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NPS Form 10-900
(Rev. 8-86)

OMB No. 1024-0018

United States Department of the Interior
National Park Service

MAR 13 1989

NATIONAL REGISTER

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations of eligibility for individual properties or districts. See instructions in *Guidelines for Completing National Register Forms* (National Register Bulletin 16). Complete each item by marking "x" in the appropriate box or by entering the requested information. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, styles, materials, and areas of significance, enter only the categories and subcategories listed in the instructions. For additional space use continuation sheets (Form 10-900a). Type all entries.

1. Name of Property

historic name: Fourteen Foot Bank Light
other names/site number: United States Coast Guard Light List #1355

2. Location

street & number: Fourteen Foot Bank ☐ not for publication
city, town: Bowers Beach ☒ vicinity
state: Delaware code: DE county: Kent code: zip code: NA

3. Classification

Ownership of Property	Category of Property	Number of Resources within Property		
		Contributing	Noncontributing	
☐ private	☒ building(s)	0	0	buildings
☐ public-local	☐ district	0	0	sites
☐ public-State	☐ site	1	0	structures
☒ public-Federal	☒ structure	0	0	objects
	☐ object	1	0	Total

Name of related multiple property listing: NA

Number of contributing resources previously listed in the National Register NA

4. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this ☒ nomination ☐ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property ☒ meets ☐ does not meet the National Register criteria. ☐ See continuation sheet.

Signature of certifying official — Date: 3/10/89

SHPO, Acting Director, Division of Historical & Cultural Affairs
State or Federal agency and bureau

In my opinion, the property ☐ meets ☐ does not meet the National Register criteria. ☑ See continuation sheet.

Signature of commenting or other official — Date

State or Federal agency and bureau

5. National Park Service Certification

I, hereby, certify that this property is:

☑ entered in the National Register. ☐ See continuation sheet. — Patrick Andrus — 3/27/89
☐ determined eligible for the National Register. ☐ See continuation sheet.
☐ determined not eligible for the National Register.
☐ removed from the National Register.
☐ other, (explain:) _____

Signature of the Keeper — Date of Action

6. Function or Use

Historic Functions (enter categories from instructions)
Coast Guard Facility

Current Functions (enter categories from instructions)
Coast Guard Facility

7. Description

Architectural Classification
(enter categories from instructions)

Other: Lighthouse

Materials (enter categories from instructions)

foundation cast iron
walls cast iron
roof cast iron
other stone

Describe present and historic physical appearance.

Fourteen-Foot Bank Lighthouse (Light List Number 1355) rises abruptly up out of the water almost in the middle of Delaware Bay, some twelve miles east of Bowers, Delaware. The lighthouse consists of a white two-and-half story gable-roofed dwelling, cruciform in shape, with an integral square tower. The superstructure rests upon a bell-shaped caisson, 35' in diameter, 24' high, formed of 12 courses of cast-iron plates and filled with cement. The foundation shell is sunk more than 33' into the surrounding shoal; when it was completed in 1886, ti was the first light in the United States built by the pneumatic caisson method.

The dwelling is Classical Revival in style, with full returns of the cornice on each of its three principle gables. The main roof extends westward from the square tower which is built into the front or east end of the lighthouse. Gable-roofed wings extending to either side are somewhat lower in height, and the angles between wings are occupied by one-story infills, giving the lighthouse an octagonal plan. The eight-sided lantern located atop the three-story tower has vertical muntins between its glass panes, a pyramidal roof, and an orb-shaped ventilator-lightning rod. The entire structure - walls, roof, and cornice - is constructed of iron plates bolted together through interior flanges. The lighthouse is further protected by a heavy standing-seam metal roof.

