National Park Service
Department of the Interior

Cape Hatteras National Seashore
Manteo, NC

Hatteras Light Station
Principal Keeper's Quarters

Historic Structure Report





The historic structure report presented here exists in two formats. A traditional, printed version is available for study at Cape Hatteras National Seashore, the Southeast Regional Office of the NPS, Denver Service Center of the NPS, and at a variety of other repositories. For more widespread access, the historic structure report also exists in a web-based format through ParkNet, the website of the National Park Service. Please visit www.nps.gov for more information.

Cape Hatteras National Seashore

Hatteras Light Station

Principal Keeper's Quarters

Historic Structure Report

December 2017

for

Cape Hatteras National Seashore
Manteo, NC

by

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Cape Hatteras National Seashore

Hatteras Light Station

Principal Keeper's Quarters

Historic Structure Report

Approved: _____ 2/16/18
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Recommended: Kathleen M. Bond 3/19/2018
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Recommended: _____ 3/20/2018
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Executive Summary

This Historic Structure Report (HSR) was produced for the Cape Hatteras National Seashore and the Southeast Regional Office to determine the best treatment and use for the Hatteras Light Station Principal Keeper's Quarters. Use of the building is preferred as per National Park Service policies and guidelines for Cultural Resource Management and Executive Order No. 130006: *Locating Federal Facilities on Historic Properties*. This HSR will guide future rehabilitation and repair work on the building.

The project was conducted under a project agreement between the Historic Preservation Training Center (HPTC) and Cape Hatteras National Seashore (CAHA) entitled: "Prepare an HSR for Cape Hatteras Light Station" (PMIS #157627B). Funding was allocated through the Southeast Regional Office (SERO); project management was also done through SERO. HPTC, CAHA, and SERO are units of the National Park Service (NPS), U.S. Department of the Interior. NPS policies and guidelines were adhered to in the production and distribution of this HSR.

A Historic Structure Report is the primary guide to treatment and use of a historic building. It is prepared to identify and minimize the loss of character-defining features and materials and provides a basis upon which to address anticipated management objectives. This HSR aims to provide a current understanding of the historic Hatteras Light Station Principal Keeper's Quarters and meet the following goals: provide a historical background and context for the building; supply a current physical description and timeline for changes to the building; identify character-defining features for the building; document the condition of the building; and provide treatment recommendations for the proposed use of the building (see pp. 197-199 for Hatteras Light Station Principal Keeper's Quarters Prioritized Treatment List).

The historical background, context, building chronology, and technical evaluations provide an understanding of the historical integrity of the building. This information is valuable for guiding sustainable development of the Hatteras Light Station Principal Keeper's Quarters by offering research and insight to park management. The contents are used by the park when scoping new projects. These new projects contain parameters for re-use functions and physical modifications that complement resource protection and preservation goals. This HSR informs management and directs planning and construction alternatives.

Research Conducted to Produce HSR

The following activities were conducted to gain a thorough understanding of the Hatteras Light Station Principal Keeper's Quarters at Cape Hatteras National Seashore:

- Primary and secondary historic research into the sequence of changes and evolution of construction by the NPS:
    - Harpers Ferry Center Willow Springs, Charles Town, WV
    - Denver Service Center, Technical Information Center (eTIC), Denver, CO

    - Cape Hatteras National Seashore, Manteo, NC
- Architectural documentation by HABS
- Condition assessments by HPTC
- Recommended treatments by HPTC

Condition Assessment Summary

After HPTC's visit and assessment of the Principal Keeper's Quarters, investigation reveals modest maintenance deficiencies, resulting in an overall condition assessment rating of good.

It should be noted that this is a high-quality and historically significant building that cannot be replicated in today's economic environment. The maintenance deficiencies described herein, while needing to be addressed, are superficial and in no way signify justification for any treatment other than full restoration of the building and continued use. Reversal of recent out-of-character modifications is easily incorporated into any design or planning work and represents a return to the sustainable management of this historic structure.

The exterior and interior retain a high level of historic integrity dating to and/or sympathetic to the original date of construction and the period of significance for this HSR (1871-1936). Since the end of the period of significance, major changes to the original features include:

- Removal of exterior associated buildings, fences, and gates
- 1985-87 preservation work which "restored" the interior to the 1927-1936 timeframe
- Removal of shutters (between 1995-1999)
- Relocation of the building to its current location (1999)
- Installation of exterior ramped walkways (ca. 2000)
- Installation of HVAC and associated closets on the interior (ca. 2000)
- Installation of sprinkler system, fire alarm system, and security alarm system on the interior (ca. 2000)

Overall the Hatteras Light Station Principal Keeper's Quarters is in **good** condition, with a maintenance deficiency rating of **minor**, from the standpoint of NPS facility management programs (FMSS) and standards (with some features in "fair" and "poor" condition and "serious" and "critical" deficiencies).

The results of these investigations at the Principal Keeper's Quarters provide a more fully integrated narrative of developmental history of the extant building, including changes made over the years by former owners and the NPS. It also will educate users of the building about the integrity of the historic fabric and the character-defining features so that it may be uncovered, interpreted, and preserved for future generations.

Recommendations for Treatment and Use Summary

The recommended ultimate treatments and use for the Hatteras Light Station Principal Keeper's Quarters, as determined through research for this HSR, are as follows:

- *Exterior Restoration* with the removal of non-sympathetic modern accretions and retention, preservation and restoration of character-defining features and associated buildings important to the historic design and construction of the dwelling by the United States government in 1871, and alterations which occurred to the dwelling and associated buildings through 1936.
- *Interior Rehabilitation* and preservation of character-defining features with removal of non-sympathetic modern accretions to reflect its original function. This treatment will preserve character-defining features and allow for the reversal of non-sympathetic treatments, materials, and finishes.

The treatment and use recommendations provided are meant to guide the final scope and description of the funded project and do not provide a construction or architectural program.

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Administrative Data

Project Identification

PMIS Number:	157627B
Project Title:	Prepare an HSR for Cape Hatteras Light Station
Project Location:	Cape Hatteras National Seashore, Manteo, NC

Name and Location Data

Preferred Structure Name:		Hatteras Light Station Principal Keeper's Quarters
Other Structure Name:		Building 327
Structure Number:		HS-4D
LCS ID:		000112
Park:		Cape Hatteras National Seashore
Park District:		Cape Hatteras Light Station
Structure's County:		Dare
Structure's State:		North Carolina
NPS Region:		Southeast
Cluster:		Atlantic Coast
Administrative Unit:		Cape Hatteras National Seashore
GPS:	Longitude:	-75.5293036789506
	Latitude:	35.2530861353564

Related Studies

Denver Service Center, National Park Service. "Relocate the Cape Hatteras Light Station." *Design Development Drawings*. October 1, 1998. NPS DSC eTIC No. CAHA 603 25006.

Denver Service Center, National Park Service. "Relocate the Cape Hatteras Light Station." *Final Construction Drawings*. October 1, 1998. NPS DSC eTIC No. CAHA 603 25006A.

Denver Service Center, National Park Service. "Relocate the Cape Hatteras Light Station." *Project Record Drawings*. December 23, 1999. NPS DSC eTIC No. CAHA 603 25006B.

Historic American Building Survey, National Park Service. "Cape Hatteras Lighthouse, Principal Keeper's Dwelling, Point of Cape Hatteras, Access Road from Route 12, Buxton, Dare County, NC." *Photos from Survey HABS NC-357-B*. 1989. Accessed at https://www.loc.gov/item/nc0477/ on June 1, 2016.

Holland, Jr., F. Ross. "A History of the Cape Hatteras Light Station, Cape Hatteras National Seashore, N. Car." Division of History, Office of Archeology and Historic Preservation, National Park Service, U.S., Department of the Interior. September 30, 1968. NPS DSC eTIC No. CAHA 603 D22.

Hurelle, Gary (Job Captain). "Design Analysis: Lightstation Move – Phase II, Historic District Contact Station & Site Development, Cape Hatteras National Seashore." May 1998, Rev. June 1998, Rev. August 1998. NPS DSC eTIC No. CAHA 603 D145.

International Chimney Corporation. "Supplemental Technical and Price Proposal: Final Proposal – Design and Construction (Design/Build) Contract to Relocate Cape Hatteras Light Station, Cape Hatteras National Seashore, Dare County, North Carolina, package CAHA 175/Request for Proposal." May 29, 1998. NPS DSC eTIC No. CAHA 603 D156.

National Park Service. "Cape Hatteras Light Station Cultural Landscape Report." Southeast Region. Cultural Resources. 2003. NPS DSC eTIC No. CAHA 603 D214.

National Park Service. "History of the Establishment of Cape Hatteras National Seashore Recreational Area." July 13, 1961. NPS DSC eTIC No. CAHA 603 D136.

National Park Service. "The Creation and Establishment of Cape Hatteras National Seashore." 2007, NPS DSC eTIC No. CAHA 603 D233.

Cultural Resource Data

National Register of Historic Places

National Register Status: Entered – Documented
National Register Date: March 29, 1978
National Historic Landmark? Yes
National Historic Landmark Date: August 5, 1998
Significance: The Hatteras Light Station is significant at the national level under NR Criteria A and C. The station represents the operations and architecture of the U.S. Lighthouse Service on the Outer Banks of North Carolina.
NR Information System No.: 78000266

Period of Significance

The period of significance for the Cape Hatteras Light Station National Historic Landmark District, of which the Principal Keeper's Quarters is considered contributing, is 1870, the year the current lighthouse was lit, to 1936, the year the lighthouse was deactivated by the U.S. Coast Guard and the year it was acquired by the National Park Service. However, because the Principal Keeper's Quarters was not completed until 1871, the period of its significance for the purposes of this HSR will be 1871-1936.

Recommended Treatment & Use

The recommended treatment for the Hatteras Light Station Principal Keeper's Quarters is exterior restoration and interior rehabilitation. The recommended use is to continue as office space for park staff.

Recommendations for Cataloguing & Storage of Materials Generated by HSR

All project materials will be turned over from HPTC to the Cape Hatteras National Seashore's Museum Resource Center. Electronic files and media will be transferred via the NPS ftp network site and through archival CDs mailed to DSC. Copies of materials will also be submitted to the Southeast Regional Office.

Abbreviations (alphabetical)

BFML	Building Feature Master List
CAHA	Cape Hatteras National Seashore
CCC	Civilian Conservation Corps
CDF	character-defining feature
DKQ	Double Keepers' Quarters
DSC	Denver Service Center
FMSS	Facility Management Software System
GMP	General Management Plan
HABS	Historic American Building Survey
HPTC	Historic Preservation Training Center
HSR	Historic Structure Report
ICC	International Chimney Corporation
NPS	National Park Service
PFMD	Park Facility Management Division
PKQ	Principal Keeper's Quarters
RFP	Request for Proposal
SERO	Southeast Regional Office
SHPO	State Historic Preservation Office
TIC	Technical Information Center
USCG	United States Coast Guard
USLHB	United States Light-House Board
USLHE	United States Light House Establishment
USLHS	United States Light House Service

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Part 1 | Developmental History

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Historical Background and Context

A Keeper's Job

Under the United States Light House Establishment, 1797-1852

A keeper's ultimate task was to maintain a good light a mariner could see and, if applicable, a fog signal a mariner could hear. During the earliest years of the United States Light House Establishment (USLHE), a spider lamp required "keeping the oil reservoirs full, the wicks lighted, and the panes of the lantern freed of the smoke that inevitably resulted from such primitive lamps." After the introduction of Winslow Lewis' Argand-style lamp and parabolic reflectors, duties likely increased, to include tending a dozen or more lamps and keeping the reflectors clean—not an easy task with shortened chimneys that rapidly blackened the reflectors. An in-depth inspection of the system in 1838 determined that "poorly kept lights apparently outnumbered good ones." The reasons for so many poorly kept lights are conjectured to include the type of lighting system used at the time, the lack of instruction to keepers at the time, and as political appointees, the quality of keepers left much to be desired. It is unknown exactly how keepers were trained during this time period, as very little formal instruction was provided; it is likely that instructions came word of mouth from outgoing keepers, the Collectors of Customs, or even from oil supply ships.[1]

Under the USLHE, lighthouse keepers were assigned via appointment, sometimes politically, not through the civil service system. Which political party a person backed mattered more than their competence for the job at hand. At Cape Hatteras, the first keeper, Adam Gaskins, a local state legislator, was initially recommended for the position by a local congressman in 1794—ten years before the lighthouse would be completed. When the lighthouse was nearing completion, Gaskins was still the lead candidate, "over another nominee of more education who wanted to open a school in the vicinity of the cape."[2] Gaskins began his keepership on December 29, 1802 at a rate of $333 per year[3] (equivalent to approximately $7,400 in 2016[4]).

This salary rate was average for a keeper at that time; most ranged between $200 and $350 per year. This varied based on a number of factors including the light station's location and the amount of work required at that station to maintain the light. Complaints by keepers were numerous, particularly regarding low pay, rare raises, the inability to support a family on their salary, etc. The federal government countered that keepers received free lodging and could supplement their income in other ways, e.g. working an additional job, gardening, and fishing. Despite the complaints, competition for nomination as a keeper was stiff.[5]

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[1] Holland, Jr., Francis Ross. "America's Lighthouses: An Illustrated History." New York: Dover Publications, Inc., 1972, pp. 43-44.
[2] Holland, Jr., "America's Lighthouses," p. 39.
[3] Cape Hatteras National Seashore. "The Keepers of Cape Hatteras Light." n.d. Accessed at https://www.nps.gov/caha/learn/historyculture/upload/KEEPERS%20chronological.pdf on September 27, 2016.
[4] DaveManuel.com. "Inflation Calculator." 2016. Accessed at http://www.davemanuel.com/inflation-calculator.php on September 27, 2016. Note: all inflation calculations in this document were completed through this website.
[5] Dolin, Eric Jay. "Brilliant Beacons: A History of the American Lighthouse." New York: Liveright Publishing Corporation, 2016. pp. 63-4.

