NPS Form 10-900
(Rev. 10-90)

OMB No. 1024-0018

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
REGISTRATION FORM

1. Name of Property

historic name: Bodie Island Light Station

other names/site number: Bodie Island Lighthouse; Body's Island Lighthouse; Bodie Island Visitor Center and Lighthouse

2. Location

street & number: Off North Carolina Highway 12 not for publication ___

city or town: Nags Head vicinity: X

state: North Carolina code: NC county: Dare code: 055

zip code: 27959

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1986, as amended, I hereby certify that this _XX___ 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 _X_ meets ____ does not meet the National Register Criteria. I recommend that this property be considered significant _XX__ nationally ___ statewide ___ locally. (___ See continuation sheet for additional comments.)

Signature of certifying official — Date: May 14, 2003

National Park Service
State or Federal agency and bureau

In my opinion, the property _XX___ meets ____ does not meet the National Register criteria. (___ See continuation sheet for additional comments.)

Signature of commenting or other official — Date: 31 Mar 03

North Carolina State Historic Preservation Officer, Dept. of Cultural Resources
State or Federal agency and bureau

4. National Park Service Certification

I, hereby certify that this property is:

__✓__ entered in the National Register Entered in the National Register _____
___ See continuation sheet.
_____ determined eligible for the _____ _____
National Register
___ See continuation sheet.
_____ determined not eligible for the _____ _____
National Register
_____ removed from the National Register _____ _____
_____ other (explain): _____

_____ 7.4.03
Signature of Keeper Date of Action

5. Classification

Ownership of Property

___ private
___ public-local
___ public-State
_X_ public-Federal

Category of Property

___ building(s)
_X_ district
___ site
___ structure
___ object

Number of Resources within Property

Contributing	Non-contributing	
3	1	buildings
0	1	sites
7	6	structures
4	0	objects
14	8	Total

Number of contributing resources previously listed in the National Register: N/A

Name of related multiple property listing (Enter "N/A" if property is not part of a multiple property listing.): N/A

6. Function or Use

Historic Functions

Cat: TRANSPORTATION	Sub:	water-related
DOMESTIC		multiple dwelling

Current Functions

Cat: TRANSPORTATION	Sub:	water-related
RECREATION and CULTURE		museum

7. Description

Architectural Classification:
OTHER: First-order brick lighthouse (tower)
Italianate (oil house)

Materials (Tower):
foundation: STONE (Granite)
roof: METAL (Copper)
walls: BRICK
other: METAL (Iron) Lantern

Narrative Description

Present and Historic Physical Appearance

The Bodie Island Light Station is part of a system of aids to navigation on the coast of the Outer Banks of North Carolina. Located in the Cape Hatteras National Seashore, the 15-acre station includes a 164-foot brick tower (156-foot focal plane) with an attached brick oil house/workroom. A brick walk runs toward the southwest to a brick double keepers' quarters flanked by three brick cisterns. A wooden storehouse stands just north of the keepers' quarters. Originally referred to as Body's or Boddy's Island, later spellings included Bodies or Bodie's Island. Although still pronounced as 'Body', 'Bodie' is the standard spelling today.

The light station is located to the west of NC Highway 12, approximately 3,800 feet from the Atlantic Ocean shore. The station is approximately 2,700 feet from the shore of Roanoke Sound. Situated on what was once a wide, sandy, flat area the light station is now separated from the ocean by barrier dunes built in the 1930's. Vegetation on the island is marsh, shrubs and small trees, expect for the pine trees, planted in 1954, that line the paved two-lane entrance road from NC Highway 12. The entrance road comes in from the north to a one-way loop immediately west of the double keepers' quarters. Two parking lots, to the northwest and southwest of the double keepers' quarters, are accessed from the paved loop road. The immediate grounds of the lighthouse and quarters are mowed grass. To the north, west, and south are pine trees. To the east is a pond that extends from near the lighthouse to NC Highway 12. Although the vegetation has changed since the dunes were built, Bodie Island still retains a wild, undeveloped character reminiscent of the 19th century when the lighthouses were built along the coast of North Carolina to protect coastal shipping.

The current lighthouse tower on Bodie Island is the third one constructed to mark that section of the Outer Banks. Built on a brick foundation in unstable soil, the first tower, lit in 1848, soon began to settle unevenly and by 1858 was beyond repair. A second tower was completed in 1859; however it was soon destroyed by Confederate troops during the Civil War. In 1872 the third and current tower on Bodie Island was completed and lit. The tower reflects a standardized design used for many first-order lighthouses (see discussion of orders in statement of significance), a standardization process begun by the U. S. Lighthouse Board after its establishment in 1852. Bodie Island Lighthouse retains her 1871 Fresnel lens and several of her station buildings survive intact.

Existing Resources

There are three contributing buildings—the tower with its attached oil house/workroom (IDLCS #000114), the double keepers' quarters (IDLCS #007244), and the storehouse (IDLCS #007249). The seven contributing structures are the three cisterns (IDLCS #091898), two hand pumps (IDLCS #202972 and #202818) next to two of the cisterns, the brick walkway (IDLCS # 271500) connecting the lighthouse with the keepers' quarters and the concrete walkways (IDLCS # 271501) from the brick walkway in front of the oil house to the site of an oil house south of the tower and at each end of the double keepers' quarters. The four contributing objects are the boundary markers (IDLCS #027229, #207370, #207362, 207294). The restroom is a non-contributing building; the foundation of the wood house is a non-contributing site; and the platform supporting air conditioning units, nature viewing platform, parking lot, entrance road, wooden walks, and safety fence are all non-contributing structures.

Tower (Exterior)

The conical brick tower with iron lantern rests on a dressed granite base and granite foundation and is attached to a brick oil house/workroom (IDLCS #000114). The distance from ground level to the top of the ventilator ball is 164.4 feet. The focal plane, the distance between the center of the lens to the mean high water mark, is 156 feet. The tower is 150 feet from the surface of the ground to the focal plane. The diameter of the base of the granite foundation is 28 feet and the diameter at the parapet of the lantern is 16 feet, 8 inches. About 11 feet of the granite base of the tower is above ground.[1]

[1]Dimensions based on a drawing found in the files at Cape Hatteras National Seashore and "Description of Buildings, Premises, Equipment, at Bodie Island Light-Station, Seacoast of North Carolina," (Department of Commerce and Labor, Light-House Establishment, Fifth District), completed March 6, 1909; also found in park files.

The granite foundation, an octagonal pyramid, rests on a timber grillage system. The aboveground foundation is octagonal with one of the eight sides opening into the passageway between the tower and the attached oil house/workroom. Above ground, the foundation is made up of five courses of cut granite blocks; the first three courses consist of blocks with a rough or split-faced finish with a cut band around each face. The top two courses, which form the belt course or cap, consists of blocks with a smooth face. The granite courses are filled with rubble stone set in cement. A brick column provides the foundation for the floor at the base of the tower.

The tower's brick shaft tapers from 6 bricks thick at the base to 2 ½ bricks at the top. There is an interior and exterior wall connected by brick sections similar to the spokes in a wheel so that small hollow sections are created between the inner and outer walls—a design attribute common to many masonry lighthouse towers. The hollow sections served several functions. The air in the voids acted to keep the interior of the tower warmer in the winter and cooler in the summer. The voids also allowed for a less massive structure overall, allowing the tower to be built on ground that could not support a heavier structure. The design also required fewer bricks so was less expensive to construct.[2] The hollow sections also probably provide the tower with more flexibility to shift in changing temperatures and ground conditions. The exterior walls are coated with a cement wash and painted with alternating black and white stripes as its distinctive daymark. Each of the three white and two black stripes measure 22 feet.

There are nine windows in the shaft section of the Bodie Island Lighthouse. Each window has a granite casing. Five windows are recessed in the shaft section and are encased by raised brick and stone arched frames on the exterior.[3] Two of those windows are located in the black stripes and face west towards the keepers' quarters, and three windows are located in the white stripes and face east. The four windows directly under the lantern in the service room face north, south, east and west. All nine windows are casement-type opening out. Those in the shaft are wood frame with marble sills and cast-iron sill guards. The service room windows are also wood frame with cast-iron headers, sills, and jams.

The tower is topped with a cast-iron polygonal (16-sided) lantern that houses a first-order Fresnel lens (see description in lens section below). Three rows of glass panes, 16 per row, surround the lens, separated by vertical wrought-iron posts finished with bronze and horizontal bronze sash bars. The lantern panes are 3/8 inch thick. Eight bronze air vents are located at the bottom of

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[2]Wayne Wheeler, "The 1870 Tower Design," *The Keeper's Log*, Summer 1998, p. 14.

[3]For the purpose of this history, the room below the lens is referred to as the watch room and the room below the watch room is called the service room, following the terminology in the drawings. Some sources indicate the reverse terminology, the service room being the area below the lens and the watch room below the service room which makes sense in that there would be windows in the watch room for the keeper to observe weather conditions and ship traffic and the service room would be more accessible to the lens area.

every other pane. The lantern is capped with a copper-sheet roof and copper ventilator ball surmounted by a bronze pinnacle with a platinum tip. The roof is lined with sheet zinc. Below the roof, a tin hood protects the lantern. Eight iron rods protrude from the roof and connect to an iron spider that secures the top of the lens.

The lantern has two decks. The lower deck, referred to in the plans as the 'watch room gallery', consists of iron plates supported by 16 cast-iron brackets. There is an iron door to access the gallery deck from the watch room that swings outward. The webbed 'skid proof' iron gallery deck area is protected by an iron railing. Between the deck and the brackets, a rolled-iron cornice provides a decorative trim. Sixteen spanning plates are located between the brackets. The brackets are seated on a brick ledge covered with cast iron, which is called a belt course. The upper deck, referred to as the 'lantern gallery' in the plans, is accessible from the lens area. This deck is also surrounded by a wrought-iron railing and a cornice below it. A wrought-iron ladder rail along the lantern gallery deck allowed the keeper to use a ladder in cleaning the exterior of the upper lantern panes or for replacing them when broken.

An exterior braided copper wire, running the length of the tower, serves as a lightning conductor.

Tower (Interior)

The interior diameter of the tower at its base is 16 feet, 8 inches. The interior diameter of the tower diminishes to 10 feet, 8 1/8 inches under the service-room floor or on eighth landing. The interior walls are brick painted white.

One enters the tower through the west-facing door of the attached oil room/workroom. A hallway leads past an oil room on the right and a workroom to the left, and stops at another doorway opening into a passageway leading to the base of the tower. Above the arched entrance inside the tower is a dedication plaque inscribed,

> Body's Island Light House
> Erected A.D. 1872
> Latitude 35°-48'
> Longitude 75°-33'

This plaque replaced an earlier plaque listing the members of the U. S. Lighthouse Board when the tower was constructed.

Eight granite steps lead up to a landing with four additional steps leading diagonally both to the right and to the left. A semi-circular wrought-iron pipe railing is located between the steps. Another circular pipe railing protects a well for clockwork weights, which were never used in this particular tower. Following a standardized design used by the U. S. Lighthouse Board for all stand-alone conical first-order towers built during that period, the design included this element

even though it was not pertinent to this particular tower, because the light was always fixed. The well, 3 feet, 7 inches, in diameter, is in the center of the floor and is sunk 3 feet deep into the foundation and rounded by a cast-iron curb. The floor at the base of the tower is marble tile in a diamond checkerboard pattern.

