Evaluate benefit of invasive foundation repair versus the risk of continued/future damage to resource.	-Repair of the foundation will help protect the resource

1 ***Light Station Tower Photographs, 2009***



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3 *DI-LS-01: North elevation, 2009 (Source: A&A DSC00867)*



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DI-LS-02: Lantern, 2009 (Source: A&A IMGP2878)



DI-LS-03: Entry and foundation (Source: A&A DSC00945)



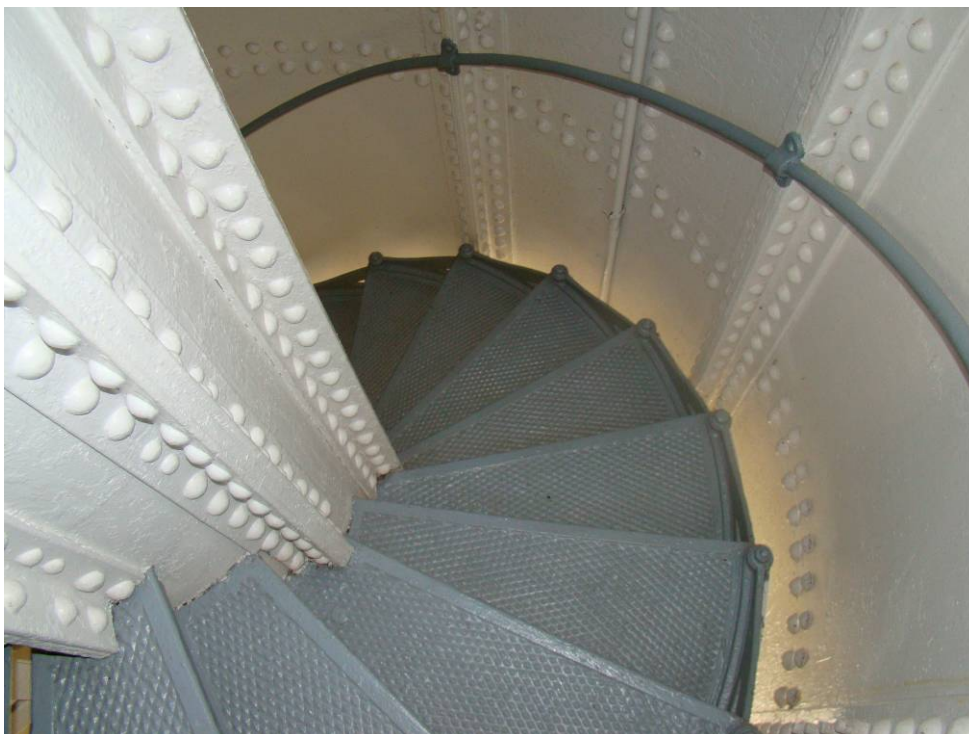
DI-LS-04: Entry door (Source: A&A 100_9715)



DI-LS-05: Entry (Source: A&A DSC00948)



DI-LS-06: Porthole style window (Source: A&A 100_9711)



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2 *DI-LS-07: Stair, looking down (Source: A&A DSC00853)*
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5 *DI-LS-08: Door to watch room (Source: A&A 100_9712)*



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DI-LS-09: Stair and hatch from service level to lantern (Source: A&A 100_9708)



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DI-LS-10: Lantern and glazing (Source: A&A 100_9701)



DI-LS-11: Glazing detail (Source: A&A 100_9706)



DI-LS-12: Lantern door (Source: A&A 100_9705)



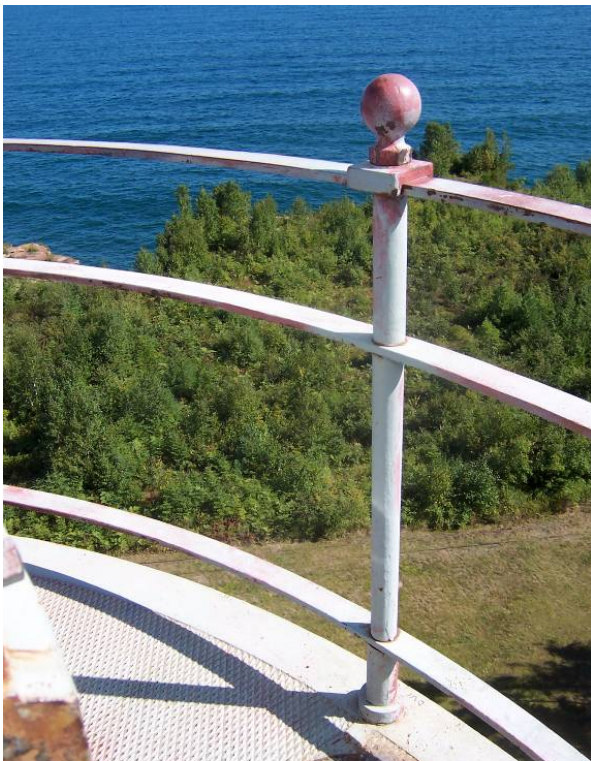
DI-LS-13: Lantern ceiling (Source: A&A 100_9702)



DI-LS-14: Lantern roof (Source: A&A IMGP2862)



DI-LS-15: Lantern roof, glazing and trim detail (Source: A&A IMGP2875)



DI-LS-16: Lantern walkway and railing (Source: A&A 100_9704)



DI-LS-17: Severe cracking of mat foundation (Source: Martin/Martin)



DI-LS-18: Cracking of mat foundation (Source: Martin/Martin)

CHAPTER 4: HISTORIC STRUCTURE REPORT

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