CAPE HATTERAS LIGHTHOUSE
Point of Cape Hatteras,
access road from Rt. 12
Cape Hatteras National Seashore
Buxton
Dare County
North Carolina

HABS NO. NC-357

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PHOTOGRAPHS AND

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

REDUCED COPIES OF MEASURED DRAWINGS

Historic American Buildings Survey
National Park Service
Department of the Interior
Washington, D.C. 20013-7127

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HISTORIC AMERICAN BUILDINGS SURVEY

CAPE HATTERAS LIGHTHOUSE

HABS NO. NC-357

Location: Point of Cape Hatteras, access road from Rt. 12, Cape Hatteras National Seashore, Buxton, Dare County, North Carolina.

Present Owner: National Park Service, under the direction of the Superintendent, Cape Hatteras National Seashore, Rt. 1, Box 675, Manteo, North Carolina.

Present Occupant: The United States Coast Guard operates and maintains the light; the lighthouse is otherwise uninhabited and inaccessible.

Present Use: The lighthouse is still used as such, although it is automated and now inaccessible to the public.

Significance: Cape Hatteras Lighthouse is significant as an important aid to the navigation of the Atlantic Coast. The Diamond Shoals which extend up to ten miles out from Cape Hatteras, coupled with the Gulf Stream currents, earned this area its reputation as the "graveyard of the Atlantic." A lighthouse was first established here in 1803, heightened in 1853. It was replaced with the current lighthouse in 1869-70. The current light tower, painted with black and white spirals for recognition during the day, is the tallest brick light tower in the United States.

PART I. HISTORICAL INFORMATION

A. Physical History:

1. Date of erection: 1869-1870. According to the Annual Report of the Light-House Board for 1868-1870, "a working party was organized in October, 1868, and on the 19th started for Cape Hatteras to commence operations, arriving there on the 4th November..." They began with the construction of quarters, etc. for the workmen, a wharf where building materials were delivered and a tram railway (1/2 miles long) from the wharf to the site. Construction of the lighthouse began in 1869. It was finished in 1870 when, "During the month of December the new lens was received and set up, and on the 16th of the same month the light from the new tower was exhibited."

2. Architect: The lighthouse was designed by the Light-House Board, 5th District. The original drawings "First Order L.H. for Cape Hatteras, N.C.," engraved and printed by Julius Bien of New York are still extant. There are eighteen plates; elevations, sectionals and details. There is no architect or delineator's name, only the 5th district and a date, 1869. The drawings do, however, comply at least in general, with the "Specifications for a First Order Light-House (Brick Tower)" prepared at the office of the Light-House Board, October 1861.

3. Original and subsequent owners: The actual site of the lighthouse, a lot of four acres, was deeded to the United States of America from William Jennett et al in February of 1801. A larger, adjoining lot of approximately 40 acres was deed from Pharoah Farrow. The National Park Service acquired ownership of the lighthouse when it was temporarily abandoned in 1935. When the light was reinstated in 1950, the Coast Guard then gained ownership and operation of the lighting equipment while the National Park Service maintains the tower, as part of the Hatteras National Seashore.

4. Builder, contractor, suppliers: The lighthouse was erected by the Light-House Board, using its own crew. It fell under the supervision of the Engineer's Office for the 5th Lighthouse District, Baltimore, Maryland, under the direction of Major George B. Nicholson, Assistant Engineer. The Superintendent of construction on site was Dexter Stetson. Nicholas M. Smith of Baltimore was awarded the contract for the red brick (of which it took 1,250,000 to build the lighthouse). The stone used for the foundation and steps was supplied by Beattie, Dawson & Company of Niantic, Connecticut. Bartlett, Robbins & Company supplied the metal work. The shipping and delivery of materials was provided by Lennox and Burgess of Philadelphia.

5. Original plans and construction: As mentioned, the original drawings still exist. A team of HABS architects, who recently re-drew the lighthouse, discovered that the existing light tower-as built-matches the 1869 drawings almost identically. Discrepancies seem to occur only where later changes were made. Reports included in the Annual Reports of the Lighthouse Board (1868-1870) outline the construction process as follows:

1868 "An appropriation is available for rebuilding this important light-house, and the requisite

materials therefore are now being collected. Contracts for the brick have been entered into, a tram road of the Peteler pattern has been contracted for, and every necessary preparation will be made looking to the commencement of work early in the season."

"Under the act of Congress approved March 3, 1868, appropriating the sum of $80,000 for rebuilding the lighthouse, a working party was organized in October 1868 and on the 19th started for Cape Hatteras to commence operations, arriving there on the 4th November. Suitable buildings for workmen's quarters and mess-room were erected; a blacksmith shop built; a house in which to store cement and other perishable materials put up; two derricks erected; a wharf built on the south side of the island, distant 1-1/4 miles from the station.... Also, a tram railway.... laid from the wharf to the lighthouse, upon which to transport materials. These preparations having been made, and the materials beginning to arrive, work has commenced upon the foundations of the new tower."

