

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

**NATIONAL REGISTER OF HISTORIC PLACES
INVENTORY -- NOMINATION FORM**

FOR FEDERAL PROPERTIES

FOR NPS USE ONLY

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DATE ENTERED

SEE INSTRUCTIONS IN *HOW TO COMPLETE NATIONAL REGISTER FORMS*
TYPE ALL ENTRIES -- COMPLETE APPLICABLE SECTIONS

1 NAME

HISTORIC

AND/OR COMMON

Operating Lighthouses in the State of Connecticut

2 LOCATION

STREET & NUMBER

see individual forms

NOT FOR PUBLICATION

CITY, TOWN

CONGRESSIONAL DISTRICT

STATE

VICINITY OF

CODE

COUNTY

CODE

3 CLASSIFICATION

CATEGORY	OWNERSHIP	STATUS	PRESENT USE
<input type="checkbox"/> DISTRICT	<input type="checkbox"/> PUBLIC	<input checked="" type="checkbox"/> OCCUPIED	<input type="checkbox"/> AGRICULTURE <input type="checkbox"/> MUSEUM
<input type="checkbox"/> BUILDING(S)	<input type="checkbox"/> PRIVATE	<input checked="" type="checkbox"/> UNOCCUPIED	<input type="checkbox"/> COMMERCIAL <input type="checkbox"/> PARK
<input type="checkbox"/> STRUCTURE	<input checked="" type="checkbox"/> BOTH	<input type="checkbox"/> WORK IN PROGRESS	<input type="checkbox"/> EDUCATIONAL <input checked="" type="checkbox"/> PRIVATE RESIDENCE
<input type="checkbox"/> SITE	PUBLIC ACQUISITION	ACCESSIBLE	<input type="checkbox"/> ENTERTAINMENT <input type="checkbox"/> RELIGIOUS
<input type="checkbox"/> OBJECT	<input type="checkbox"/> IN PROCESS	<input type="checkbox"/> YES RESTRICTED	<input type="checkbox"/> GOVERNMENT <input type="checkbox"/> SCIENTIFIC
<input checked="" type="checkbox"/> Thematic Group	<input type="checkbox"/> BEING CONSIDERED	<input checked="" type="checkbox"/> YES UNRESTRICTED	<input type="checkbox"/> INDUSTRIAL <input checked="" type="checkbox"/> TRANSPORTATION
		<input type="checkbox"/> NO	<input type="checkbox"/> MILITARY <input type="checkbox"/> OTHER

4 AGENCY

REGIONAL HEADQUARTERS (if applicable)

U.S. Department of Transportation, U.S. Coast Guard Third District

STREET & NUMBER

Aids to Navigation Branch and District Planning Office, Governors Island

CITY, TOWN

New York

STATE

VICINITY OF

NY 10004

5 LOCATION OF LEGAL DESCRIPTION

COURTHOUSE,
REGISTRY OF DEEDS, ETC

see individual forms

STREET & NUMBER

CITY, TOWN

STATE

6 REPRESENTATION IN EXISTING SURVEYS

TITLE

see continuation sheet

DATE

FEDERAL STATE COUNTY LOCAL

DEPOSITORY FOR
SURVEY RECORDS

CITY, TOWN

STATE

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The following properties have been recorded in the Historic American Engineering Record (HAER), Library of Congress, Washington, D.C.

- Tongue Point Lighthouse, surveyed October 1979.
- Stratford Point Lighthouse, surveyed March 1980.

The following property has been recorded in the Connecticut State Historic Resources Inventory, Buildings and Structures, Connecticut Historical Commission, 59 South Prospect Street, Hartford, Connecticut:

- New London Ledge Lighthouse, surveyed September 1980.

The following properties were listed as "eligible for inclusion in the National Register" in the Scope of Work for Historic Sites Survey, Inventory and Analysis of Aids to Navigation in the State of Connecticut, U.S. Coast Guard Third District, 1983:

- Falkner Island Light
- Lynde Point Light
- New London Ledge Light Station
- Penfield Reef Light
- Stratford Point Light
- Stratford Shoal Light

CONDITION		CHECK ONE	CHECK ONE
<input type="checkbox"/> EXCELLENT	<input type="checkbox"/> DETERIORATED	<input type="checkbox"/> UNALTERED	<input type="checkbox"/> ORIGINAL SITE
<input type="checkbox"/> GOOD	<input type="checkbox"/> RUINS	<input type="checkbox"/> ALTERED	<input type="checkbox"/> MOVED DATE _____
<input type="checkbox"/> FAIR	<input type="checkbox"/> UNEXPOSED		

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

INTRODUCTION

This thematic nomination is based in part on a preliminary survey conducted in 1982 by the U.S. Coast Guard Third District Planning Office, Governors Island, New York. This office has jurisdiction along the east coast from Watch Hill, Rhode Island to the southern boundary of Delaware. The purpose of this survey was to identify potentially eligible aids to navigation in compliance with the National Historic Preservation Act (Public Law 89-665), as amended, Executive Order 11593 (Protection and Enhancement of the Cultural Environment), and Procedures for the Protection of Historic and Cultural Properties (36 CFR 800). Sources used in the preliminary survey included: the official Light List, Volume I, Atlantic Coast; records of the Third District Legal Department and Engineering Branch; and field experience of Aids to Navigation staff. Three criteria were used in identifying potentially eligible aids to navigation:

- U.S. Coast Guard Third District jurisdiction. This excluded any aid to navigation not owned and/or operated by the U.S. Coast Guard.
- Age. No aid to navigation built within the previous fifty (50) year period was determined to have the exceptional level of significance necessary to outweigh the usual limitations on eligibility.
- Engineering significance. Only permanent, substantial structures were included, eliminating the majority of aids to navigation on the Light List which are buoys, pole lights, and day markers.

