SAYBROOK BREAKWATER LIGHT
South tip of the Saybrook Breakwater
Old Saybrook
Middlesex County
Connecticut

HAER No. CT-178

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11-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
U. S. Custom House
200 Chestnut Street
Philadelphia, PA 19106

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HISTORIC AMERICAN ENGINEERING RECORD

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Photographer: Robert Brewster, Warren Jagger Photography, Inc., Providence, RI, June 18, 1998.

CT-178-1	View looking northwest, showing Saybrook west breakwater and Lynde Point Lighthouse in the right background
CT-178-2	View looking northeast, showing Saybrook east breakwater in the right background
CT-178-3	View looking southeast
CT-178-4	View looking northeast, with Saybrook east breakwater in the background
CT-178-5	View looking southwest
CT-178-6	Detail of galleries and lantern, looking southwest
CT-178-7	Detail of gallery railings, looking north along Saybrook east breakwater to Lynde Point Lighthouse
CT-178-8	Detail, first story window surround
CT-178-9	Interior view, first floor, looking northeast
CT-178-10	Interior view, second floor, looking southwest
CT-178-11	Interior view, third floor, looking southwest
CT-178-12	Interior view, fourth floor, looking southeast
CT-178-13	Interior view, looking up into fifth floor (watch room) from fourth floor
CT-178-14	Photo copy of historic photograph, 1972, VIEW LOOKING NORTH, SHOWING ORIGINAL AWNING AT BASE OF LIGHTHOUSE. U.S. Coast Guard Civil Engineering Unit, Warwick, RI
CT-178-15	Photo copy of drawing, June 2, 1985, SAYBROOK BREAKWATER LIGHT, SAYBROOK, CONNECTICUT, MODERNIZATION 1985: REMOVALS. U.S. Coast Guard Civil Engineering Unit, Warwick, RI

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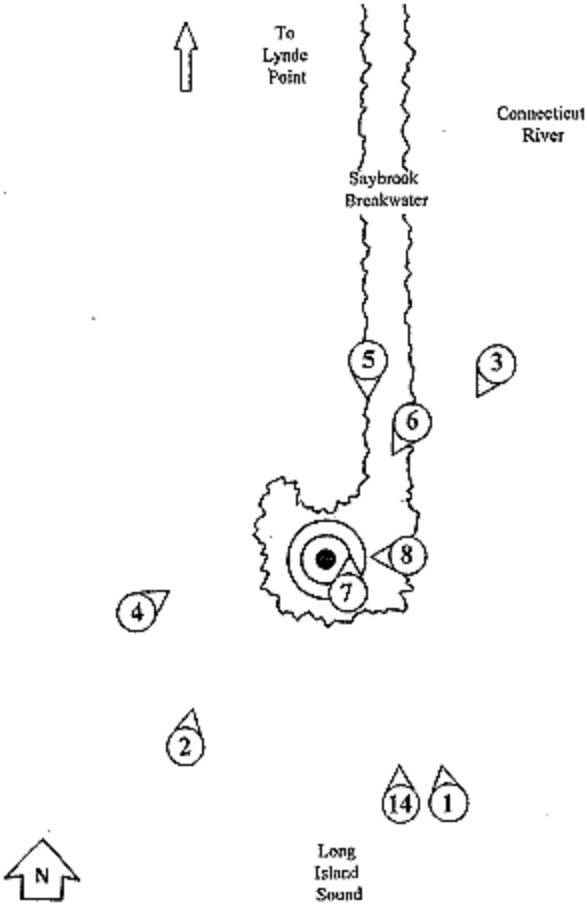
Exterior Views