1869 "The operations on this edifice progressed rapidly and satisfactorily under the direction of the engineer of the district from the date of the last annual report until the 16th of June. By this time the entire portion of the brick work of the tower beneath the iron capital which carries the lantern was completed. All the window frames were set, and four flights of the iron stairway in position, and their landings arched. The work thus far has been of the most thorough character, the iron work finished by the contractors is excellent, and the brick laid in the most substantial manner, each brick being completely embraced in the best kind of cement mortar, and each course as it was laid brought truly to the batter and leveled. The cement and brick used were of unexceptionable quality...."

"The tower having attained the above height of 153-1/2 feet, a delay occurred in procuring the iron work of the capital, and as nothing more could be done without it, it was order on the 16th of June to suspend operations and withdraw the force until such time as the castings would be ready.... The capital finally advanced toward

completion at the workshops, the steamer Tulip was dispatched on the 10th September with a party in order to make preparations for the reception and setting up of the iron work.... on the 27th they left under tow of the steam tender Tulip, via the Albemarle and Chesapeake Canal, for the work."

"On the 25th of September, 1869, the ninth course of granite quoins was set up and backed with brick, as was also a portion of the tenth course."

"During November extensive repairs were made to the old dwelling, and a large quantity of filling in of sand and soil was made in a slough surrounding the house."

"January 30, brick work reached a height of 32 feet above the main floor."

"April 30, the tower had reached a height of 103 feet above ground, making it 97 feet above the main floor. The first two flights of iron stairway were also placed in position, as were also the wrought iron oil tanks."

"May 28, a height of 147 feet from the ground or 141 feet above the main floor was reached."

"June 16, the brick work was leveled up to a height of 153-1/2 feet from the ground to the lower edge of the necking or belt course of the capital. Four flights of iron stairway were in position in the cylinder. At this date the work was temporarily suspended as was above related."

"The iron casing of the watch-room and the lantern are now being placed, and it is expected that the entire height (180 feet to focal plane) will be completed before the ensuing winter. This will be the highest brick light-house tower in the world."

"This important Light-house was well advance towards completion at the date of the last annual report. During the month of December the new lens was received and set up, and on the 16th of the same month the light from the new tower was exhibited.... The new tower has been covered with

> a cement wash to protect it from the effects of the weather, the upper part (projected against the sky) colored red, the lower part (projected against the foliage in the rear) painted white; all the iron work of the stairs, lantern, etc. painted, and the tower inclosed in a neat iron fence.... In addition to the finishing of the new tower, a brick dwelling for the principal keeper of the Light-station was built and inclosed in a neat picket-fence. The above completed the work at this station."

6. Alterations and additions: Few alterations have been made to the Hatteras Lighthouse, beyond general repairs. The first significant change was made in 1873 when the tower was repainted with alternating black and white spiral bands. This was done to make the tower more distinctive, and therefore a better "day mark" for ships traveling the coast. In the spring of 1879 the tower was struck by lightning, creating cracks in the masonry of the tower. It was determined by the Light-House Board that this was due to an imperfect connection of the iron-work of the tower with the earth. Thus, a metal rod connecting the iron work of the tower with an iron disk sunk in the ground was added.

The most significant changes were made in light apparatus. In 1913 the original lamps were replaced with incandescent oil vapor lamp. In 1934, the rotating system of weights was replaced with electricity and a time switch to turn the light on and off was added. The light was removed from the tower in 1935-1950 and a light was exhibited from a steel skeletal tower built for that purpose. A new light device was installed in the tower when the light was returned to it in 1950. Finally, the current system was installed in 1972. The lighthouse, once open to the public, has been closed due to needed repairs, including the extensive repair/replacement of the cast-iron gallery.

B. Historical Context:

The current Cape Hatteras Lighthouse was built in 1869-1870 to replace the original light tower built in 1802 and raised in 1853. Both were constructed to guide ships through this dangerous passage known as the "graveyard of the Atlantic." It is the shallow Diamond Shoals, which extend more than ten miles out along the Cape, combined with the Gulf Stream currents which make navigation

through this area so difficult. Because of the distance at which a light need be seen, the Cape Hatteras Lighthouse is the tallest brick tower in the United States, displaying a first order Fresnel lens.

The existence of lighthouses can be traced back to the ancient Egyptians. From the earliest times, ways have been sought to guide ships past dangerous shoals, reefs, etc. and safely into harbor. The earliest lighthouse in America was the Boston Harbor lighthouse built in 1716. It was followed by ten other colonial era lighthouse built along the Atlantic coastline. These early lights were erected and maintained by the local people, generally the merchants and ship captains who had the most to gain. They were often financed through "light dues," a fee charged by weight to ships entering the harbor.

The importance to the American economy of shipping, and of the importing and exporting of goods was recognized by the newly formed United States government. Thus, in 1789 an act was passed in Congress conveying all responsibility for aids to navigation to the central government. Administration fell to the Treasury Department with various different officials supervising. In 1802, a year before the first Cape Hatteras Lighthouse was built, responsibility passed to Albert Gallatin, Secretary of the Treasury. Plans for the construction of the Cape Hatteras Lighthouse began in 1797 when Congress authorized construction of a lighthouse at this site. The light was not exhibited until 1803, still making it one of the country's earliest lighthouses.