As a result of the preliminary survey twelve lighthouses in the State of Connecticut were identified for intensive evaluations of historical significance.

In 1985 John Milner Associates, Inc., West Chester, Pennsylvania was retained by the U.S. Coast Guard Third District to conduct an historic sites survey, inventory and analysis of these twelve lighthouses. The project was managed and supervised by F. Neale Quenzel, Director, Building Materials Conservation, and Richard Meyer, Principal

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Architectural Historian. Field examinations were conducted by Carl Baumert, Structural Engineer, Edward Smith, Assistant Conservator, and Dorothy B. Templeton, Historian. Mrs. Templeton also conducted all research for the project and authored this nomination, a major component of the final report.

As a result of this investigation, John Milner Associates, Inc. recommended all twelve lighthouses as eligible for the National Register. These lighthouses are: (see location diagram) Falkner Island (1802); Greens Ledge (1902); Lynde Point (1838); New London Harbor (1801); New London Ledge (1909); Peck Ledge (1906); Penfield Reef (1874); Saybrook Breakwater (1886); Southwest Ledge (1877); Stratford Point (1877) and Tongue Point (1894).

Each is significant as part of the maritime history of Long Island Sound and each embodies the distinctive characteristics of a type, period or method of lighthouse construction (Criteria A and C).

Since this project did not include an archeological investigation, no subsurface testing was undertaken. However, three lighthouses present opportunities for future archeological assessment: Falkner Island, Lynde Point, and Stratford Point. Of the remaining nine lighthouses, eight are situated on waterbound sites and one, on an outcropping of rock.

DESCRIPTION

The theme of this nomination is the architectural and engineering design of lighthouses in Connecticut from colonial days to the twentieth century, and the importance of these structures to the maritime development of Long Island Sound. The twelve lighthouses in the thematic group comprise all those still in operation under Coast Guard jurisdiction in Connecticut at the time this nomination was undertaken (1985). Built on the coast of Connecticut and in the waters of Long Island Sound, these lighthouses aid maritime traffic entering and leaving the harbors and rivers of the state, and ships passing along the Sound between the New York City region and the Atlantic Ocean to the east. (See location diagram)

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Each of the lighthouses in the thematic group shares the functional requirements of providing an elevated light signal for the benefit of mariners, housed in a strongly constructed structure composed of long-lasting building materials. They vary in the types of building materials used, the engineering techniques employed for adaptation to their sites, and their architectural design. This variation reflects the development of American architecture and engineering, as well as the history of Federal supervision of the lighthouse establishment and the growing needs of American maritime commerce.

The Connecticut lighthouses may be divided formally into three sub-groups as follows:

- The oldest structures within the group are three tapering brownstone towers (New London Harbor, Falkner Island, and Lynde Point), built with adjacent keeper's dwellings. Only one keeper's dwelling survives. These towers resemble American colonial light towers although they were built during a later period, from 1801 to 1838. Two are located on the mainland; one on an island.
- Four of the lighthouses take the form of a house with a light on the roof, or in an attached tower. Of these four, one is a dwelling, built of cast-iron and ornamented in Second Empire detailing (Southwest Ledge). The remaining three are of masonry. Stratford Shoal exhibits some Gothic Revival detailing; Penfield Reef has a Second Empire mansard roof; and New London Ledge is an unusual twentieth century Colonial Revival version of the genre.

All four of these lighthouses are situated on wave-washed sites offshore.
- The five remaining lighthouses are cast-iron structures built of prefabricated curved sections in the form of a truncated cone. Three of these cast-iron towers (Stratford Point, Saybrook Breakwater, and Tongue Point) exhibit a consistently identifiable vocabulary of ornamentation which was used between ca. 1875 and the 1890s: arched window and door openings, projecting pedimented window hoods, deeply molded window surrounds and a plain,

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projecting door surround at the entrance. The earliest known example of this type was the Ipswich, Massachusetts Lighthouse (built in 1875, since moved to Edgartown, Massachusetts). The two remaining cast iron towers (Peck Ledge and Green's Ledge) date from the early twentieth century, and exhibit architectural detail from a second phase of cast-iron construction which seems to have begun ca.1885 and lasted until the second decade of the twentieth century. Their identifying characteristics are: rectangular window openings with simplified, shallow-molded arched hoodmolds on brackets, and at the entrance, an arched hoodmold resting on simplified consoles and pilasters. The earliest known example of this type is the Delaware Breakwater Light, constructed in 1885.

A third phase of cast-iron construction not represented in the Connecticut group, appeared in the second decade of the twentieth century, perhaps earliest at Miah Maul Shoal in 1913. Characterized by larger dimensions, more windows and a wider deck, this third phase offered a more comfortable living situation for the lighthouse keepers.