A pipe railing with ornamental turned stanchions surrounds the deck on top of the foundation, and another simple rail of pipe and flat stock forms a gallery at the top of the tower. Cast-iron window frames are finely detailed with consoles below the sills and a full classical entablature - architrave, frieze, and molded cornice - across the top. The windows have all been blocked up but formerly contained two-over-two sash. Other parts of the structure include ladders on the caisson which permit boarding from several directions; a small crane (not original) near the northeast corner; two brick chimneys in the north- and southwest angles and a modern stack running up the west

[X] See continuation sheet

8. Statement of Significance

Certifying official has considered the significance of this property in relation to other properties:

[X] nationally [ ] statewide [ ] locally

Applicable National Register Criteria [X] A [ ] B [X] C [ ] D

Criteria Considerations (Exceptions) [ ] A [ ] B [ ] C [ ] D [ ] E [ ] F [ ] G

Areas of Significance (enter categories from instructions)	Period of Significance	Significant Dates
Maritime History	1885 - 1939	NA
Engineering		

Cultural Affiliation
NA

Significant Person
NA

Architect/Builder
Heap, Major F. P.

State significance of property, and justify criteria, criteria considerations, and areas and periods of significance noted above.

Fourteen-Foot Bank Lighthouse is a landmark in the history of lighthouse engineering, the first American use of the pneumatic caisson method of foundation construction (Criterion C). This technique, while difficult, represented a great advance in dealing with the problem of locating lighthouses on unstable sandy bottoms. Using a pressurized wooden chamber open at the bottom, the shoal at Fourteen-Foot Bank was excavated to a depth of more than 33'. As the digging progressed, more tiers of iron plates were added so as to keep the top of the foundation shell above water, and the cavity (except the air shaft) filled with concrete. Following the pioneering effort at Fourteen-Foot Bank, ten other lights in similar circumstances were built by this method, at which time more precise ways of pile-driving superceded the use of pneumatic caissons. Although the dwelling and tower are less revolutionary than the substructure, they constitute a good example of the use of cast-iron plates for superstructures, a construction technique characteristic of the period. One of the Bay's more stylish lights, Fourteen-Foot Bank's Classical Revival form and details reflect the federal government's penchant for classical architecture in public buildings. Finally Fourteen-Foot Bank Lighthouse is also significant because it reflects the great increase in shipping, and consequent need for an improved system of navigational aids, which occurred in the late 19th century (Criterion A).

Fourteen-Foot Bank is a critical turning point for ships navigating the Delaware Bay and had been marked by a lightship as early as 1876. As in the case of other lightships in the Bay, however, this arrangement proved inadequate; ice floes and storms tended to force the lightship from its mooring when it was most needed.

[X] See continuation sheet

9. Major Bibliographical References

Holland, Francis Boss, Jr. America's Lighthouses: An Illustrated History (New York: Dodd Publications, 1988)

Johnson, Arnold B. The Modern Lighthouse Service (Washington: Government Printing Office, 1890)

National Archives, Still Picture Branch, photographs c. 1900

Snow, Edward Bowe Famous Lighthouses of America (New York: Dodd, Mead & Co., 1955)

U.S. Lighthouse Board, Annual Report 1877 - 1886

☐ See continuation sheet

Previous documentation on file (NPS):

- NA ☐ preliminary determination of individual listing (36 CFR 67) has been requested
- NA ☐ previously listed in the National Register
- NA ☐ previously determined eligible by the National Register
- NA ☐ designated a National Historic Landmark
- NA ☐ recorded by Historic American Buildings Survey # _____
- NA ☐ recorded by Historic American Engineering Record # _____

Primary location of additional data:

- ☒ State historic preservation office
- ☐ Other State agency
- ☐ Federal agency
- ☐ Local government
- ☐ University
- ☐ Other

Specify repository: _____

10. Geographical Data

Acreage of property .07

Coordinates: 39 02.9 75 11.0

UTM References

	Zone	Easting	Northing
A	18	484200	4321950
B			
C			
D			

☐ See continuation sheet

Verbal Boundary Description

The bounds of this nomination are the lighthouse and the riprap foundation surrounding the lighthouse. This extends for approximately 20 feet from the base of the caisson.

☐ See continuation sheet

Boundary Justification

The boundary includes the lighthouse and the foundation material associated with the lighthouse.