A 214-step cast-iron spiral staircase leads from the base of the tower to lantern, interrupted by eight cast-iron landings. The rise from step to step is uniformly 7 ½ inches; however, the number of steps between each landing, aside from the final spiral, decreases as you climb the tower. Decorative cast-iron newel posts sit at the base of the staircase. The stairways are free floating, supported only by the landings which in turn are supported by three brick courses—two singles and one double. The stairway follows the interior brick wall on the left and supports a 2-inch gas-pipe hand railing on the right. An identical railing also protects each landing. The rods of all the railings are 6 inches apart. Each section of the stairway is a half spiral until the last landing. There is a full spiral between the last landing and the service room. The stairway from the service room to the watch room is a half spiral. A nine-step staircase leading from the watch room to the lens area does not have a railing. The lens pedestal is located in the watchroom. Seven glass portholes penetrate the floor of the lens area providing additional light into the watchroom. The stairways, landings, and all other iron components are painted black.

Lens

The first-order lens was manufactured by Barbier and Fenestre, Paris, France, in 1871. The inside diameter of the lens is 6 feet, 9/16 inches. It is shaped like a beehive with its center section consisting of eight panels or bullseyes. Above the central panels, the 16 upper catadioptric panels each consist of eighteen prisms; and below the central panels, the seven lower catadioptric panels consist of eight prisms. The lens sits on an iron pedestal. When an oil or kerosene lamp was used, a 4-inch-diameter iron tube would have connected a damper tube at the top of lens to the bottom of the ventilator ball.[4] Today an electric cable powers a modern lamp. (Note: The lens was not transferred with the tower to the National Park Service in 2000. The United State Coast Guard considers the lens personal property, rather than real property, and retained ownership.) The light was first exhibited on October 1, 1872, and continues to be maintained and operated by the U. S. Coast Guard as an active aid to navigation.

Attached Oil House/Workroom

The oil house is a white, one-story, brick structure (two courses of stretchers to each course of headers, as is the tower) 27'5" x 18'4", with a 7' wide passageway connecting to the base of the tower. The front stoop, located on the west elevation has a Stick Style, cantilevered gabled overhang supported by three brackets. Four granite steps and sill lead up to a wooden door.

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[4]"Description of Buildings, Premises, Equipment, Etc. at Bodie Island Light-Station, Seacoast of North Carolina," March 6, 1909.

(The door is not original.) A transom of three-over-three panes is located over the door. Above the doorway, '1871' is carved in granite, as specified in the original construction drawings. The interior has a central hallway leading to the base of the tower with a doorway and room on the north and south sides. The workroom is located to the left (north) and the oil room to the right (south). The workroom was used as an office where the keeper kept the station log and other records. The oil room was used for storing fuel until a generator was introduced that ran on a highly flammable agent requiring fuel storage a safe distance from the tower. The oil room has two shelves for oil butts at either end. Each shelf has four semi-circular recesses at the back in which oil butts would have been stored. Both the workroom and oil room has a fireplace. The floor of the workroom is wooden whereas the floor of the oil room and passageway is 12" x 12" black and white marble tile set to produce a diamond pattern in the space. The doors leading into the workroom and oil room are pine, faux painted to look like oak.

There are two four-over-six pane windows in the oil room section (south elevation) and two four-over-six pane windows in the workroom section (north elevation). All are wooden double-hung sash windows mounted in wood frames and casing. They are recessed with an overhead brick and stone arch on the exterior. They all have cast-iron sills and a granite casing. Although shutters are indicated on the original drawings of the oil house/workroom and appear in original drawings and the 1893 photos, none survive.

The foundation of the oil house/workroom is masonry with a granite face lining the perimeter. The walls of the attached passageway and oil house/workroom are brick, with unknown bond, with a granite belt course and are painted white. The oil house/workroom and adjoining passageway has a wooden roof sheathed in asphalt shingles.[5] Two chimneys extend from the roof of the oil house/workroom; one for each fireplace on the north and south elevations. The chimneys are brick with a granite cap and detail. They are located on the center of the elevations and inset into the building so that the chimney is not expressed in the outside wall.

Double Keepers' Quarters

The two-story brick double keepers' quarters (IDLCS #007244), also referred to as the keepers' dwelling, was intended to house the keepers and their families. The brick is five-to-one common bond construction, although the bond has not been analyzed for composition. Essentially the layout of each half of the house mirrored the other. The plan for each quarters contained five rooms. The overall dimensions are 28'3" x 48'11" without the porches and 40'3" x 48'11"

[5]According to the Historic Structures Report, the oil house had been shingled with asphalt shingles by November 1977.

including both porches. The keepers' quarters was originally constructed in 1872, and a 1950 disposal memo indicates that it was altered in 1900, 1910, 1925, and 1934.[6] The NPS completed major restoration and rehabilitation of the keepers' quarters in 1990-1992.

There are two entrances on the east and two on the west side. No openings, doors or windows, are present on the north and south ends. A wooden full-length hip-roof 6' wide porch faces the tower on the eastern elevation and another porch faces the parking lot on the western elevation. Both the eastern and western facades have identical fenestration. Six double sash windows broach the second floor with six-over-six panes. On the eastern and western facades of the first level are located four double sash windows, six-over-six panes, and two doors with three-pane transoms. Inside, a balustered stairway leads up from the east entrances. Four interior chimneys pierce the cedar shake side-gable roof. The structure rests on brick piers.

Records indicate that many of the keepers' families did not live on the station, which is not surprising in that at times there were three, even four, keepers assigned to the station. One keeper indicated "that all were thrown too intimately in contact to maintain proper discipline and order."[7]

Today the keeper's quarters is a National Park Service Visitor Center. One can pass between the two residences at both the front and back entrances. On the first level, one side serves as a bookstore and the other is used as exhibit space with displays on lighthouses and lighthouse keeping. The upper level now serves as park offices.

Cisterns and Water Pumps

Rainwater was collected off the roofs of the quarters through a gutter system and stored in three brick cisterns (IDLCS #091898). The capacity of each cistern was 2,500 gallons. Two cisterns appear on the 1893 survey. In 1909 the number increased to three. One cistern is located at the southeast end of the quarters used by the principal keeper and measures 9'6" x 8'2" with the top 2'4" above grade. The cistern at the northeast end of the quarters measures 11'3" x 8'2" with the top 3' above grade. The third cistern is located at the northwest end of the quarters measures 9'7" x 8'4" with the top 2'5" above grade. All were fitted with water and dirt-proof covers. Today, two of the cisterns (southeast end nearest the lighthouse and the northwest end nearest the parking lot) are still connected to the quarters' gutter system. What appears to be a fourth cistern on the

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[6]Memos dated February 1949 and March 3, 1950, from Commander of the Fifth Coast Guard District to the Coast Guard Commandant, regarding Disposal of Buildings at Bodie Island Light Station; found in National Archives Record Group 26, Entry 100, "Mixed Boards of Survey, 1939 - 1950."

[7]Correspondence from Lighthouse Inspector E. P. Wood to the Light House Board, Washington, D.C., dated August 29, 1899; found in the files at Cape Hatteras National Seashore Headquarters. Apparently the Inspector recommended that a separate building be constructed to house the principal keeper but his suggestion was never carried out when no bids were received that fell within the appropriation.

principal keeper's side of the quarters was built by NPS to support air conditioning units; this is a non-contributing structure.

Two of the cisterns (southeast and northeast corners nearest the lighthouse) have hand pumps (IDLCS #202972 and #202818) on white painted brick pedestals between the quarters and the cistern; the pumps are no longer connected to the cisterns above ground.

Storehouse

About 75 feet north of the keepers' quarters is a white, board and batten surfaced, frame storehouse (IDLCS #007249) with a cedar shake side-gable roof. The building measures 24'5" x 12'5". The south side has a double hinged door. The west, north and east walls each have a single three-over-three pane window. The structure rests on brick piers.

According to John Gaskill, son of former keeper Vernon Gaskill, the existing storehouse was built in the 1920s, probably at the time a new oil house was built. According to Gaskill, "the storehouse contained all the necessary tools and equipment that the keepers needed to make minor repairs and maintenance. Large projects were left to the lighthouse working party. The building also stored the tackle to paint the tower, paints, painting equipment, rope etc. This is the building I remember where they mixed the paint."[8] (This is not one of the two storehouses shown in the 1893 site plan and described in the 1909 "Description of Buildings, Premises, Equipment, at Bodie Island Light-Station, Seacoast of North Carolina.")

The NPS completed restoration of the storehouse in 1990. The storehouse continues to be used by the NPS for equipment and supply storage.

Walkways

A brick walkway (IDLCS # 271500), probably dating to 1871-1872, connects the tower to the front porch of the keepers' quarters. It is shown on the 1893 survey. The survey also shows a brick walkway coming off the rear (west) porch of the keeper's quarters. The walkway on the west is believed to be present but buried under sand and mostly covered by a wooden visitor access ramp to the porch. The walkway between the tower and the keepers' quarters is just over 185' long. It is 6' wide for 163' from the tower, then flares to a width of 17'6" in the last 22' to the keeper's quarters.

Concrete walkways (IDLCS # 271501) were built to connect the tower to the previously existing metal oil house which later served as a generator building, and at each end of the keepers' quarters to connect the porches with the historic outbuildings. The concrete walks, due to

[8]Ibid. Other sources indicate the sheet metal oil house was built in 1896; perhaps a second oil house replaced the 1896 one.

material and finish, seem to have been built at the same time. Although no date has been documented for the construction of the concrete walkways, a sheet iron oil house is referred to in 1909 as being 50' southeast of the tower, which is approximately where the concrete walkway at the tower ends. The concrete walkway at the tower is 2'2" wide and extends up to 90' although only 42' is visible, the remainder being covered by sand and grass. The configuration and size of the walkways at each end of the keepers' quarters vary.

Boundary Markers

Four granite boundary stones (IDLCS #027229, north; #207370, west; #207362, south; #207294, east) mark the corners of the original boundary of the 15-acre station. Although there is no documentation, these stones were probably installed when the 15-acre property was acquired from John and Fanny Etheridge on June 13, 1871 just prior to construction of the light station. The stones correspond to the corner markers on the 1893 site plan, which refers to them as "granite boundary post." The stones do not have markings on them. Each granite stone is approximately 10" x 10" and 3'-4' high.

Non-Contributing Resources

Non-contributing elements consist of the parking lot, entrance road, nature viewing platform, public restroom, platform with air conditioning units, wooden safety fence, and raised wooden walkways. The National Park Service constructed all these visitor use related elements after 1940; therefore they have no association with the operation of the light station as an aid to navigation.

The concrete foundation of the 1930s wood house is not considered contributing due to its short-lived existence. According to John Gaskill, it was built with only three walls and was blown away in a storm soon after construction. Without the wood house structure, the foundation alone lacks integrity. In addition, its purpose was not directly related to the operation of the light station as an aid to navigation.

Previous-Existing Structures

Previous Towers

Although built in an entirely different location, two previous towers were built to mark Bodie Island. The first station, completed in 1848, consisted of a brick tower, an unpainted wood single dwelling, a 2,000-gallon brick cistern and two outhouses. A reply to a circular issued by the Secretary of the Lighthouse Board on July 15, 1851 indicated that the height of the tower from its base to the center of the lantern was 48 feet with a focal plane of 50 feet. The tower windows and door had granite sills and lintels with iron sashes. The spiral staircase was iron with an iron-

frame octagonal lantern whose dome was covered in copper. The height of the lantern was 8 feet, five inches; the width was 9 feet, 8 inches.[9]

The foundation of the 1848 tower settled unevenly soon after completion and was eventually replaced in 1859. Confederate forces destroyed the second tower in 1861. When it came time to site the third tower, Oregon Inlet had moved to within 400 yards of the site of the original Bodie Island towers, so the Lighthouse Board decided to select a site on the opposite side of the Inlet.

Outbuildings

The 1893 survey indicates that there were two storehouses, one wood shed and two privies. "Description of Buildings, Premises, Equipment, at Bodie Island Light-Station, Seacoast of North Carolina," completed March 6, 1909, indicates the presence of two storehouses, two water-closets (privies), a stable and chicken house.