One cast-iron cone (Tongue Point) is of small size and in 1985 is sited at the water's edge. It was built on a breakwater which extended from Tongue Point, and was moved to shore when the breakwater was removed in 1919. Stratford Point Light stands on dry land, Greens Ledge and Peck Ledge are built on wave-washed off-shore sites, and Saybrook Breakwater can be reached from shore by foot over the riprap breakwater on which it stands.

The construction skills involved in the Connecticut lighthouses demonstrate the progress of structural engineering in America. Only one hundred and seven years elapsed between construction of the oldest of the twelve lighthouses, New London Harbor Lighthouse (1802), and the youngest, New London Ledge (1909). Yet in the technology of lighthouse construction, the twelve structures represent a greater span of time. New London Harbor Light was built in the same manner as the Colonial period tower which it replaced. The original New London Harbor Light was a tapering masonry tower similar to others built in the eighteenth century along the Atlantic coast. Conversely, at a time when cast-iron technology was well understood and construction with concrete was only

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beginning to be popular, the 1906 design of New London Ledge Light incorporated steel I-beams embedded in cinder concrete in the floor structure, thus anticipating the concrete and steel technology of the twentieth century.

Each of the twelve lighthouses shares a common origin in the Federal government. The brownstone towers were built from local materials by contractors from the area, who followed detailed specifications issued by the Treasury Department officials in charge of lighthouse construction and maintenance. Later Connecticut lighthouses reflected in both materials and engineering methods contemporary practices of Army engineers employed in the U.S. Lighthouse establishment. Likewise, architectural design was centralized in the Federal bureaucracy, its complexion tempered by internal politics and budgetary constraints.

Even when ornamentation was minimal, many lighthouse designs reflected the revival styles which dominated American architecture during most of the nineteenth century. With modifications of materials detail and siting, the same design might be used repeatedly not only within the same lighthouse district but also in other districts. The cast-iron cone lighthouses represented a high degree of standardization in design, permitting cost saving through mass production and pre-fabrication.

Interior finish of the Connecticut lighthouses varies with the construction date and the function of the structure. The brownstone towers were not intended as dwellings; each had an adjacent keeper's house of which only the New London Harbor dwelling (built in 1863) remains standing. Brick linings and winding stairs are the principal features in the masonry towers. Each originally was furnished with wood stairs. At Lynde Point a well-preserved wood stair still exists; both New London Harbor and Falkner Island now contain cast-iron stairs.

The three house-lights of the 1870s and the 1909 New London Ledge Lighthouse were originally carefully finished on the interior with wood and/or cast-iron detail which reflected contemporary domestic models. Some detail is unexpectedly refined. For example, at Stratford Shoal false graining of a doorframe was located beneath many coats of paint, and encaustic tile was used in the tower stair hall. Carefully designed newels and ballusters, drops and molded window and door surrounds are to

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be found at Penfield Reef, Stratford Shoal and New London Ledge Lighthouses.

The five cast-iron towers are uniform in interior finish since each resulted from mass-production. The few differences can be accounted for by the function, date or size of the structure. For example, the only cast-iron lighthouse without a brick lining is Tongue Point, a small version of the type. Similarly, Stratford Point, never intended as a dwelling, lacks the curving interior metal walls which enclose the living spaces in Saybrook Breakwater, Greens Ledge and Peck Ledge.

8 SIGNIFICANCE

PERIOD		AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW			
<input type="checkbox"/> PREHISTORIC	<input type="checkbox"/> ARCHEOLOGY-PREHISTORIC	<input type="checkbox"/> COMMUNITY PLANNING	<input type="checkbox"/> LANDSCAPE ARCHITECTURE	<input type="checkbox"/> REGION	
<input type="checkbox"/> 1400-1499	<input type="checkbox"/> ARCHEOLOGY-HISTORIC	<input type="checkbox"/> CONSERVATION	<input type="checkbox"/> LAW	<input type="checkbox"/> SCIENCE	
<input type="checkbox"/> 1500-1599	<input type="checkbox"/> AGRICULTURE	<input type="checkbox"/> ECONOMICS	<input type="checkbox"/> LITERATURE	<input type="checkbox"/> SCULPTURE	
<input type="checkbox"/> 1600-1699	<input type="checkbox"/> ARCHITECTURE	<input type="checkbox"/> EDUCATION	<input type="checkbox"/> MILITARY	<input type="checkbox"/> SOCIAL HUMANITARIAN	
<input type="checkbox"/> 1700-1799	<input type="checkbox"/> ART	<input checked="" type="checkbox"/> ENGINEERING	<input type="checkbox"/> MUSIC	<input type="checkbox"/> THEATER	
<input checked="" type="checkbox"/> 1800-1899	<input type="checkbox"/> COMMERCE	<input type="checkbox"/> EXPLORATION SETTLEMENT	<input type="checkbox"/> PHILOSOPHY	<input checked="" type="checkbox"/> TRANSPORTATION	
<input checked="" type="checkbox"/> 1900-	<input type="checkbox"/> COMMUNICATIONS	<input type="checkbox"/> INDUSTRY	<input type="checkbox"/> POLITICS GOVERNMENT	<input type="checkbox"/> OTHER (SPECIFY)	
		<input type="checkbox"/> INVENTION			

