Seven-Foot Knoll Lighthouse
Mouth of Patapsco River
Riviera Beach Vicinity
Anne Arundel County
Maryland

HAER No. MD-54

HAER
MD,
2-RIVBE.V,
1-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
MID-ATLANTIC REGION, NATIONAL PARK SERVICE
DEPARTMENT OF THE INTERIOR
PHILADELPHIA, PENNSYLVANIA 19106

HAER MD 2-RIVBE.V, 1-

HISTORIC AMERICAN BUILDINGS SURVEY

INDEX TO PHOTOGRAPHS

SEVEN-FOOT KNOLL LIGHTHOUSE — HAER No. MD-54
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Photographer: (Views 1-36) Jay L. Baker — June 9, 1987
(View 37) Historic - copied by Jay L. Baker

MD-54-1	EXTERIOR LOOKING EAST
MD-54-2	EXTERIOR LOOKING WEST
MD-54-3	EXTERIOR LOOKING NORTH
MD-54-4	EXTERIOR LOOKING SOUTH
MD-54-5	LIGHT ITSELF, SOUTH SIDE, FROM THE WALKWAY
MD-54-6	DETAIL OF THE RAILING AND WALKWAY AROUND THE LIGHT
MD-54-7	DETAIL OF LIGHT CUPOLA FROM EXTERIOR
MD-54-8	DETAIL OF BELL, WEST SIDE, LOOKING NORTH
MD-54-9	DETAIL OF BELL, WEST SIDE, LOOKING SOUTH
MD-54-10	DETAIL OF RIGGING USED FOR RAISING BOATS
MD-54-11	FROM UNDERSIDE SHOWING OUTHOUSE AND FUEL TANK
MD-54-12	CENTER OF UNDERSIDE SHOWING FRAMING
MD-54-13	UNDERSIDE OF FRAMING LOOKING OUT
MD-54-14	DETAIL OF INTERIOR TRIM TAKEN FROM CENTER OF LIGHTHOUSE
MD-54-15	ROOF AS SEEN FROM THE SECOND FLOOR WINDOW
MD-54-16	FIRST FLOOR EAST ROOM, WEST WALL
MD-54-17	FIRST FLOOR EAST ROOM, EAST WALL
MD-54-18	FIRST FLOOR SOUTH ROOM, WEST WALL
MD-54-19	FIRST FLOOR SOUTH ROOM, EAST WALL
MD-54-20	SOUTH ROOM DETAIL OF KITCHEN
MD-54-21	SOUTH ROOM DETAIL OF CABINETS AND WOODEN TANK
MD-54-22	SOUTH ROOM DETAIL OF CORNER WITH SHELVES
MD-54-23	SOUTH ROOM DETAIL OF CEILING SPOUT
MD-54-24	SOUTHWEST ROOM DETAIL OF WOODEN TANK
MD-54-25	WEST ROOM WEST WALL
MD-54-26	WEST ROOM EAST WALL WITH PLATFORM
MD-54-27	NORTHWEST ROOM DETAIL OF CLOSET
MD-54-28	NORTHWEST ROOM WEST WALL
MD-54-29	NORTH ROOM DETAIL OF SMALL ROOM WITH WINDOW, LEFT SIDE
MD-54-30	NORTH ROOM DETAIL OF SMALL ROOM WITH WINDOW, RIGHT SIDE
MD-54-31	NORTHEAST ROOM DETAIL OF CLOSET
MD-54-32	NORTHEAST ROOM NORTH WALL WITH WINDOW
MD-54-33	NORTHEAST ROOM LOOKING SOUTHEAST
MD-54-34	FIRST FLOOR STAIRWAY LEADING TO SECOND FLOOR
MD-54-35	SECOND FLOOR LOOKING NORTHEAST
MD-54-36	SECOND FLOOR LOOKING SOUTHWEST
MD-54-37	HISTORIC VIEW, CIRCA 1900

HAER
MD
2-RIVBE.V
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HISTORIC AMERICAN ENGINEERING RECORD

SEVEN-FOOT KNOLL LIGHTHOUSE HAER No. MD-54

Location: Chesapeake Bay, mouth of Patapsco River, Riviera Beach vicinity, Anne Arundel County, Maryland.