☐ See continuation sheet

11. Form Prepared By

name/title SEE ATTACHED SHEET

organization Bureau of Archaeology & Historic Preservation date January 1989

street & number 15 The Green telephone (302) 736 - 5685

city or town Dover state DE zip code 19901

elevation; and a mast with emergency beacon attached to the west side of the lantern. Interrupting the rail on the northwest rim of the caisson deck is a small hip-roof iron-plate privy, complete with its own lightning rod.

The interior of the lighthouse continues the classical motif, with window and door surrounds of the fluted board and corner block type. Walls are finished with a wainscot of narrow vertical boards, and the four-panel interior doors appear original. The hallway inside the double iron-plate entrance doors contains the stairway to the upper levels. The natural dark maple rail is carried on simple square balusters. Where they take their first turn, the stringers are shaped in a long, graceful S-curve. The railings within the stairwells are narrow round sections of wood. They are covered with twine in a variety of wrapping patterns and knots. There were installed by the lighthouse keepers in their spare time.

The first floor of the lighthouse contains the diesel generators for electric power. The lights and the foghorn are powered by this equipment which is of modern design. The horn is turned off when a crew is on board for inspection duties as it is too loud and intense for the human ear.

The lens is old but not original to this lighthouse and is a drum-shaped Fresnel lens mounted on a four-cornered brass pedestal. Marked "HENRY LEPEAUTE Paris," it is about 18" in diameter and 2' high. The focal plane is 59' above sea level. Plastic insets form a red sector covering the shoal to the southwest. The red sector provides a warning to mariners for the Brown and Joe Flogger shoals. The white main beam can be seen for 15 miles. The red insert reduces the light's visibility to 12 miles.

The lighthouse is in fair condition. Both railings have large sections missing and some of the interior trim has been removed. Overall, however, the light retains its historical appearance, the chief alteration being the blocking off of the windows.

Moreover, traffic on the channel had greatly increased in the 1870s; imports into Philadelphia almost doubled in that decade. Ships carrying goods and passengers to Philadelphia not only had to avoid Fourteen-Foot Bank, but nearby Brown and Joe Flogger shoals as well. The Lighthouse Board began planning in 1882 for a permanent light to better mark these hazards.

After considering several options, the board adopted the suggestion its engineer, Major D.P. Heap, that an iron-plate foundation be sunk into the shoal with the pneumatic-caisson method. First used in lighthouse construction (with mixed results) in building the Rothersand, Germany, light in 1881-82, the pneumatic caisson used compressed air to create an underwater chamber in which excavation crews could work. When the Fourteen-Foot Bank Light was designed, it was still an extremely advanced technique.

A lighthouse constructed in this manner offered several advantages over alternative methods. The screw-pile lighthouses which were the previous state-of-the-art were susceptible to ice damage and proved better suited to warmer waters than Delaware Bay. Iron caissons attached to wooden piles driven into the sand had been used at Ship John Shoal light and Great Beds in New York Harbor. Precise pile driving was difficult, however, and involved underwater leveling of the piling by diving crews. Moreover, the foundation had to be accurately and securely set onto the piling. With the pneumatic method, however, the foundation itself could be sunk into the shoal, providing a more stable base.

The wooden caisson, as well as the first three courses of iron plates was assembled on shore at Lewes, Delaware, and towed to the site, where it was submerged and work was begun. A ship's tender, "Moro Castle" was used as a construction platform, warehouse, and worker's barrack. On site, workmen entered the caisson and worked within the air-shaft working chamber to excavate the shoal. When the iron plate walls broke the surface of the water, the caisson was filled with concrete to the water level.