The lighthouse served as a great help to the navigation of Cape Hatteras--when it could be seen. For decades complaints that the light was not continuously lit, or that it could not be seen from a great enough distance, were heard. Thus, the light was refitted to extend its range in 1835, and again in 1838 and 1840! Still, complaints continued, such as a letter from Lt. David Porter, commander of the U.S. Mail Steamer, the *Georgia* in July 1851 which stated, "Hatteras Light, the most important on our coast, and, without doubt, the worst light in the world....The first nine trips I made I never saw the Hatteras light at all.... When I did see it I could not tell it from a steamers light, except a steamers lights are much brighter.... It is all important that Hatteras be provided with a revolving light of great intensity, and the light be raised fifteen feet higher than at present" (National Archives, Clippings file RG

26, Box 10). Finally, in 1853 the tower was heightened, and in 1854 a First Order Fresnel Lens was installed (Henry Leparte of Paris, maker). The new lens was also equipped with a gear-and-weight mechanism that enabled it to rotate. A keeper's dwelling was also built at this time.

The Fresnel Lens revolutionized lighthouse technology. The lens consisted of an assemblage of prisms around a single lamp. The prisms both magnified and refracted the light outward, greatly increasing the intensity of the light. The lens varied in size from first-being the largest-to sixth order (with a three-and-a-half order), depending on the range required. It was named for its inventor, Augustin Fresnel had been perfected in 1822 in France. It soon became the standard in Europe but was resisted by the Fifth Auditor of the Treasury, Stephen Pleasonton, who oversaw the administration of Light-Houses. Finally, in 1851 a board of specialists was appointed to investigate, among other things related to aids to navigation, the Fresnel Lens. It was determined to be superior, and slowly replaced all existing lens by the mid 1860s.

The Fresnel Lens greatly improved navigation past Cape Hatteras. Problems with repairs to the light tower, however, began to emerge. In 1864 a request for funds to repair the tower was submitted. Upon investigation, the Light-House Board determined the existing tower was not worth repairing but that a new tower should be erected instead. Congress appropriated $80,000 for a new tower in 1868, and construction on the current lighthouse finally began (Annual Reports of the Lighthouse Board, National Archives).

In October of 1868 a work-crew was organized by Asst. Engineer George B. Nicholson of the Light-house Board, Engineer's Office for the Fifth Lighthouse District in Baltimore, Maryland. The crew arrived on the 4th of November and construction began under the direction of Dexter Stetson, the superintendent on site (See Part I., A.5. Original plans and construction for an account of the construction process). The lighthouse was completed and the lens installed in December of 1870. On December 16th the light was exhibited from the new tower for the first time. In February, the old tower was blown-up and destroyed. A new keepers house was also undertaken at this time, begun in November of 1870 and completed in early 1871. The tower received its distinctive spiral black & white bands, which identify it by day, in 1873 (Ibid.).

A number of changes in the status of the lighthouse occurred in the 1930s. First, in 1934, the Fresnel Lens was removed and an automated light was installed. No longer would it be necessary to have keepers on site to tend to the constant maintenance of the light and the structures on site. Automation, in fact, marked the end of an era in Lighthouse history. The Hatteras Lighthouse once required three keepers (and their families), and now all that was necessary was periodic checking of the bulb by the Coast Guard. Also during the 1930s the tower itself was threatened. Erosion, which had been a problem at Cape Hatteras from the time that the first tower was construction, became increasingly worse during the 1930s. Interlocking steel-pile groins were installed in an attempt to hold the beach. Erosion continued, however, and fear that it would topple the tower led to the erection of a skeletal tower on which the automated light was placed, in 1936. The lighthouse structure was then turned over to the National Park Service. By 1950, erosion had subsided enough that a light was returned to the lighthouse. The lighthouse and associated buildings (two keepers dwellings and oil house) remain the property of the National Park Service and are now part of the larger Hatteras National Seashore. The light, which is still exhibited from the tower, is maintained by the Coast Guard.

PART II. ARCHITECTURAL INFORMATION

A. General Statement:

1. Architectural character: Lighthouses come in a variety of shapes and sizes depending on the site and the necessary visibility of the light. They epitomize the form follows function rule. The height of the tower depends on the height of the site and the distance the light must travel. The size of the lantern depends on the size of the lens and the mechanisms needed, etc. They are necessarily functional architecture--although often decorative too--designed for a specific purpose. The functional aspect along with the fact that the Light-House Board prepared all drawings and specifications lead to standardization of designs. The design of the Cape Hatteras lighthouse, with its tall, conical brick tower, was outlined in a 1861 Light-House Board publication "Specifications for a First Order Brick Tower." It was, in fact, one of a number of similar towers constructed in the southeast region of the country during the 1870s. The Hatteras Lighthouse is however, distinguished by its

extreme height, being the tallest in the country, and by its black and white spiral paint.

2. Condition of the fabric: Although the light tower appears sound, it is in need of extensive repairs to its structural iron work, particularly in the gallery.

B. Description of Exterior:

1. Overall dimensions: The Cape Hatteras Lighthouse is a conical brick tower, resting an octagonal brick foundation with stone quoining with an iron lantern atop it. The tower rises 208'-0" from the bottom of the foundation to the peak of the lantern. The focal plane of the light is 191'-0" above the mean high water mark. The diameter of the tower at the base just above the foundation is 32'-5-1/2", and at the top below the lantern it is 17'-2."