UTM: 18.378210. 4334750
Quad: Sparrows Point, Maryland

Date of Construction: 1856. Rebuilt 1875-1910.

Present Owner: United States Coast Guard, 5th Coast Guard District,
431 Crawford Street
Portsmouth, Virginia 23705-5004
(804) 398-6270

Present Use: Navigational Marker

Significance: Built in 1856, the Seven-Foot Knoll Lighthouse was the second screwpile structure built by the U.S. Lighthouse Service. The present structure contains some elements of the original cast-iron structure, and the house dates from the late 19th Century. The light is historically linked to the development of the Port of Baltimore and sits beside one of the busiest shipping lanes on the East Coast. Technologically, the screwpile form illustrates Americans' ability to produce large cast-iron foundry castings, the same development that produced cast-iron architecture. In the period 1835-1860, Baltimore was a leading national center of this new metal-working technology and of new marine engineering techniques. Seven-Foot Knoll is, arguably, the most significant of the remaining screwpile structures.

Project Information: This documentation is undertaken in accordance with a Memorandum of Agreement between the U.S. Coast Guard and the City of Baltimore, Maryland, approved by the Advisory Council on Historic Preservation on April 10, 1987, as mitigation for the relocation of the Lighthouse to Pier 5 in Baltimore. This narrative was prepared by:

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The Seven-Foot Knoll Lighthouse is a round wrought-iron two story structure supported on cast iron columns. It is located in the State of Maryland on the Chesapeake Bay on a rocky shoal at the mouth of the Patapsco River, marking the channel to the harbor at Baltimore.

The Seven-Foot Knoll Lighthouse is a wrought-iron house on a base of cast-iron columns, braced by wrought-iron tension members. The original house was described as being square of cast-iron panels, but the present one is round, of rolled-iron plates drilled and riveted together. The present house has two stories, plus a lantern which houses the light. The first floor is 51 feet in diameter, including a five-foot exterior platform around the entire circumference, making the internal living space 40 feet in diameter. The second story is 15 feet in diameter, and the light chamber itself is 6 feet across.

The house is supported on nine cast-iron screwpiles, one in the center and eight arranged radially 20 feet from it. The radial piles are connected around the circumference by 4-inch square bar girders. The girders are connected at the piles by cast caps with pin connections for both the girders and the wrought-iron-tension members that provide cross bracing. The caps also have bolt-through flanges to support the vertical columns which support the house. The columns have similar caps with connections for the girders that support the house. The girders around the circumference are an unusual fish-belly design, characteristic of early cast girders, rather than rolled sections. Another set of girders run radially to the center hub to support the iron plates of the floor system. A small wooden platform is suspended from them on wrought-iron hangers.

The present house is made of rolled-iron plate much in the manner of riveted iron-hull construction. Three horizontal bands of 3' x 6' plates form the exterior wall with a narrow soffit band forming the connection with the plates which form the shallow cone of the roof. As in ship construction, the pattern of plates, including the cuts for doors and windows was carefully layed out in advance and the cuts made in a shop with large fabricating machinery. Since the strength demands did not approach those of a ship at sea, there was no need to overlap the plates. Instead, plates are butted and riveted to a six-inch strip on the exterior surface. The roof plates terminate in a gutter which forms the catchment system for the lighthouse water supply held in large interior water tanks.

The second story of the house is much smaller than that on the original, being only 15 feet in diameter. It housed the oil tanks and a self-feeding mechanism for the light above. It is pieced by two openings with 2-over-2-double-hung sash.

The interior of the 1st floor is divided into spaces which functioned as living quarters for the keeper - a kitchen, a living room and two bedrooms. The interior partitions are of pine matchboarding and some are covered with later hardboard. Flooring is tongue-and-grove laid on the iron plate. Windows are double-hung sash in a variety of sizes showing the changes as large lights replaced the earlier multipaned sash. Interior doors are of a four-paneled late 19th-Century type.

The light chamber is accessed with a ladder from the second story. It is six feet in diameter and seven in height. Glass plate windows enclose the upper portion of the lantern. These are in the form of alternating truncated triangles held by iron mullions. A small finial sits atop the lantern roof and two metal stovepipes flank it.