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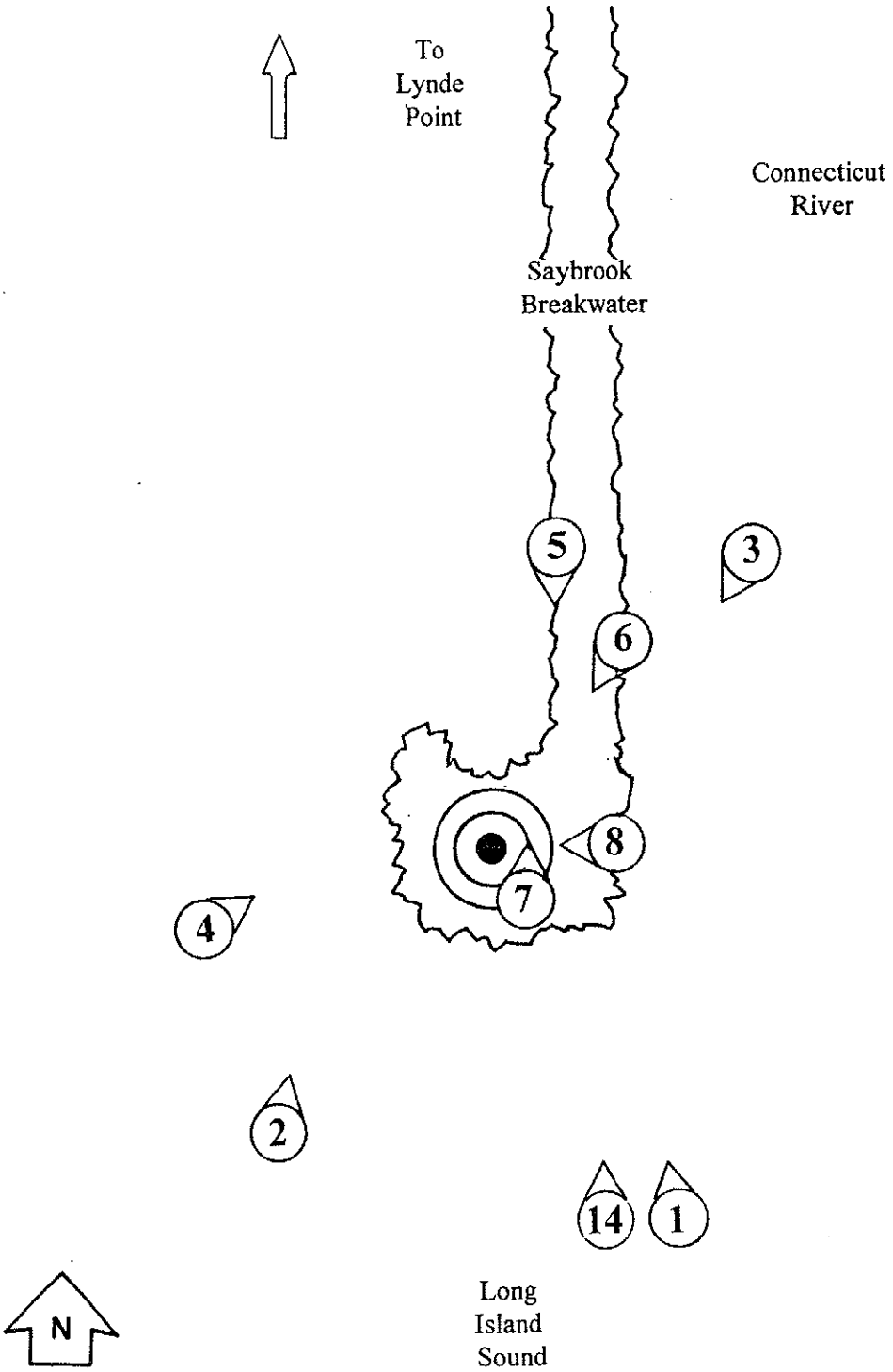

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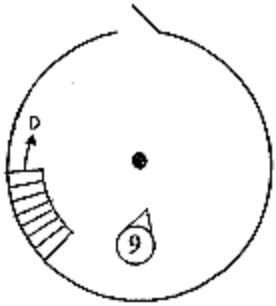

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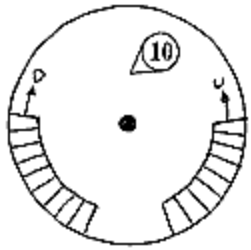

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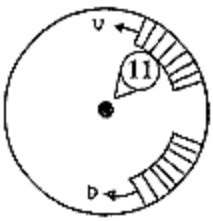

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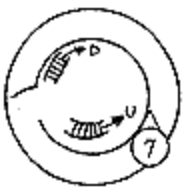
FOURTH FLOOR