SPECIFIC DATES see individual forms

BUILDER/ARCHITECT

STATEMENT OF SIGNIFICANCE

The twelve Connecticut lighthouses in the nominated group exemplify the architectural history of New England lighthouses as typical examples of the three major architectural types which dominated lighthouse design along the Northeastern coast of the United States from the eighteenth century to the early twentieth century. Three of these, tall masonry lighttowers of the Federal period, recall a design used in the Colonial period to mark important harbors or river mouths. Four others are versions of the house light type. Flourishing in the mid-nineteenth century, this type emphasized the domestic function of the structure. The five remaining lighthouses are truncated cones fashioned prefabricated cast-iron plates, a type developed during 1870s, and used into the twentieth century. In addition, these Connecticut lighthouses demonstrate the long-term importance of maritime traffic to commercial, industrial and transportation development, not only of the communities bordering Long Island Sound, but also to regional and national interests as well. Substantial public appropriations established the lighthouses marking the mouths of the Connecticut, Thames, and Housatonic Rivers. As shipping increased between New York City and the Atlantic via Long Island Sound, hazards such as Falkner Island, Stratford Shoal, Penfield Reef, Greens Ledge, Peck Ledge, and New London Ledge were marked with lighthouses and fog signaling equipment. Harbor improvement campaigns at New Haven, New London, and Bridgeport included the construction of lighthouses, some of which are included in the nominated group. Not only do these lighthouses serve as navigational aids, they also exemplify to onlookers, ashore or aboard a vessel, the long history of concern for the welfare of the mariner on the national level. In addition, the twelve Connecticut lighthouses demonstrate the progress of structural engineering in the United States, in dealing with the special requirements of lighthouse construction. The earliest towers date from the period before professional engineering training was available in the country. Among the house structures are two examples of offshore masonry foundation construction and one of cast-iron. New London Ledge, the most recently built of the thematic group, utilized concrete and steel construction at an early stage of that technology.

Most lighthouses built in the United States during the Colonial and early Federal periods reflect a tradition of lighthouse construction established by the Romans and continued in England and on the continent over the ensuing centuries. Ancient Egyptian builders had created a

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lighthouse at Alexandria which was a wonder of the ancient world and gave its name, Pharos, to the building type. In France, Italy and Spain during the Middle Ages and Renaissance, famous lighthouses of sound construction and architectural imagination were built near the harbors of Boulogne, Genoa, and Corunna, and near the mouth of the Gironde River on the island of Cordouan. From an engineering standpoint, the most advanced lighthouses were built on oceanbound sites off the costs of England and Scotland at Eddystone (1698, 1708, 1759) and Inchcape (1811) Rocks. However, few improvements were made to the basic design: a tower constructed strongly enough to resist high winds, high enough to raise the light to a level where it could be seen from far at sea, and fireproof enough to withstand the flammable materials used to kindle the signal light.

The first lighted aids to navigation in the American colonies may have included devices like the vippefyr, a Danish invention of 1624 which raised a firebasket aloft on a long lever. The first permanent lighthouse built in the original thirteen colonies was established in 1716 on Little Brewster Island in Boston Harbor. A stone tower with wood stairs, this lighthouse was destroyed by the British troops upon their evacuation of the area in 1776. The Boston lighthouse was followed by the establishment of a wood beacon light at Brant Point on Nantucket (1746) and an octagonal wood daymark (not a light), built on Tybee Island, Georgia in 1736 and 1742 and assigned the establishment date of 1748. The next lighthouse established in the English colonies was a rubble stone tower built on Conanicut Island, Rhode Island, known as Beavertail Light (1749).

The next lighthouse to have been built in the United States formerly stood on the site of one included in this thematic group. This is the New London Harbor Light, established in 1760 by act of the colonial government and financed by a public lottery. The structure standing on the site in 1985 was built in 1801 to replace the 1760 tower, which had developed serious cracks in the masonry. The 1801 New London Harbor tower is the oldest lighthouse in Connecticut, and one of the oldest extant lighthouse structures in the country. Falkner Island Light, also included in the thematic group, was constructed the following year (1802) and shares many characteristics of the New London Harbor Light, including similar architectural ornamentation above the entrance.

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During the earliest days of the United States Constitution, lighthouse construction and maintainance was recognized as a responsibility of national scope. On August 7, 1789, in the first public works act passed by the first Congress, all aids to navigation were taken under the control of the federal government.

At first, architectural design of lighthouses under federal supervision was largely the same as that of the colonial days. Octagonal or circular towers of masonry or wood were often specified in requests for proposals placed in newspapers by the Treasury Department when seeking bids from private contractors. The requisite height, diameter, thickness of walls, building materials and size of the glass panes in windows and in the lantern often appeared in newspaper advertisements as well. Even such specifics as Boston glass or Philadelphia bricks were designated in some of the requests for proposals. Specifications were frequently copied from advertisements for previously constructed lighthouses, often in other states or even in other regions of the country.