The 1909 "Description of Buildings, Premises, Equipment, at Bodie Island Light-Station, Seacoast of North Carolina," indicated that "two storerooms, constructed by keeper; one used by the keeper, 60 feet west of the dwelling; the other by assistants, 60 feet east of the dwelling." According to John Gaskill, son of former keeper Vernon Gaskill, the storehouses were actually north and south of the dwelling. Later the storehouses were turned into garages and after the war the storehouses were sold, moved, and made into cottages.[10]

Keeper Peter G. Gallop received permission to build a stable on the lighthouse premises on September 7, 1897.[11] Second Assistant Keeper F. E. Simpson requested permission to build a similar building in 1902 although a reply to his request is unavailable.[12] The 1909 form also indicates that there was a one-acre garden described as "unprofitable." The ground cover is described as "marsh and sand."

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[9]National Archives, Record Group 26, Entry 17C.

[10]Personal communication from John Gaskill to Cheryl Roberts, forwarded to Candace Clifford on September 21, 2002.

[11]Correspondence from the Lighthouse Engineer to Keeper Gallop dated September 7, 1897; found in files at Cape Hatteras National Seashore Headquarters.

[12]Correspondence from Simpson to Engineer Jones dated October 3, 1902, in files at Cape Hatteras National Seashore Headquarters.

In 1896 a sheet-metal oil house was built to store the kerosene.[13] The oil house, 10 by 16 feet, was located 50 feet southeast of the tower. It could store 504 five-gallon cans.[14] When electricity replaced kerosene as the illuminant in 1932, the oil house became a generator building. In 1953 the source of electricity was switched from the generator to commercial power.[15]

The privies were periodically rebuilt, with the last set dating from 1921. None survive.

A 1949 memo describes a woodshed built in 1930 as being frame with a concrete floor, 16 by 28 feet. It also mentions two one-story frame garages, 12 by 20 feet, which were possibly converted from earlier buildings. The same memo states, "The Board finds that the buildings and land were retained by the Coast Guard and Navy during the war to provide additional barracks facilities; that the buildings are obsolete; that all structures are in poor condition, the wood shed being all torn down with exception of concrete floor; that the buildings are not now being used or maintained by the Coast Guard."[16]

The Board was also of "the opinion that the buildings are a fire hazard" and recommended that brick keepers' quarters be retained and the deteriorating frame-constructed buildings be disposed of.

Fence and Wooden Walkways

At one time a wooden board fence enclosed 1.92 acres of the station. It appears in the 1893 photos and is listed in the 1909 "Description of Premises, Equipment, Etc." Wooden walkways connected the keepers' quarters to all the outbuildings. The 1897 *Annual Report* indicates "Some 2,200 square feet of new wooden walks were put down, and 360 square feet of old wooden walks were relaid." In 1925 the station acquired 1,380 linear feet of a wire and concrete post fence to enclose the station.

Boat Landing

Transportation to and from the station would have been by boat. A landing was located about a ½ mile west of the station. In 1909, the Lighthouse Engineer described the area between the landing

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[13]The Historic Structures Report indicates kerosene was introduced in 1883; the 1896 *Annual Report* indicates that the metal oil house had been erected during the past year.

[14]"Description of Buildings, Premises, Equipment, at Bodie Island Light-Station, Seacoast of North Carolina," (Department of Commerce and Labor, Light-House Establishment, Fifth District), completed by Major W. E. Craighill, Corps of Engineers, USA, Lighthouse Engineer, March 6, 1909.

[15]Historic Structures Report, p. 12.

[16]Memo dated February 1949 on "Disposal of land and buildings at Bodie Island Light Station," from Joseph Greenspun; found in National Archives, Entry 100, "Mixed Boards of Survey, 1939 - 1950."

and the station, "About one-half the way from landing to station is low and very muddy, as it is covered with water at almost every flood tide. The other half is sandy, covered with coarse grass."[17]

Current Condition

Aside from some adjustments to the original plans and ongoing repairs, no significant alterations or modifications have been made to the tower during its first one-and-a-quarter century of service. Windows and hardware have been replaced and surfaces have been repeatedly painted as part of ongoing maintenance to keep the structure a functioning lighthouse. Although major repairs are needed to restore the corroded and worn metal work, the tower is remarkably intact with its original lens still in place and operational.

Planning for a complete restoration was underway in 2002. The scope of work included providing access to the oil house; repainting the tower interior; rehabilitating the electrical system; replacing or restoring windows; lead paint abatement; repairing masonry; replacing or repairing stair treads and associated components; repairing and replacing metal components of the lantern; repairing wooden floor and roof framing in oil house; replacing copper roof flashing on oil house; repainting tower exterior; providing lightning protection; restoring or replacing wooden doors; and repairing marble flooring.[18]

[17]"Description of Buildings, Premises, Equipment, at Bodie Island Light-Station, Seacoast of North Carolina," (Department of Commerce and Labor, Light-House Establishment, Fifth District), completed by the Lighthouse Engineer in March 6, 1909.

[18]"Project Funding Component Data Sheet: 59651A" on file at Cape Hatteras National Seashore.

8. Statement of Significance

Applicable National Register Criteria

_X_ A Property is associated with events that have made a significant contribution to the broad patterns of our history.

____ B Property is associated with the lives of persons significant in our past.

_X_ C Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.

____ D Property has yielded, or is likely to yield information important in prehistory or history.

Criteria Considerations

____ A owned by a religious institution or used for religious purposes.

____ B removed from its original location.

____ C a birthplace or a grave.

____ D a cemetery.

____ E a reconstructed building, object, or structure.

____ F a commemorative property.

____ G less than 50 years of age or achieved significance within the past 50 years.

Areas of Significance

ARCHITECTURE
ENGINEERING
MARITIME HISTORY
TRANSPORTATION

Period of Significance: 1872 - 1953

Significant Dates: 1872 (construction and first lighting)
1932 (electrification)
1940 (automation of the light, keeper moved out)

Significant Person: N/A

Cultural Affiliation: N/A

Architect/Builder: U. S. Lighthouse Board, Major George Elliot, Engineering Secretary. The station was built under the direction of Capt. Peter C. Harris, Lighthouse Engineer for the Fifth Lighthouse District headquartered in Baltimore, Maryland. The onsite supervisor or 'superintendent of construction' was Dexter Stetson.

Narrative Statement of Significance

The Bodie Island Light Station is eligible for listing in the National Register of Historic Places under criteria A and C. The construction of the station is directly associated with federal government efforts to provide an integrated system of navigational aids for national and international shipping on the Atlantic coast. Bodie Island Light Station also provided safe passage for maritime trade along the hazardous waters of the Outer Banks of North Carolina often referred to as the "graveyard of the Atlantic." The lighthouses on the Outer Banks, located at Currituck Beach, Bodie Island, Cape Hatteras and Ocracoke, guided both national and international shipping plying along the coast. This national significance, explained in detail below, meets criterion A.

The 1872 tower reflected a standardized design used for many first-order lighthouses built by the U. S. Lighthouse Board. The distinctive architectural features of the tower and its integral oil house, and the double keepers' quarters meet criterion C for architecture. The station and its setting retain a 19th-century and early 20th-century appearance with few modifications. The tower and the original first-order lens are nationally significant for engineering as they are among a small number of nineteenth century resources on the east coast of the United States that reflect the important accomplishments that went into the design of these tall brick structures and a large precision instrument that could project a small flame 20 miles out to sea.

The lighthouse, with its Fresnel lens in place, was a critical federal aid to national and international navigation from 1872-1953. Although the Bodie Island Light Station continued to be an active aid to navigation from 1953 to the present, it has been determined that the station does not meet Criterion Consideration G, and therefore the fifty-year date for Criterion A is the end of the period of significance.

National Significance as an Aid to Navigation and Importance to Maritime Trade

The Outer Banks of North Carolina refer to a thin slice of land separated from the mainland by a vast body of shallow water, which make up the Albemarle, Croatan and Pamlico Sounds. These barrier islands extend almost the entire length of the North Carolina coast. The entire coastline of the state, more than 300 miles of shoreline, comprises more than a quarter of the total coastline of the original 13 colonies.[19] Much of the North Carolina coast is relatively flat and lacking in significant landmarks so lighthouses played an important role in identifying a mariner's position both by day and night.

After the Spanish settled in the New World they soon found that their ships could return to Europe from the Caribbean more quickly by sailing north with the Gulf Stream to the general area of Cape Hatteras and then veering to the northeast for home, often saving weeks of sailing time. Later, mariners used the same route to reach the mid-Atlantic coast of the U.S.[20] Located off the Outer Banks, the Gulf Stream provided a trade route for ships bound for Europe or coasting up and down the East Coast. As the country's and the world's commerce increased so did the number of shipwrecks off the Outer Banks. Dangerous shoals and reefs posed serious hazards to navigation. In addition, the warm Gulf Stream met the cold Labrador Current offshore and created turbulence deadly to many vessels. The great numbers of lost lives and cargo prompted the area along the Outer Banks to be known as the "graveyard of the Atlantic" and it is estimated that more than 2,200 craft of various sizes and types met disaster in the vicinity of Cape Hatteras.[21] In an effort to protect mariners and their cargo, lighthouses were established at Ocracoke (Shell Castle) between 1800 and 1803[22] and at Cape Hatteras in 1803. A lighthouse at Cape Lookout followed in 1812. Although the southern portion of the Outer Banks was fairly well lit, the northern portion between Cape Hatteras and Cape Henry at the entrance to the Chesapeake Bay was still dark, leading one observer to report that Bodie Island was "literally covered with wrecks."[23]

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[19]David Stick, *North Carolina Lighthouses* (Raleigh, North Carolina: Division of Archives and History, N.C. Department of Cultural Resources, 1980) p .5.

[20]Ralph E. Eshelman and Candace Clifford, *National Historic Landmark Nomination, Cape Hatteras Light Station*,1997, p. 12.

[21] "Cape Hatteras," *The Ships' Bulletin*, volume 35, number 1 (January-February 1955), p. 5.

[22]Dates found in Jim Utter, "Ocracoke Lighthouse: A History of North Carolina's Oldest Operational Lighthouse," *The Keeper's Log*, Fall 1996, p. 3.

[23]*25th Cong., 2nd Sess. House Doc. No. 41* (Serial # 322), p. 60; *25th Cong., 3rd Sess., House Ex. Doc. No. 24* (Serial # 345), p. 113; found in Holland, p. 3.

An 1806 report from Congress captured the situation for ships along the Outer Banks:

> With the exception of Nantucket shoals, it is supposed there is no part of the American coast where vessels are more exposed to shipwreck, than they are in passing along the shores of North Carolina, in the neighborhood of these shoals. The Gulf Stream certainly approaches very near the American coast in this quarter; indeed, experienced navigators assert, that it touches Cape Hatteras shoals in its progress to the northeast, out of the Mexican gulf, and, as it turns with great rapidity hereabouts, they can place very little dependence on the ship's reckoning. Their estimated distance from land, therefore, is often found to be very erroneous, and as no soundings are to be procured within a short distance from the outer part of the shoals, it too frequently happens that shipwrecks take place; and hardly a season passes that does not afford the melancholy spectacle of stranded ships, and a great destruction of property is sure to follow: and it is fortunate, indeed, if the friendless mariner escapes with his life.