Thirty-eight men spent the summer of 1885 working on the excavation and filling the caisson. According to one author the following incident occurred as the construction crew was preparing to leave the work site:

> "In a heavy southerly sea, the Moro Castle parted her moorings and began to drift down toward the lighthouse cylinder. which at the time was only eight feet above the water and filled with concrete to water level. The steamer was about to hit the obstruction a glancing blow, but several of the men sitting on the upper flanges of the cylinder dropped fenders to ward off the vessel. Thus the Moro Castle struck relatively gently. Nevertheless that light bump was enough to prevent the men from leaving their seated positions, for it momentarily opened the joints between the cylinder sheets a tiny fragment of an inch--just enough to catch their trouser seats when the joints closed again. As their floating home was rapidly leaving them, the workmen, with a single shout, discarded the garments in which they were trapped and leaped aboard the Moro Castle with only their pride injured." (Snow, p.144)

After the caisson was complete, 1,000 tons of riprap were placed around the caisson. A mast with a light was left to mark the site of the caisson. The lighthouse was completed during the summer of 1886 and occupied that fall. After weathering several storms, the lighthouse trembled during storms, consequently 2,000 additional tows of riprap were added to the base of the lighthouse.

The superstructure is also characteristic of the improved lighthouse technology of the 1880s. Unlike the stone, brick, and frame structures common earlier, the iron-plate dwelling and tower at Fourteen-Foot Bank was pre-fabricated and bolted together on the site, an important economy in the construction stage. Moreover, when properly painted, the iron was as maintainable any substance until reinforced concrete became available.

In its stylishness, the light at Fourteen-Foot Bank is more akin to the lighthouses of the 1870s than the prosaic conical towers which prevailed in the 1880s and 1890s. The Classical cornice moldings, the gables treated as pediments, and the molded door surrounds in the interior are all elements derived from the architecture of ancient Greece. Fourteen-Foot Bank was recognized in its time as a major engineering accomplishment, and this may explain why a more elaborate superstructure was chosen.

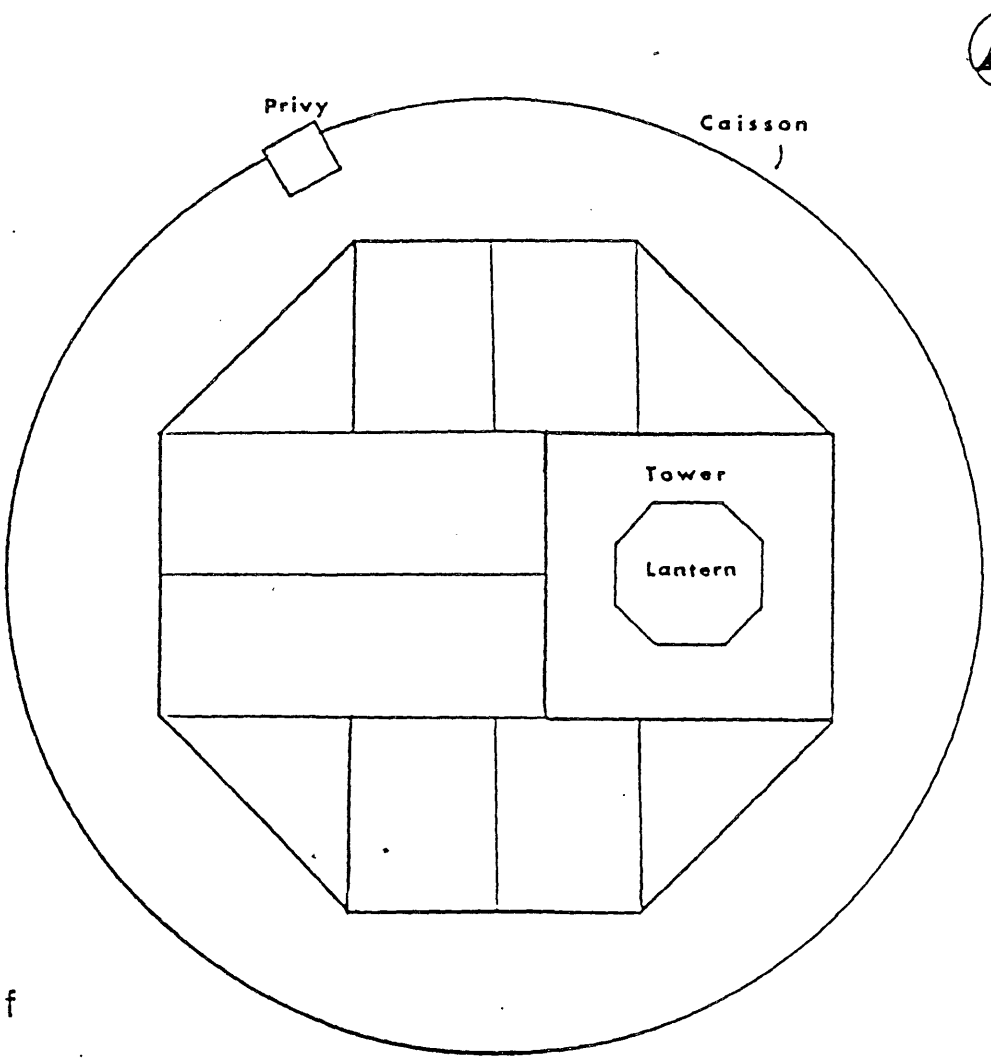
Classical architecture had passed from fashion in private construction, but governmental projects continued to favor the style for its connotations of elegance and permanence. Although it is not the original lens in the lighthouse, the present lens at Fourteen-Foot Bank dates from 1918 and is one of a dwindling number of in-place Fresnel lenses. The Fresnel lens was the major innovation in lighthouse illumination of the 19th century.