2. Foundation: The tower rests on an octagonal base of brick and stone with stone quoining. At the ground, are four courses of rock-faced ashlar block which decrease in diameter as the rise up in a pyramid effect. This same ashlar block is used as quoining at each of the eight corners of the octagon. Stone steps flanked with walls leads to the entry.

The actual foundation is referred to as a "floating foundation" of criss-crossing yellow pine timbers buried in a pit and immersed in seawater to preserve them. When the construction crew commenced to dig the foundation it was discovered that the sand here was so compact that the piles could not be made to penetrate more than six feet and a sounding rod no farther then nine feet. This information was relayed to Gen. J.H. Simpson, Engr. 5th Lighthouse Dist. by the Superintendent of construction on site at Hatteras, Dexter Stetson. Simpson's reply ordered them to dispense with the piling and instead lay two layers of six inch timbers at that depth (in the manner shown in the drawings). Thus, a double "grillage" platform served as the foundation (National Archives, RG 26, Clippings file, Cape Hatteras).

3. Walls: The walls are of brick, approximately 1,250,000 of them. There is an outer wall (octagonal on the first level and cylindrical above) and a cylindrical inner wall with connecting walls between, like the spokes of a wheel. The brick walls were covered with a cement wash to protect it from the effects of the weather. Originally, the upper portion of the tower (that part

projecting against the sky) was painted red, and the lower portion (projecting against the foliage) was painted white. Since 1873 it has been painted with alternating black and white spiral bands as are currently seen. The paint served as a "day mark" for identification during daylight hours.

4. Structural system, framing: The tower is constructed of a system of load-bearing brick walls, consisting of inner and outer walls with twelve spoke-like connecting walls. The interior spiral stairway is of cast and wrought iron as is the lantern, gallery and supporting brackets at the top of the tower.

5. Stoops, galleries: A small stoop with stone steps and side walls of ashlar block is located at the entryway, at the north elevation of the lighthouse. The tower is topped by a cast-iron gallery onto which is mounted the lantern which houses the light. The gallery is supported all around by large iron brackets, in a circle and drop pendant motif. A decorative cast-iron railing runs around the perimeter of the gallery deck. It consists of a lower rail of bars with an upper rail where every other rail from below extends, broken by a large turned newels at evenly spaced intervals. The deck of the gallery is also cast iron.

6. Openings:

a. Doorways and doors: The doorway at the base of the tower is recessed, and has a classical stone frontispiece, with a projecting pediment supported by console brackets. There is a pair of heavy metal doors, divided by plain rails into three panels each. There is a louvered vent over the door.

b. Windows: Three small casement windows, aligned down the front over the entry, and four to the rear, light the spiralling stairway. They are rectangular and are recessed into the walls. The original drawings show the windows with pedimented windowheads, but these do not currently appear on the lighthouse.

7. Lantern: The tower is topped by a rounded lantern which houses the light. It is completely enclosed with large glass panels, one of which opens up for entry onto the upper gallery. It is topped by a finial-like ball and rod, which serves as a lightning rod.

C. Description of Interior:

1. Interior plan: Entering into the base of the lighthouse there are four recessed spaces (north, south, east and west). The entry occupies the north space and the other have in them benches on which oil tanks to fuel the light once sat. The interior contains a spiralling, cast iron stairway which runs along the interior wall. At the base of the stair, upon entering the lighthouse, is located the light well where the weights that operated the mechanism that turned the light descended (Cookoo clock principle). The stair is broken by seven semi-circular landings, each lit by a window. At the top of the stair is a doorway into the base of the lantern where the gears of the mechanism that rotated the original light can be found. A small stairway leads to the inside of the lantern itself.

2. Stairways: A cast iron, spiral stairway runs along the interior wall, winding its way up to the top of the tower. The decorative, cast iron steps consist of treads cast in a small, raised diamond pattern (for traction), and risers with two cut-outs, flanked with a simple rosette. At the corner of each step a narrow, rounded baluster rises to the handrail, terminated at the base with a decoratively cast newel post. The stairway is broken by semi-circular landings which are set at intervals proceeding the formation of a full circle of steps, or each individual flight. According to the standards set by the Light-house Board for a first order brick tower, the stairway was to be made of cast iron with the step height to a uniform gauge of eight inches. Each flight was to be temporarily erected and fitted together at the workshop (pgs. 5-6).

3. Flooring: The floor at the base of the lighthouse is presumably concrete covered with black and white linoleum tile in a checkerboard pattern. The floors of the landings are cast iron. As specified in the Light-house Boards standards, "Each landing is formed of two cast-iron plates one inch thick, partly (im)bedded in the brickwork and partly resting on a cast-iron girder, whose ends are also secured in the brickwork of the cylinder" (p. 6). The landings are also covered with black and white linoleum tiles.

4. Wall and ceiling finish: The interior walls are brick, painted white.

5. Openings:

a. Doorways and doors: The front doorway into the tower is recessed into the thick walls, forming a small hall or vestibule. There is a doorway at the top of the tower, into the lantern/watchroom area.

b. Windows: There are small, rectangularly-shaped casement windows at each landing. They are recessed into the thick walls and have single panel, cast iron reveals, and a panel on the wall above the window. The narrow surrounds are also cast iron and have a half-round bead along the inner edge (extending up into the panel above) and a smaller bead along the outer edge.