There were 27 lighthouses in the United States in 1800. These early light stations marked entrances to harbors and estuaries; but only three were located south of Cape Henry, Virginia.[24] In February 1837, "Congress directed the Secretary of the Treasury to have the coast south of Chesapeake Bay examined with an eye toward establishing lighthouses and other aids to navigation."[25] Lt. Napoleon L. Coste, commanding officer of the revenue cutter *Campbell*, conducted a meticulous examination of the coast from Key West northward and made numerous recommendations for the placement of lighthouses, lightships, and beacons. He considered Bodie Island "of great importance," saying, "More vessels are lost there than on any part of our coast. It is the eastern-most point of land on the coast of North Carolina, forming in fact, a cape. It is my opinion, that by the erection of a lighthouse on it, much property would be saved, and the navigation of the coast facilitated."[26]

The Atlantic coast was and still is the principal sea lane for the shipping of goods between ports along the East coast of the United States. Before the completion of the Inland Waterway by 1940, which runs from just north of Boston, Massachusetts, to Key West, Florida, the Atlantic coast was the only means of such travel and still is for larger ships[27]

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[24]Eshelman, p. 13.

[25]Francis R. Holland, Jr., *A History of Bodie Island Light Station* (U. S. Department of Interior, National Park Service, Division of History, February 1, 1967), p. 16.

[26]*American State Papers, Commerce and Navigation, Class IV, V.2, 11th-17th Congress, 1814-1823* (Washington: 1834), 521; *25th Congress, 2nd Session, House Document No. 21* (Serial # 322), p. 1-6; found in Holland, p. 17.

[27]Eshelman, p. 13.

Significance as a Masonry Tower

Lighthouses reflect a variety of architectural styles and construction types that were influenced by politics, need, cost, location, and geography of the site, as well as technology available at the time of construction. After the U. S. Lighthouse Board took over the administration of the Lighthouse Service in 1852, it began to standardize lighthouse designs.

The present light station embodies a distinctive design and method of construction that typified first-order coastal lighthouse construction on the East Coast of the United States during the second half of the 19th century. Coastal lights, as opposed to harbor lights, were generally taller and used more powerful optics. The earliest materials used for lighthouse construction were wood and/or rubblestone. Later cut stone and brick were used, allowing towers increased height for better visibility. The design of the tall brick towers consisted of a double wall with a hollow space between the walls, thereby lightening the load, creating an insulation "member," and reducing the overall cost by using fewer bricks.[28]

Brick is the most popular construction material of the surviving 640 lighthouse towers in the United States—approximately 200 are constructed of brick. Of those constructed of brick, approximately half are attached to another structure, generally a keepers dwelling. Two-thirds of those remaining are unattached structures and a third are integral to another structure. Most brick towers are conical in shape, although some are octagonal with a few square, cylindrical, or pyramidal. Less than 12 of the surviving brick towers are over 150 feet, with 25 over 100 feet, 43 over 75 feet, and 97 over 50 feet. Of the surviving towers of every construction type, 16 are more than 150 feet and at least 66 are over 100 feet.[29]

Bodie Island is one of many first-order lighthouse towers built to a similar design. The 1871 plans for the Bodie tower, signed off by the Board's Engineering Secretary, Major George H. Elliot, were used for subsequent lighthouses including the tower at St. Augustine, Florida (1874), and the one at Sand Island, Alabama (1873).

Bodie Island Lighthouse, at 164 feet tall, is considered to be a 'tall brick tower type,' a term used currently to organize lighthouses according to construction types. Tall brick towers, those over 150 feet tall, were first designed in the 1850s to support first-order Fresnel lenses, the most powerful of the seven orders of lenses being introduced by the newly formed U. S. Lighthouse Board to American lighthouses. In tall towers, the light from these lenses could be seen up to 20 nautical miles. For the low-lying and featureless barrier islands of the Outer Banks, both the tall

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[28] Eshelman, p. 13.

[29] All of these statistics are derived from the National Park Service's National Maritime Initiative Inventory of Historic Light Stations in November 1997.

towers and the high powered lenses were critical to safe navigation given the shoaling and rough seas along the coast.

Of the 640 surviving lighthouses, only 17 over 150 feet in height survive. Of those seventeen, only 14 are made of brick. Other surviving tall brick towers include Absecon, New Jersey (1857); Barnegat, New Jersey (1857); Fire Island, New York (1858); Cape Romain, South Carolina (1858); Dry Tortugas (Loggerhead Key), Florida (1858); Cape Lookout, North Carolina (1859); Cape May Point, New Jersey (1859); Pensacola, Florida (1859); Cape Hatteras, North Carolina (1870); St. Augustine, Florida (1874); Currituck Beach, North Carolina (1875); Morris Island (Charleston), South Carolina (1876); and Ponce de Leon, Florida (1887).

History of Bodie Island Light Station

First Tower at Bodie Island

On March 3, 1837, Congress passed an act that included appropriations for a large number of lighthouses including $5,000 for a lighthouse on Pea Island, just south of Bodie Island, near New Inlet. Capt. Charles Skinner, who was asked to examine the site, argued a better location for the lighthouse would be Bodie Island because it "is farther from Hatteras, and is nearer the ocean, not being more than half a mile distant, whereas Pea Island is within the sound about one and a half miles, and, in fact, is but the southwest part of the island." He argued that the vast majority of the vessels came from the north and a light situated on Bodie Island would better serve these vessels. Moreover, the naval officer added, the land would be much cheaper and it would be easier to get construction materials to Bodie Island than to Pea Island. For the lighthouse he recommended erecting "a tower, sixty feet high, with a good *revolving light*; revolving, because Hatteras, nearest south, is *fixed*, and Cape Henry, the nearest north, is also *fixed*."[30]

On July 7, 1838, Congress reappropriated $5,000 for a lighthouse to be built on either Pea Island or Bodie Island, leaving the decision to the Fifth Auditor, Stephen Pleasonton, who was the administrator of the Lighthouse Service. Following Skinner's recommendation, Pleasonton instructed Collector Blount to purchase a site on Bodie Island. Purchasing the site and obtaining clear title took several years. In January 1843, Collector Blount, concerned about the delays in building the station, appealed to a member of Congress,

> . . . I presume the reason why it has not been commenced is that the appropriation was insufficient and will require one of the first class [lights]. There is no part of the Coast of the U.S. which requires a Light House more than Body's Island–'tis' in the direct route of all going North or South & of all foreign vessel bound into

[30]Holland, pp. 18-19.

> the Chesapeake, & when there during the last summer, there were fifteen wrecks in sight at one place, & within the last month, a Brig bound into Norfolk was wrecked there worth more than would have built the light house.
>
> You will excuse my calling your attention to this subject, but many of your constituents have suffered and will continue to do so unless a light is placed there, & not only yours but the north are, from their owning more shipping than the south, still more interested.[31]

After some prodding from the Fifth Auditor, the Attorney General ruled the deed valid three years later in 1846.

The original $5,000 was not enough to construct a first-order lighthouse on Bodie Island so in 1847 Congress appropriated $12,000. The contract was awarded to the lowest bidder, Francis A. Gibbons of Baltimore, who bid $8,750.[32] Gibbons, along with his partner Francis X. Kelly, would later build the first eight lighthouses on the West Coast. The former collector of customs at Washington, N.C., Thomas H. Blount, was selected to oversee the construction.

The tower was completed in September 1847. The specified lighting apparatus was 14 Argand lamps with fourteen 21-inch reflectors. (Argand lamps, named for inventor Aime Argand of Geneva, have a circular hollow wick and glass chimney that allows a current of air both inside and outside of the flame.) Towards the end of September, Samuel Tillitt received his appointment as keeper at an annual salary of $400. Winslow Lewis installed the lamps and reflectors by mid-October but lighting was delayed for the want of lamp equipment such as tube glass and wicks. It is not known when the light was first displayed—sometime between January 22, 1848, and March 13,1848.[33]

Within two years of completion, the tower was found to be one foot out of plumb, "canted to eastward," and the collector was at a loss as to what to do. Pleasanton suggested that he employ "an experienced mechanic to examine the tower and devise a plan of straightening it." He added,

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[31]Correspondence from Thos. H. Blount to Hon. Ed Stanly, U. S. Representative, dated January 20, 1843; found in National Archives (Washington, D.C.), Entry 17C, "Letters Received from Superintendent of Lights, 1803-52."

[32]National Archives, Record Group 26, Entry 17C.

[33]S. Pleasonton to Winslow Lewis, Aug. 28, 1847; S. Pleasonton to James K. Hatton, October 21, 1847; S. Pleasonton to Secretary of the Treasury, Dec. 16, 1847; all in Lighthouse Letters, Fifth Auditor's Office, July 24, 1847 to Jan. 11, 1848; S. Pleasonton to George W. Blunt, Feb. 11, 1848; and S. Pleasonton to James K. Hatton, June 29, 1848; both in Lighthouse Letters, Fifth Auditor's Office, Jan. 12, 1848 to Aug. 1, 1848; found in Holland, p. 26. Holland extends the period of when the light might have been lit until June 29, 1848. The author of this report found a letter dated March 13, 1848, from Collector Hatton, indicating the light was lit by that date; National Archives, Record Group 26, Entry 17C.

"Perhaps it can be done by digging the ground away from the highest side of the foundation, so as to let the tower settle on that side equal to the other." At any rate Pleasanton was anxious that the tower be fixed and authorized any cost necessary for the repair work.[34] The cost of repair was estimated at $1,490.[35] It was soon apparent that the lighting apparatus had been thrown out of kilter and also had to be repaired.

In 1851 Congress appointed a board to investigate the condition and operation of the Lighthouse Establishment. The resulting report indicated the following about the condition of Bodie Island Light Station:

> The Body's [sic] Island light is badly located, and insufficient in power and range to sub-serve fully the requirements of commerce and navigation. Vessels bound south from the eastward to run to make this coast, with the view to avoid the opposing currents of the Gulf-stream, and at the same time to avail of the favorable currents within the limits of the cold wall bounding the Gulf-stream.
>
> The trend of the coasts on either side of the Chesapeake Bay renders navigation more dangerous than it would otherwise be, and therefore it becomes the more important to light well the entire coast from Cape Hatteras to Cape Henlopen [Delaware].
>
> It is of great importance especially to the coasting trade, and would be of much more, if it were increased to a first-class light...This [light], in addition to the proposed seacoast light between it and Cape Henry, would, if properly fitted, save the life of many a gallant seaman, and millions of dollars worth of property to the country.[36]

The U. S. Lighthouse Board, created to administer the Lighthouse Service in 1852, was strongly committed to using the superior Fresnel apparatus for lighting United States lighthouses. In 1854, Fresnel lenses were installed in the lighthouses at Cape Hatteras, Ocracoke, and Bodie Island. A first-order lens was placed in the Cape Hatteras Lighthouse, but only fourth-order lenses were installed at Ocracoke and Bodie Island. The Bodie Island lens exhibited a fixed white light, varied by red and white flashes.[37] This effect was achieved by a red shield that rotated

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[34]S. Pleasonton to R. H. J. Blount, Aug. 28, 1850, Lighthouse Letters, Fifth Auditor's Office, Jan. 25, 1850 to Feb. 18, 1851; *31st Cong. 2nd Sess. House Ex. Doc. No. 14* (Serial # 598); found in Holland, pp. 28-29.

[35]R. H. J. Blount to S. Pleasonton, Oct 16, 1850, National Archives, Record Group 26, Entry 17C.

[36]*32nd Cong., 1st Sess., Ex Doc. No. 28* (Serial # 617), pp. 137-138; found in Holland, pp. 29-30.

[37]*32nd Cong., 2nd Sess., House Ex Doc. No. 3* (Serial # 780), pp. 288, 318; found in Holland, pp. 30-31.

slowly around the outside of the lens, and at regular intervals it would cover the emission of the lens, thus changing it to red.

The decision to install a fourth-order lens was evidently determined by the size of the lantern. To place a third-order lens, roughly equivalent in intensity to Argand lamps with 21-inch reflectors, would have necessitated setting a larger lantern on the tower, and the tower in all probability could not have supported a heavier lantern.[38]

The Second Lighthouse Tower at Bodie Island

By 1858 the tower with its poor foundation was beyond repair, and the Lighthouse Board decided to build a new tower. At the same time they decided to upgrade the light and provided for the installation of a third-order Fresnel lens. An appropriation of $25,000 was requested and received. The new tower was completed quickly and it was lit for the first time on July 1, 1859. After the lighting of the new tower, the old tower was razed.[39]

Correcting the primary defect of the old tower, the new tower rested on a pile foundation.