In 1816, Winslow Lewis, a jack-of-all-trades government contractor, surveyed all of the extant light stations at that time to determine an accurate keeper's salary at each. His results varied from $250 to $500 per year ($4,237 to $8,474 in 2016). At Cape Hatteras, he recommended the annual salary of $400 ($6,780 in 2016) be kept in place and provided the following justification: "No wood on the public land & the garden nearly covered with sand which makes its situation similar to Cape Look Out." The justification for Cape Lookout reads: "Situated on the extremity of the Cape eight miles from the main land, no land which can be cultivated, no wood nearer than three miles, the salary for keeping the light I think ought to be put on the same footing as all the Southern Light Houses 400 Dollars."[6]

Usurpation of a keeper was also common initially. A story from Cape Hatteras from 1816-17 details a group of people trying to replace the resident keeper there:

> The most articulate [one of the group] wrote the secretary of the treasury complaining of the light, saying that it was burning bright and clear at the beginning of the night but was permitted to go out after a few hours. He implied further that the keeper was in collusion with wreckers on the Outer Banks. Moreover, he continued, the keeper was a vendue master (i.e., he conducted auctions of the goods of wrecked vessels), thus benefiting from the tragedy of shipwreck. The letter writer's motives had a false ring, since at the same time he questioned the integrity of the Cape Hatteras keeper, he was urging the appointment of a fellow townsman as keeper of the Cape Hatteras light.[7]

Fifth Auditor Stephen Pleasonton, in charge of the USLHE issued the first *Instructions to the Keepers of Light Houses within the United States* on April 23, 1835. The instructions were short and included nine bullet points.[8] See fig. 1.

Under the United States Light-House Board, 1852-1910

The 1851 *Act Making Appropriations for Light House, Light Boats, Buoys, &c* appointed a board to study every aspect of the troubled USLHE.[9] The resulting 760-page report "found the interest and ability of keepers 'was very various' and advocated testing keepers prior to their selection." A year later, when the United States Light-House Board (USLHB) assumed control of the system, the

INSTRUCTIONS TO THE KEEPERS OF LIGHT HOUSES WITHIN THE UNITED STATES

1. You are to light the lamps every evening at sun-setting, and keep them continually burning, bright and clear, till sun-rising.

2. You are to be careful that the lamps, reflectors, and lanterns, are constantly kept clean, and in order; and particularly to be careful that no lamps, wood, or candles, be left burning any where as to endanger fire.

3. In order to maintain the greatest degree of light during the night, the wicks are to be trimmed every four hours, taking care that they are exactly even on the top.

4. You are to keep an exact amount of the quantity of oil received from time to time; the number of gallons, quarts, gills, &c., consumed each night; and deliver a copy of the same to the Superintendent every three months, ending 31 March, 30 June, 30 September, and 31 December, in each year; with an account of the quantity on hand at the time.

5. You are not to sell, or permit to be sold, any spirituous liquors on the premises of the United States; but will treat with civility and attention, such strangers as may visit the Light-house under your charge, and may conduct themselves in an orderly manner.

6. You will receive no tube-glasses, wicks, or any other article which the contractors, Messrs. Morgan & Co., at New Bedford, are bound to supply, which shall not be of suitable kind; and if the oil they supply, should, on trial, prove bad, you will immediately acquaint the Superintendent therewith, in order that he may exact from them a compliance with this contract.

7. Should the contractors omit to supply the quantity of oil, wicks, tube-glasses, or other articles necessary to keep the lights in continual operation, you will give the Superintendent timely notice thereof, that he may inform the contractors and direct them to forward the requisite supplies.

8. You will not absent yourself from the Light-house at any time, without first obtaining the consent of the Superintendent, unless the occasion be so sudden and urgent as not to admit of an application to that officer; in which case, by leaving a suitable substitute, you may be absent for twenty-four hours.

9. All your communications intended for this office, must be transmitted through the Superintendent, through whom the proper answer will be returned.

Fifth Auditor and Acting Commissioner of the Revenue

TREASURY DEPARTMENT
Fifth Auditor's Office
April 23d, 1835

Figure 1. The first instructions for keepers were distributed in 1835. Photo: http://uslhs.org/1835-instructions-keepers.

[6] Lewis, Winslow. "Light House Keeper's Salary." 1816. Accessed at http://uslhs.org/1816-winslow-lewis-lighthouse-keeper-salaries on September 26, 2016.
[7] Holland, Jr., "America's Lighthouses," p. 40.
[8] "Instruction to the Keepers of Light Houses within the United States." Accessed at http://uslhs.org/1835-instructions-keepers on September 26, 2016.
[9] Cybularz, Rebecca (NPS HPTC). "Cape Hatteras Lighthouse." *Historic Structure Report.* 2016. p. 29.

Board "did all it could do to minimize the effect of politics on appointment of keepers."[10] This included "requiring prospective keepers to meet certain standards, placing keepers on probation for three months, and at the end of that period testing their skills and firing those who didn't pass. [They also stripped]… custom collectors of their power to nominate keepers, transferring the task instead to lighthouse inspectors."[11]

A major goal of the USLHB was to have men make a career of being a keeper, rising from lesser positions to that of head keeper.[12] This happened several times at Cape Hatteras from the 1870s to the early 1900s.[13]

Another way the Board assumed control was by issuing a new and more in-depth *Instructions for Light-Keepers of the United States* in 1852. This described when to light (sunset) and extinguish (sunrise) the lamps, when and how to clean the lighting apparatus, when and how to clean the lantern room, instructions on noting weather conditions and shipwrecks, and updating the station's store book, among other things. Of interesting note, the use and presence of alcohol at the light stations was especially frowned upon:

> The light keepers are required to be sober and industrious, and orderly in their families. They are expected to be polite to strangers, in showing the premises at such hours as do not interfere with the proper duties of their office; it being expressly understood that strangers shall not be admitted to the light-room after sunset. … The light-keepers must not, on any pretext, admit persons in a state of intoxication into the light-house.

Additionally, it was noted that the "principal light-keeper is prohibited from selling any malt or spirituous liquors, and from allowing any to be sold on the premises under his charge."[14]

A.W. Simpson, the third assistant keeper at Cape Hatteras from 1894-99, has been interpreted as one who liked to imbibe, which got him in trouble from time to time. The following saga unfolds at the time of his second nomination to the light station:

> …D. McD. Lindsey wrote the Lighthouse Board protesting his appointment, saying that Simpson was a thief, a common drunk, and a notorious liar. He stated that Simpson had been a watchman at the War Department in Washington and while there had been arrested a number of times for drunkenness. Once he stole his roommate's pants and sold them to buy whiskey. Simpson undoubtedly was appointed, Linsey [sic] went on, because of the efforts of the principal keeper who was related to Simpson. The District Inspector was instructed to investigate the charges, but his findings have not survived. Whatever they were and whatever the action of the Board, Simpson was not dismissed , for three years later the board received another letter, this time from an Alexander Hunter. Hunter charged Simpson with engaging in politics despite the rules and regulations against such activity, with being 'indecently drunk' in uniform in Manteo, North Carolina, and 'with being a felon, thief, and man of vile habits, and unfit to serve the government of the United States.' Hunter followed this letter up a few days later with one stating that Simpson had also been seen in the streets of Elizabeth City drunk. Again the District Inspector was instructed to investigate and again the results of his investigation have not

[10] Holland, Jr., "America's Lighthouses," p. 40.
[11] Dolin, Eric Jay. "Brilliant Beacons: A History of the American Lighthouse." New York: Liveright Publishing Corporation, 2016. pp. 208-9.
[12] Holland, Jr., "America's Lighthouses," p. 103.
[13] Cape Hatteras National Seashore. "The Keepers of Cape Hatteras Light."
[14] United States Light-House Board. "Instructions for Light-Keepers of the United States." 1852. Accessed at http://uslhs.org/1852-instructions-light-keepers on September 26, 2016.

survived but the records of keepers show that Simpson continued on duty until 1899 when he was transferred to another station.[15]

Around this same time the USLHB began training its keepers and made literacy a job requirement so that keepers could accurately fill out their required reports and read the numerous instructions circulated to them.[16] Some of the publications the Board circulated included: *Lighthouse Establishment Instructions*; *Instructions and Directions for the Management of Lenses, Lights, and Beacons*; *List of Illuminating Apparatuses, Fixtures, Implements, and Supplies in general use in the U.S. Lighthouses, Lighted Beacons and Light-Vessels…*; *Instructions and Directions to Guide Lighthouse Keepers and others Belonging to the Lighthouse Establishment*; and *Management of Lens Apparatus and Lamps.* Annually, keepers also received an updated *Light List.*[17]

The number of keepers present at a light station increased during the Board's oversight. The number coincided with how large the lenses were. The head keeper was in charge and the assistants ranked in descending order depending on their time in service and experience.[18]

For example, Cape Hatteras had only a principal keeper for its first fifty years; in 1854, two years after the Board's establishment, three keepers—a principal keeper and two assistants—were assigned to the station (also coincides with raising the height of the tower and installation of the Fresnel lens). A third assistant would later be assigned (1878) to the light station to man a smaller, accompanying beacon there.[19]



Figure 2. Principal Keeper Unaka Jennette cleaning the lens' glass prisms in 1933, though he is not wearing his required apron. Photo: Cape Hatteras National Seashore Archives.

At light stations with two or more keepers, work was divided between two "departments." The keeper performing the duties of the first department "had to clean and polish the lens [fig. 2], clean and fill the lamp, dust the framework of the apparatus, trim carefully the wicks of the lens lamp, and, if required, put new ones in, and see that everything connected with the apparatus and lamp in general was perfectly clean and the lamp ready for lighting in the evening." The keeper performing the duties of the second department "had to clean the copper and brass fixtures of the apparatus as well as the utensils used in the lantern and watchroom; clean the

[15] Holland, Jr., F. Ross. "A History of the Cape Hatteras Light Station, Cape Hatteras National Seashore, N. Car." Division of History, Office of Archeology and Historic Preservation, National Park Service, U.S. Department of the Interior. September 30, 1968. pp. 108-109.
[16] Dolin, "Brilliant Beacons," pp. 133-4.
[17] Holland, Jr., "America's Lighthouses," pp. 44-45.
[18] Dolin, "Brilliant Beacons," p. 232.
[19] Cape Hatteras National Seashore. "The Keepers of Cape Hatteras Light."

walls, floors, and balconies, or galleries, of the lantern; and sweep and dust the tower stairways, landing, floors, windows, window recesses, and passageways from the lantern to the oil storage area."[20] All of these tasks were to be completed between sunrise and 10am, so that the lighthouse would be ready for lighting at sunset. At night, "watches were established, usually of four to six hours, when the keeper on duty would stay awake in the watch room below the lantern room, and tend the light as necessary." If only one keeper was assigned to a station, the keeper was required to check on the light at least twice between 8pm and sunrise.[21] Sleeping on the job was not tolerated. At Cape Hatteras in the 1880s, the second assistant keeper was found asleep by the head keeper; the assistant was dismissed.[22]

In addition to the tasks at the lighthouse and tending the lights, the keepers were also responsible for many other duties, including repairing the lighthouse boats, replacing broken glass, repairing and repainting all lighthouse buildings, and completing reports. Larger construction jobs were completed by working parties from the district office (fig. 3).[23]

In 1871 and 1881, new "Instructions" were issued. These sets were far more detailed than any of the previous iterations and further explained the daily, monthly, quarterly, annual, and other reports the keepers had to write, the different operating instructions for the numerous lighting apparatuses, and various other day-to-day tasks.[24]

In 1884 the Board required all lighthouse keepers to wear a uniform (fig. 4). The dress uniform consisted of "coat, vest, trousers, and cap, all of 'suitable dark indigo-blue jersey or flannel.' A double row of five yellow metal buttons ran down the front of the double-breasted coat and a yellow metal lighthouse badge perched on the cap just above the visor. There was an optional canvas helmet for warm weather."[25] When cleaning the lens, they were to wear an apron. When working outside, they were allowed to exchange the dress uniform for a brown working suit.[26]



Figure 3. The working party which built the addition to the Principal Keeper's Quarters in 1927. Principal Keeper Unaka Jennette is located in the front row, third from left. Photo: Cape Hatteras National Seashore Archives. Cropped by author.



Figure 4. First Assistant Keeper John Quidley in his USLHB uniform. Quidley was stationed at Cape Hatteras between October 1909 and March 1911. Photo: Cape Hatteras National Seashore Archives.

[20] Holland, Jr., "America's Lighthouses," p. 45.
[21] Dolin, "Brilliant Beacons," p. 235.
[22] Holland, Jr., "America's Lighthouses," p. 46.
[23] Dolin, "Brilliant Beacons," p. 238.

The Board also set up a twice yearly (at least) inspection of each light station. The inspections were intended to be unannounced, but the keepers were seldom completely surprised. "As the tender with the inspector on board approached the lighthouse, it would raise the inspector's ensign and sound the ship's horn to alert the keepers to his impending arrival, giving them enough time to quickly don their uniforms and put things in their proper place." The inspector scrutinized everything, including cleanliness and orderliness of the light station, review of the keeper's logbooks and other records, and inspection of the lantern room, lighting apparatus, storage areas, and even the living quarters.[27]

Despite the momentous efforts of the Board to rid the service of nepotism and make it a professional organization, keepers' positions were not included in the two Civil Service Reform Acts in 1871 and 1883. It was not until Grover Cleveland's executive order on May 1896 that keepers would finally be included in the classified civil service.[28] Applicants were now required to be qualified for the job and pass written and oral exams; political affiliation was not considered in any way. Further, once hired, the new employee was required to complete a six-month probationary period.[29]

Under the United States Lighthouse Service, 1910-1939

In 1910, the Light-House Board was replaced by the United States Light House Service (USLHS) under the direction of George R. Putnam.[30]

Putnam believed that the keepers were the backbone of the Service and believed that they deserved rights not previously privy to them, despite their employment with the federal government, like a pension. Lighthouse keepers were not eligible for pensions because there was no retirement system. Without a pension, most elderly lighthouse keepers were financially unable to retire. Those who still worked were becoming too feeble to properly perform the job. It took Putnam eight years to lobby Congress and on June 20, 1918, "President Woodrow Wilson signed legislation enabling keepers to retire after thirty years of service at age sixty-five, and to collect a generous pension (the mandatory retirement age was seventy). Soon after, not unpredictably, a large number of keepers who had been hoping that this day would arrive cheerfully submitted their resignations."[31]

Similarly, Putnam also fought to provide disability benefits to keepers and survivors benefits to families of keepers who died while on duty. He also rallied for increased salary. In 1867 the average salary was raised to $600 ($9,667 in 2016), where it stayed for fifty years! "Putnam believed keepers should be paid more, not only to benefit those already in the service but also to ensure that salaries remained competitive enough to hire competent people." In 1918, Congress raised the average

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[24] United States Light-House Board. "United States Light-House Establishment, Instructions and Directions to Light Keepers." 1871. Washington: Government Printing Office. Accessed at http://uslhs.org/1871-instructions-light-keepers on September 26, 2016. United States Light-House Board. "United States Light-House Establishment, Instructions to Light-Keepers." July 1881. Washington: Government Printing Office. Accessed at http://uslhs.org/1881-instructions-lightkeepers on September 26, 2016.
[25] Holland, Jr. "America's Lighthouses," p. 41.
[26] Dolin, "Brilliant Beacons," p. 206.
[27] Dolin, "Brilliant Beacons," p. 248.
[28] Holland, Jr. "America's Lighthouses," p. 40.
[29] Dolin, "Brilliant Beacons," pp. 209-10.
[30] Cybularz, HSR, p. 34.
[31] Dolin, "Brilliant Beacons," p. 223-4.

salary to $840 ($13,333 in 2016). By the early 1930s, keepers' salaries ranged from $1,080 to $2,100 ($18,947 to $36,842 in 2016).[32]

Under the United States Coast Guard, 1939 and on

The United States Coast Guard (USCG) gained control of the lighthouse service on July 1, 1939, "paradoxically, just as they were preparing to celebrate the service's illustrious [150-year] history." Some keepers resigned due to the shift. Others had to decide between retaining their civilian status or converting to the military hierarchy of the Coast Guard; about fifty percent chose the former and fifty percent chose the latter, becoming chief or first-class petty officers. Grumblings did occur, but the transition was smooth. Eventually, as older keepers did retire, they were replaced by USCG "servicemen who were usually stationed at lighthouses for relatively short stints, often just a couple of years.... Thus, slowly over time, temporary keepers replaced those who had chosen to make a career of lighthouse work."[33]

A Note on Diversity

African Americans and American Indians were sometimes employed in the early days of the USLHE. However several historians note that the Establishment was mostly Caucasian. At Cape Hatteras, a keeper was removed from his position because he had used a slave to tend the lighthouse there. After the Civil War, the USLHB did, from time to time, appoint African Americans into service, but this was infrequent.[34]

Women were more frequently employed as lighthouse keepers. Women often began as assistant keepers at lighthouses where their husbands or fathers were head keepers. If her husband or father died while still a keeper, the female assistant was sometimes promoted to fill the place of the deceased.[35] An estimated 240 women officially served as assistant keepers and 140 became principal keepers. All were typically paid the same as their male counterparts.[36] Records indicate that no female keepers, of any rank, were stationed at Cape Hatteras.