6. Mechanical Equipment: Although the Fresnel lens has been removed and the light has been automated, the mechanical system of gears which rotated the light remains. The gears were set into motion by 150 lbs. of weights which hung from the gears under the lens at the top of the tower, down 160 feet through the tower into the pit at the base of the tower. It was regulated by a round pedestal clock mounted on the inside of the pedestal which supported the lens. Once wound, the clock would run for fifteen hours before the keeper would have to reset it.

D. Site:

1. General setting and orientation: The lighthouse sits at the tip of Cape Hatteras, an elbow-like projection to the southern end of the Outer Banks peninsula. West of the peninsula is the Pamlico Sound beyond which is mainland North Carolina. To the east is the vast Atlantic Ocean where lies the dangerous Diamond Shoals which make the lighthouse necessary. The entry faces north, though the light rotates a full 360 degrees, thus facing all directions. When erected in 1870, the tower stood 1,500 feet from the shore. Due to erosion, the tower now sits dangerously close to the shore, raising questions as to ways to move, or otherwise save, the lighthouse. A short wall once encircled the lighthouse. Due to the shifting sand, only the top of this wall is now visible. A wooden fence encircles the lighthouse in the same location.

2. Historical setting and orientation: The original lighthouse, constructed in 1803, sat just south of the

current lighthouse. According to an 1869 account, "The site selected bears north-by-east 600 feet distant from the old tower, and is therefore as near it as it well could be" (National Archives, Clippings file, RG 26, Box 10). The foundations of the original tower were once visible but have since eroded into the ocean. Much of the beach that was here at the time that both the original tower and the current 1870 tower were built has also eroded away, despite the belief at the time the new tower was built that the new site would resolve this problem. According to the 1869 account of the site, "It is on the general level of the beach, and therefore is secure from the destructive action of the wind, which has always so seriously threatened the foundations of the old tower.... The site is also above the highest level of the sea, and so far removed from the water line as to render it safe from encroachments of the sea" (Ibid.).

3. Outbuildings: Located just north of the lighthouse, along the edge of the fence line, is the oil house. This small brick structure was built in 1890 to store cans of oil used as fuel for the light. It is rectangularly shaped with a gable front roof. There is a doorway on the west facing elevation and window openings to either side (boarded over on the south side and ventilated on the north). Also on the site are two keepers dwellings (see NC-357-A and NC-357-B). A number of storage and other outbuildings were once located on this site as well. Automation of the light which meant that oil, keepers, etc. were no longer needed, made these buildings obsolete and they have since been removed.

PART III. SOURCES OF INFORMATION

A. Original Architectural Drawings: The original drawings executed by the Light-House Board still exist, and are located at the National Archives, Washington, D.C. They consist of 18 "plates" or sheets (plate 13 is missing however), showing the elevation, sectional, foundation and plinth, stairway, landings, windows and doors, the lantern, iron work and extensive details (see Field Records for copy). The plates were executed by J. Bien, Lithographer of New York.

B. Annotated Bibliography:

1. Primary and unpublished sources:

Cape Hatteras Lighthouse. "Clippings File, Cape Hatteras Lighthouse," National Archives, RG 26. File

includes abstracts form the annual reports of the Lighthouse Board, misc. letters regarding the construction of the foundation, newspaper article, draft of an unsigned, undated history, request for proposals for the original lighthouse (with specifications) and a type written copy of "History of Cape Hatteras Light Station, N.C.," by Eldrige, ca. 1950.

Hatch, Charles E., Jr. and J. Fred Roush. "Cape Hatteras National Seashore, North Carolina; Historical Management Plan. Washington, D.C.: National Park Service, Department of the Interior, Division of History, Office of Archeology and Historic Preservation, June 1968. This report discusses the main historical themes, and a statement of historical significance for the lighthouse, providing historical context.

Light-House Board. Annual Report of the Light-House Board, 1868 Washington, D.C.: Government Printing Office, 1868. The Annual Reports of the Light-House Board (available at the National Archives) came out every year, beginning with its conception in 1852. 1868 is the first year that the current lighthouse is discussed, in terms of planning and appropriations. Other important years include: 1869 discussing site, construction progress (foundation, etc), 1870 discussing brick work and progress, 1871- progress, brick keepers dwelling, 1873- black & white spiral paint job, 1876, 1880 & 1881- repairs, 1887- oil house, 1888 & 1892- repairs and changes to keeper's dwellings.

_____. "Index to Light-House Board Correspondence, Cape Hatteras, National Archives, RG 26, NNRC 13E. An index to the correspondence between the Lighthouse Board and anyone having business with them regarding the light, including the keepers, district engineers and superintendent, contractors, etc. The individual slips for each letter gives date, writer, and a statement of the business discussed. Many of the actual records were lost. However, much can be learned from the index alone. The index for the Hatteras Lighthouse covers the years 1853-1897.