An alternative design to the masonry tower, with a house for the keeper alongside, was a dwelling designed to support the "lantern," the name for the glass-enclosed room housing the light, above the roof. Drawings in the National Archives show such a design as early as 1827.² Designs for this type of lighthouse were adaptable for reuse by the government in other locations.

Most routine lighthouse contracts were bid on by builders from the area in which the lighthouse was to be built. Of the three early masonry lighthouses in the thematic group, the builders of two are known. The construction of New London Harbor Light in 1801 was undertaken by Abishai Woodward, a master carpenter from New London. The original wood Lynde Point Light was constructed in 1802 by the same man. In 1838 the brownstone tower still standing at Lynde Point was erected by three men from Madison, Connecticut, thirteen miles to the west of the site of the lighthouse: Jonathan Scranton, Volney Pierce and John Wilcox.

In addition to local master craftsmen, however, the few men in America with architectural and engineering training were occasionally involved in lighthouse design and construction. Their designs often reflected

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nothing more than the traditional functional lighttower. The nation's first professional architect, Benjamin Latrobe, bid on the construction of a lighthouse proposed for Old Point Comfort, Virginia, in 1798 in partnership with a builder in the area. They did not win the contract. Latrobe was asked in 1805 by the Secretary of the Treasury, Albert Gallatin, to design a lighthouse for a difficult site at the mouth of the Mississippi River. His initial response was a design similar to the simple American towers of colonial days.³ Similarly, Alexander Parris, at the end of a successful career as an architect in New England, produced a design for the light tower at Execution Rocks, New York, in 1850, utilizing that same plain tapering masonry tower design.

Innovative designs for more difficult lighthouse sites challenged the ingenuity of these early architect/engineers. Most colonial lighthouses in America were located on land along the east coast to mark major harbors, and were constructed and maintained with funds from local sources. After 1789, federal funding made possible the marking of landmarks and hazards between major population centers. Masonry towers served to mark secure sites on solid ground; the challenge of marking sandy or muddy beaches, shoals, reefs and sandbars challenged even the most expert of engineers. American training for engineers did not begin until the establishment of West Point in 1802, and the English engineering training of Latrobe which he passed along to his pupil, William Strickland, was not equal to the challenge of designing a lighthouse for difficult sites. Latrobe's final design for the Mississippi River mouth was carried out by his son Henry in 1817; the lighthouse settled unevenly in the muddy soil and had to be rebuilt. Strickland contracted in 1826 to build a cylindrical brick lighthouse on a blue marble and rubble stone foundation at Brandywine Shoal in Delaware Bay; completed in 1828, it survived a very short time before it was demolished by the waves.⁴ Not until the adoption of the use of screwpile lighthouses in 1848 did American engineering triumph over the challenge of sandy and muddy subsurfaces at lighthouse sites.

During the first half of the nineteenth century, the construction and equipping of American lighthouses did not keep pace with European improvements in lighthouse engineering and lighting technology. A major cause of this was the nature of the management of the American

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lighthouse establishment on the federal level between 1820 and 1851. During this time period, Stephen Pleasonton, the fifth auditor of the Treasury Department, was the general supervisor of the lighthouse establishment, but also had many other responsibilities. With a staff of nine clerks in 1842, his office handled not only the details for 256 lighthouses, but also accounts for the Departments of State, the census, the Patent Office, and boundary commissions. Pleasonton's chief focus for the lighthouse service was to establish and maintain economy, rather than to develop and implement improvements from an engineering or technical standpoint.

Pleasanton lacked any maritime background, and relied heavily on the advice of Winslow Lewis, a ship captain, who in 1810 had developed an improved lighting system for lighthouses utilizing an Argand lamp and a parabolic reflector. This Lewis system was adopted for all U.S. lighthouses in 1812, replacing the earlier candles and spider lamps. It continued in use until the 1850s. Lewis had been awarded the contract to install his lamp system in all U.S. lighthouses. In addition, he consistently placed the lowest bid for supplying the equipment, in effect maintaining a monopoly, and was involved in construction of lighthouses, including Latrobe's design, as well as the details of specifications. A lighting device vastly superior to the Lewis system was invented in France by Augustin Fresnel in 1822, and was quickly adopted by Britain and France for their lighthouse systems. The Fresnel lens, in the shape of a beehive, is composed of horizontal rings of circular glass prisms above and below the level of the flame of the lamp placed within the lens. Light from the lamp is bent by the prisms to be concentrated in a band projected horizontally through the central ring which magnifies the beams. Fresnel designed this lens in several sizes, calling the largest a first-order lens and the smallest a sixth-order lens.

Americans who were aware of the superiority of the Fresnel lens pressed for its adoption in the U.S. lighthouse system. Pleasanton, however, made only token attempts to obtain Fresnel lenses, until forced by severe criticism to do so. In 1837, an attack on Pleasanton's administration by the men behind a publication called "The American Coast Pilot" led to a Congressional committee of investigation. As a result, Commodore Matthew Perry was sent abroad to examine European

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lighthouses, and to obtain both a revolving and a fixed Fresnel lens. These lenses, installed in 1841 on the headlands of New Jersey just south of the entrance to New York Harbor, quickly proved their superiority.