> Workers drove seventy piles vertically into the ground and on top of them they laid a stone foundation. Upon this foundation the masons erected a brick tower rising 80 feet into the air. Crowning the tower was the lantern containing a third order lens. When completed the focal plane of the light was 86 feet above the ground and 90 feet above sea level. The lens revolved, flashing every 90 seconds, and a mariner could see the light under normal conditions for a distance of 15 miles. The tower was painted white.[40]

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[38]S. Pleasonton to James K. Hatton, July 9, 1849, Lighthouse Letters, Fifth Auditor's Office, May 14, 1849 to Jan. 25, 1850; and Letters to Inspector 5th District, Dec. 18, 1852 to July 30, 1860, p. 144; found in Holland, p. 31.

[39]*34th Cong. 3rd Sess. Estimates of Appropriation for 1858 (Serial #909), p.40; 36th Cong., 1st Sess., Sen. Ex. Doc. No. 3* (Serial # 1027), p. 294; L. Sitgreaves to W.B. Franklin, Baltimore, July 1, 1859, 5th Dist. Engineer Letter Press, 1857-1864; found in Holland, p. 32.

[40]L. Sitgreaves to W.B. Franklin, Baltimore, Oct. 1, 1858, 5th Dist. Engineer's Letter Press, 1857-1864; U. S. Light-House Board, List of Lighthouses Lighted Beacons, and Floating Lights of the Atlantic, Gulf and Pacific Coasts of the United States (Washington: G. W. Bowman, 1861), p.44-45. Work on the new lighthouse apparently began around Sept. 1, 1858, and the structure was completed on May 14, 1859. Certain vicissitudes accompanied the work. Shortly after the work began a vessel carrying brick for the tower was lost, and in October a storm closed Oregon Inlet so that it became necessary to enter the sound via Hatteras Inlet and then lighter the construction material to the Bodie Island site, some forty miles away; found in Holland, pp. 32-33.

The keeper's quarters underwent repairs and a dwelling was constructed for the new assistant keeper that third-order lights generally rated.

During the Civil War, Confederate forces used Bodie Island Lighthouse as a lookout tower and storage place for guns. Fort Oregon had been constructed about three-quarters of a mile from the lighthouse at Oregon Inlet. Forts were also built near Cape Hatteras and Ocracoke Lighthouses. The forts along the Outer Banks were meant "to guard the inlets and thus protect the sounds from Yankee incursions."[41] After a two-day battle in the latter part of August 1861, Forts Hatteras and Clark fell to Federal forces and the Confederates abandoned the forts at Ocracoke and Oregon Inlets. The rebel commanders moved all troops, supplies, ammunition, and material from Fort Oregon to Roanoke Island.[42] Before leaving the Outer Banks, the Confederates blew up the tower at Bodie Island, possibly because they believed it could be used as a lookout by the Union troops. Lighthouse Board records indicate that the lens was saved and eventually shipped to the Lighthouse Inspector at the General Depot on Staten Island in New York.[43]

Construction of the Third Tower at Bodie Island

The first appropriation in 1870 mentioned a lighthouse on Paul Gamiel's Hill situated near Kitty Hawk some 15 to 20 miles to the north of the former Bodie Island Lighthouse site. The Hill site was eventually eliminated in favor of the former Bodie Island location probably after a lighthouse was planned for Currituck Beach located to the north.[44] The Paul Gamiel's Hill site was much too close to the Currituck Beach location to effectively light the coast to the south.

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[41]Holland, p. 34.

[42]Ibid., pp. 34-35.

[43]*Official Records, War of the Rebellion, Navies*, Series I, v. 6 (Washington: 1897), pp. 80, 270, 790, 792; J. T. Scharf, *History of the Confederate States Navy* (Albany: 1894), p. 378; John G. Barrett, *The Civil War in North Carolina* (Chapel Hill, University of North Carolina, c 1963), pp. 46-47; Subject Index Slips to Light-House Board Records, Bodie Island, Aug. 25 and 28, 1862; *37th Cong., 3rd Sess. House Ex. Doc. No. 22* (Serial # 1165), p. 259; Walter S. Sanderlin, *The Great National Project; A History of the C&O Canal* (Baltimore, 1946); found in Holland, p. 35.

[44]Light-House Board Journal, May 3, 1867 to May 29, 1869, p.133; Subject Index Cards to Incoming Letters, Body Island, Oct. 9, 1867 and Nov. 19, 1869; Annual Report of W. J. Newman, District Engineer, dated Sept. 20, 1867, 5th District Engineer, Letter Press, May-Nov. 1870; *Annual Report, 1870*, p.35-36; Clipping File, Body's Island, R. G. 26 Nat. Arch. "An act making appropriations for sundry Civil Expenses of the Government for the year ending June thirty, eighteen hundred and seventy-one, and for other purposes." Light-House Board, Annual Report, 1869 (Washington: 1869), p.46; Site File, Bodie Island; Light-House Board, Annual Report, 1871 (Washington: 1871), p.31-32; David Stick, *The Outer Banks of North Carolina* (Chapel Hill, c 1958), p. 263; found in Holland, pp. 36-37.

Exposed to the repeated encroachment of the sea, the Outer Banks are constantly shifting. By 1870, Oregon Inlet had moved to within 400 yards of the site of the original Bodie Island towers, so the Board decided to select a site on the opposite side of the inlet.

> The new site is 1½ nautical miles north of Oregon Inlet, 3/4 mile from the Atlantic and 3/8 mile from Roanoke Sound. It is protected on the west by Roanoke Island from the action of storms tending to drive the waters of Pamlico Sound towards the sea. It is a square piece of land 15 acres in extent, and was purchased of John B. Etheridge and wife, June 13, 1871, for $150. The character of the soil is sandy and unfit for cultivation, but by covering it with marsh mud some slight crops could be raised.[45]

John Etheridge, an early keeper of the first Bodie Island Lighthouse, had laid claim to 240 acres of vacant land belonging to the state, which was conveyed to him on June 28, 1860. He was quite willing to sell a portion to the U. S. Lighthouse Board for a lighthouse.[46]

On June 19, 1871, Capt. Peter Hains, Lighthouse Engineer for the Fifth Lighthouse District, provided the following instructions to Dexter Stetson, Superintendent of Construction for Bodie Island Light Station:

> You will proceed without delay to Body's Island, N. C., and commence the construction of the First Order Light house at that place in accordance with the drawings and instructions furnished you. . . .
>
> You will take down the temporary buildings at Hatteras and send them to Body's Island—there to be used for storehouses and quarters for your men. For the purpose of landing supplies with facility you will build a temporary wharf on piles and of other cheap materials into Roanoke Sound from a point on shore convenient to the Lighthouse . . . The arrangement for landing supplies and storeroom for 1,000 bbls. of cement must be completed with as little delay as practicable. The L. H. at Body's Island, the construction of which is placed in your charge, will be one of the most important on the Atlantic Coast and too much energy cannot be displayed in hastening its completion.
>
> As the work you superintended at Cape Hatteras has rendered you familiar with the details and requirements of such a tower, as that to be built at Body's Island, detailed instructions are not deemed necessary, the drawings being sufficiently explicit with general instructions. The foundation will be on grillage similar to that at Cape Hatteras tower—the top of the grillage being six feet two

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[45]Description of "New structure at Body's Island" in National Archives, Record Group 26, Entry 66, "Site Description Files."

[46]Holland pp. 37-38.

> inches below the surface of the ground. All the foundation, stone & brick work will be laid in Portland Cement—the mortar being made of three parts sand to one of cement. With these general instructions you are expected to push the work along with the greatest practical dispatch. Any points of doubt that may arise in your mind you will submit with the least delay to this office for decision. The Light house [sic] Board expects this tower to be completed in one year.[47]

Rather than letting the work out to contract, the Lighthouse Board decided to undertake the actual construction. The Board put an emphasis on quality of materials and workmanship rather than on cost. The 1872 light station cost more than five times as much as the previous station. It took three congressional appropriations totaling $140,000 to complete the station.

A working party was dispatched to Bodie Island in June 1871 under the supervision of Dexter Stetson. They erected the storage buildings, quarters, wharf and tramway that had been transported from the Cape Hatteras Light Station, completed in 1870.

The Lighthouse Board was determined not to repeat their earlier mistake in building a solid foundation on unstable soil. Before starting the foundation, borings were made with an artesian-well apparatus to test the underlying strata. The first 22 feet consisted of "sharp compact sand, light in color with dark specks." The next 6 feet was "coarse sand and gravel mixed with shell." The next 8 feet after that was found to be "fine dark sand mixed with a small quantity of soft alluvium." The subsequent 10 feet was "coarse sand again" and the final 14 feet was "fine dark sand."[48] Based on these findings, it was decided that piling was unnecessary.

The construction crew dug a pit seven feet deep, and during construction they kept it pumped dry of water. At the bottom of the pit they placed a wood grillage of 6" x 12" timber laid in two courses, one at right angles to the other. Decay posed no problem since the wood was to rest in at least four feet of water. The builders then laid large granite blocks, eighteen inches thick, on the grillage. On top of that they laid courses of rubble block weighing one to five tons, so as to raise the foundation an additional five feet. Each course of stone was grouted with hydraulic Portland cement. On this foundation the builders placed the base of the tower which was cut granite on the outside and rubble set cement on the inside.[49]

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[47]National Archives (Washington, D.C.), Record Group 26, Entry 3 (NC-63), "Records of the Fifth Light-House District (Baltimore), 1851-1912."

[48]Description of "New structure at Body's Island" in National Archives, Record Group 26, Entry 66, "Site Description Files."

[49]Holland, p. 39.

In late November 1871, the brick contractor had been instructed to begin shipment of bricks, and in March 1872, Walter Frazier, a bricklayer, joined the crew. Frazier was instructed to bond the brick to reflect that used at Cape Hatteras.[50]

The ironwork was provided by the West Point Foundry in Cold Spring, New York. It appears they used components manufactured by the Phoenix Iron Works in Philadelphia. The iron sections would have been pre-assembled at the plant and inspected before being disassembled and shipped south. They also manufactured the ironwork for St. Augustine Lighthouse in Florida, built to the same plans as Bodie Island.

Work on the keepers' quarters was initiated in early May and suspended in June so that the crew could concentrate on completing the tower. In July the engineer requested that the lens be ordered for the light and that a complete outfit for a first-order fixed light be shipped from the General Depot on Staten Island, New York.

On September 30, 1872, Engineer Hains reported to Major Elliot:

> I have to report that I have just returned from a visit to Body's Island made chiefly with the view of passing off the men. Work is progressing satisfactorily. The lantern is finished, the lens up and if the lamp is in order the light can be and will be exhibited on the first of next month. The black and white bands show well and the tower will undoubtedly make an excellent daymark for coasters. The scaffolding was taken down the first of the present week. The keepers dwelling is well nigh completed also. I propose to fence in about 300 feet square of the light house [sic] lot. It is not deemed advisable or necessary to fence in the whole fifteen acres. The corners of the track are marked by large granite posts. . . .[51]

The light was first exhibited on October 1, 1872, as anticipated in the "Notice to Mariners" that had been issued previously on July 13, 1872:

> *Lighthouse on Body's Island, between Cape Hatteras and Cape Henry.*
>
> Notice is hereby given that the light house at Body's Island, on the seacoast of North Carolina, has been rebuilt and the light will be exhibited on or about the 1st of October, 1872, and every night thereafter, from sunset to sunrise.
>
> It is situated north of Oregon Inlet, one and a half nautical miles, and is about two and a half nautical miles northerly of the site of the former light-house, which was destroyed during the late war. It is three-quarters of a mile from the

[50]Correspondence dated September 16, 1871, from L.H. Engineer Peter Hains to Supt. of Construction Dexter Stetson, found in National Archives (Washington, D.C.), Record Group 26, Entry 3.