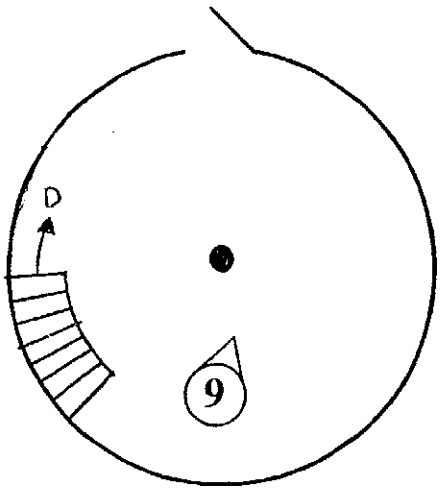


FIFTH FLOOR
WATCH ROOM



LANTERN

Interior Views



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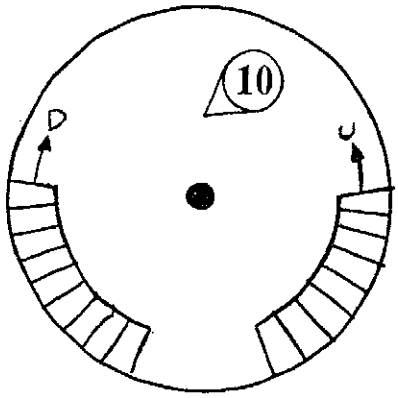

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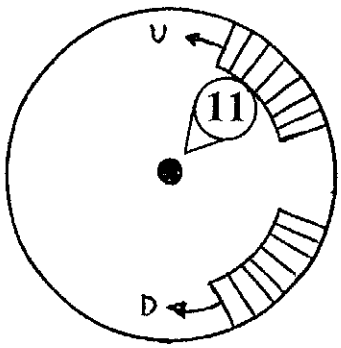

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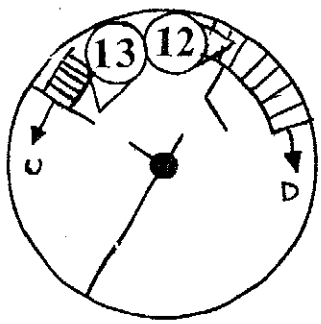

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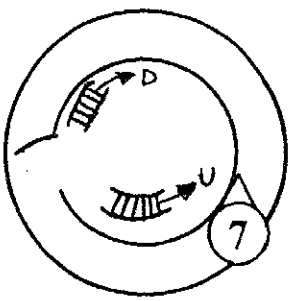
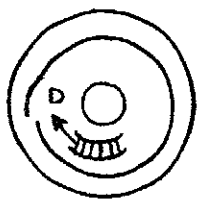


FIFTH FLOOR
WATCH ROOM



LANTERN

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HISTORIC AMERICAN ENGINEERING RECORD

SAYBROOK BREAKWATER LIGHT

HAER No. CT-178

Location: South tip of the Saybrook Breakwater
Old Saybrook, Middlesex County, Connecticut
USGS Old Lyme CT Quadrangle
Universal Transverse Mercator Coordinates: 18.722580.4571160

Date(s) of Construction: 1885-1886

Engineer, etc.: G.W. and F. Smith Iron Company, Boston, Massachusetts

Present Owner(s): United States Coast Guard
Aid to Navigation Team
120 Woodward Avenue
New Haven, CT 06512

Present Occupant: United States Coast Guard

Present Use: Active navigational aid

Significance: Saybrook Breakwater Light is a significant example of a prefabricated, cast-iron lighthouse built on a concrete foundation. This design was developed by the U.S. Lighthouse Board in 1873 as a less expensive alternative to masonry construction for the marking of submerged hazards. The materials, construction, architectural detail and interior finish at Saybrook Breakwater Light reflect the standardized design for this type of structure. This lighthouse is also significant for its role in the navigational aids system on coastal Connecticut, where it warns of shallow water at the mouth of the Connecticut River.

Project Information Statement: The United States Coast Guard (USCG) proposes to install a solar array on Saybrook Breakwater Light. The proposed project will impact the historic and engineering integrity of this property. The lighthouse is listed in the National Register of Historic Places as part of a thematic nomination of Operating Lighthouses in the State of Connecticut. In accordance with an agreement between the United States Coast Guard and the Connecticut State Historic Preservation Office (SHPO), Historic American Engineering Record documentation was to be prepared for the lighthouse prior to installation of the solar array.