Machemehl, Jerry L. and MTMA Design Group. "Cape Hatteras Lighthouse; Study and Report prepared for the National Park Service, U.S. Department of the

Interior, Denver Service Center, December 1980. Basically a technical report of the efforts to stabilize both the lighthouse and the surround shoreline, with a brief historical background.

National Park Service, Hatteras National Seashore (Headquarters, Manteo, North Carolina). "Building Records- Cape Hatteras Light Station." Individual building data forms, records of repairs, 1982-87.

_____. "Cape Hatteras Lighthouse, Restoration Project." A log book of structural analysis and recommendations for the restoration and preservation of the lighthouse.

Tech-Fab, Inc. "Report on Complete Inspection of the Cape Hatteras Lighthouse." Raleigh, N.C.: Tech-Fab, Inc., 24 January 1980. A report on the existing conditions, and the structural systems of the lighthouse, with photographs.

United States Coast Guard. "U.S.C.G. Lighthouse Sites, Bald Head (NC No. 1)- Cape Lookout (NC No. 10),National Archives, RG 26, box #165, file for Cape Hatteras, NC No. 9. This file includes information of the acquisition of the both the lighthouse site and the park property- Hatteras National Seashore. Included are the deeds (going back to 1795), letters, etc. regarding the condemnation proceedings for the park; a "Questionnaire covering Real Estate owned by the United States" describing the lighthouse property, dated October 30, 1929; blueprint drawing, "Cape Hatteras Light Station, Plat of new reservation" approved May 21 1936 by L.M. Hopkins, 5th dist. Superintendent. It compares the focal plane of the lighthouse with the temporary skeletal tower which housed the light from 1936-1950; "Site Lt. House at Cape Hatteras, N.C." a site plan for the original light, dated Nov. 29th 1854.

_____. "Records of the United States Coast Guard, Description of Light Stations, 1876-1938," National Archives RG 26, Box 8. Contains a full description of the Cape Hatteras Light Station, dated June 9, 1927. The description includes the lighthouse- is materials, specifications, characteristics; information regarding the lantern and illuminating apparatus; fog signal; keepers dwellings, etc.

Whitehouse, Frank E. "A field Investigation of Cape Hatteras Lighthouse, Buxton, North Carolina." F.E. Whitehouse, Assoc. Engineer, March 15-18, 1937. A typed report on file at the Park Headquarters office, Manteo discussing the present conditions of the lighthouse, descriptions, and suggestions for the necessary repair work.

2. Primary and unpublished sources, general lighthouse history:

United States Life-Saving Service. Regulations for the Government of the Life-Saving Service of the United States. Washington, D.C.: Government Printing Office, 1899. Information on the management of the service and duties of the various branches such as the Superintendents of Construction, Inspectors, District Superintendents, keepers, etc. (Smithsonian).

United States Light-house Board. Management of Lens Apparatus and Lamps. Washington, D.C.: Government Printing Office, 18??. Descriptions, composition, measurements, etc. of lenses, and lamps, and directions for their use. (Library of Congress).

_____. Specifications for a Double-Dwelling for the Keepers of First Order Lights. Prepared at the Office of the Light-House Board, Treasury Department. Washington, D.C.: Government Printing Office, 1862. Excellent source for knowing how the light-house keepers house should have been constructed and appear when finished. It gives all the specifications for everything from excavation and foundation to door and window frames, plastering, etc. (Smithsonian).

_____. Specifications for a First Order Lighthouse, (BrickTower). Prepared at the Office of the Light-House Board, Treasury Department. Washington, D.C.: Government Printing Office, 1861. Excellent source for determining how the lighthouse was constructed and how it should have looked when completed. It gives all the specifications, from excavation and foundation to interior finish and iron work, including the housing of the light itself (Library of Congress).

United States Light-House Establishment. Instructions to Light-House and Light Vessel Keepers of the United States, 2nd ed. By Authority of the United States Light-House Board. Washington, D.C.: Government Printing Office, 1856. Describes the duties of the light-keeper and directions for executing those duties, including the care of lights and other equipment, use of lard and mineral oils, sirens and fog signals, etc., directions for painting, allowances for provisions, tables of salaries and diagrams of lighting equipment.

_____. Instructions to Keepers. July, 1881.

_____. Instructions to Light-Keepers and Masters of Light-House Vessels. 1902.

3. Secondary and Published Sources- Hatteras Lighthouse:

Committee on Options for Preserving the Cape Hatteras Lighthouse. "Saving Cape Hatteras Lighthouse from the Sea." Washington, D.C.: National Academy Press, 1988. Recommendations for saving the lighthouse, mostly regarding the problems connected with the site and its physical environment. Also includes some historical background.

Holland, Ross, Jr. America's Lighthouses; An Illustrated History. New York: Dover Publication, Inc., 1972. This is a good general history of lighthouses in America. It discusses the history of the administration of lighthouses, the light apparatus, keepers life, etc. It includes a brief section on the hatteras lighthouse, pgs. 112-116 with a photograph. This is a good source for the historical context.

_____. Cape Hatteras Light Station, North Carolina. Washington, D.C.: U.S. Department of the Interior, National Park Service, Office of Archeology and Historic Preservation, 1968. This report is considered the source for the history of the Hatteras Lighthouse. It was conducted as a historic structures report for the NPS and includes a complete history of the lighthouse, and the site, going back to the construction of the original lighthouse that this one replaced. It covers everything from congressional appropriations to repairs, fuel oils to keepers.