The Personal Life of a Keeper and His Family

Keeping a lighthouse is often thought of as isolated, lonely, and monotonous. However the families stationed at light stations made the best of the world in which they lived.

The education of children was particularly important. In isolated areas, keepers made their own accommodations for the education of their children. Some transferred to different stations when their kids were old enough for school, some boarded their children in a nearby town with a school, some trekked their children back and forth to school every day, and some hired tutors to spend time with their children periodically throughout the year. In locations with a town/school nearby,

[32] Dolin, "Brilliant Beacons," pp. 224-226.
[33] Dolin, "Brilliant Beacons," p. 385.
[34] Holland, Jr. "America's Lighthouses," p. 41.
[35] Holland, Jr. "America's Lighthouses," pp. 41-42.
[36] Dolin, "Brilliant Beacons," p. 266.

children more easily obtained their education.[37] Rany Jennette, son of Unaka Jennette, the last principal keeper at Cape Hatteras, remembers attending school in nearby Buxton:

> Sometimes we would have to walk to school along the sandy trails, about two miles. Most of the time, however, someone from the lighthouse or the Life Saving Station would give us a ride. After school, we knew it was going to be a long walk back home. Sometimes a car would pass, winding its way along the soft, sandy car track and we could hitch a ride on the running board. No one seemed to mind, as this was a favorite means of transportation for the young boys and girls. There was no lunchroom so lunches were packed and carried to school, usually in brown paper bags. … C.P. Gray was also the school principal and served in this capacity for many years. He was a well educated [sic] and intelligent man who has not had an equal to this day in any Dare County School. Stern but fair, with complete control over students and teachers, he knew how to handle a switch in the most effective way.
>
> At recess, morning and afternoon, we played baseball, shot marbles, and played a very simple game of basketball, with an old hoop nailed to a pine tree with a clearing underneath. We also had skis and sleds made form barrel staves, which we used to slide down a steep, pine-needle-covered hill close by the school house. The girls skipped rope and made playhouses with the abundance of straw that was most [sic] everywhere.[38]

To assist in reaching more remote areas, the USLHB began rotating minilibraries throughout the more isolated light stations in 1876. They began with "fifty minilibraries, each containing about forty books, housed in an attractive, sturdy, and portable wooden box." A minilibrary would stay at one light station for six months and then would rotate to the next while being replaced with another. "Donated by private individuals or purchased by the board, the books included the obligatory Bible and hymnbooks, along with a great variety of fiction and nonfiction—everything from novels to poetry and books on science." Within five decades, the number of minilibraries in circulation increased to five hundred.[39] Rany Jennette remembers the minilibraries, adding that because of the access to the books, the "lighthouse young folks had an advantage over the village youngsters."[40]

The USLHB provided various domestic food and supplies to each light station. For example, the 1881 food allowances per man included:

> Pork: 200 pounds
> Beef: 100 pounds
> Flour: 2 barrels
> Rice: 50 pounds
> Brown Sugar: 50 pounds
> Coffee (green grain): 24 pounds
> Beans or pease [sic]: 10 gallons
> Vinegar: 4 gallons
> Potatoes: 2 barrels[41]

[37] Holland, Jr. "America's Lighthouses," p. 47.
[38] Jennette, Rany. "Cape Hatteras Lighthouse as I Knew It." *Oral History*. n.d. Accessed at https://www.nps.gov/caha/learn/historyculture/upload/RANY's%20oral%20history%20edited%2011202008.pdf on September 27, 2016.
[39] Dolin, "Brilliant Beacons," pp. 205-6.
[40] Jennette, "Cape Hatteras Lighthouse as I Knew It."
[41] United States Light-House Board. "United States Light-House Establishment, Instructions to Light-Keepers." July 1881.

To offset further food costs, those with access to fertile soil farmed and raised animals (fig. 5); others "farmed" the sea.[42] At Cape Hatteras, Rany Jennette remembers doing both:

> We had chickens, hogs, cows, and vegetable gardens. So, like the farmer, most of our food was home-grown and close at hand. Staple foods were purchased at one of the general stores in Buxton and the other villages. This was a monthly trip after payday, referred to as 'grubbing up.' With fresh vegetables from the garden, fresh milk from the cow, and other supplies from the general store, we lived pretty good. Fresh beef was had only occasionally. A local person would slaughter a steer, usually on the beach on the beach, skin the animal, cut it into chunks, and peddle it through the village. By this time the flies would be trying to take over.[43]



Figure 5. Animal pens, including a chicken coop, can be seen in this May 1893 photograph of the Principal Keeper's Quarters. Tilman Smith was the principal keeper at that time and can be seen standing between the two women in his USLHB uniform. Photo: Cape Hatteras National Seashore Archives.

Pets, like dogs and cats, were quite common at light stations (figs. 6-7). Historic pictures show at least two dogs present at Cape Hatteras. Rany Jennette also noted in his oral history that his brother kept a pet goat at Cape Hatteras.



Figure 6. First Assistant Keeper John Quidley with his wife Emma Midgette Quidley, daughter Marie, and family dog "Pechichi," who was rescued from a shipwreck in ca. 1908, in front of the Double Keeper's Quarters sometime between October 1909 and March 1911 when he was stationed there. Photo: Cape Hatteras National Seashore Archives.



Figure 7. A pet dog photographed sometime after 1927 (the year the addition was put on the Principal Keeper's Quarters). The dog may have belonged to Principal Keeper Unaka Jennette's family. Photo: Cape Hatteras National Seashore Archives.

[42] Holland, Jr., "America's Lighthouses," p. 49.
[43] Jennette, "Cape Hatteras Lighthouse As I Knew It."

The Board and Service also supplied a medicine chest to every light station acknowledging that when living in isolated location illness and injury could quickly become life-threatening.[44] Rany Jennette remembers the following as contents in Cape Hatteras' medicine chest: "sweet spirits of nitre, cough mixture, castor oil, spirits of camphor, coliform liniment, saltpeter, quinine pills, cathartic pills, laudanum, carbolic acid, iodine, glycerine, lacto pepsin, rochelle salts, bandages, and a medical dictionary." He also noted that despite these supplies his mother also had her own remedies, like "fatback or sow belly and turpentine for nails stuck in feet, kerosene or coal oil for cuts, to name a few."[45]

During the 1920s USLHS commissioner Putnam believed that bringing a radio to each light station would aid in the quality of a secluded life. Putnam did not have the funding available to directly buy radios for each station, but in 1925 a New York woman purchased twenty-five radios and donated them to various light stations. A year later, Secretary of Commerce Herbert Hoover appealed the public to donate radios to the service. Nearly three hundred radios were donated as a result of Hoover's appeal. They were distributed nationwide.[46]

[44] Dolin, "Brilliant Beacons," p. 282.
[45] Jennette, "Cape Hatteras Lighthouse As I Knew It."
[46] Dolin, "Brilliant Beacons," pp. 287-8.

Chronology of Development and Use

Early Dwellings

Planning for the first Cape Hatteras Lighthouse occurred throughout the 1790s. In October 1798, the federal government purchased four acres of land for the establishment of Hatteras Light Station. Concurrently, recently retired Massachusetts congressman Henry Dearborn submitted a final proposal for building the Cape Hatteras Lighthouse. This proposal was accepted by President John Adams. In the fall of 1799, Dearborn travelled to Cape Hatteras to begin the construction of a keeper's quarters there. Work at the Light Station was nearly complete by the end of December 1802, when the first keeper began his appointment.[1]

On July 21, 1828, keeper Pharaoh Farrow sold approximately forty acres to the federal government for $200. The new tract was just north of the original lot and would be the site of a new keeper's dwelling and the 1870 lighthouse.[2] The original dwelling had become "so deteriorated that the Fifth Auditor of the Treasury, who administered this country's aids to navigation, authorized the expenditure of $1,500 to erect a new 'quarters building.'"[3]

In October 1852, Congress created a nine-member United States Light-House Board (USLHB) to oversee the administration of the country's lighthouses. The Board took up their duties immediately upon organization.[4]

> At the Board's request Congress in 1853 appropriated $15,000 to improve the Cape Hatteras Light Station. The Lighthouse Board used this money to raise the light tower about 50 feet and to erect a new dwelling for the keepers. Since by this time the Board had assigned several keepers, in addition to principal keeper, to the station, the Board ordered construction of a double dwelling. The evidence indicates that this structure, in modified form, survives today as the museum at the light station.[5]

The alterations to the lighthouse and the construction of the new dwelling (now known as the Double Keepers' Quarters) were completed in 1854. The Light Station stayed in this configuration for nearly two decades.

New Lighthouse and New Dwelling

After many months of planning for the new Cape Hatteras Lighthouse, a working party departed Baltimore, MD for Cape Hatteras on October 19, 1868. Also at this time, Fifth Lighthouse District

[1] Cybularz, Rebecca, Historic Preservation Training Center, National Park Service. "Cape Hatteras Lighthouse." *Historic Structure Report.* February 2016, pp. 41-44.
[2] Ibid, p. 45.
[3] Holland, Jr., F.R., and Archie Franzen. "Keeper's Dwelling: Cape Hatteras Light Station, Cape Hatteras National Seashore, North Carolina." *Historic Structure Report-Part I.* Division of History, Office of Archeology and Historic Preservation, National Park Service, U.S. Department of the Interior. December 1, 1968. p. 5.
[4] Cybularz, "Cape Hatteras Lighthouse," p. 30.
[5] Holland, Jr. and Franzen. "Keeper's Dwelling," pp. 5-6.

Engineer W.J. Newman selected Dexter Stetson to be superintendent of construction. Work proceeded almost continuously until the lighthouse was lit on December 16, 1870.[6]

On November 7, 1870, Fifth District Engineer J.H. Simpson asked the USLHB for permission to build a dwelling for the third keeper stationed at Hatteras Light Station. His letter stated:

> In view of the fact that the light keeper's dwelling at Cape Hatteras is only intended for two keepers' families, and that a surplus of 50,000 brick yet remains after completing the tower, as well as a quantity of good lumber used in the temporary buildings and scaffolding, I would respectfully suggest that before the working party is removed from the locality, I be authorized to build a dwelling for the third keeper, similar to that at Leading Point…a dwelling of four rooms and a kitchen may be built for $3600.[7]

Three days later Simpson wrote to Dexter Stetson, the superintendent of construction of the Cape Hatteras lighthouse, to tell him that the Board had approved the construction of the new brick dwelling, similar to the one at Leading Point (Brewerton Channel, Maryland).[8] Plans for the dwelling and a request for requisition of needed materials were transmitted to Stetson on November 19.[9] The dwelling was "to be located…a short distance east of the present dwelling, its front on the same line as the front of that and about in the rear of the Superintendents or workmens [sic] quarters." The USLHB allowed $3,600 for the new quarters (fig. 8).[10]

It appears construction began almost immediately. The January 1871 Progress Report stated that the brickwork for the new dwelling had commenced to a height of 5'-0". The first-floor structural floor joists had been set and the first-floor doors and windows had been installed. It was also estimated that the brickwork would be completed in two weeks if good weather continued.[11] In February 1871, the brickwork had been completed.[12] The March 1871 Progress Report stated that the dwelling had received a shingle roof, the interior had received lath and plaster and its finished flooring. In addition, a new boardwalk had been started to join the Principal Keeper's Dwelling to the lighthouse.[13] The April 1871 Progress Report stated that the new dwelling had been completed and was ready for occupation; the boardwalk had been completed as well. It was noted that a board fence similar to the one around the Double Keepers' Quarters had been nearly completed, however because a building (used as quarters and an office associated with the lighthouse construction) was in the way, the fence could not be completed until the building was removed to Body's Island.[14]

Sometime during or shortly after the construction of the new dwelling, the building was assigned to the principal keeper, not the third keeper as originally planned.[15]

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[6] Cybularz, "Cape Hatteras Lighthouse," pp. 56-70.
[7] Simpson, J.H., Lighthouse Engineer. *Letter to Rear Admiral W.B. Shubrick, Chairman, United States Light-House Board.* November 7, 1870. Part of NARA's RG 26 Entry 3 (NC-63). Available for review at Cape Hatteras National Seashore Archives.
[8] Simpson, J.H., Lighthouse Engineer. *Letter to Dexter Stetson, Superintendent of Construction.* November 10, 1870. Part of NARA's RG 26 Entry 3 (NC-63). Available for review at Cape Hatteras National Seashore Archives.
[9] Hains, Peter C., Captain of Engineers. *Letter to Dexter Stetson, Superintendent of Construction.* November 19, 1870. Part of NARA's RG 26 Entry 3 (NC-63). Available for review at Cape Hatteras National Seashore Archives.
[10] Holland, Jr. and Franzen. "Keeper's Dwelling," p. 6.
[11] Hains, Peter C., Captain of Engineers. *Letter to Rear Admiral W.B. Shubrick, Chairman, United States Light-House Board.* January 12, 1871. Part of NARA's RG 26 Entry 3 (NC-63). Available for review at Cape Hatteras National Seashore Archives.
[12] Hains, Peter C., Captain of Engineers. *Letter to Rear Admiral W.B. Shubrick, Chairman, United States Light-House Board.* February 15, 1871. Part of NARA's RG 26 Entry 3 (NC-63). Available for review at Cape Hatteras National Seashore Archives.
[13] Hains, Peter C., Captain of Engineers. *Letter to Rear Admiral W.B. Shubrick, Chairman, United States Light-House Board.* March 18, 1871. Part of NARA's RG 26 Entry 3 (NC-63). Available for review at Cape Hatteras National Seashore Archives.
[14] Hains, Peter C., Captain of Engineers. *Letter to Rear Admiral W.B. Shubrick, Chairman, United States Light-House Board.* April 11, 1871. Part of NARA's RG 26 Entry 3 (NC-63). Available for review at Cape Hatteras National Seashore Archives.
[15] Holland, Jr. and Franzen. "Keeper's Dwelling," p. 7.