Matthew A. Kierstead, Industrial Historian

The Public Archaeology Laboratory, Inc.
210 Lonsdale Avenue
Pawtucket, Rhode Island 02860

PART I. DESCRIPTIVE INFORMATION

The 1985 *National Register of Historic Places Inventory—Nomination form for the Saybrook Breakwater Lighthouse* describes the structure as follows:

Saybrook Breakwater Light, built in 1885–1886, is part of the navigational infrastructure at the mouth of the Connecticut River, where it empties into Long Island Sound. This infrastructure marks and maintains a ship channel dredged through the alluvial shoals at the mouth of the river. This channel is protected by 2000 ft long, stone riprap breakwaters that line it on either side. The east breakwater is water bound, and marked on its north tip by Saybrook Beacon. The Saybrook Breakwater Light is located at the south tip of the west breakwater, which extends south from Lynde Point, where the 1838 Lynde Point Lighthouse is located. The lighthouse structure consists of a segmental cast iron tower with a lantern resting on a cylindrical cast iron and concrete foundation. The tower is currently painted white with black railings and architectural details. The base is surrounded with boulder riprap to protect it from the actions of waves and ice. The riprap curves around the base in a crescent to form a small, protected shelter for boat access to a short metal ladder.

The lighthouse foundation consists of a cylinder 30 feet in diameter and 32 feet high, composed of an outer shell of cast-iron plates bolted together through flanges cast on the inside edges. The cylinder stands in 17 feet of water on a sand and gravel surface. The cylinder is filled with concrete, with the upper portion left open for the brick-lined basement. A corrugated profile was cast into the interior surface of the iron plates to stabilize the concrete fill. The foundation cylinder flares out in a trumpet shape at the top to accommodate a deck upon which the lighthouse rests. A replacement chain-and-stanchion railing is located at the perimeter of the base, where an awning, no longer extant, originally encircled and sheltered the walkway around the bottom of the structure.

The 48 ft high, four-story tower is built up with four courses of curved cast iron plates, assembled in the same manner as the foundation. The plates are one story in height and overlap the plate below with a semi-circular ridge. Exterior architectural elements are cast as the central part of a single plate. A brick lining, 12 inches thick at the bottom and 8 inches thick at the top, insulates and stabilizes the bottom three stories of the tower. On the first and second floors, a steel-plate, brick-lined wall separates the circular inner rooms from an outer circular staircase. A gallery or deck encircles the tower outside the watch room and the lantern.

The Saybrook Breakwater Light is notable for considerable retention of original cast iron architectural ornament, including window and door surrounds, and gallery brackets. The northwest, first-story entrance contains an outer metal plate replacement door within an elliptically arched cast iron entrance with a simple, unembellished door hood. Above the entrance is a cast iron plate with the legend "G. W. and F. Smith Iron Co., Boston, Mass." The segmentally arched window openings have surrounds that include projecting shallow-peaked pediments, recessed spandrels, molded cornices, flanking consoles, and molded sills. Many contain replacement transparent plastic panels. The windows are arranged asymmetrically to accommodate interior lighting requirements. On the fourth story, regularly spaced porthole windows illuminate the watch room. The railings and brackets associated with the watch room and lantern galleries are a major decorative feature of the lighthouse exterior. Both the watch room and lantern galleries are edged with double pipe rails supported on ornate cast-iron stanchions. Each stanchion is anchored to the deck by a threaded bar which has been inserted through a semi-circular projection at the edge of the deck and secured with an ornate

pendant. Beneath the watch room gallery, a ring of flaring, ornate, triangular cast iron brackets support the gallery deck.

The interior includes six levels, all of which include only structural elements from the period prior to automation in 1968. The interior tapers from a diameter of 21 feet at the top of the first floor to 10 feet 2 inches at the fourth, or watch room floor. Cast-iron stairs wind around the periphery of the tower from the first to the fourth floor, anchored to the brick lining and the interior wall. Helically-curving cast-iron ladders provide access to the basement, watch room and lantern. A central cast-iron column rises from a brick platform in the basement to the ceiling of the third floor, supporting the floors at each level. Floors are constructed of wedge shaped cast-iron sections bolted together on the underside and covered with cement on the first story and narrow wood floor boards on the second and third stories. Plaster covers the brick walls on all rooms except on the fourth floor, where vertical beaded board sheathing covers the walls. The basement, which is accessed by a curving iron staircase, and includes a brick-lined water cistern in its northeastern quadrant, is currently inaccessible due to partial flooding. The most notable feature of the first floor, originally used as a kitchen, is the row of segmentally-arched storage niches built into the brick lining. Remaining original features of the second and third floors, which held bedrooms and bathrooms separated by partitions, include some door and window trim, as well as closets and cupboards fitted into the space between the brick lining and the interior metal staircase wall. The watch room is notable for its radially-framed ceiling and eight glazed ceiling porthole oeculi which admit light from the lantern above.