_____. Great American Lighthouses. Washington, D.C.: The Preservation Press (Great American Places Series), 1989. Gives a brief overall history of various types of lighthouses, of lights and other aids to navigation, keepers and the administration of lighthouses. The bulk of the book is a region by region survey of lighthouses, including the Hatteras light. This is a good sources for comparing lighthouse types for contextual purposes.

_____. Keepers Dwelling: Cape Hatteras Light Station. Washington, D.C.: U.S. Department of the Interior, National Park Service, Office of Archeology and Historic Preservation, 1 December 1968. This was also a historic structures reports conducted of the NPS. It regards the principal keepers dwelling on site and included historical and architectural data as well as the existing conditions (with photographs and copies of original drawings).

Norcross, Kathy. "The Hatteras Lighthouse Keeper's Son." Mid-Atlantic Country, May 1986, pg. 34- . Recollections of Rany Jennette, son of the last lightkeeper of the Hatteras Lighthouse. It gives insight into the life of a keeper during the early 20th century.

Picketts, Alfred C. "Hatteras the Stormy." Los Angles Times, April 10, 1910, p. 460. The problems in navigation of the area of the Hatteras Lighthouse, and the legends associated with.

Stick, David. The Outer Banks of North Carolina, 1584-1958. Chapel Hill, North Carolina: University of North Carolina Press, 1958. Provides historical context for the area, giving a general history with a brief account of the history of the lighthouse, pgs. 288-291. Discusses the legends, storms and shipwrecks.

Whitehouse, Frank E. "Sentinel of the Atlantic Graveyard." The Regional Review, Vol. III, No. 2, August 1939, pgs. 11-16. This article gives a brief history of the lighthouse and a description of the light apparatus, and discusses the dangers on navigating along the Outer Banks.

4. Secondary and Published Sources- General Lighthouse History:

Alexander, John Henry. Experiments on Mr. Babbage's Method of Distinguishing Light-Houses, Reported to the Committee of the United States Light-House Board. Washington, D.C.: Government Printing Office, 1861. Discusses methods for distinguishing lighthouse lights by means of periodical occulations which allow the ship captain to positively identify lights.

Heap, David P. Ancient and Modern Lighthouses. Boston: Ticknor & Company, 1889. Informative chapter on the "Characteristics of Light Houses" including lighting and lenses, painting of lighthouses, etc. Also a brief history of the U.S. Light House Board.

Hyde, Charles K. The Northern Lights; Lighthouses of the Upper Great Lakes. Lansing, Mich.: Two Peninsula Press, 1986. Although this book does not cover east coast lighthouses, it has a chapter on lighthouse automation and abandonment of lighthouses during the early 20th century.

Johnson, Arnold Burgess. The modern Lighthouse Service. Washington, D.C.: Government Printing Office, 1889. General history of the Light House Service with information on cost and construction of lighthouses, light vessels, buoys and fog signals, light dues, and service personnel and administration.

Kettle, William R., ed. The Lighthouses of the World and Coast Fog Signals. With introductory remarks by Alexander G. Findlay, F.R.G.S., 36th ed. London: Richard Holmes Laurie, Publisher, 1896. Brief history of lighthouses and light vessels with a larger section discussing the various types of lenses and reflector systems. The bulk of the book is a series of graphs listing all the lighthouses of the world, giving basic information such as size, type. etc.

New York Exhibition Illustrated. "The Fresnel Lens of Dia-Catoptric Illuminating Apparatus for Light Houses." New York: 1853. Period discussion of the Fresnel lens which later (after 1853) became the standard lens for American lighthouses.

Stevenson, Thompson. Lighthouse Construction and Illumination. London & New York: E. & F.N. Spon, 1881. Informative book with description and explanations of the use of lenses (Fresnel, Azimuthal condensing system, etc.; distinctive characteristics of lighthouses (variations on the lights, paint, etc.); statistics of lighthouse apparatus, fog signals.

United States Coast Guard. Guide to Historically Famous Lighthouses in the United States, 1789-1939. Washington, D.C.: Government Printing Office, 1939. Overview of the best known lights.

United States Department of Commerce. "The Bureau of Lighthouses" (George R. Putnam, Commissioner). Washington, D.C.: Government Printing Office, 1926. Three page pamphlet discussing the organization of the Bureau and the purpose of lighthouses, lightships and buoys.

United States Lighthouse Service, compiler. Papers on the Comparative Merits of the Catoptric and Dioptric of Catadioptric Systems of Lighthouse Illumination and Other Subjects Relating to Aids to Navigation. Washington, D.C.: Government Printing Office, 1861. Compiled from the British, French and American reports and lighthouse authorities for the use of the U.S. Light-House Establishment Service.