Still another decade of inertia under Pleasonton's leadership passed, during which only two other American lighthouses were equipped with Fresnel lenses. Then in 1851 a thorough evaluation was made of America's lighthouse establishment. Congress created an investigating board, its six members appointed by the Secretary of the Treasury. The Board membership included representatives of the Navy and the Army Corps of Engineers, as well as a civilian distinguished in the scientific community. Thus the disciplines most concerned with the design and the use of lighthouses at last were involved at the decision-making level.

After an exhaustive study, the investigating board found in 1852 that the U.S. Lighthouse Establishment needed a thorough overhaul to bring it up to the standard of Britain and France. Conditions were unsatisfactory in the areas of design, construction, the spacing of the sites of lighthouses, lighting apparatus, maintenance, and the overall management of the system. The board members recommended that they be made the nucleus of a governing Lighthouse Board, adding to their number the Secretary of the Treasury, another civilian scientist, and another army engineer to serve as a secretary. Congress accepted their proposals, and on October 9, 1852, the U.S. Lighthouse Board was established. This organization would shape the U.S. Lighthouse Establishment from that date until 1910.

The size of the lighthouse establishment had increased dramatically during Pleasonton's regime, the number of lighthouses growing from 55 in 1820 to 331 in 1852. During this period, little advance was made in the engineering design of American lighthouses, as exemplified by the only lighthouse in the thematic group which was built during this period, Lynde Point (1838). An octagonal brownstone light tower much like New London Harbor Light and Falkner Island Light, Lynde Point was built more than 30 years after the former two towers were constructed.

The major advance in American lighthouse engineering under Pleasonton is said to have been the adoption of the screwpile lighthouse design,

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developed in England by Alexander Mitchell for a lighthouse built at the mouth of the Thames River in 1838. The base of a screwpile lighthouse consisted of long iron piles, the bottom end of each fitted with a spiraled iron flange which could be embedded in a soft surface by twisting the pile.

The first screwpile lighthouse in the U.S., designed by Major Hartman Bache of the U.S. Corps of Topical Engineers, was erected in 1848 at Brandywine Shoal in Delaware Bay. It replaced the circular lighthouse designed by William Strickland in 1828, which had failed quickly. Screwpile lighthouses were most successful on the sandy shores of the southern states; the ice floes borne on the waves of Long Island Sound and other northern coastal waters proved to be an overwhelming hazard for such lighthouses. There is no screwpile lighthouse in the nominated group.

After the establishment of the Lighthouse Board in 1852, a new spirit animated those concerned with aids to navigation in the United States, a drive toward excellence. Personnel in the lighthouse service were for the first time required to be literate, and maintenance manuals were drawn up and distributed to ensure uniformly high standards throughout the nation. Energetic feats of engineering and construction technology were performed, one goal being to erect masonry foundations upon reefs and rocks which could withstand wind, waves and ice.

Foundations for lighthouses on such sites were designed of colossal blocks of masonry, shaped to fit into interlocking circles and laid with Portland cement; iron staples were added to insure the bond, and the center was filled with stone rubble and more cement. Rip-rap was placed around these foundations to act as a breakwater. Two of the nominated lighthouses fall into this group: Penfield Reef (1874) and Stratford Shoal (1878). These lighthouses proved to be satisfactory. However, their design proved to be a short-lived solution. The development in the 1870s of cast-iron tubular foundations provided the successful model for future installations of lighthouses on wave-washed sites in Long Island Sound.

Under the Lighthouse Board, architectural designs for new lighthouses were proposed to the Lighthouse Board in Washington by the engineers

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appointed for each district, who also recommended sites for new lighthouses and supervised construction.⁵ Final approval of designs for new lighthouses was reserved for the Lighthouse Board, which would refer proposed designs from the district engineers to the Engineering Committee of the Board, and later act upon the recommendation of that Committee. Although the attribution of most designs is uncertain at present, hidden by the anonymity of bureaucracy, further research may allow specific names to be assigned to many designs new merely ascribable to the Engineering Committee of the Lighthouse Board.

Such centralized responsibility made possible the adaptation and reuse of architectural designs and engineering solutions in more than one district, as had been the practice with basic specifications before the formation of the Lighthouse Board. A conscious effort was made to collect and preserve both drawings and source material in Washington.⁶ The development of lithography in mid-century made possible multiple reproductions of plans and elevations and working drawings for potential bidders on construction contracts. Economy of manhours spent in designing, drafting and fabricating parts was the motive for developing standardized designs for lighthouses. In the years following the establishment of the Lighthouse Board, reuse of lighthouse designs became common practice.

This drive toward standardized design is illustrated in the thematic group of Connecticut lighthouses. Three of the Connecticut lighthouses which date from the 1870s represent three different versions of the house-light, each version having duplicates in other locations. Penfield Reef (1874) is based on a design used for Hudson River lighthouses, such as at Esopus Meadows (1871); the same design was designated for Bridgeport Harbor Lighthouse, Hart Island, Sabin's Point, Long Beach Bar Light, and Colchester Reef Lighthouse.⁷ Southwest Ledge (1877), an innovative cast iron house, was duplicated at Ship John Shoal (1878) in Delaware Bay. The third lighthouse in this group, Stratford Shoal (1878), bears great resemblance to Race Rock Lighthouse, which was under construction at the same time in Long Island Sound.