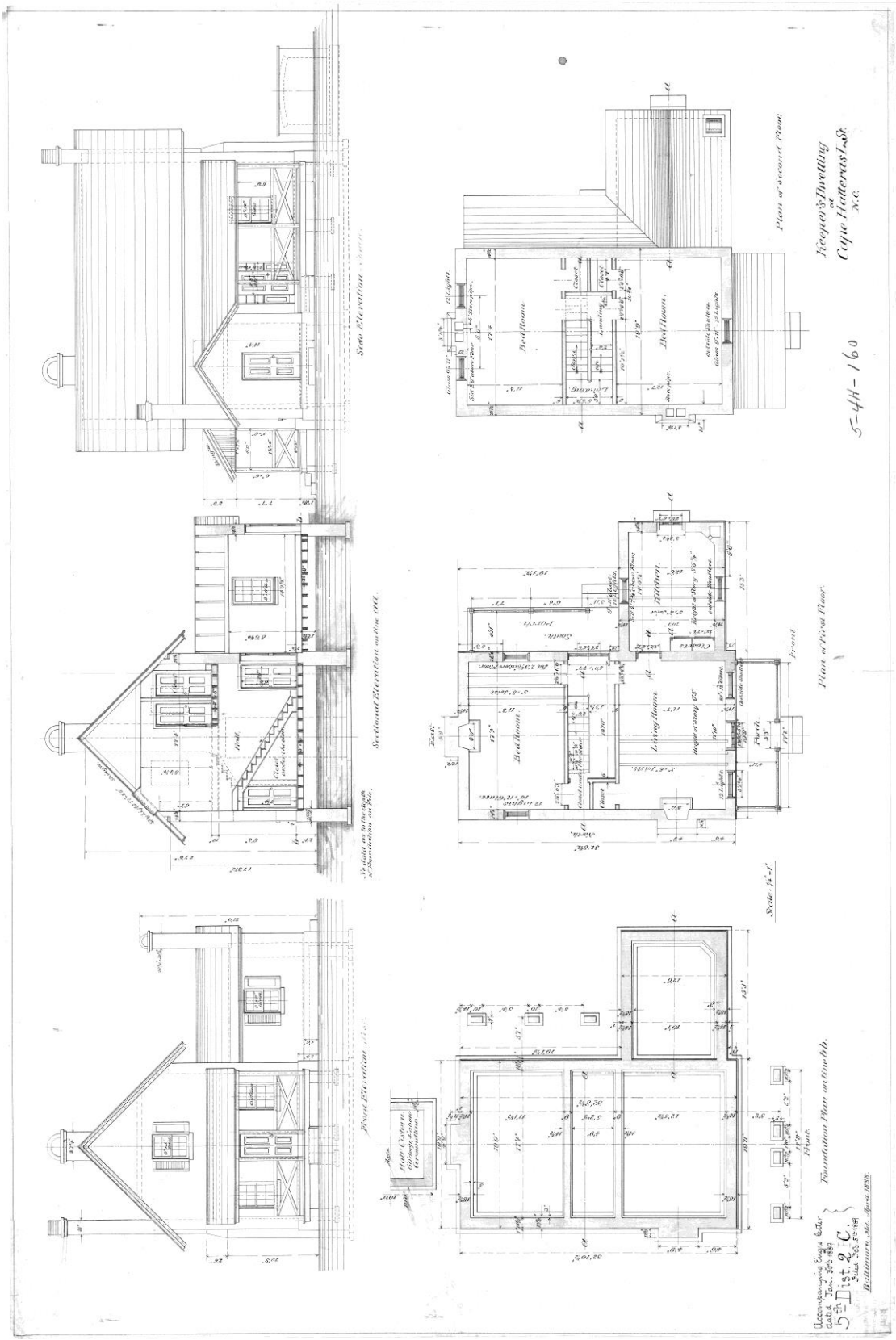


Figure 8. An April 1888 drawing of the Principal Keeper's Quarters which accompanied the Engineer's letter, dated January 30, 1889 and filed on February 5, 1889. Drawing: National Archives and Records Administration.

A description of the dwelling, as it was originally constructed, was written in 1968:

> The Keeper's Quarters…was originally a story and a half brick structure with a one story brick kitchen ell to the east. The kitchen opened off of the living room located at the south end of the main structure. A bedroom at the north end was separated from the living room by a central stair hall running east and west. Two bedrooms were located on the second floor, one to the north of the stair hall landing, the other to the south. That there is no basement indicates that water would have been a serious problem.
>
> Substantial brick foundation walls supported the structure on its sand site. Water from the roof was collected and stored in a ten foot square brick cistern immediately adjacent to the north of the structure. There were two wood porches, one at the south entrance door and the other opening off of the central stair hall to the east. Fireplaces provided heat for the downstairs bedroom and living room. The kitchen probably derived its heat from a cooking stove. The two upstairs bedrooms may have had stoves if heated at all. The quarters were undoubtedly served by a privy that no longer exists.[16]

In November 1875, Engineer of the Fifth Lighthouse District F.T. Harwood requested the presence of a brick layer and carpenter to Cape Hatteras in order to construct a cement-lined brick cistern adjoining or inside the Principal Keeper's Quarters. It is assumed the extant exterior cistern, adjacent to the Principal Keeper's Quarters (north), was completed not long after.[17]

In 1881, "extensive repairs" were completed to both dwellings; these included rebuilding a chimney, repairs to doors, windows, and porches, plaster repairs and painting, repairing and repainting the woodwork and brick of the cistern, and repairing the pumps of the cistern.[18]

A request was made in October 1882 for the installation of electric call bells to both the Principal Keeper's Quarters and the adjacent Double Keepers' Quarters to connect to the lighthouse tower. The call bells were soon after supplied.[19] Five years later, correspondence discussed repairs to the call bell system and replacement of the insulated wire between the bells was completed.[20]

During the last six months of 1887, several repairs were made at the light station. These included a total of $500 expended on repairs to dwellings, porches, and cistern roof, $150 expended on small store rooms, $50 expended on a cistern cover, and $300 expended on fences.[21] The details of these repairs are unknown.

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[16] Holland, Jr. and Franzen. "Keeper's Dwelling," pp. 10-11.
[17] Harwood, F.T., Lighthouse Engineer. *Letter.* November 2, 1875. Part of NARA's RG 26 Entry 3 (NC-63). Available for review at Cape Hatteras National Seashore Archives.
[18] Nistal-Moret, Benjamin, Southeast Regional Office, National Park Service. "Narrative Report on the Findings of Historic Structure Inspection. Conclusions and Recommendations. Cape Hatteras National Seashore: Cape Hatteras Principal Keeper's Quarters (Pink House)." 1983. Box #1: CAHA 5029 Cape Hatteras Light Station Principal Keeper's Quarters Preservation Project Records, 1983-1988. Folder #2: CAHA - Cape Hatteras Light Station Principal Keepers Quarters. Preservation Project Section 106 Case Report - 1983-1984.
[19] L.H. Engineer. *Letter to Rear Admiral R.H. Hyman, Chairman, United States Light-House Board.* October 23, 1882.
Luckey, Levi P. *Letter to A. Johnson, Portsmouth Buoy Depot.* January 15, 1883.
Babcock, O.E., Lighthouse Engineer. *Letter to J.D. Franzoni, Wahington, DC.* March 9, 1883.
Part of NARA's RG 26 Entry 3 (NC-63). Available for review at Cape Hatteras National Seashore Archives.
[20] Mallery, J.C., Lighthouse Engineer. *Letter to Chairman, United States Light-House Board.* October 8, 1887.
Chairman, United States Light-House Board. *Letter to J.C. Mallery, Lighthouse Engineer.* October 8, 1887.
Mallery, J.C., Lighthouse Engineer. *Letter to Keeper Tillman F. Smith.* October 14, 1887.
Part of NARA's RG 26 Entry 3 (NC-63). Available for review at Cape Hatteras National Seashore Archives.
[21] Mallery, J.C., Lighthouse Engineer. *Letter to Chairman, United States Light-House Board.* 1887. Part of NARA's RG 26 Entry 3 (NC-63). Available for review at Cape Hatteras National Seashore Archives.

The Annual Report for the Fiscal Year ending June 30, 1889 included the following report for the dwellings: "Slight repairs are needed to plastering, floors, etc., in dwellings."[22] The Annual Report for the Fiscal Year ending June 30, 1890 estimated that $500 was expended on the dwellings and fences that year.[23]

In 1893, USLHB civil engineer and surveyor Herbert Bamber surveyed Hatteras Light Station (figs. 9-11). His survey drawings show how the buildings of the site related to one another and provide great detail on the sizes of the numerous buildings. The Principal Keeper's Quarters, or Dwelling 1, is depicted as an ell-shaped building with a front (south) porch and east porch inside the ell. An approximately 10'-0"-square brick cistern was located to the north. An approximately 12'-2"-wide and 15'-2"-deep summer kitchen was located to the northeast. An 8'-5"-wide and approximately 8'-2"-deep shed was located north of the summer kitchen. Another 18'-0"-wide and 14'-6"-deep shed was located north of the cistern. Surrounding the entire Principal Keeper's Quarters complex (approximately 114'-0" wide x 112'-0" deep) was a wood board fence. An approximately 4'-1"-square privy was located just north and outside the fence. All of the outbuildings were noted to be frame with wood foundations and shingle roofs. A brick and concrete walk extended from the south porch south through the surrounding fence. Another brick and cement walk was located on the east side, which connected the east kitchen entrance, east porch, and cistern through the surrounding fence.

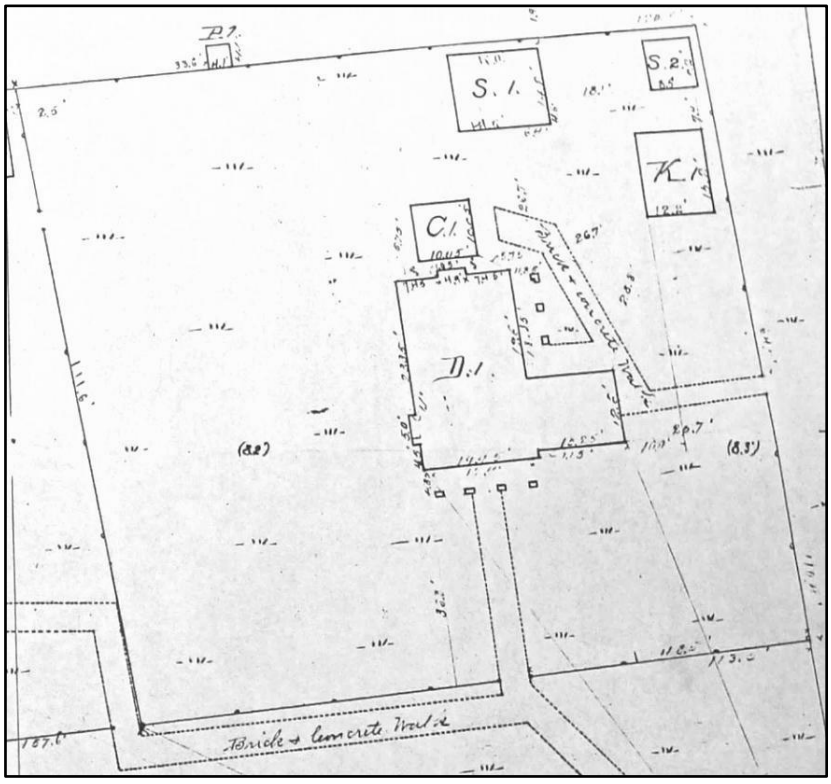


Figure 9. An 1893 site plan of the Principal Keeper's Quarters and associated outbuildings at Hatteras Light Station by Herbert Bamber. Source: Cape Hatteras National Seashore Archives.

[22] Mallery, J.C., Lighthouse Engineer. *Letter to Chairman, United States Light-House Board.* June 30, 1889. Part of NARA's RG 26 Entry 3 (NC-63). Available for review at Cape Hatteras National Seashore Archives.
[23] Mallery, J.C., Lighthouse Engineer. *Letter.* June 30, 1890. Part of NARA's RG 26 Entry 3 (NC-63). Available for review at Cape Hatteras National Seashore Archives.



Figure 10. The Principal Keeper's Quarters in May 1893, from the southeast. The principal keeper at the time was Tilman Smith; he is likely the man in uniform standing between the two women in the yard. Note the dark-painted exterior brick walls; the summer kitchen (right) with board-and-batten siding, shingle roof, and brick chimney; the shed (white) with board-and-batten siding; and the surrounding painted wood board fence. Photo: Cape Hatteras National Seashore Archives; Box #4: Cape Hatteras Light Station Photos, Principal Keepers Quarters.