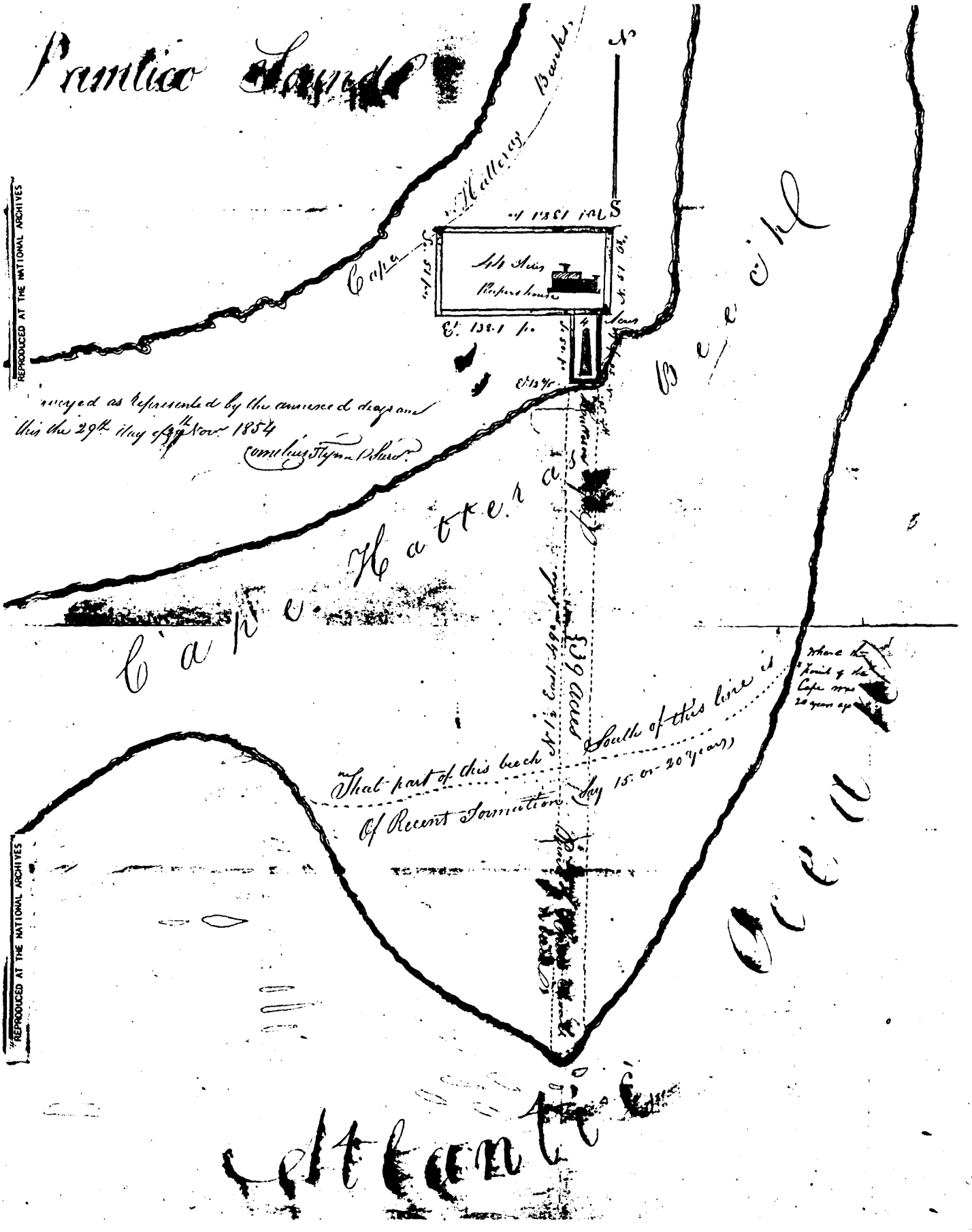
Weiss, George. The Lighthouse Service: Its History, Activities and Organization. Baltimore: The Johns Hopkins Press, 1926. Good reference, gives a historical overview of the lighthouse service and discusses the duties and activities of the service as well as the keepers. Also includes an organizational outline with lists of lighthouse (and ships) in operation in 1926.

Prepared by: Catherine C. Lavoie
Historian
Historic American Buildings Survey
Fall 1989

IV. PROJECT INFORMATION

The documentation of the Hatteras Lighthouse was part of the cooperative project between the Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER), of the National Park Service, Robert J. Kapsch, chief and the Southeast Regional Office of the National Park Service, Cape Hatteras National Seashore. The WASO project leader was Paul Dolinsky, Principal Architect for HABS. Drawings were executed by: Frederick J. Lindstrom, Supervisory Architect HABS; Timothy A. Buehner, Architect HABS; Judith E. Collins, Architectural Technician, Auburn University; and Thomas P. Forde, Jr., Architectural Technician, Virginia Polytechnic Institute and State University. Large format photographs were taken by Jack E. Boucher, HABS Photographer. The historical report and bibliography was prepared by HABS Historian, Catherine C. Lavoie. The project was begun in September of 1989.

Figure #1 Site Plan (1854), Cape Hatteras Lighthouse. National Archives, Maps & Drawings Collections (Pickett Street Annex).



ADDENDUM TO:
CAPE HATTERAS LIGHTHOUSE
Cape Hatteras National Seashore
Point of Cape Hatteras, access road from Route 12
Buxton
Dare County
North Carolina

HABS NC-357
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1849 C Street NW
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