COMPREHENSIVE PLANNING

The Fourteen-Foot Bank as a federal constructed aid to navigation is important to the historic theme of transportation and communication. As an example of a specific solution to an engineering problem, i.e. the permanent display of a fixed point of light, the light and its related buildings is significant to the theme of architecture, engineering and decorative arts.

Geographically, the Fourteen-Foot Bank Light falls within the Coastal Zone by virtue of its location in the Delaware Bay.

Constructed in 1885-1886, the light represents the intensification of the rate of Urbanization and Suburbanization in Delaware. Increasing traffic to all the ports along the Delaware Bay caused the federal government to significantly up grade the aids to navigation in the Bay or River and to improve the depths of the various channels.



Site Plan of

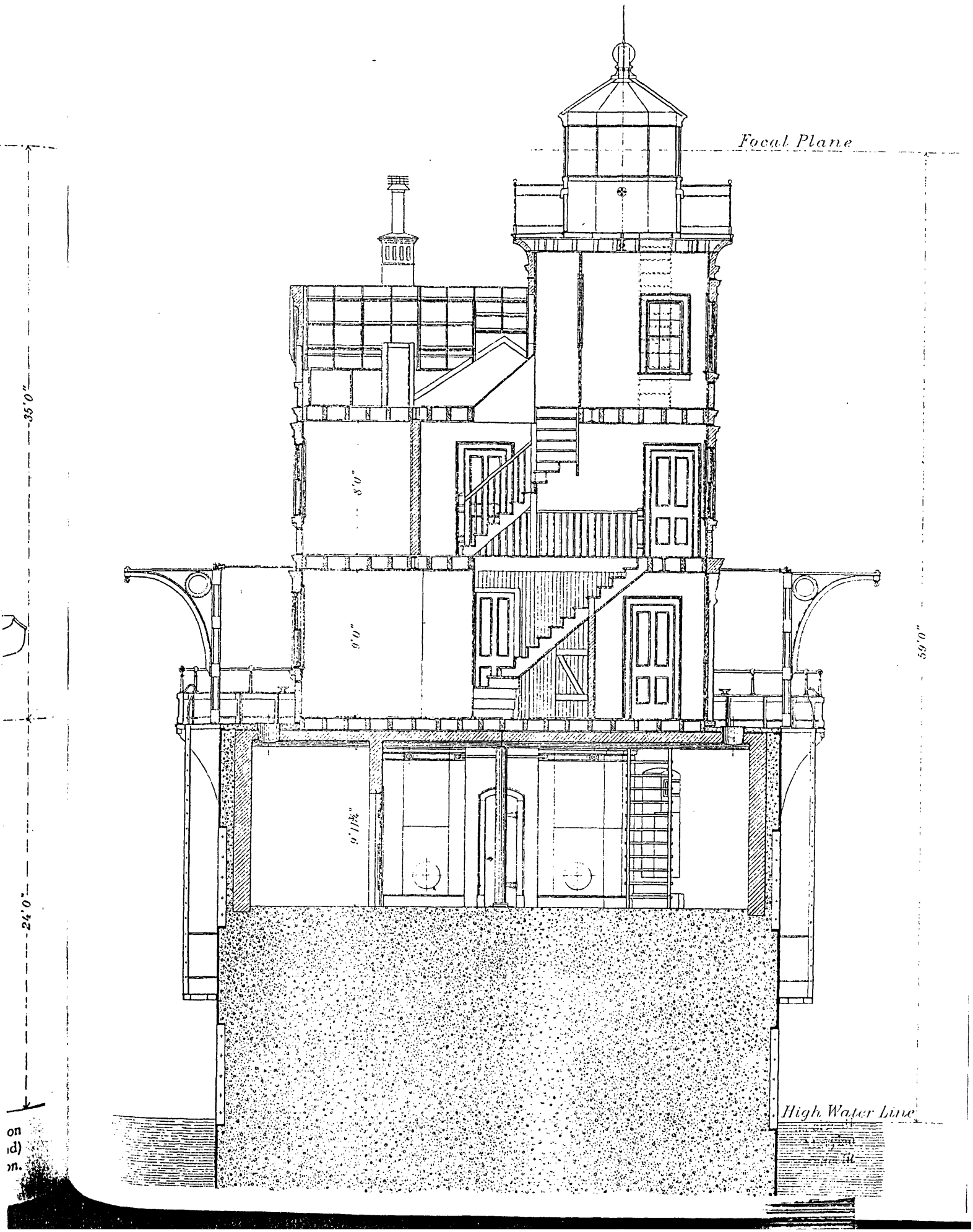
Fourteen-Foot Bank Light

Approximate Scale

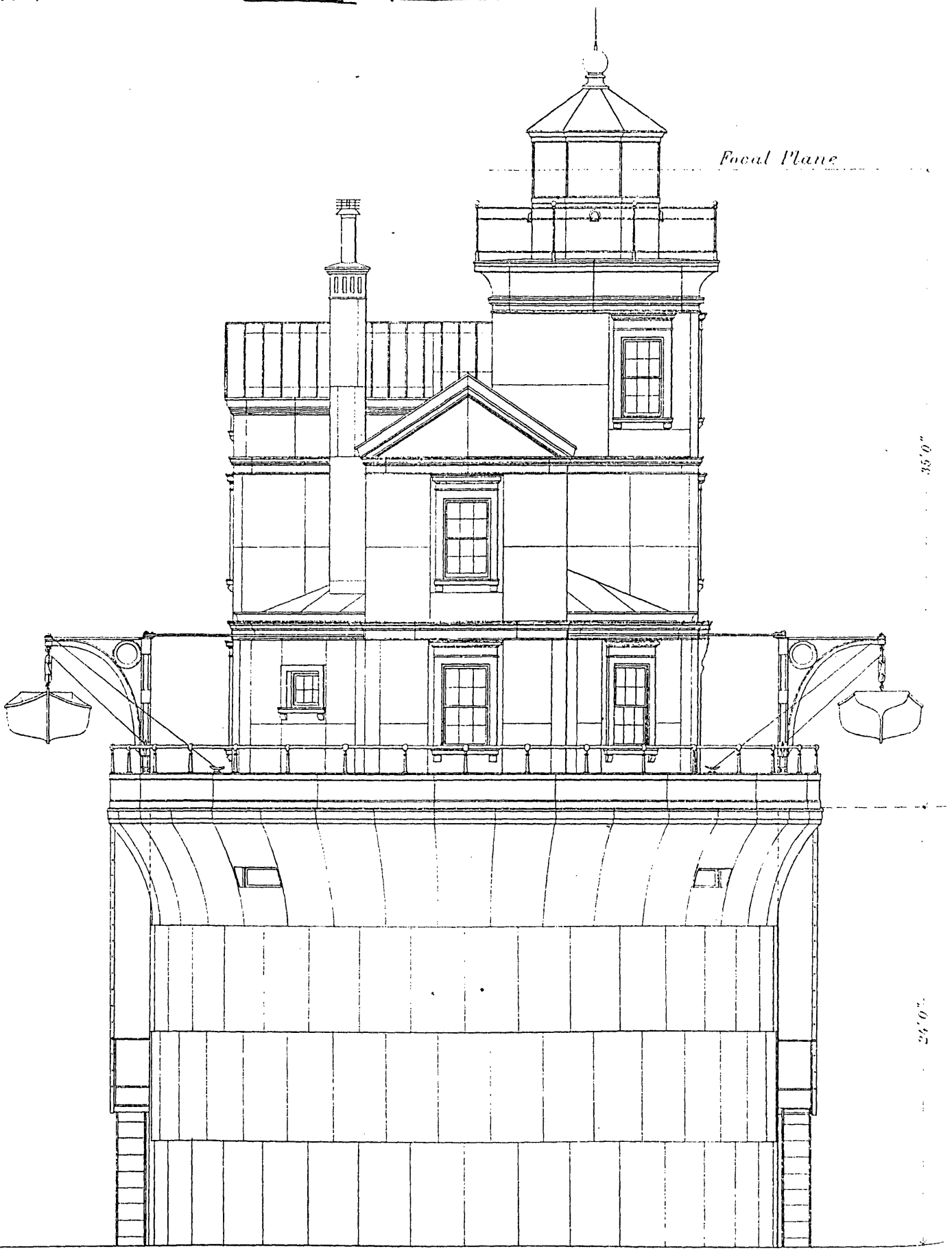
0 5 10 20

feet

From: F.B. Holland America's Light Houses

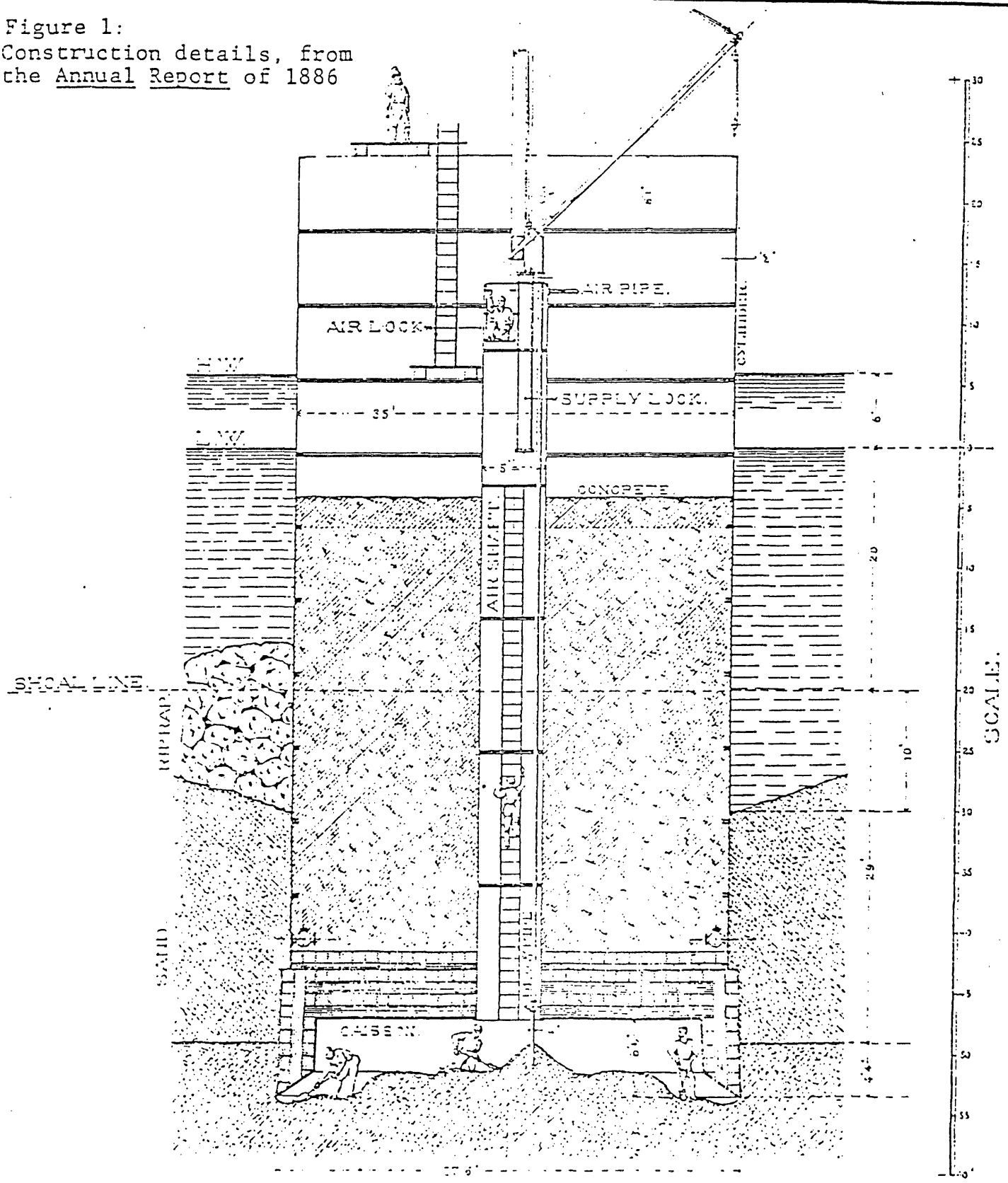


From F. B. Hilland America's lighthouses



South and sectional elevations (1886) of the caisson lighthouse established in 1887 at Fourteen Foot Bank in Delaware Bay. The cast-iron caisson was floated into position and filled with concrete. Compare this elevation with the exterior photograph of Sandy Point (Maryland) light, on page 117. *Drawing in the author's collection.*

Figure 1:
Construction details, from the Annual Report of 1886



NPS Form 10-900-a