[51]Ibid.

Atlantic, and three-eighths of a mile from Roanoke Sound. The tower is of brick, is conical in form, and is placed on an octagonal pyramid of granite.

The focal plane is 150 feet above the ground, and 156 feet above the sea.

The lens is dioptric, of the first order of the system of Fresnel lens, and will show a fixed white light, illuminating the entire horizon, and can be seen from the deck of a vessel, fifteen feet above the sea, at a distance of eighteen and half nautical miles.

The light will also illuminate the waters of the Sounds of North Carolina, within the same distance.

The dome of the lantern, the railing, brackets of the gallery, and all the iron-work at the top of the tower, will be painted black. The tower will be painted in zones or belts, alternately white and black, each zone being about twenty-two feet in height. The upper zone will be *white*.

The keeper's dwelling, two stories high, is of brick, has the usual out-buildings, and is placed to the westward of the tower.

These buildings will be painted white.

The geographical position of this light-house, as shown by the United States Coast Survey, is as follows: Latitude 35° 49' 18" North, Longitude 75° 33' 27" West.

Cape Hatteras light bears due south, thirty-five nautical miles.

Cape Henry light-house bears N. by W. ½ W., seventy nautical miles.

Bearings are magnetic. Variation 2° 30' W., (1870.)

By Order of the Light-House Board: Joseph Henry, Chairman.[52]

The 1872 light tower, quarters, and other structures at the station were expensive to construct, costing more than five times as much as the previous station. It took $140,000 to complete the station.[53]

Shortly after completion of the station, the Lighthouse Board began advertising for bids for acquiring the old lighthouse site across Oregon Inlet. A bid of $65 was accepted from John Wescott & Co. of Manteo, and the deed was made out to John Wescott and W.D. Chaddic.[54]

Operational History of the Current Light Station

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[52]Office of the Light-House Board, Treasury Department, *Notice to Mariners* No. 65. (Washington, DC: July 13, 1872); found in National Archives, Record Group 26, Entry 5 (A-1), "Lighthouse Service Publications, 1838 - 1942."

[53]Light-House Board, *Annual Report, 1873* (Washington: 1873), p. 47; Clipping File, Body's Island, N.C., National Archives (Washington, D.C.); found in Holland, p. 42.

[54]Peter Hains to George H. Elliot, Dec. 5, 1872, Jan. 11, Jan. 16, Feb. 11, 1873, 5th Dist. Eng. Letter press, Nov. 1872 to Feb. 1873; Hains to Messrs. Wescott & Chaddic, May 16, 1873, John W. Cathcart to John Wescott & Co., Feb. 6, 1873, 5th Dist. Eng. Letter Press, Feb. - May, 1873, Record Group. 26; found in Holland, p. 42.

Operational History of the Current Light Station

The first-order lens, which had been purchased from Barbier & Fenestre of Paris, France, exhibited a fixed white light that could be seen for over eighteen miles. The light was first exhibited on October 1, 1872. Eighteen days later, a flock of geese smashed into the lantern, destroying three panes of lantern glass and damaging the lens. A wire screen was installed to protect the lantern glass soon thereafter.

In December 1877, the District Engineer inspected the tower and found cracks on the second to seventh landings. "The cracks on the inside of the tower," he said, "are vertical and very slight—in but a few places large enough to admit the point of a small knife blade—usually very small, traceable only by a slight crack in the coating of the whitewash." He felt the cracks were due to lightning rather than irregular settling. The lightning conductor at this time was the interior metal spiral stairway connected to the metal work of the lantern at the top, and to a copper rod inserted in the ground near the center of the tower at the bottom. During storms the stairway became heavily charged with lightning. A witness to this fact was the lighthouse keeper who, standing on one of the landings during a storm, received a severe shock, "so much so as to produce a numbness for some little time through the lower half of his body." As an alternative, the Engineer suggested running a vertical rod from the lantern down the center of the tower to the ground where it would be connected to the copper grounding rod then in use. The rod was to be insulated where it passed through the eye that protrudes from each of the landings. The Lighthouse Board considered the recommendation, but took no action until seven years later when lightning struck the tower again in April 1884. After this incident, the Lighthouse Board ordered the installation of a cable inside the tower which would run from the lantern to a cast iron plate buried in the ground. The cable was to be connected at each landing in the tower.[55] It is not known when the outside lightning cable was installed.

In 1897, 2,200 square feet of wooden walks were replaced at the Bodie Island Light Station, and in 1898, it was recommended that one of the two cisterns be replaced.[56] Today there are three historic cisterns adjacent to the keepers' quarters; two are connected to the gutter system. In 1898 a telephone was installed as part of a national defense program.

> For many years the U. S. Signal Service had had telephone lines connecting the various Life Saving Stations on the Outer Banks, these lines fed into a central location. The War Department decided to broaden their coverage and used their funds to tie five lighthouses on the North Carolina and Virginia coasts into the lines connecting the Life Saving Stations. The light stations affected were those at

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[55]O.E. Babcock to Joseph Henry, Dec. 10, 1877, 5th Dist. Eng. Letter Press, Feb. 1877 to Feb. 1878; O.E. Babcock to Chairman, U. S. Light-House Board, April 29, 1884, 5th Dist. Eng. Letter press, Jan. - Jun, 1884; Meeting of May 6, 1884, Light-House Board Journal, May 6, 1884 to May 5, 1886; Holland p. 45.

[56]Holland, p. 46.

> Hog Island, Virginia, Bodie Island, Cape Lookout, Currituck Beach and Cape Hatteras. Any untoward activity off the coast was to be reported immediately.[57]

In 1874 the Lighthouse Board abolished the position of third assistant keeper, then held down by the wife of the keeper. In 1922, the Lighthouse Bureau did away with the position of second assistant.[58]

In 1928, Lloyd V. Gaskill reported the following duties at Bodie Island Light Station:

> As Keeper in charge of this station, I am responsible for the proper execution of the duties whether performed by myself or Asst. I light [the] lamp in tower every other evening and raise curtains so the light will be visible to passing ships. Asst. Keeper performs the same duty the following evening. I watch the light [at] intervals until sunrise when I extinguish [the] light and refill tanks with kerosene so it will be ready for lighting in the evening. Also I clean [the] lens and watch room before coming down to [the] dwelling. I am on duty about twelve hours in this instance.
>
> I have one Asst. and I superintend and assist in painting, cleaning paint on outhouses and dwelling, clean iron work by chipping rust from same when needed. Also keep grass cut on lawn, make minor repairs to station, such as replacing hinges when broken, painting motor boat and skiff, keep engine repaired so it can be used at any time for getting supplies and mail from nearest store and Post Office seven miles across the sound. I put in about five hours per day at this work.
>
> In addition to above duties I must make weekly inspection of station, including assistant's quarters and record condition in station log. Make monthly report of condition of station to district Supt. at Baltimore. Take annual inventory and list all articles worn out, have them surveyed and condemned when Supt. visits station on inspection. Also I superintend and assist in the painting of tower outside, steps inside and whitewash inside once every five years. I attend to all correspondence from station with the Supt. relative to general repairs to station. Average about two hours per day at this work.[59]

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[57]U. S. Light-House Board to Supt. Of Lights, Edenton, N.C., July 16, 1876, Letters Sent to Superintendents to Lights, Jan. 3, 1874 to Jan. 13, 1879; O.E. Babcock to J. C. Duane, April 26, 1884, 5th Dist. Eng. Letter Press, Jan. to June, 1884; W.A. Jones to Light-House Board, Feb. 7, 1898, 5th Dist. Eng. Letter Press, Jan. to Aug. 1898; Bodie Island, June 13, Aug. 25, 1922, Index Card, Lighthouse Correspondence, 1910-1938; Light-House Board, *Annual Report, 1895*, p. 101; Light-House Board, *Annual Report 1896*, p. 87; Light-House Board, *Annual Report, 1897*, p. 99; Holland, p. 46.

[58]Holland, p. 46.

[59]"Personnel Classification Board Form No. 14–Field Questionnaire," dated Sept. 25, 1928; found in National Archives, Entry 111.

Gaskill's assistant, William H. Etheridge, reported similar duties in tending the light every other night, maintaining the station, and completing paperwork.[60]

The last keeper at Bodie Island Light Station, Gaskill transferred to another station in 1940 when the light at Bodie Island was automated. No longer needing the daily attendance of a keeper, the light became the responsibility of the nearby Nags Head Lifeboat Station.[61]

Bodie Island Lighthouse and the Cape Hatteras National Seashore

The Cape Hatteras National Seashore was established in 1937, encompassing the land surrounding Bodie Island Light Station. Soon after the National Seashore was created, the Department of the Interior approached the Lighthouse Bureau about the possibility of the light station being declared surplus. Change in administration of the Lighthouse Service to the Coast Guard in 1939 and World War II delayed any action. In January 1945, the size of the Bodie Island Light Station was increased by 40 acres. In 1953 the Coast Guard declared 56.37 acres of the Bodie Island Light Station excess to their needs and shortly afterwards the General Services Administration (GSA) listed it for disposal. The National Park Service asked GSA to withdraw the acreage from the disposal list since the land was within the boundary of the Cape Hatteras National Seashore Recreational Area Project as provided by Act of Congress, dated August 17, 1937. GSA complied and withdrew the land, and paperwork was initiated to turn the land over to the National Park Service, effective October 15, 1953. The National Park Service acquired the light station property, except for a small square plot of ground, 100 feet on each side, on which the light tower stood.[62] That same year, commercial power replaced the generator that had been installed to electrify the light in 1932.

The National Park Service converted the keepers' quarters into a visitor center and small natural history museum. The tower was closed to the public while the Coast Guard continued to maintain the active aid. In May 1983, the National Park Service began to interpret the station, allowing visitors to enter the tower and look up towards the lantern. In May 1984, an 8-foot-high chain-link security fence was installed at the beginning of the stairway by the U. S. Coast Guard to discourage the general public from climbing the stairs. As part of the 200-anniversary celebration

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[60]Ibid.

[61]Lloyd V. Gaskill papers; found in Historic Structures Report, p. 21.

[62]Merlin O'Neill to Director, National Park Service, Washington, April 1, 1953; Frank V. Lanham, "Notice of Availability of Excess Real Property," GSA, dated June 23, 1953; Conrad Wirth to Frank V. Lanham, Washington, Jul 3, 1953; Hillory Tolson to Frank V. Lanham, Washington, July 14, 1953; Charles A. Rickey to Frank V. Lanham, Washington, Oct. 1, 1953; Frank V. Lanham to Hillory A. Tolson, Atlanta, Oct. 1, 1953; R.E. Wood to Director, National Park Service, Norfolk, Oct. 13, 1953; all in Cape Hatteras, 1953, file, Office of Land and Water Rights, National Park Service. Coast Guard Drawing No. ND - 1599, dated Oct. 1, 1952, in files of the 5th Coast Guard District Headquarters, Norfolk, Virginia; found in Holland, p. 51.

commemorating the establishment of the U. S. Lighthouse Service, visitors were allowed to climb the tower during one weekend in August 1988.

Interpretation of the light station was expanded when the Outer Banks Lighthouse Society (OBLHS) established a presence at the station in 1994. OBLHS volunteers opened the lower portion of the lighthouse tower and offered interpretation of the light station and its history. In 2002 OBLHS continues its relationship with the station, allowing the park to keep the tower open year round and providing educational, fundraising, and technical support. On July 13, 2000, the tower at Bodie Island was officially transferred from the U. S. Coast Guard to the National Park Service. In 2002, planning for a complete restoration of the tower was underway.