During the 1860s and 1870s, stylistic references and ornamentation reached a zenith in the history of American lighthouse design. Although lighthouses built both before and after this period exhibit some detail,

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the functional aspect of lighthouses was more dominant in earlier or later structures. Individual exceptions occurred, but after the Civil War and before the dominance of cast-iron conical lighthouses, a variety of Second Empire, Gothic Revival, Italianate, and Classical Revival lighthouse designs were built. Later keeper's dwellings can be found with Stick Style, Queen Anne and Colonial Revival details. One lighthouse within the nominated group, New London Ledge Light (1909), is a twentieth century Colonial Revival design.

A major engineering achievement of the Lighthouse Board in the 1870s was the development of the conical cast-iron lighthouse, and the tubular cast iron foundation, both constructed of pre-fabricated curved panels of cast-iron. Six lighthouses in the thematic group represent this type of construction. Southwest Ledge Lighthouse (1876) has the earliest known extant example of a tubular cast-iron foundation, and Stratford Point Lighthouse (1881), is among the earliest cast iron conical lighthouses in the nation. This design, with variations, was used from the 1870s until the second decade of the twentieth century. In addition to Southwest Ledge and Stratford Point Lighthouses, the thematic group includes four other cast-iron conical lighthouses: Saybrook Breakwater (1886), Tongue Point Light (1894), Greens Ledge (1902), and Peck Ledge (1906).

Present research suggests that this design for a lighthouse and foundation was developed by Major George H. Elliot, who served as Engineer/Secretary of the Lighthouse Board in the early 1870s.⁸ Elliot had designed a conical cast-iron lighthouse for a site on Hunting Island, South Carolina, which was subject to severe erosion. Established in 1873, the lighthouse was designed to be easily disassembled and reconstructed elsewhere on the island when the site was eroded. Curved iron plates of identical dimensions were cast with flanges extending along each edge toward the inside of the curve. Knees were cast in for support. At the construction site, the plates could be connected by wrought iron bolts through holes in the flanges, to make rings. The rings were then bolted together vertically, the lower rim of each row, or course, of plates overlapping the one below in a half-round cast ridge. Architectural features such as doors and windows were cast as the integral part of a plate. By varying the size of the plates and the number of courses, lighthouses of different height or dimension could be produced.

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When used as a tubular foundation, cast-iron plate construction could be filled with cement and rocks and buttressed by surrounding riprap to successfully withstand the pressure of tides, waves and ice floes in northern waters. The first superstructures placed on the cast iron tubular foundations were cast-iron houses (e.g. Southwest Ledge Light). With the development of conical cast-iron plate lighthouses, the whole construction could be planned from drawings on file in Washington, prefabricated and shipped in pieces to the assembly location, where work crews put the pieces together and completed the structure with interior fittings and finishes sent out from the lighthouse shops.

In the twentieth century, lighthouse design continued to utilize cast iron plate construction, as well as more traditional materials such as brick, while testing the new developments in concrete construction. New London Ledge, designed in 1906, contains an early example of steel and concrete floor construction. The first lighthouse built primarily of concrete was established in 1908 on the Pacific coast.

In 1910, one year after New London Ledge was established, the Bureau of Lighthouses was created to supervise U.S. lighthouses. The rate of construction of new lighthouses in the northeast slowed in the twentieth century, as virtually all the sites requiring warning signals had been marked with long-lasting structures of masonry or cast-iron. In 1939, the U.S. Coast Guard assumed control of the lighthouses in the United States and her possessions.

During the period following the Second World War, the automation of lighthouses and consequently the removal of personnel has increased. At the time of this nomination, the only lighthouse in the nominated group still staffed by Coast Guard personnel was New London Ledge Light, although the keeper's dwelling at Stratford Point Light Station was in use by a Coast Guard family. Although the buildings were built to survive for many years while inhabited by their keeper, in an unoccupied state they are far more vulnerable to damage from vandals and the elements.

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2. "Old Lighthouse Records: 1792-1855, Contracts," Record Group 26, National Archives, Washington, D.C.
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4. "Old Lighthouse Records: 1792-1855, Contracts."
5. Organization and Duties of the Lighthouse Board, U.S. Government Printing Office, Washington, D.C., 1869.
6. "Report of the Officers Constituting the U.S. Light-house Board . . . Convened under Instructions from the Secretary of the Treasury to Inquire into the Condition of the Light-house Establishment of the U.S. under the Act of March 3, 1851," A. Boyd Hamilton, Washington, D.C., 1852, 17.
7. Index to Letters of the Lighthouse Board, Records Group 26, National Archives, Washington, D.C., #322-134, 269-926, 269-994.
8. Barnard, J.G., "Lighthouse Engineering as Displayed at the Centennial Exhibition," American Society of Civil Engineers Transactions, 8 (1879), 70.

9 MAJOR BIBLIOGRAPHICAL REFERENCES

see continuation sheet

10 GEOGRAPHICAL DATA see individual forms

ACREAGE OF NOMINATED PROPERTY _____

UTM REFERENCES

A

ZONE	EASTING	NORTHING
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B

ZONE	EASTING	NORTHING
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C

ZONE	EASTING	NORTHING
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D

ZONE	EASTING	NORTHING
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VERBAL BOUNDARY DESCRIPTION

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE	Connecticut	CODE	COUNTY	Fairfield	CODE
	Connecticut			Middlesex	

STATE	Connecticut	CODE	COUNTY	New Haven	CODE
	Connecticut			New London	

11 FORM PREPARED BY

NAME / TITLE

Dorothy B. Templeton/Historian

ORGANIZATION

John Milner Associates, Inc.