(8-86)

OMB Approval No. 1024-0018

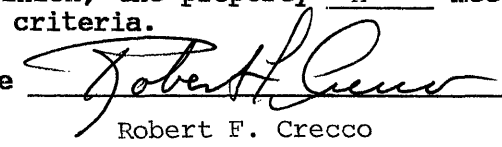
United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section number _____ Page _____

Fourteen-Foot Bank Light House, Bowers Beach, Delaware

In my opinion, the property X meets _____ does not meet the National Register criteria.

Signature 

Name Robert F. Crecco

Title/Agency Historic Preservation Officer, U.S. Department of Transportation

Address 400 7th Street, S.W., Washington, D.C. 20590

Date 2/22/89

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National Park Service

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SUPPLEMENTARY LISTING RECORD

NRIS Reference Number: 89000286 Date Listed: 3/27/89

Fourteen Foot Bank Light	Kent	DE
Property Name	County	State

Multiple Name

This property is listed in the National Register of Historic Places in accordance with the attached nomination documentation subject to the following exceptions, exclusions, or amendments, notwithstanding the National Park Service certification included in the nomination documentation.

Patrick Andrus 3/27/89

for Signature of the Keeper Date of Action

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Amended Items in Nomination:

The nomination form has both building and structure listed as the resource type. The data base can list only one - structure is the most appropriate. Steve DelSordo with the DE SHPO agrees and the form is now officially amended.

DISTRIBUTION:
National Register property file
Nominating Authority (without nomination attachment)