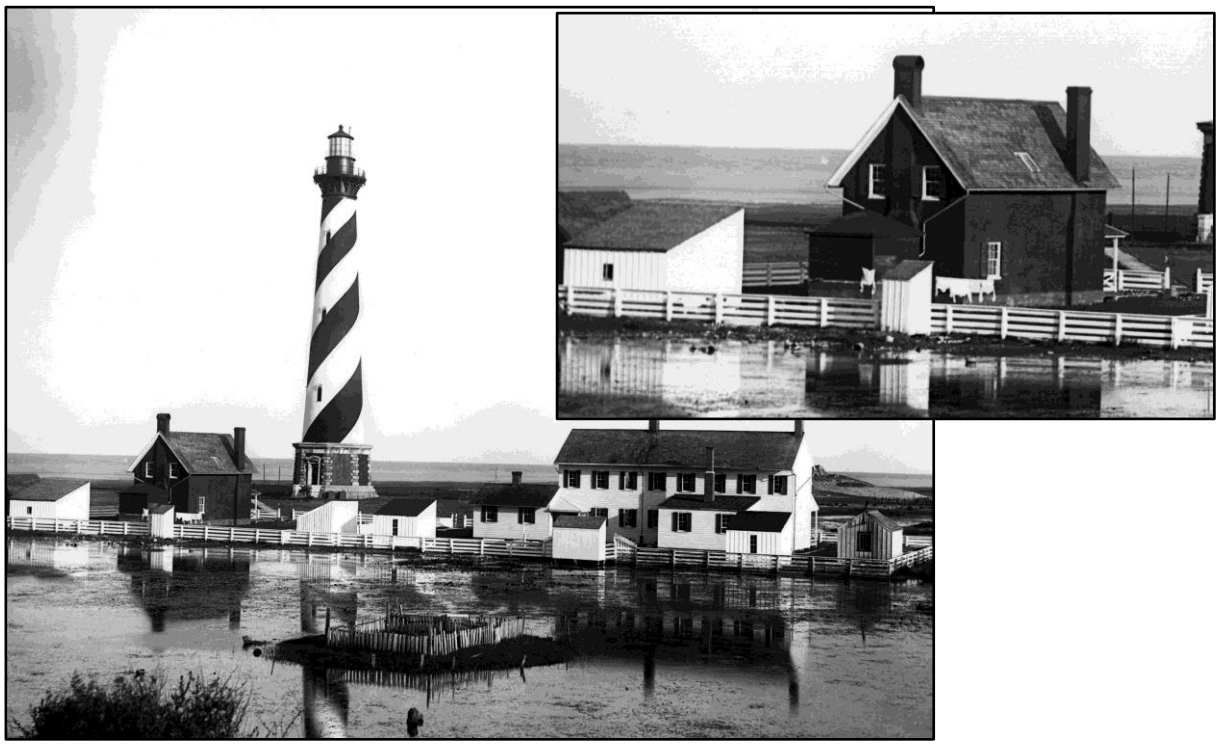


Figure 11. The Hatteras Light Station on May 30, 1893, from the northwest. Inset: The west and north elevations of the Principal Keeper's Quarters. Note the presence of a wood-frame structure atop the brick cistern directly north of the dwelling and the wood-framed privy located outside the surrounding fence. Photo: NARA, RG 26, LG 26 82A. Copies found in NPS Harpers Ferry Center photographic archives and Cape Hatteras National Seashore Archives.

In early 1895, it was reported that the interior and exterior of both dwellings required painting. Furthermore, the Principal Keeper's Quarters needed a new roof and lightning rod, the front sill was partly decayed, and a new cistern pump was needed. By May, the cistern pump and a box of window glass, to be put in place by the keepers, were supplied. In the June Annual Report, it was noted that the (porch?) railings needed repair and the roofs of the dwelling, kitchen, and building atop the cistern should be re-shingled.[24]

In September 1898, one of the building's chimneys was raised 2'-6" (it is unknown which one) and window screens were added to the window openings. In addition, the fences around the dwellings were repaired with ten new posts and fifty-four 1" x 6" x 18'-0"-long boards. The old wood walks were replaced with sixty 4" x 4" bearing pieces and 2,800'-0" of new planking. The next month additional repairs were completed at the Principal Keeper's Quarters. These included: installing two new sections of railing on the east porch; a shelf with brackets in the kitchen; supply of new sash cord; installing a set of shutter fasteners; "easing" a door, sash, and shutters; installing six screen doors with new fasteners; and the repair of plaster in two rooms and a hall.[25]

After a "great hurricane" August 17-19, 1899, an inspection determined the light station had fared well. It was noted that the dwelling roofs "leaked very badly, but no shingle roof can be made to resist the driving effect of water before such wind."[26]

In May 1900, the old call bell system was replaced with telephones for communication between the keepers' dwellings and the lighthouse.[27]

In May 1901, Keeper P.H. Etheridge wrote to the USLHB requesting that a "ditch be cut between this station and the back landing creek for the purpose of draining the stagnant water from around this station." This request was based on a recommendation by Assistant Superintendent of Construction Mr. Fouchy, who had made a survey of the station. Etheridge also stated "that it is not only disagreeable, but it is very unhealthy and is causing lots of malaria and rheumatism and is also taking the drilled men from the station and putting undrilled men in their places."[28] Further discussion of the issue was made in September and October of the same year, and involved the filling of the marsh and/or the drainage of the stagnant water:

> ...the condition at this station from stagnant water in the marsh, is very bad, and, in its present state, imperils the health of the keepers of Cape Hatteras Light-House and their families, and also, the keepers of the life-saving station. Recommendation is therefore made that an open ditch be cut from the marsh to the back-landing creek, and that shoal spots in the creek be opened up so as to not only drain the stagnant water from the marsh, but to allow tidal water to

[24] Bergland, Eric, Lighthouse Engineer. *Letter to United States Light-House Board.* February 13, 1895.
Bergland, Eric, Lighthouse Engineer. *Letter to United States Light-House Board.* June 30, 1895
Part of NARA's RG 26 Entry 3 (NC-63). Available for review at Cape Hatteras National Seashore Archives.
[25] Jones, W.A., Lighthouse Engineer. *Letter to United States Light-House Board.* October 1, 1898.
Jones, W.A., Lighthouse Engineer. *Letter to United States Light-House Board.* November 1, 1898.
Part of NARA's RG 26 Entry 3 (NC-63). Available for review at Cape Hatteras National Seashore Archives.
[26] Jones, W.A., Lighthouse Engineer. *Letter to United States Light-House Board.* November 27, 1899. Part of NARA's RG 26 Entry 3 (NC-63). Available for review at Cape Hatteras National Seashore Archives.
[27] Jones, W.A., Lighthouse Engineer. *United States Light-House Board.* June 1, 1900. Part of NARA's RG 26 Entry 3 (NC-63). Available for review at Cape Hatteras National Seashore Archives.
[28] Etheridge, P.H., Keeper. *Letter to General Superintendent, United States Light-House Board.* May 11, 1901. Part of NARA's RG 26 Entry 3 (NC-63). Available for review at Cape Hatteras National Seashore Archives.

> pass from the ocean into the marsh at high water; and to fill up a portion of the marsh next adjoining the houses, if funds for the same could be provided.[29]

It is unknown if this work was ever completed.

It appears that no major changes occurred to the Principal Keeper's Quarters until 1927. That year a "lighthouse working party from Portsmouth or Baltimore, under W.F. Lynch, foreman," constructed a two-story frame addition on the east elevation of the building, within the ell. This included access from the interior into the attic above the extant kitchen wing (fig. 12).[30]

Rany Jennette, son of Principal Lighthouse Unaka Jennette, said the following about the addition:

> I remember when the addition was built on the keeper's quarters, two large rooms on the ocean side of the building, bedroom upstairs and dining room downstairs. A bouy tender, towing a house barge, anchored in Cape Channel. The barge was loaded with the materials for the building and also served as living quarters for the building crew. (Later they moved into the First Assistant's quarters for the duration of the project.) This was 1927. ... W.F. Lynch was foreman...and lived with us. He and my father had been friends for a long time. [31]

Only five years later, in 1932, the Jennette family moved out of the Principal Keeper's Quarters due to flooding from a hurricane. They would never move back (fig. 13).[32]

Because of the new battle with beach erosion near the lighthouse tower, the Bureau of Lighthouses began the process to acquire land to build a new light station. Keeper Jennette owned the land which the bureau preferred. After negotiations, Jennette sold the land to the Bureau for $266,880 in 1935. Because of defects in the title and the emergency (erosion) causing the procurement of the land, both parties



Figure 12. The east elevation of the Principal Keeper's Quarters in 1927, during the construction of the addition. Mr. Lynch, foreman of construction, is at left. Mr. "Blacky" Emerson, a blacksmith, is at right. Photo: Cape Hatteras National Seashore Archives, Box #4: Cape Hatteras Light Station Photos, Principal Keepers Quarters.



Figure 13. The station in 1932, the year the principal keeper moved away. Photo: Cape Hatteras National Seashore Archives.

[29] Jones, W.A., Lt. Col., Lighthouse Engineer. *United States Light-House Board.* October 2, 1901. Part of NARA's RG 26 Entry 3 (NC-63). Available for review at Cape Hatteras National Seashore Archives.
[30] Wallace, David H., Harpers Ferry Center, National Park Service. "Principal Keeper's Quarters, Cape Hatteras Light Station, Cape Hatteras National Seashore, North Carolina." *Historic Furnishing Report.* 1991. NPS DSC eTIC No. CAHA 603 D109. p.3.
[31] Jennette, Rany. "Cape Hatteras Lighthouse As I Knew It."
[32] Ibid,p. 4.

agreed to condemnation proceedings. This resulted in a court case, and the Bureau officially acquired the land in 1936. Meanwhile, a new 150'-0"-tall skeleton tower located approximately 1½ miles WNW from the 1870 tower was completed in September 18, 1935.[33]

Simultaneously, the Civilian Conservation Corps (CCC) Company 3423 arrived at Cape Hatteras State Park on August 12, 1935 (fig. 14). Because no other provisions had been made, both keepers' dwellings were used as quarters for the workers. At that time the buildings were in a rundown state and required rehabilitation to make them habitable.[34]

On May 13, 1936, the new skeleton tower, or the "Buxton Light," was activated. Two days later, on May 15, the light on the 1870 lighthouse was extinguished.[35]



Figure 14. The CCC Camp at Hatteras Light Station surrounding the Principal Keeper's Quarters, right, and the Double Keepers' Quarters, left. Photo: Cape Hatteras National Seashore Archives.

[33] Cybularz, "Cape Hatteras Lighthouse," p. 82.
[34] Nistal-Moret, Benjamin, Southeast Regional Office, National Park Service. "Second Narrative and Analytical Report on the Findings of Historic Structure Inspection. Conclusions and Recommendations. Cape Hatteras National Seashore: Cape Hatteras Principal Keeper's Quarters (Pink House). " 1983. Box #1: CAHA 5029 Cape Hatteras Light Station Principal Keeper's Quarters Preservation Project Records, 1983-1988. Folder #2: CAHA - Cape Hatteras Light Station Principal Keepers Quarters. Preservation Project Section 106 Case Report - 1983-1984.
[35] Cybularz, "Cape Hatteras Lighthouse," p. 83.

Formation of a National Park

In 1934, at the request of the Secretary of the Interior, the National Park Service (NPS) surveyed "the seashores of the continental United States to ascertain whether there were remaining relatively unimpaired areas of such outstanding character and magnitude as to be worthy of acquisition and preservation by the people of the United States as National Seashores." The survey revealed that the Outer Banks of North Carolina "presented one of the finest opportunities to establish and preserve as a National Seashore an area of great biological interest, scenic beauty, historical value, and recreational appeal." It was recommended that the seashore be added to the national park system.[36]

On July 31, 1936, shortly after the Buxton Light was activated, Secretary of the Interior Ickes "...approved a plan to transfer the [former] Cape Hatteras Lighthouse property (about forty-four acres) to the Park Service for designation as a National Historic Site."[37]

The Department of the Interior formally requested title to the light station on August 4, 1936. On August 31, Acting Secretary of the Treasury Wayne C. Taylor notified the Secretary of the Interior that the NPS would receive the light station and its grounds.[38]

The "Cape Hatteras Lighthouse Reservation" was formally transferred to the National Park Service on November 9, 1936, with its "illuminating apparatus and other objects which add to the historical background of the lighthouse tower left intact until such time as they might again be needed by the Lighthouse Service." E.J. Byrum, the Project Supervisor for the CCC camp, had been designated the custodian of the property in September 1936, on behalf of the NPS.[39]

The transfer was publically announced on December 6, 1936. "Funds for the new NPS lighthouse were provided by the Public Works Administration, but no decision had yet been made about the final status of the surrounding area." A decision had to be made whether the lighthouse would become a national monument, a recreational area, or a historic site. Further studies were planned. In the meantime, a CCC enrollee was stationed on site to serve as a watchman.[40]

On March 15-18, 1937, a field investigation and photographic survey of the lighthouse was undertaken by F. E. Whitehouse and Charles Porter respectively. The field investigation only mentioned the lighthouse and oil house, and did not specifically mention the Principal Keeper's Quarters or other buildings.[41] The only photograph of the Principal Keeper's Quarters shows paint deterioration on the exterior of the building, but otherwise was just rundown (fig. 15). By this time, the south-facing window opening had been altered to include two windows (rather than just one, as originally designed and seen in earlier photographs). Additionally, many of the outbuildings had been removed from around the dwelling. A newer wood-clad, gable-roofed building is shown to the northwest corner of the building. Other photos show that the cistern, with its wood-sided superstructure, was also extant at this time.

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[36] National Park Service. "History of the Establishment of Cape Hatteras National Seashore Recreational Area." July 13, 1961. NPS DSC eTIC No. CAHA 603 D136. p.1
[37] NPS, "The Creation and Establishment of Cape Hatteras National Seashore ,", p. 44.
[38] Yocum, Roberts, & Shelton-Roberts, "Cape Hatteras," pp. 67-68.
[39] NPS, "The Creation and Establishment of Cape Hatteras National Seashore," pp. 44-5.
[40] Ibid, p. 45.
[41] Whitehouse, F.E., Associate Engineer. "A Field Investigation of Cape Hatteras Lighthouse, Buxton, North Carolina." March 15-18, 1937. Cape Hatteras National Seashore Archives.



Figure 15. The Principal Keeper's Quarters in March 15-18, 1937. Photograph included as part of "A Field Investigation at Cape Hatteras Lighthouse" by Charles W. Porter. Photo: Cape Hatteras National Seashore Archives, Box #4: Cape Hatteras Light Station Photos, Principal Keepers Quarters.

CCC Job #10 received final approval on August 31, 1937. Associated drawings, dated June 23 of the same year, describe the proposed work for the Principal Keeper's Quarters and the adjacent Double Keepers' Quarters (fig. 16):

- Replace…Guttering
- Scrape and wire-brush all outside surfaces. Repaint two coats white paint.
- Replace missing window pains [sic]. Repoint damaged putty. Repair all damaged sash.
- Replace missing shutters. Repaint three coats green paint.
- Cleanout and repair all fireplaces, chimney and flues. Replace missing mantels.
- Install sash fasteners on all windows, side friction type.
- Scrape and refinish floor. Color and finish to be selected.
- A complete wiring system is to be installed during the construction and all wiring is to be concealed between the joists and rafters. See plan for outlets and switches.[42]

A few treatments for the Principal Keeper's Quarters were different:

- All paper board is to be removed from walls and ceilings and replaced with cypress boards finished with Minwax.
- One bathroom to be added [to the west part of the north second-floor bedroom, as well as a stair connection the bathroom from the intermediate stair landing,] and three kitchen sinks.[43]

[42] United States Department of the Interior, National Park Service, Cooperating with North Carolina Department of Conservation & Development. "Cape Hatteras Lighthouse, Repairs to Dwellings." *2 Sheet Set.* June 23, 1937. NPS DSC eTIC No. CAHA 603 9006.
[43] Ibid, sheet 2.