Lenses and Illuminants

An important character-defining feature of a lighthouse is the light. The lighthouse at Bodie Island is significant in that it still retains its historic optic, a first-order Fresnel lens. Few of the tall masonry towers in the U. S. have retained their original first-order lens, the largest and most powerful of the lighthouse lenses. Fresnel lenses revolutionized the lighting systems of lighthouses in the United States when the Lighthouse Board installed them in the 1850s. Prior to that time, American lighthouses for the most part, used a system of lamps and parabolic reflectors. A specified number of lamps were placed side by side around the circumference of a circle, and the number of lamps used depended upon the arc of the horizon it was desired to illuminate. Although inexpensive, Argand lamps used a vast amount of oil, required constant attention, and produced relatively little light.[63]

Augustin Fresnel, a French physicist, developed the Fresnel lens apparatus in 1822. It was based on the dioptric or refracting principle; the old system of Argand lamps and reflectors was a catoptric, or reflecting system. Most dioptric systems also use some principle of reflecting; consequently, they are called catadioptric systems.[64] The Fresnel lens is like a glass barrel whose outer surface is made up of prisms and bullseyes. In a revolving or flashing light, the bullseyes are surrounded by curved, concentric prisms, concentrating the light of a central lamp into several individual beams, radiating out like the spokes of a wheel. In the fixed, or steady light, such as was used in the last Bodie Island Lighthouse, the bullseye becomes a continuous "lens belt," with the prisms parallel to it, producing an uninterrupted, horizontal sheet of light.[65]

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[63]John S. Conway, *The United States Lighthouse Service*, 1923 (Washington, 1923), pp. 29-30; Johnson, 50; found in Holland, pp. 9-10.

[64]Conway, p. 30; found in Holland, p. 10.

[65]Holland, p. 10.

Fresnel lenses were classified into seven orders.[66] The order was determined by the focal distance—that is, the distance from the flame to the lens. The first order was the largest and was used primarily in coastal lights that needed to be seen at a great distance out to sea.

The United States was slow to adopt the Fresnel lens and for years the country debated the merits of the old and new systems. Finally, in 1841 the United States purchased its first Fresnel lenses and tested them in the twin towers at Navesink Light Station, New Jersey. Sea captains applauded the new lenses; however, ten years later there were just two light stations in the country with Fresnel lenses. Finally in 1851, complaints regarding the country's inferior system of aids to navigation grew so intense that Congress ordered a sweeping investigation of the country's aids to navigation, and appointed a panel consisting of distinguished military officers and civilian scientists to oversee the investigation. The resulting study was broad and thorough, not only analyzing and criticizing the current state of aids to navigation, but also offering detailed recommendations to cure the problems. Surveys of ship's captains who sailed up and down the coasts were conducted. All findings were compiled into a report that made specific recommendations for improvements.[67]

In 1852 Congress passed legislation to establish a U. S. Lighthouse Board that was essentially composed of those who had overseen the earlier investigation. The country was organized into 12 lighthouse districts, each having an inspector (a naval officer) who was charged with building the lighthouses and seeing that they remained in good condition and that the lens was in operation. After a few years the inspectors became overloaded with work and an engineer (an army officer) was appointed to each district to tend to the construction and maintenance of lighthouses.[68] The Lighthouse Board moved quickly in applying new technology, particularly in purchasing and installing new Fresnel lenses. In May 1852 the first chairman of the Lighthouse Board said that the "[Fresnel] Lens in useful effect, brilliancy and economy is superior in its different orders to any combination, number and size of the best parabolic reflectors."[69] By the time of the Civil War, all lighthouses had Fresnel lenses. Despite the higher initial cost of the system, the Fresnel apparatuses paid for themselves within a few years, principally because of the savings in oil.

Argand lamps burned sperm or whale oil. (Whale oil is a general term for oil derived from any species of whale, including sperm oil obtained with spermaceti from the head cavity and blubber of the sperm whale, *Physeter macrocephalus*.) A number of lamps were required in the lamp and reflector system whereas a Fresnel lens required only one lamp in the center of the lens. Sperm oil was also initially used in the lamps for Fresnel lenses. In the early 1840s, sperm oil was 55

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[66]Conway, p. 30; found in Holland, pp. 10-11.

[67]"Administrative History of the Lighthouse Service," National Park Service web site <www.cr.nps.gov/maritime/light/admin.htm>.

[68]Ibid.

[69]Holland, pp. 11-12.

cents per gallon. Soon afterwards, however, the supply of sperm oil began to diminish, and at the same time the use of sperm oil for manufacturing purposes increased. The result was a steady rise in price. In 1854 sperm oil brought $1.38 per gallon and by 1863 it cost $2.43 a gallon. The Lighthouse Board, concerned about this increase, soon began to look about for a substitute fuel. They turned first to colza, or rapeseed oil. Subsequently, tests by the Lighthouse Board revealed that colza oil was ideally suited for lighthouse purposes; it was as good as sperm and cost only half the price. By the late 1850s colza oil was being introduced in United States lighthouses. In 1861 the Lighthouse Board purchased 5,000 gallons, and in 1862, 12,000 gallons. The amount that was being produced, however, was insufficient to supply the needs of the Lighthouse Board.[70]

Meanwhile, experiments were being conducted with lard oil. Professor Joseph Henry, who was Chairman of the Board's Committee on Experiments, personally conducted the experiments with lard oil and reported that he found it to be highly satisfactory in the Fresnel lamp and in the Franklin lamp "in which the combustion is carried on at a high temperature . . ." Moreover, lard oil yielded more light than sperm oil. Tests had been run on lard oil before, but as a fuel it was found unsatisfactory because the first experiments, as Professor Henry later found, had used too low a combustion rate. As a result of Henry's report lard oil was soon introduced, and by 1867 it had supplanted sperm oil as the principal illuminant in lighthouses. Colza oil continued to be used in smaller lamps.[71]

In the 1870s experiments were once again conducted on a better fuel. This time the substance was kerosene, or mineral oil, as it was more popularly known then. It was found satisfactory and began being substituted in 1880. By 1885 it was in general use in lighthouses. In 1880 the lighthouse service purchased 48,000 gallons of mineral oil. Nine years later the annual purchase totaled over 330,000 gallons as compared with 16,000 gallons of lard oil in the same year.[72]

In 1904 the incandescent oil vapor (IOV) lamp was first introduced in a United States lighthouse. "In this lamp the kerosene, forced into the vaporizer by air pressure, is heated and vaporized, and is burned mixed with air under a mantle, which is thus brought to a brilliant incandescence," said George Putnam, Commissioner of Lighthouses. "This lamp," he added "gives a much more powerful light than the wick lamp, with a smaller consumption of oil, and has been greatly appreciated by mariners because of its superior brilliancy."[73]

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[70]Secretary of the Treasury, *Report on the State of the Finances, 1853-54* (Washington, 1854), p. 295; *Report on the State of the Finances, 1868* (Washington, 1868), p. 309 Washington A. Bartlett to William L. Hodge, Paris, France, Dec. 13, 1852, National Archives; Johnson, p. 54; Putnam, p. 185; found in Holland, pp. 13-14.

[71]Secretary of the Treasury, *Report on the State of the Finances, 1864* (Washington, 1864), p. 173; *Report on the State of the Finances, 1867* (Washington, 1868), p. 194; Putnam, pp. 185-186.

[72]Johnson, p. 55; Putnam, p. 186

[73]Putnam, p. 187.

Later, electricity was introduced in lighthouses and the conversion to this means of lighting occurred over a long period of time starting around the 1920s.

At Bodie Island, sperm or whale oil would have been used in the first tower. As sperm oil became too expensive, it was replaced with lard oil. In 1883, lard oil was replaced with mineral oil and in 1884, regular mineral oil lamps were installed. In 1896, a sheet metal oil house was constructed to house the highly flammable mineral or kerosene oil.[74] An incandescent oil vapor lamp was introduced in 1912, increasing the candlepower from 10,000 to 57,000. In 1915, the candlepower was reduced to 22,000. In 1932 the power source was converted to electricity, and a generator was installed in the oil room. The new incandescent lamp produced a candlepower of 160,000 permitting an occulting characteristic which meant the light was on for 2.5 seconds, off for 2.5 seconds, on again for 2.5 seconds, and then off for 22.5 seconds. In 1941 the candlepower was once again reduced, this time to 13,000.[75] No subsequent changes have been made to the light's characteristics.

9. Major Bibliographical References

Historic Structure Report: Bodie Island Lighthouse, Cape Hatteras National Seashore, Manteo, North Carolina, report prepared by Hartrampf and OJP Architect (Atlanta, Georgia: June 2002).

Holland, Francis R., Jr., *A History of Bodie Island Light Station* (U. S. Department of Interior, National Park Service, Division of History, February 1, 1967).

National Archives (Washington, D.C.) Record Group 26, Entries 3 (NC-63), 5 (A-1), 17C (NC-31), 66 (NC-31), 111..

Stick, David, *North Carolina Lighthouses* (Raleigh, North Carolina: Division of Archives and History, N.C. Department of Cultural Resources, 1980).

Previous documentation on file (NPS)
___ preliminary determination of individual listing (36 CFR 67) has been requested.

[74]Holland, p. 46.

[75]Subject Index Cards, Lighthouse Correspondence, 1852-1899, Bodie Island, Dec. 26, 1883; Subject Index Cards, Lighthouse Correspondence, 1910-1938, Bodie Island, Sept. 11, 1911, April 8, 1932; Light-House Board Meeting of Jan. 16, 1889 Light-House Board Journal, Jan. 2, 1889 to June 2, 1890; Wm. Chalmers to Department of Commerce, Norfolk, July 23, 1925, Lighthouse Correspondence, 1923; G.R. Putnam to Wm. Chalmers, Aug. 7, 1925, Lighthouse Correspondence, 1925. U. S. Light-House Board *Light List, 1873* (Washington: G.P.O, 1873): *Light List, 1886*, pp. 52-53; *Light List, 1882*, pp. 46-47; *Light List, 1898*; *Light List, 1912*; *Light List, 1915*; *Light List, 1933*; *Light List, 1941*; *Light List, 1963*, p. 344; Holland, p. 49. On page 46, Holland indicates mineral oil lamps were first used in 1884.

___ previously listed in the National Register
___ previously determined eligible by the National Register
___ designated a National Historic Landmark
_X_ recorded by Historic American Buildings Survey # NC-395
___ recorded by Historic American Engineering Record # _____

Primary Location of Additional Data
___ State Historic Preservation Office
___ Other State agency
_X_ Federal agency
___ Local government
___ University
___ Other

Name of repository: Cape Hatteras National Seashore Headquarters, Manteo, North Carolina
Record Group 26, National Archives, Washington, D.C.

10. Geographical Data

Acreage of Property: 15

UTM References

		Zone	Northing	Easting
1	N corner	18	449083.7843	3964120.836
2	W corner	18	448920.7672	3963944.454
3	S corner	18	449103.4428	3963771.128
4	E corner	18	449274.9016	3963942.517

Coordinate System Info: UTM 83 Zone 18 Meters

Verbal Boundary Description

Four granite boundary stones mark the corners of the original boundary of the 15-acre station. The boundary encompasses all the historic (contributing) buildings, structures, and objects.

Boundary Justification

The boundary chosen is the one the station has retained since it was originally constructed. The 15-acre site for the 1872 station was purchased from John and Fanny Etheridge for $150 by the U. S. Lighthouse Board on June 13, 1871.

11. Form Prepared By

name/title: Candace Clifford

organization: Cypress Communications date: July 2002

street & number: 35 E. Rosemont Avenue telephone: 703-548-0532

city or town: Alexandria state: VA zip code: 22301

Additional Documentation

Submit the following items with the completed form:

Continuation Sheets

Maps
A USGS map (7.5 or 15 minute series) indicating the property's location.
A sketch map for historic districts and properties having large acreage or numerous resources.