DATE

October 22, 1985

STREET & NUMBER

309 North Matlack Street

TELEPHONE

(215) 436-9000

CITY OR TOWN

West Chester

STATE

Pennsylvania 19380

12 CERTIFICATION OF NOMINATION

STATE HISTORIC PRESERVATION OFFICER RECOMMENDATION

YES___

NO___

NONE___

STATE HISTORIC PRESERVATION OFFICER SIGNATURE

In compliance with Executive Order 11593, I hereby nominate this property to the National Register, certifying that the State Historic Preservation Officer has been allowed 90 days in which to present the nomination to the State Review Board and to evaluate its significance. The evaluated level of significance is ___National___State___Local.

FEDERAL REPRESENTATIVE SIGNATURE

TITLE

DATE

FOR NPS USE ONLY

I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER

Beth S. Savage

DATE 10-5-89

DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION

ATTEST:

DATE

KEEPER OF THE NATIONAL REGISTER

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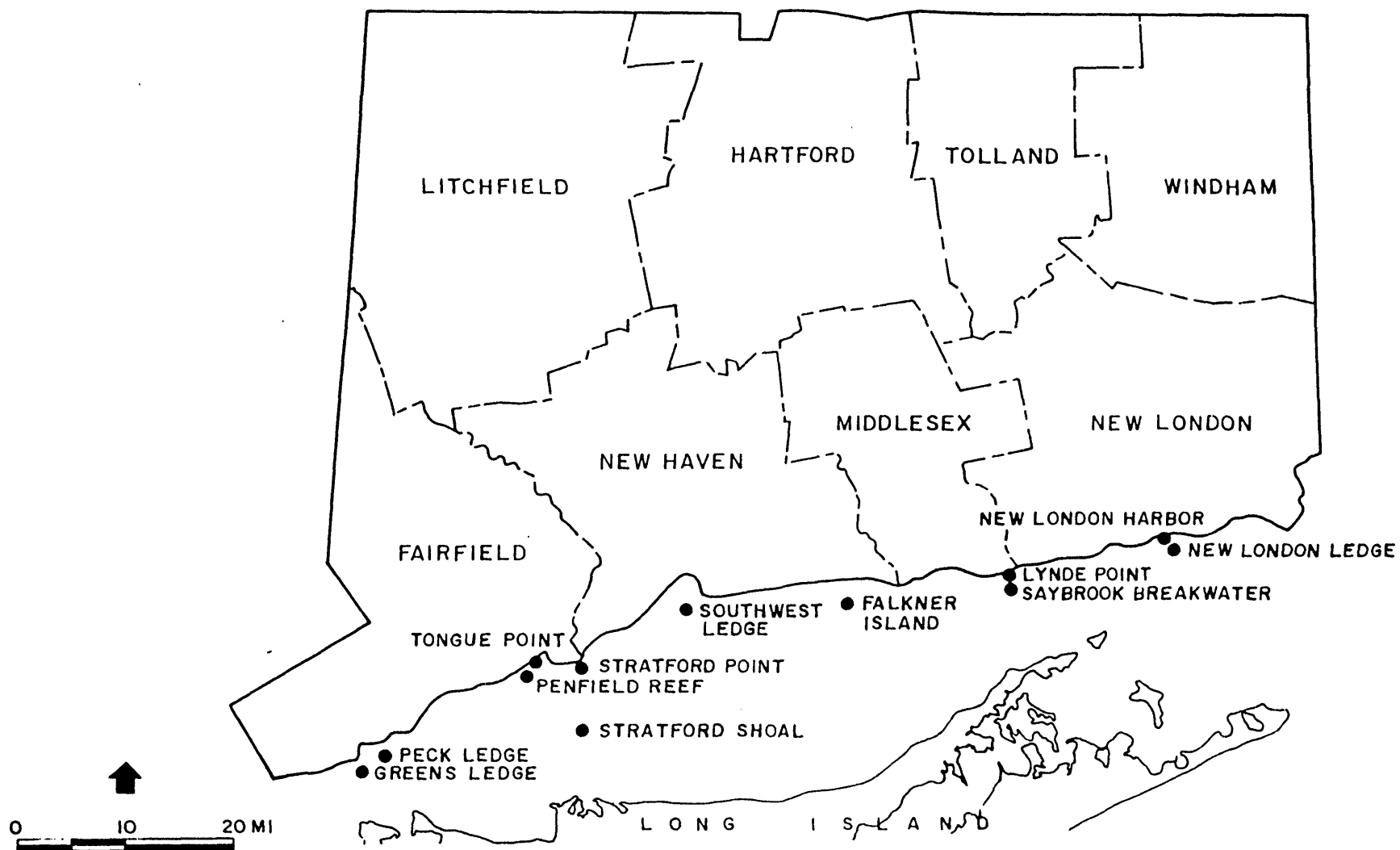
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