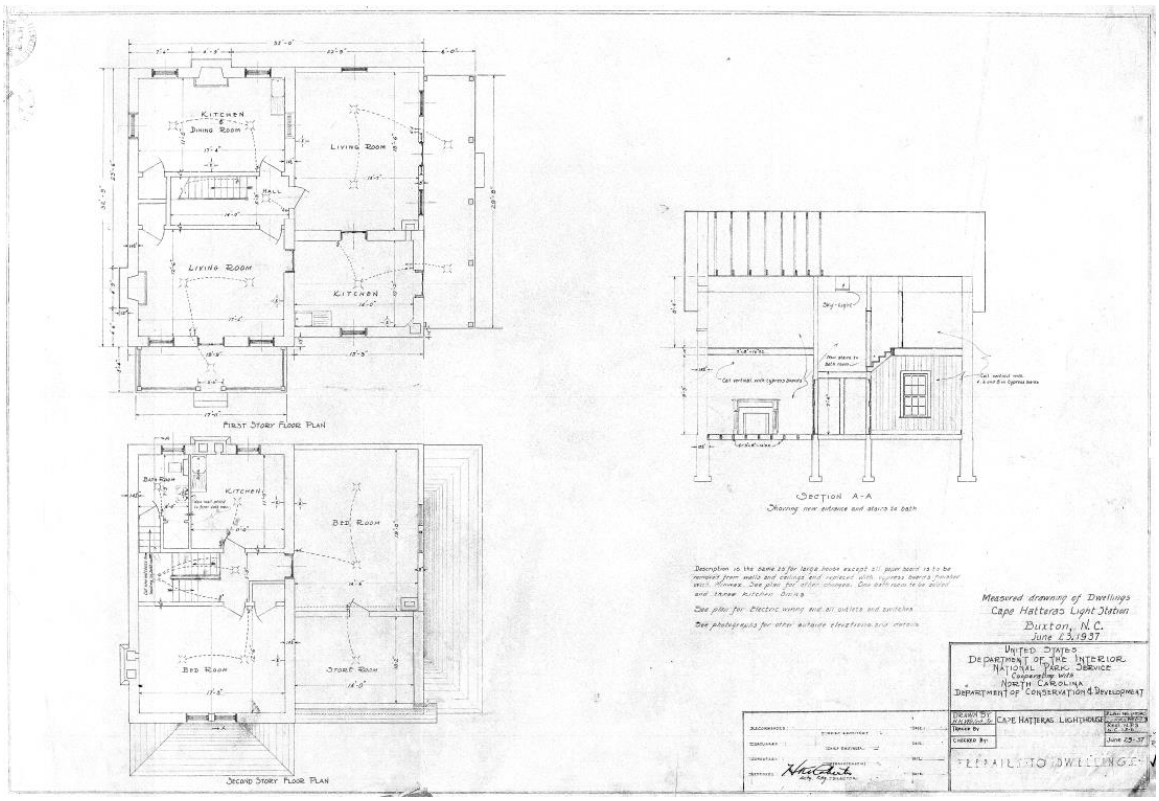


Figure 16. The June 23, 1937 drawing depicting CCC repairs to the Principal Keeper's Quarters. Drawing: NPS DSC eTC No. CAHA 603 9006.

Based on these drawings the Principal Keeper's Quarters was going to be used as at least three apartments (two downstairs and one upstairs) by CCC employees while they worked on dune rehabilitation along the Outer Banks.

Photographs, likely used to accompany the drawings, further show the extant condition of the buildings prior to their rehabilitation (figs.17-19).



Figure 17. The northeast corner of the Principal Keeper's Quarters in June 1937. Note the structure still present atop the cistern. Photo: Cape Hatteras National Seashore Archives, Box #4: Cape Hatteras Light Station Photos, Principal Keepers Quarters.



Figure 18. The east elevation of the Principal Keeper's Quarters in 1937 (ca. June). Photo: Cape Hatteras National Seashore Archives, Box #4: Cape Hatteras Light Station Photos, Principal Keepers Quarters.



Figure 19. A rare view of the north side of both keepers' dwellings in 1937 (ca. June). The newer outbuilding is located northwest of the Principal Keeper's Quarters and the structure is still present atop the cistern. Photo: Cape Hatteras National Seashore Archives, Box #4: Cape Hatteras Light Station Photos, Principal Keepers Quarters.

After treatment was completed to the dwellings, CCC work superintendent Byrum supplied a summary of the work, dated August 29, 1939. The work consisted of…

> …removing all plaster, replacing cypress ceiling, cleaning all floors, stairways, building closets and cabinets, staining walls and stairways, replacing new shingles on large and small houses where old ones were missing, repairing fireplaces and hearths, new top on front porch, two kitchens, back porch, new guttering installed on both houses, three cisterns cleaned, sewer rough in for both houses, water works roughed in and two coats of paint on outside of all buildings.

Including two modifications to the scope of work, the project for both buildings was completed for $4,402.91.[44]

On August 2, 1937, the House of Representatives unanimously passed the Cape Hatteras park bill. On August 14, the Senate passed the bill and sent it to the President. "The bill authorized the creation of Cape Hatteras National Seashore, contingent upon donation of ten thousand acres of land by the state of North Carolina or private gift within a period of ten years." On August 17, 1937, President Roosevelt signed the bill.[45]

On November 11, 1937, the Hatteras Light Station was transferred to the NPS. Even though the park was not operational at the time, the light station was included as part of the nation's first National Seashore.[46] However, it was not until 1939 that the property was used for any recreational or tourist use when the CCC began giving tours of the lighthouse.[47]

[44] National Archives and Records Administration, College Park, MD, Record Group 79, Cape Hatteras National Seashore, Box #19, Folder: Cape Hatteras National Seashore Correspondence.
[45] NPS, "The Creation and Establishment of Cape Hatteras National Seashore," p. 35-7.
[46] National Park Service. "Cape Hatteras Light Station." *Website.*
[47] National Park Service. "Cape Hatteras Light Station." *Website.*

In late 1937, a water system (CCC Job #16) and a sewage and waste disposal system (CCC Job #17) were planned for Cape Hatteras State Park for use by up to twenty-five people of the Principal Keeper's Quarters and the Double Keepers' Quarters (figs. 20-21). A new power plant for the well pump was located east of the new septic tank (located between and north of the two Quarters buildings). The large drain field was located north of the septic tank. A pump house was located several hundred feet south of the dwelling sites.[48] The plans show the cistern was still located behind the Principal Keeper's Quarters, but the newer frame outbuilding had been removed. The water supply system was completed for $1,605.14; the sewage and waste disposal system was completed for $475.41.[49]

On February 14, 1939, "Horace A. Dough, Custodian of Kill Devil Hill National Monument, [was appointed] as acting custodian of both the Cape Hatteras and Currituck Lighthouse reservations." Byrum continued to lead CCC efforts, but received Dough's authorization and direction as needed.[50]

In early 1939, drawings were completed for new furniture (CCC Job #21) for both dwellings (figs. 22-23).[51] By March 7, 1940, a majority of the furniture had been completed. Also at this time, the materials for painting the exteriors of the dwellings and materials for the construction of the exterior second-floor entrance at the Principal Keeper's Quarters had been received. [52]

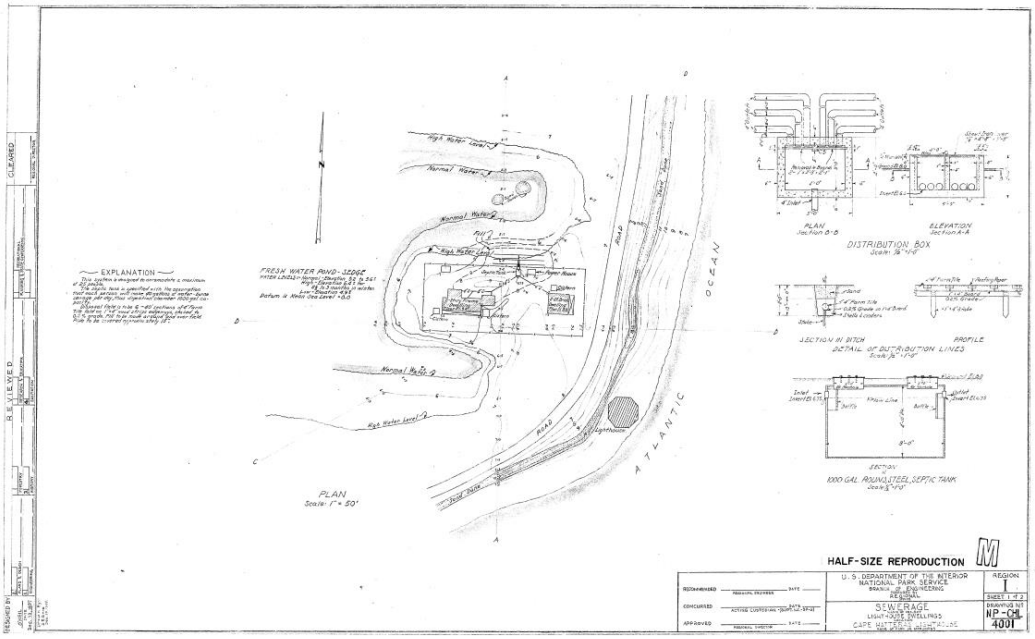


Figure 20. The 1938 plan for the new septic system. Drawing: NPS DSC eTIC No. CAHA 603 4001.

[48] U.S. Department of the Interior, National Park Service, Branch of Engineers. "Sewerage, Lighthouse Dwellings, Cape Hatteras Lighthouse." *2 Sheet Set.* December 13, 1937. DSC eTIC No. CAHA 603 4001.
U.S. States Department of the Interior, National Park Service, Cooperating with North Carolina Department of Conservation & Development. "Cape Hatteras Water Supply System, Lighthouse Dwellings." *1 Sheet.* September 9, 1937. DSC eTIC No. CAHA 603 4001.
[49] National Archives and Records Administration, College Park, MD, Record Group 79, Cape Hatteras national Seashore, Box #19, Folder: Cape Hatteras National Seashore Correspondence.
[50] NPS, "The Creation and Establishment of Cape Hatteras National Seashore," p. 45.
[51] U.S. Department of the Interior, National Park Service, Cooperating with North Carolina Department of Conservation & Development. "Cape Hatteras Lighthouse Dwellings." 2 *Sheet Set.* May 24, 1939. DSC eTIC No. CAHA 603 80030.
[52] National Archives and Records Administration, College Park, MD, Record Group 79, Cape Hatteras national Seashore, Box #19, Folder: Cape Hatteras National Seashore Correspondence.

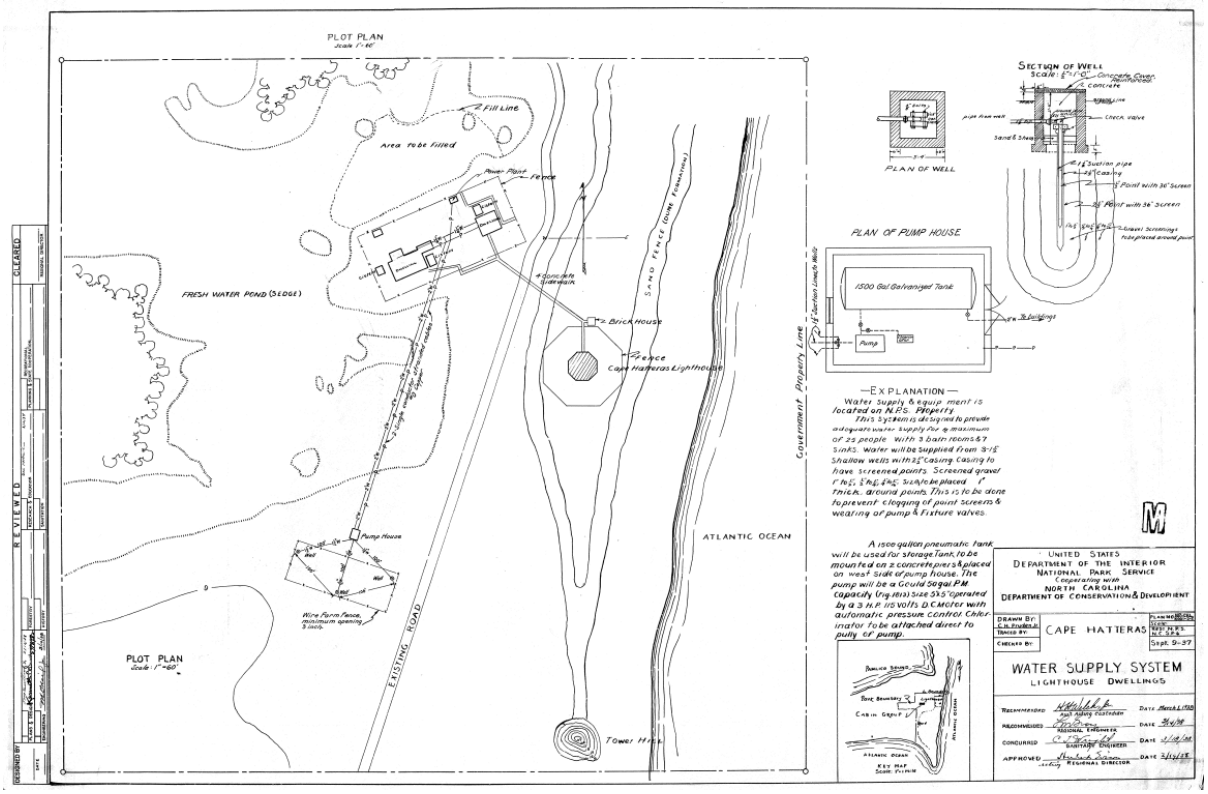


Figure 21. The 1938 plan for the new water supply system (power plant). Drawing: NPS DSC eTIC No. CAHA 603 4001.