The light at Seven-Foot Knoll, which marks the outer entrance to Baltimore's harbor, was built in 1856 as part of a Federal effort to rationalize the nation's system of navigational aids. In 1851, the government commissioned a study of such sites and began a program to build lighthouses and to devise charts and tables to make them more useful to mariners. Prior to this survey, it was difficult for navigators to distinguish from among the many lights on the coast, and navigation in bad weather remained a difficult and dangerous task. In the Chesapeake Bay, maritime traffic had become more frequent as ships increased in both number and size after the War of 1812. As early as 1819, Congress had authorized lighthouses at Bodkin Point and Sparrows Point at the entrance to Baltimore Harbor. After 1830, both the National Road and the Baltimore and Ohio Railroad enhanced Baltimore's importance as an entrepot for goods, and immigrants headed to the frontier. Fulton's steamboat and the international growth of both shipbuilding technology and maritime commerce made it obvious that the old system of locally placed and maintained navigational aids was becoming obsolete by 1840. The study by the Lighthouse Service in 1851 expressed a felt need in the maritime community. To add to its authority, it drew upon a French system already in place using the new Fresnel articulated lenses and government charts locating the new designated stations. Planning for a new series of lighthouses had already been going on for some time, and it was already determined that several would be in the Chesapeake Bay.

The creation of the first lighthouse at Seven-Foot Knoll began in 1850 when Congress appropriated $10,000 for a structure in the channel to replace the light on the mainland at Bodkin Point. By October of the next year, plans, designs and specifications were complete for what was to be a very unique screwpile lighthouse. The screwpile-type structure was itself the latest in lighthouse technology, eliminating the need for underwater caissons and heavy masonry foundations. The first had been erected on Brandywine shoal in Delaware, and, after an initial proposal to build a 60-foot brick tower, the Lighthouse Board decided to build another screwpile instead. The screwpile design took advantage of the emerging technology of cast-iron structures - very appropriate for Baltimore which was becoming a major center of cast-iron building. Hollow cast-iron piles with external threads were screwed into the river bottom to bedrock or some solid strata. These were then filled with concrete and capped to form a foundation on which to erect the house. Because all piles did not enter the bottom to the same depth, it was necessary to cast intermediate extensions of different lengths to create a uniform level for the superstructure 9 feet above mean high water.

The Seven-Foot Knoll house was further unique in that the house itself was also of cast-iron, probably the only one ever built! The original walls on the first floor consisted of 1" thick cast-iron panels 12 feet high by 3 feet, 6 inches wide. the second floor panels were 9 feet high and those for the lanterns 8 feet, 9 inches. All were cast with brackets to be bolted together just like the front of a cast-iron building. Cast-iron construction was the world's first prefabricated industrial building technology and had obvious advantages for difficult site locations like a lighthouse.

The firm of Murray and Hazelhurst in Baltimore was engaged to build the Seven-Foot Knoll. The company was not a construction firm, rather, they listed themselves as "ironfounders" in the City Directory and were one of a growing number of firms in the city that specialized in iron castings and machine building. Located on the waterfront at the corner of William and Hughes Streets, Murray and Hazelhurst were suppliers to the shipyards as well, making them ideally suited to the task at hand.

The present structure at Seven-Foot Knoll is a successor to the original cast-iron lighthouse, although much of the substructure is probably original. The current house is composed of panels or plates of wrought iron riveted together into a self-supporting shell. Just when it replaced the cast-iron house has not been determined, but the technology is characteristic of the post Civil War period of 1875-1910, as seen in bridges and also in shipbuilding. The interior wood paneling is also typical of this period and would have been added only for insulation and partition walls.