The cylindrical cast iron watch room and lantern are of standardized manufacture and have been stripped of much detail. Helically-curved metal ladders give access to both the watch room and the lantern. The lantern is decagonal in plan, the upper half of its walls containing rectangular glass panes. Below the windows, round ventilators with adjustable covers are set into vertical beaded board sheathing and connected to outlets on the exterior. The drainage system for interior condensation is well preserved; molded channels and drain holes can be seen in the metal framing at the bottom of each pane. The peaked iron plate lantern roof supports a spherical iron ventilator on beak molding and a lightning rod. Within the lantern stands the modern lighting equipment, a small, modern, automated, electrified, flashing beacon with a green plastic Fresnel-type lens. It replaced an earlier, incandescent oil-vapor lamp which, in 1917, replaced the original seventeen light oil-wick lamp.

PART II. HISTORICAL INFORMATION

The 1985 *National Register of Historic Places Inventory—Nomination form for the Saybrook Breakwater Lighthouse* recounts the history of the structure as follows:

Saybrook Breakwater Light, constructed in 1886, is significant as a typical example of a pre-fabricated, conical, cast-iron and concrete light tower and foundation, developed in 1873 by the engineers of the U.S. Lighthouse Board for erection on submerged navigational hazards. The materials, construction, architectural detail and interior finish at Saybrook Breakwater Light reflect the first phase of standardized cast-iron lighthouse design development. This lighthouse is also significant for the part it played in the improvement of the navigational aids system in Long Island Sound, where it marks the channel entrance to the Connecticut River on Long Island Sound.

Temporary lighted navigational aids were constructed in the American Colonies as early as the first half of the seventeenth century. The first permanent lighthouse was built on Little Brewster Island in Boston Harbor in 1716. The New London Harbor Light, established in 1760, was the first permanent lighthouse erected on Long Island Sound. A series of other lights were constructed along the northeastern coast to improve navigation on the busy shipping lanes between New York and Boston during the late eighteenth and early nineteenth centuries.

The alluvial shoals at the mouth of the Connecticut River represented a significant obstacle to shipping on the river and Long Island Sound. Saybrook Breakwater Light stands on a breakwater only a half-mile from the 1838 Lynde Point Lighthouse, a land based beacon first established in 1802 to mark the west side of the entrance to the Connecticut River. The challenge of marking water bound hazards to navigation had been met in the first few decades of federal control through the deployment of buoys and lightships. One such buoy was approved by Congress on March 3, 1831, to mark Saybrook Bar at the mouth of the Connecticut River. Such an aid to navigation was inadequate for the needs of the increased maritime traffic in Long Island Sound after the Civil War.

The standardized cast-iron construction method used in the Saybrook Breakwater Light was developed by the U.S. Lighthouse Board engineers in the last quarter of the nineteenth century. During this period many of the remaining proposed lighthouse sites--mostly wave-washed reefs, shoals, and ledges--posed major engineering challenges. While such sites off the Southern Atlantic coast could be marked using the relatively cheap and easily executed method of securing lighthouses with iron piles, either anchored in rock or screwed deep into sandy shoals, such construction was unsafe in northern areas where ice flows were common. In those northern areas, the marking of water-bound sites usually involved the construction, at considerable cost in terms of money, materials, and manpower, of massive masonry foundations, keepers quarters, and light towers. Typical of this type of construction are the lighthouses at Minot's Ledge in Massachusetts and Race Rock in Long Island Sound.