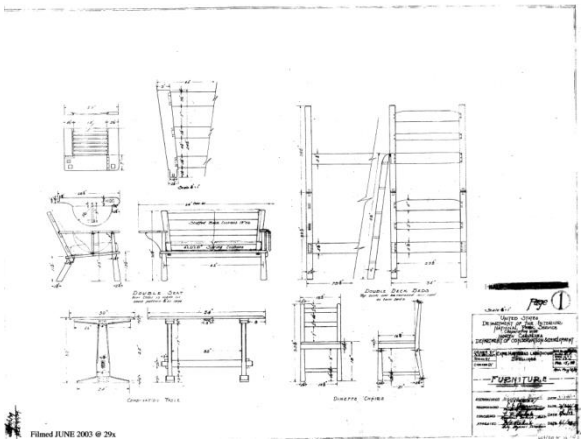


Figure 22. Furniture drawing for the Principal Keeper's Quarters and Double Keepers' Quarters. Drawing: NPS DSC eTIC No. CAHA 603 80030.

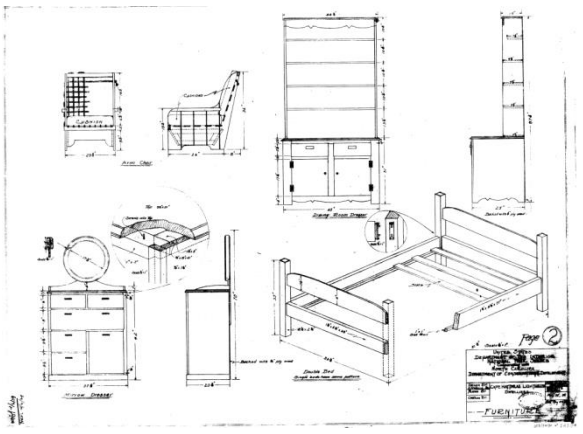


Figure 23. Furniture drawing for the Principal Keeper's Quarters and Double Keepers' Quarters. Drawing: NPS DSC eTIC No. CAHA 603 80030.

In preparation of the United States' likely participation in World War II, the United States Light House Service was absorbed by the United States Coast Guard (USCG) in 1939. This was part of President Franklin Roosevelt's second reorganization plan. It was announced on May 9, 1939 and became official in June 1939.[53]

[53] Yocum, Roberts, & Shelton-Roberts, "Cape Hatteras," pp. 70-4.

The CCC camp at Buxton was shut down on March 31, 1940. (All coastal CCC work would cease in 1942.)[54]

On June 29, 1940, the park was re-designated Cape Hatteras National Seashore Recreational Area.[55]

On August 6, 1940, Hatteras Light Station was visited by a vacationing Assistant Director Conrad Wirth. After his visit, Wirth requested several changes be made at the light station. Pertaining to the Principal Keeper's Quarters, his suggestions included screening in the porches, installation of rubber mats and stainless steel nosing on the interior stair treads, and the installation of an electric generating plant (to share with the Double Keepers' Quarters). This work was completed in 1941.[56]

An August 1940 site plan for the development of the light station shows the introduction of parking and a new restroom facility to the west of the lighthouse. The site plan was approved by the Acting Regional Director the next month.[57] Another site plan, dated January 3, 1941 shows the parking lot and restroom facility had been constructed by that time.[58]

After much debate, on January 16, 1941, NPS Chief Historian Ronald F. Lee "recommended that the lighthouse and surrounding state park lands be together designated as a national historic site that would eventually be absorbed by...Cape Hatteras National Seashore Recreational Area."[59]

Between August 1, 1941 and June 30, 1942, a seventy-five-man "Conscientious Objectors" camp was located at Hatteras Light Station. Camps of these types, part of the Civilian Public Service, "provided those whose conscience forbade them to kill an opportunity to do work of national importance under civilian direction rather than go to war."[60] Their work at the Light Station included construction of a latrine and picnic shelter in the lighthouse area, construction of an electrical distribution system for the light station, remodeling of the pump house, and alterations to the entrance road to the lighthouse area.[61] The camp may have used the dwellings as temporary residences.

On January 29, 1942, after the United States entered World War II, the USCG "leased the Cape Hatteras lighthouse under a special permit for use as a coastal watchtower to scout for German 'U-boats,' which were menacing shipping lanes even before U.S. entry into the war and sunk dozens of ships in the early months of 1942."[62] This permit would continue until August 15, 1947. During their tenure, the Coast Guard was accused of damaging the lighthouse. The Coast Guard defended itself by "…saying they cared for the lighthouse as well as they could during the time of war," but they had ceased the use of the property "sometime before the cessation of hostilities [in 1945]." This is assumed to include the dwellings as well. Increased security and surveillance was enacted, but little

[54] NPS, "The Creation and Establishment of Cape Hatteras National Seashore," pp. 46-7
[55] NPS, "History of the Establishment of Cape Hatteras National Seashore Recreational Area," p. 2.
[56] National Archives and Records Administration, College Park, MD, Record Group 79, Cape Hatteras national Seashore, Box #19, Folder: Cape Hatteras National Seashore Correspondence.
[57] National Park Service, Branch of Plans and Design, Regional Office. "Park Road Realignment." *1 drawing sheet.* August 7, 1940. NPS DSC eTIC No. CAHA 603 2002.
[58] National Park Service. "State Park Area Development Plan, Part of the Master Plan, Cape Hatteras national Seashore Recreational Area, North Carolina." *1 drawing sheet.* January 1, 1941. NPS DSC eTIC No. CAHA 603 2013.
[59] NPS, "The Creation and Establishment of Cape Hatteras National Seashore," p. 45.
[60] Mennonite Central Committee. "Civilian Public Service." 2015. Accessed at http://civilianpublicservice.org/ on August 31, 2016.
[61] National Archives and Records Administration, College Park, MD, Record Group 79, Cape Hatteras national Seashore, Box #22, Folder: Cape Hatteras Selective Service Work Camps.
[62] Ibid, p. 46.

was done to the current situation through the remainder of 1947 and the early part of 1948. In April 1948, the Coast Guard requested another special permit to continue its use of the lighthouse as an aid to navigation. It promised to restore the lighthouse, which would occur in 1949.[63]

Despite the battle between the NPS and the USCG, cosmetic work was performed on the Principal Keeper's Quarters in 1947. It is unknown which entity was responsible for the work, which included painting, replacing or repairing screens, doors, and porches, and repairing or replacing the gutters and downspouts.[64] It is believed that the Principal Keeper's Quarters was used to accommodate overnight visitors starting about 1947, under a concessions contract.[65]

Photos from June 1948 show the exterior of the Principal Keeper's Quarters in good repair with the south and east porches screened (1941) (figs. 24-25). The photos also show the ca. 1938 frame power plant located northwest of the building and that the structure over the cistern was still in place.

Sometime in 1949 the southwest chimney fell over, severing at the roof (fig. 26). The next available chronological photo (1952) shows that the chimney had been rebuilt by that time (fig. 27).



Figure 24. The south elevation of the Principal Keeper's Quarters on May 8, 1948. The ca. 1938 power plant is located northwest of the dwelling. Both porches have been screened (1941). Photo: Cape Hatteras National Seashore Archives, Box #4: Cape Hatteras Light Station Photos, Principal Keepers Quarters.



Figure 25, right. The west elevation of the Principal Keeper's Quarters on May 8, 1948. At the left of the picture, the superstructure above the cistern is still extant. Photo: Cape Hatteras National Seashore Archives, Box #4: Cape Hatteras Light Station Photos, Principal Keepers Quarters.

[63] Cybularz, "Cape Hatteras Lighthouse," pp. 88-92.
[64] Nistal-Moret, "Narrative Report on the Findings of Historic Structure Inspection."
[65] National Park Service. "Cape Hatteras Light Station." *Cultural Landscape Report.* Cultural Resources, Southeast Region. June 15, 2004. NPS DSC eTIC No. CAHA 603 D214. p. 25.



Figure 26. The chimney fell down in 1949, as its debris pile can be seen on the ground, and may have damaged the stairs. Photo: Cape Hatteras National Seashore Archives, Box #4: Cape Hatteras Light Station Photos, Principal Keepers Quarters.



Figure 27. The Principal Keeper's Quarters, right, and the Double Keepers' Quarters, left, in December 1952. The utility room is not yet part of the east porch. Photo: Cape Hatteras National Seashore Archives, Box #4: Cape Hatteras Light Station Photos, Principal Keepers Quarters.

In 1953, after years of negotiations, fundraising, meetings, site visits, and surveys, the stars aligned for the formal formation of the national park. On January 12 of that year, NPS Director Conrad Wirth recommended that Secretary of the Interior Chapman approve the order to form Cape Hatteras National Seashore. (The seashore would not be formally dedicated until April 24, 1958.)[66] After the formation of the national park, the Principal Keeper's Quarters became a rangers' station.[67]

Between December 1952 and February 1956, the southern portion of the east porch was enclosed for a utility room (fig. 28). Then between February 1956 and October 1957, the Principal Keeper's Quarters was painted pink (fig. 29), just prior to the formal dedication of the park in April 1958. Also by this time the superstructure over the cistern had been removed and the screened enclosures of the west second-floor exterior stair landing and the porches had been removed. It is likely that the Light Station was "cleaned up" for the dedication.

It is unknown why the building was painted pink. The author speculates that peeling white paint may have displayed traces of the building's original red color; the red combined with the white could have shown a pink which could have been interpreted as the original color. Otherwise, tropical colors, like the pink of the Principal Keeper's Quarters and the blue of the adjacent Double Keepers' Quarters, were very popular in the 1950s, and may simply have been the "style."

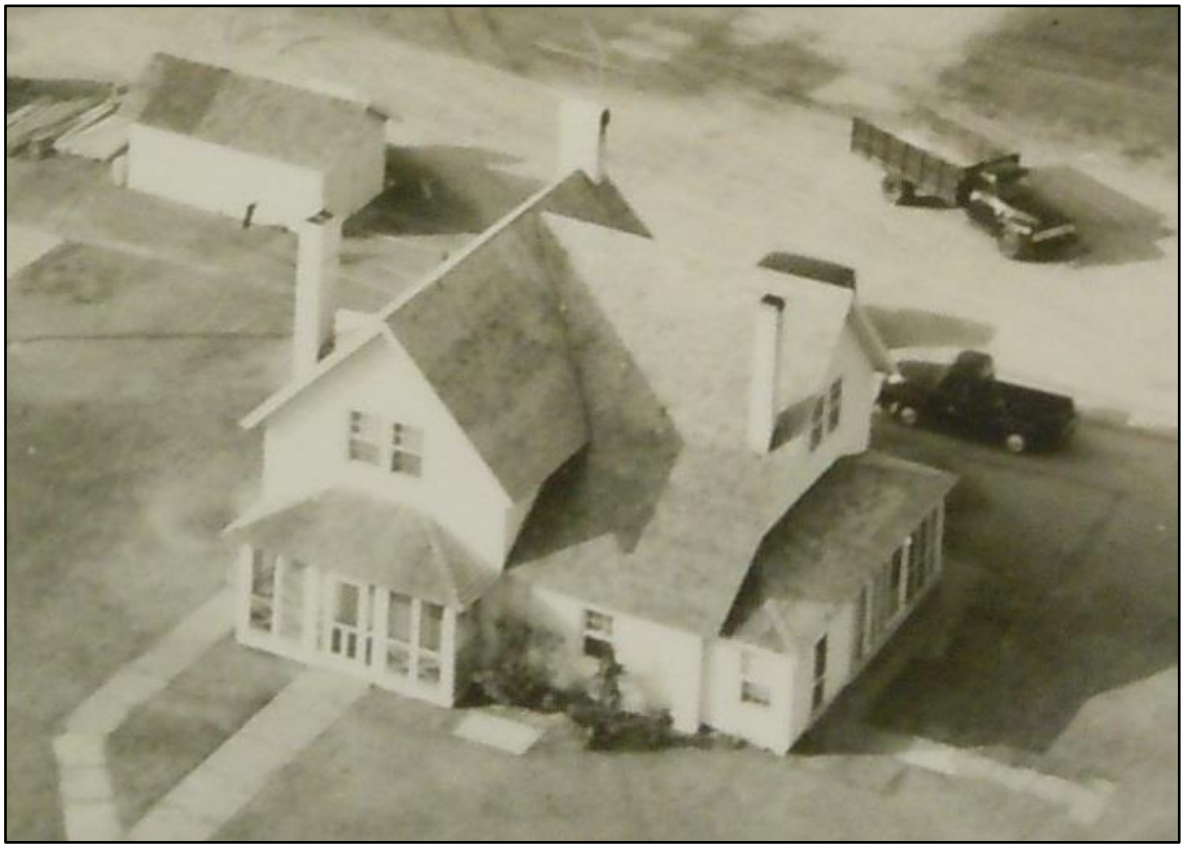


Figure 28. A view of the Principal Keeper's Quarters from the top of the lighthouse on February 8, 1956. The southern portion of the east porch has been enclosed for use as a utility room. Photo: Cape Hatteras National Seashore Archives. Cropped by author.

[66] Cybularz, "Cape Hatteras Lighthouse," pp. 93-95.
[67] NPS, *Cultural Landscape Report*, p. 25.



Figure 29. The Principal Keeper's Quarters sporting a new "pink" color (date unknown). Just noticeable is the structure missing from atop the cistern (arrow). Photo: Cape Hatteras National Seashore Archives, Box #4: Cape Hatteras Light Station Photos, Principal Keepers Quarters.

An Individual Building Data form was completed on May 20, 1959 for the Principal Keeper's Quarters. It included the following information:

Used As: Bachelor quarters
Water: Yes
Sewer: Yes
Sanitary Equipment: flush type toilets, sinks, lavatories, showers
Heating Equipment: Heaters
Fuel: Oil
Electric: Lights, cook stove, Refrigerator
Hot Water: electric
Plumbing: Modern[68]

[68] [illegible]. "Temporary Ranger Res." Individual Building Data. Cape Hatteras National Seashore. May 20, 1959. Box: CAHA 5032/016 Cape Hatteras Light Station Building Records Collection, Folder: Light Station - 1977-1996.