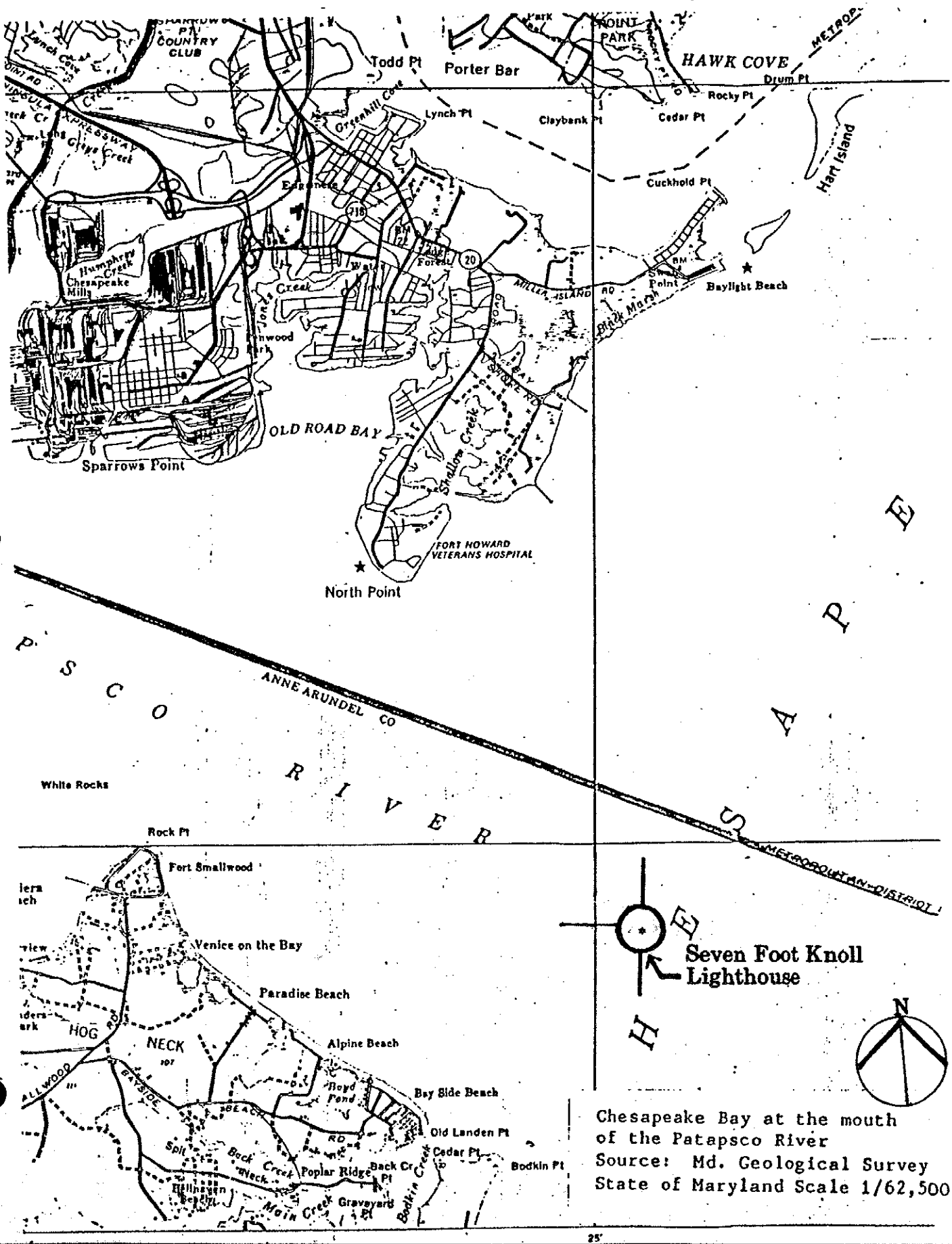
The Seven-Foot Knoll light was manned from 1856, when it went into operation, until 1948 when the Coast Guard automated it. Records of the Lighthouse Service and the Coast Guard on deposit at the National Archives include personnel registers from 1850-1912, correspondece from 1901-1939, and other items. There must have been many thrilling incidents of vessels bearing down on the lighthouse in a dense fog. In 1884, the cold weather created ice floes in the Bay that destroyed one of the screwpiles and the Lighthouse board had 15 wooden "dolphins" of 10 piles each driven around the site on a radius of 50 feet from the center pile. Ten years later, the ice had carried all of them away, and 700 cubic yards of stone was dumped around the base. These and other incidents indicate that the Seven-Foot Knoll Lighthouse was intricately connected to Maryland's maritime life and commerce. This was not a lonely post, situated as it was beside one of the busiest shipping lanes on the East Coast. Further investigation should provide fruitful sources and resources for interpretation of the structure once it is moved and opened to the public.

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Wash., D. C., National Archives and Record Service. Record Group 026 U. S. Coast Guard.

City Directory, 1853-1854. Baltimore, 1853.



Chesapeake Bay at the mouth of the Patapsco River
Source: Md. Geological Survey
State of Maryland Scale 1/62,500