With the advancing development of cast-iron technology in the middle of the nineteenth century, a cylindrical foundation constructed of cast iron and filled with concrete became a feasible alternative to stone. Major George H. Elliot, engineer of the U.S. Lighthouse Board, is given credit for developing this type of foundation in 1873. Made of identical curved cast iron plates, with flanges extending toward the inside of the curve and knees molded into the casting for reinforcement, these prefabricated foundations were assembled into rings with bolts at the construction site. Successive rings were bolted together, lowered onto the prepared site and filled with concrete or stones. These foundations proved to be as strong and stable as masonry, and since they could be mass-produced, realized substantial savings in design time, production, and transportation costs. The earliest known use of this type of foundation was at Southwest Ledge Lighthouse, near New Haven, Connecticut in 1877. Saybrook Breakwater Light was one of the early structures which resulted from this development. Cast iron became the preferred material for lighthouse foundations and was widely used between 1873 and about 1910, when reinforced concrete technology superseded it.

Compared to the often ornate architectural detailing found on their masonry predecessors, cast iron lighthouses offered little in the way of applied ornamentation. However, at least three different phases of minor architectural ornamentation can be discerned. The first phase is represented in the deeply-molded, arched and pediemented window and door hoods found at Stratford Point (1881) and Saybrook Breakwater

(1886). A second phase, incorporated simplified classical detailing found most often in cast-iron window and door surrounds. The earliest known example of this second phase of ornamentation within the present Third Lighthouse District was the Delaware Breakwater Lighthouse constructed in 1885. In 1901 a third phase of ornamentation for cast iron lighthouses was introduced at Harbor of Refuge, Lewes, Delaware. This phase was characterized by greater abstraction and simplification of door and window trim and a molded cornice in place of brackets.

In 1883, an inadequate appropriation was made for a lighthouse for Saybrook Bar. An additional appropriation was requested and approved. The subfoundation on the sand and gravel bottom was finished in 1885, and an iron tabular foundation 32 feet high and 30 feet in diameter was bolted together and sunk into place in 17 feet of water. The cast iron superstructure was fabricated by the G. W. and F. Smith Iron Company of Boston,, Massachusetts. By June 15, 1886 the pier, superstructure and lantern were completed and the light was first exhibited on that date. Riprap was placed around the site for protection up to the level of the high water mark. Fog-signal equipment was supplied in 1889, at which time the Breakwater Light took over the fog warning function from Lynde Point Lighthouse. In 1890 a fourth order Fresnel lens was fitted, replacing the original fifth order lens. Six years later a Gamewell fog bell striking machine was approved for the lighthouse. In 1917, a 17 wick oil lamp was converted to incandescent oil vapor. Since 1958 the fog signal has been operated by remote control. At that time personnel from Saybrook Breakwater Light lived at Lynde Point and stood watch only during inclement weather. Saybrook Point Light continues to serve its important role in marking the narrow channel at the mouth of the Connecticut River.

PART III. SOURCES OF INFORMATION

A. Engineering drawings:

U.S. Coast Guard Civil Engineering Unit, Warwick, RI. June 2, 1985 (Drawing No. 03-6460) entitled: "Saybrook Breakwater Light, Saybrook, Connecticut, Modernization 1985: Removals."

B. Historic views:

U.S. Coast Guard Civil Engineering Unit, Warwick, RI. 1972 view looking north, showing original awning at base of lighthouse.

C. Interviews:

None conducted.

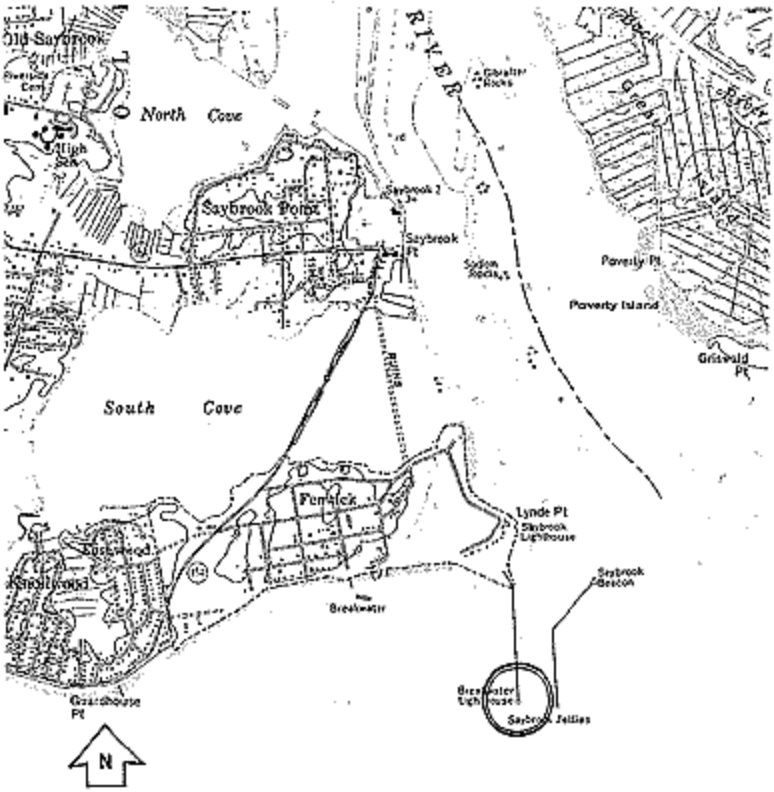
D. Bibliography:

Smith, Edward, Dorothy B. Templeton and Richard Meyer
1986 *Historic Sites Survey, Inventory and Analysis of Aids to Navigation in the State of Connecticut.* John Milner Associates, Inc., West Chester, PA.

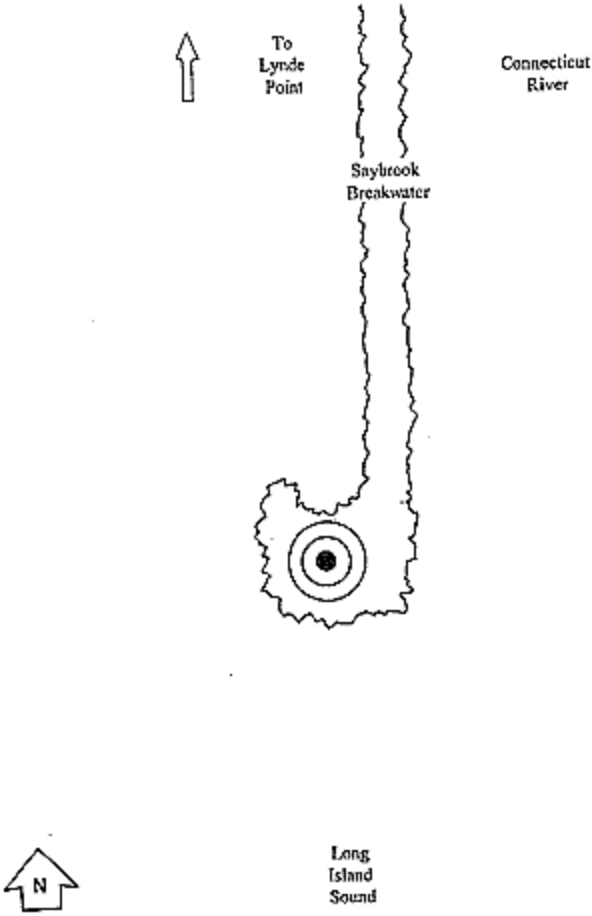
_____.
1986 *Historic Sites Survey, Inventory and Analysis of Aids to Navigation in the State of Connecticut: Appendix C—Condition Reports: Saybrook Breakwater.* John Milner Associates, Inc., West Chester, PA.

Templeton, Dorothy B.
1985 *National Register of Historic Places Inventory—Nomination Form for the Saybrook Breakwater Lighthouse.* Connecticut Historical Commission, Hartford, CT.

Location Map



Site Plan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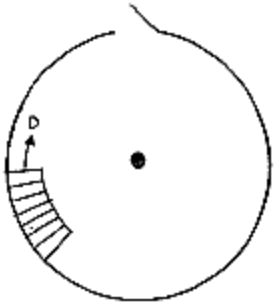
Floor Plans



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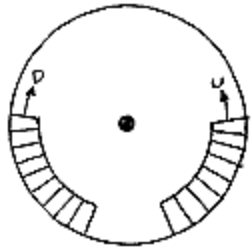

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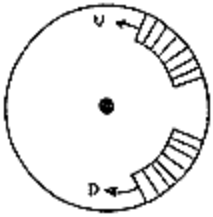

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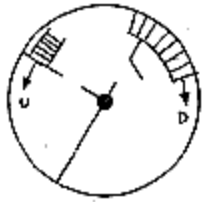

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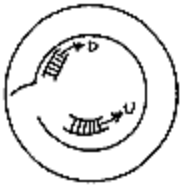

FIFTH FLOOR
WATCH ROOM



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