Photographs
Representative black and white photographs of the property.

Additional items (Check with the SHPO or FPO for any additional items)

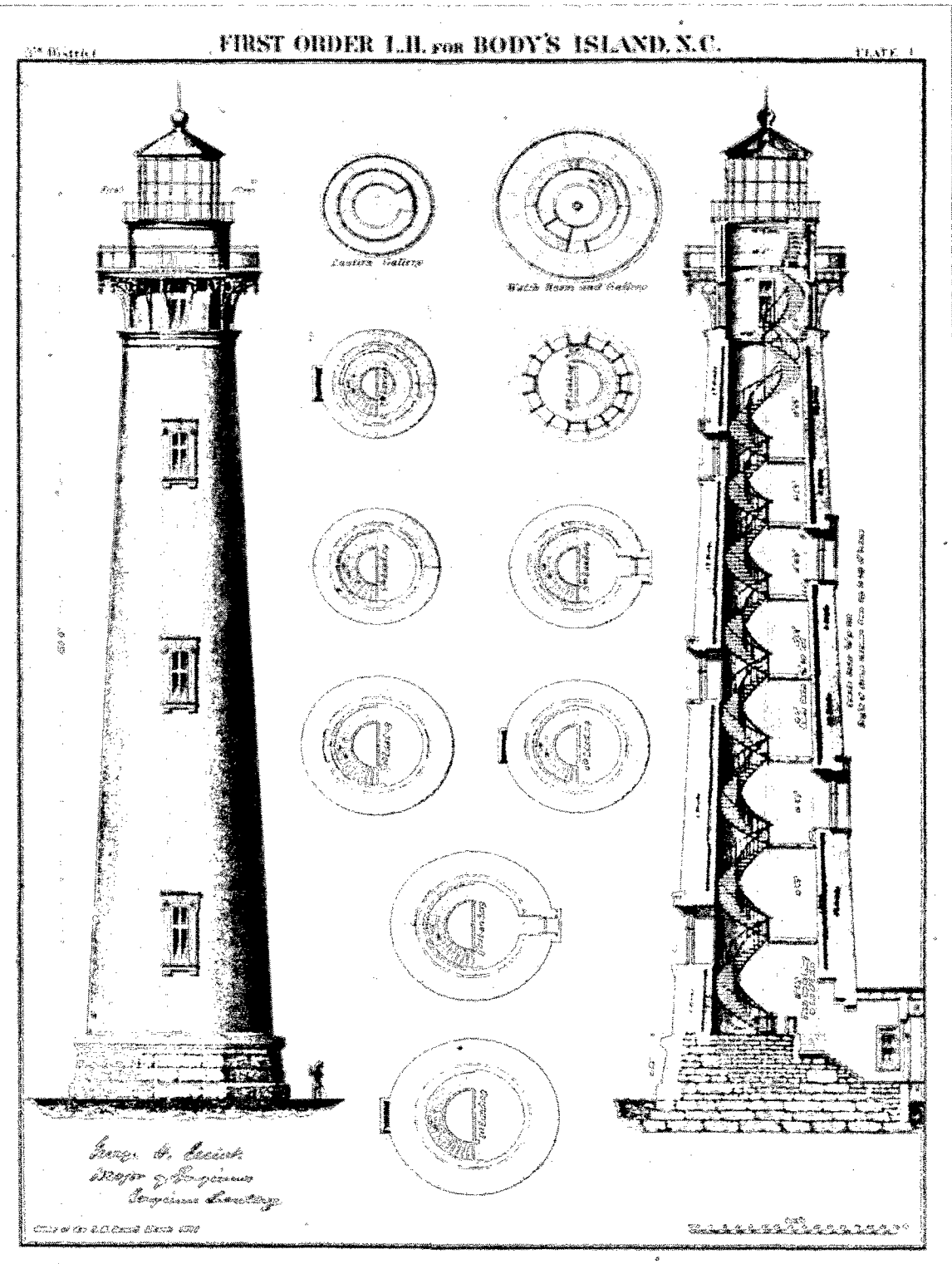
Property Owner

name: National Park Service/Cape Hatteras National Seashore

street & number: 1401 National Park Drive telephone: 252-473-2111

city or town: Manteo state: NC zip code: 27954

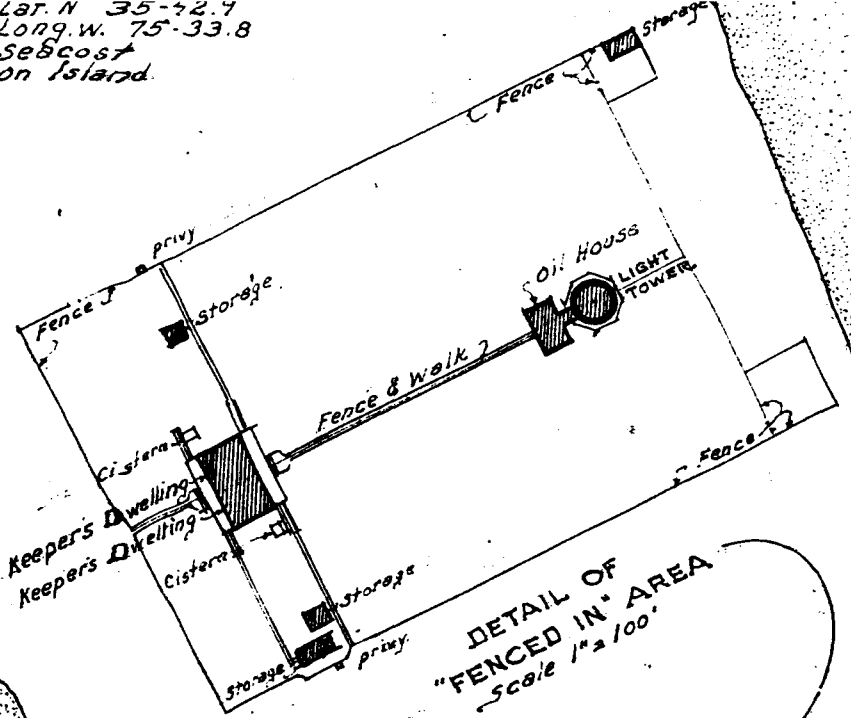
Bodie Island Light Station



Bodie Island Light Station; Dare County, N.C.; 1871 U.S. Light-House Board drawing from National Archives.

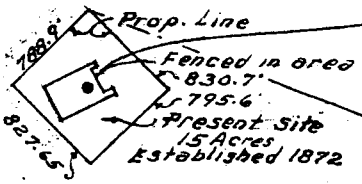
Lat. N 35-42.7
Long. W. 75-33.8
Seacoast
on Island

Estab. 1848
1872



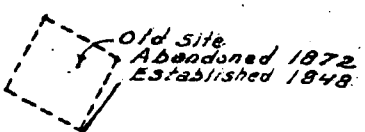
DETAIL OF "FENCED IN" AREA
Scale 1" = 100'

ATLANTIC OCEAN



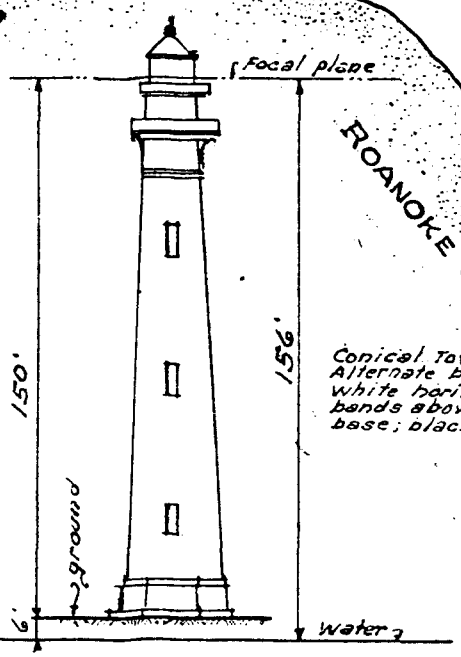
N 65° W. 95 chains

Old ship Adams



PLOT PLAN
Scale 1" = 20 chains

ROANOKE SOUND



Conical Tower; Alternate black and white horizontal bands above granite base; black ironwork.

ELEVATION
Scale 1" = 50'

Note: No resident keeper. Attended by personnel from Nag's Head Lifeboat Station

2708

REVIS	DESCRIPTION	BY	DATE
	BODIE ISLAND, N.C. LIGHT	Drawn by JLC	
	PLOT PLAN		
	UNITED STATES COAST GUARD CIVIL ENGINEERING NORFOLK DIST. ~ NORFOLK, VA	Scale As noted	
		Date: 5-10-44	
	Approved	Sheet / of	
	Sr. Civil Engr. District Engr.	Drawing No LS-100	

File Copy

HIGHTS#
4MAP-0-74

Bodie Island Light Station
Dare County, N.C.
Photo by Herbert Bomber
June 9, 1893
Courtesy Cape Hatteras National Seashore

View taken from southwest side

Bodie Island Light Station
Dare County, N.C.
Photo by Herbert Bamber
1893
Courtesy Cape Hatteras National Seashore
View taken from northwest side

Bodie Island Light Station
Dare County, N.C.
Jon A. Buono + James M. Womack, photographers
November 2000/March 2001
HABS No. NC-395-5
View to southwest of lighthouse with keepers' dwelling to right

Bodie Island Light Station
Dare County, N.C.
Jon A. Buono + James M. Womack, photographers
November 2000/March 2001
HABS No. NC-395-23
View from interior of tower lantern looking
towards ocean with lens bullseye section on right

Bodie Island Light Station
Dare County, N.C.

Jon A. Buono & James M. Womack, photographers
November 2000/March 2001
HABS No. NC-395-2

General view looking east showing (from left to right) storage shed, tower with attached oil house/workroom, and keepers' dwelling

Bodie Island Light Station
Dare County, N.C.
Jon A. Buonat James M. Womack, photographers
November 2000/ March 2001
HABS No. NC-395-30
Keepers' Dwelling, view of northeast corner


105

Bodie Island Light Station
Dare County, N.C.
Jon A Buono & James M. Womeck, photographers
November 2000/March 2001
HABS No. NC-395-36
Storage shed, view to northeast

Bodie Island Light Station
Dare County, N.C.
Jon A Buono + James M. Womack, photographers
November 2000/March 2001
HABS No. NC-395-6

Elevation of attached oil house/workroom and entry to tower, facing northeast

Bodie Island Light Station
Dare County, N.C.
NPS photo by Cecil W. Stoughton
1969
Courtesy Cape Hatteras National Seashore
Aerial view of station as part of National Seashore

Bodie Island Light Station
Dare County, N.C.

1956 photo, photographer unknown
Courtesy Cape Hatteras National Seashore
Aerial view of station 3 years after NPS acquisition of grounds

Bodie Island Light Station
Dare County, N.C.

U.S. Coast Guard photo
1944
Courtesy Cape Hatteras National Seashore
Aerial view of station 4 years after automation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Bodie Island Light Station

Dare County, N.C.

U.S. Coast Guard photo by Stevens

1944

Courtesy Cape Hatteras National Seashore

Aerial view of station 4 years after automation

Bodie Island Light Station
Dare County, N.C.
Photo by Herbert Bamber
1893
Courtesy Cape Hatteras National Seashore
View taken from south side of station

Bodie Island Light Station
Dare County, N.C.
Photo by Herbert Bamber
June 9, 1893
Courtesy Cape Hatteras National Seashore
View taken from northeast

Bodie Island Light Station
Dare County, N.C.
Photo by Herbert Bamber
June 9, 1993
Courtesy Cape Hatteras National Seashore
View of tower from west side of station