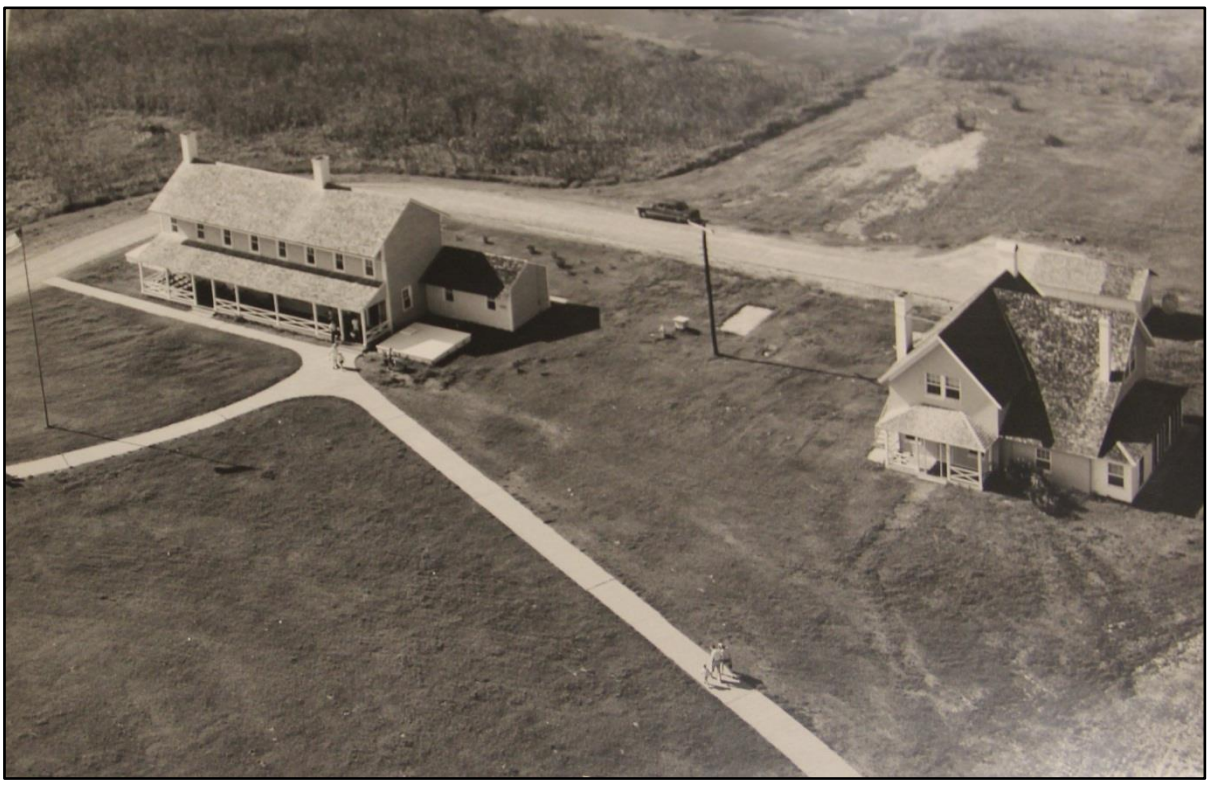


Figure 30. A photograph from atop the lighthouse looking at the Principal Keeper's Quarters, right, and Double Keepers' Quarters, left, in July 1963. Photo: Cape Hatteras National Seashore Archives, Box #4: Cape Hatteras Light Station Photos, Principal Keepers Quarters.

The 1968 Historic Structure Report for the Principal Keeper's Quarters gave the following description of the building at that time (figs. 31-34):

> The structure has been altered and enlarged in recent years. It now provides accommodations for visiting dignitaries.
>
> A small one story frame extension was added to the east end of the kitchen forming a vestibule-utility room space. A two story frame addition was built in the area formed by the ell of the original structure. This provided a larger living room on the first floor and a bedroom of like size on the second floor. To the east of this addition a one story porch was constructed to line up with the kitchen addition.
>
> Six feet of the west end of the north bedroom on the second floor was partitioned off to provide a bathroom, closet and stair run connecting the bath to the intermediate landing of the main stair. From this landing a doorway was made in the exterior wall on the west side of the building.
>
> Very little of the original interior finish can be seen. The walls and ceiling have been lined with beaded pine paneling finished natural. Linoleum covers a part of this upstairs flooring.
>
> The roof is covered with wood shingles. The exterior wood trim and the kitchen vestibule on the outside is painted white. The masonry and the balance of the structure is painted pink. No major settlement cracks were noted and from what can be seen, without removing any of the fabric, appears to be in good condition.[69]

[69] Holland, Jr. and Franzen, "Keeper's Dwelling," pp. 10-12.



Figure 31. The south elevation in 1968. Photo: Holland, Jr. and Franzen, "Keeper's Dwelling."



Figure 32. The east elevation in 1968. Photo: Holland, Jr. and Franzen, "Keeper's Dwelling."

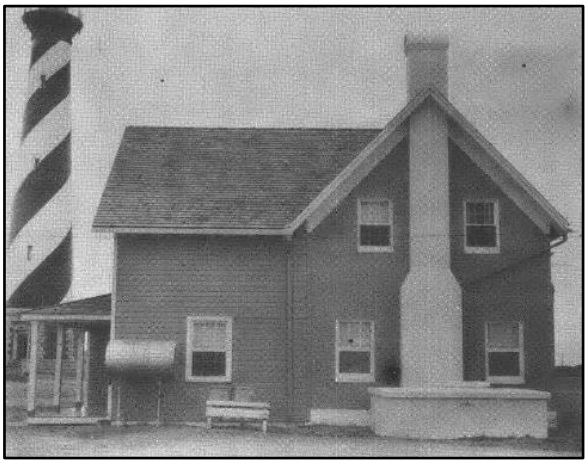


Figure 33. The north elevation in 1968. Photo: Holland, Jr. and Franzen, "Keeper's Dwelling."

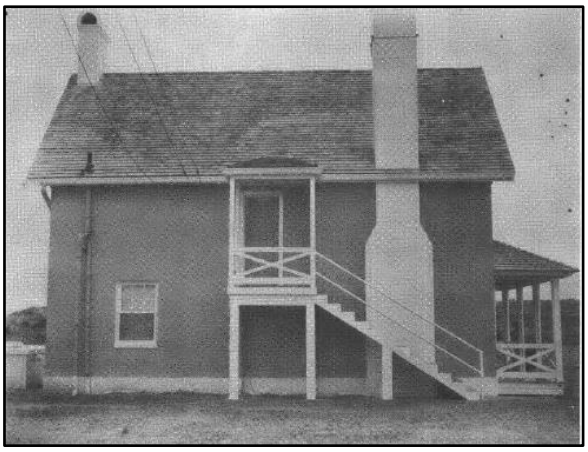


Figure 34. The west elevation in 1968. Photo: Holland, Jr. and Franzen, "Keeper's Dwelling."

The following recommendations were also given:

> To fully interpret the light house story it would be desirable to restore and refurnish the Light Keeper's Quarters for its human interest story.
>
> To bring it back to its proper scale all later additions should be removed and the interior rooms restored and refurnished to reflect their original use. A study should be made to determine the appearance of the original outbuildings and some archeological work at the site may uncover their foundations. It should also be determined how extensive the landscaping, if any, was. Electrical service should be run underground as the present lines are conspicuous and unsightly. The following is an estimate for the cost of the recommended work:

Demolition	$1,875.00
Restoration	12,500.00
Mechanical	1,875.00
Landscaping	3,125.00
Outbuildings	2,500.00
Furnishings	6,250.00
	$28,125.00[70]

[70] Holland, Jr. and Franzen. "Keeper's Dwelling," p. 12.

In 1970, an Interpretive Prospectus was developed for the light station in order, partly, to "exhibit the historic structures." Recommendations included removing the parking near the buildings, restoring the site and exterior appearance of the station, including both quarters' buildings, to the historic period, restoring the interior of the Principal Keeper's Quarters and furnish it with period furniture, and rehabilitate the interior of the Double Keepers' Quarters as a museum.[71]



Figure 35. The "Pink House" was white again in November 1971. Photo: Cape Hatteras National Seashore Archives, Box #4: Cape Hatteras Light Station Photos, Principal Keepers Quarters.

By November 1971, the Principal Keeper's Quarters had been painted white again (fig. 35). In addition, a structure had been built on the south elevation in front of the kitchen addition.

An Individual Building Data form was completed on March 23, 1977 for the Principal Keeper's Quarters. It included the following information:

Use and Occupancy: VIP Quarters
Water: Bux, System
Electric: Public
Sewer: Septic
Plumbing: Modern
Heating: Space Heater
Fuel: Oil
Electric: Range & Refrigerator
Hot Water: Electric[72]

In September 1979, the Principal Keeper's Quarters was proposed for rewiring (fig. 36-38). The State Historic Preservation Office answered on October 16, 1979 with no effect.[73] It is unknown if and/or when this was completed because the dwelling ceased to be used for volunteer and guest housing the next year.[74]

[71] Abbott, Stanley W. (landscape architect), and Carlton D. Abbott (architect). "Hatteras – Interpretive Prospectus." 1970. Harpers Ferry Center library.
[72] Moore, Harry V. "Pink House." Individual Building Data (Form 10-768). U.S. Department of the Interior. National Park Service. Box: CAHA 5032/016 Cape Hatteras Light Station Building Records Collection, Folder: Light Station - 1977-1996.
[73] Box: CAHA 5032/016 Cape Hatteras Light Station Building Records Collection, Folder: Light Station - 1977-1996.
[74] NPS, *Cultural Landscape Report*, p. 25.



Figure 36, above. The southwest corner of the Principal Keeper's Quarters in 1979. Photo: Cape Hatteras National Seashore Archives, Box: CAHA 5032/016 Cape Hatteras Light Station Building Records Collection, Folder: Light Station - 1977-1996.



Figure 37, top right. The northeast corner in 1979. Photo: Cape Hatteras National Seashore Archives, Box: CAHA 5032/016 Cape Hatteras Light Station Building Records Collection, Folder: Light Station - 1977-1996.



Figure 38, right. The west elevation in 1979 with overhead electrical service lines. Photo: Cape Hatteras National Seashore Archives, Box: CAHA 5032/016 Cape Hatteras Light Station Building Records Collection, Folder: Light Station - 1977-1996.

The Principal Keeper's Quarters was assessed by architects from the Southeast Regional Office and one Cape Hatteras National Seashore employee on August 4, 1983, to determine the condition of the building, its materials, and structural systems (figs. 39-40). The following conditions were noted:

- First-floor structural floor joists were placed directly on brick foundation with no waterproofing material or layer. Extant shim blocks were crushed or deteriorated. Joists showed varying degrees of deterioration, including collapsed bearing surfaces, rot, evidence of termites, and collapsed underpinning or non-original supplemental structural members.
- Grade conditions under the building did not allow air circulation and movement of moisture or water. Ponding occurred. Watermarks on the joists showed that flooding water did touch the wood framing members and electrical wiring. Crawlspace had a "stagnant and putrid" feel.
- Small vertical openings at the foundation were to be 1'-0" to 1'-6" above floor of the crawlspace but were obscured by grade on the exterior. This allowed water to find its way into the space, but not its way out. This also meant the exterior grade had substantially risen.[75]

[75] Nistal-Moret, Benjamin, "Narrative Report on the Findings of Historic Structure Inspection."



Figure 39. A view of the first-floor structural floor framing in poor condition in ca. 1983. Photo: Cape Hatteras National Seashore Archives, Box #4: Cape Hatteras Light Station Photos, Principal Keepers Quarters.

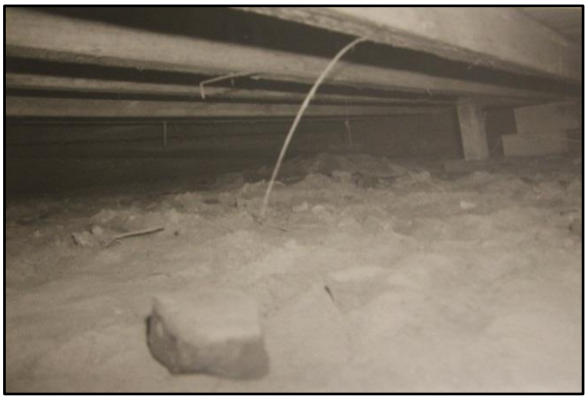


Figure 40. A view of the first-floor structural floor framing in poor condition in ca. 1983. Photo: Cape Hatteras National Seashore Archives, Box #4: Cape Hatteras Light Station Photos, Principal Keepers Quarters.

An Assessment of Actions Having an Effect on Cultural Resources was completed. The work was needed because the structural stability of the first-floor structural floor framing was nearing failure and any undue loads could provoke complete failure.[76]

A second inspection of the Principal Keeper's Quarters occurred by architects of the Southeast Regional Office on September 19-23, 1983 to more fully assess the building to determine the extent of future preservation work. The following conditions were noted:

- At the door opening between the kitchen and living room, inactive termite damage found. Excess moisture in brick had caused deterioration of wood paneling and metal fasteners. Historic brick wall exposed; brick was originally painted "in a red ochre oil base paint." The flat-arch lintel above the door opening was cracked. Surrounding oak flooring was in good condition. Door casing was likely original (1870).
- Original kitchen floor was raised approximately 1'-0" above its original height.
- Kitchen floor joists were extensively wet. Oak flooring and carpet were wet. Subflooring fasteners were rusty.
- Northeast corner of first-floor living room window and ceiling framing exposed by removal of 1937 interior paneling (figs. 41-42). Exposed balloon framing showed no corner bracing, however "1'-0" diagonal sheathing—probably recycled—acted as bracing." The window casing was found to be "floating" between wall framing members, which were being held in place by fascia boards and window trim. All exposed framing was damp and fasteners were corroded.
- At the northwest window framing in the first-floor north bedroom, brick extensively deteriorated and damp,



Figure 41. Exposed framing in the 1927 addition exterior walls, in ca. 1983. Photo: Cape Hatteras National Seashore Archives, Box #4: Cape Hatteras Light Station Photos, Principal Keepers Quarters.

[76] National Park Service, Southeast Regional Office. "Assessment of Actions Having an Effect on Cultural Resources." Not signed. No date. Box #1: CAHA 5029 Cape Hatteras Light Station Principal Keeper's Quarters Preservation Project Records, 1983- 1988, Folder #2: CAHA - Cape Hatteras Light Station. Principal Keepers Quarters. Preservation Project Section 106 Case Report - 1983-1984.

including joints. Brick pointed with Portland-cement based mortar (suggests work completed by CCC). Fasteners corroded. Furring strips degraded.

- Possible active termite activity in closet under stair. Plaster, door, and hardware at stair date to 1870.
- The ca. 1970s drywall and paneling was removed to expose the original configuration of the stair. The wood members are sound in the stair landing.
- The second-floor south bedroom closet framing has not been changed. Lath is sound.
- Removal of interior paneling at the southeast corner of the second-floor south bedroom revealed ghost marks for the original lath and plaster on the structural system. The masonry top plate and roof rafters in the section revealed no deterioration. Some corrosion of fasteners. Some roof rafters are water stained. No insect infestation.
- In the attic space above the 1870 portion of the building, no major deterioration was found. The roof system had been substantially modified and was under-designed. Rafters measured 5-½"" x 1-¾" at 24" on center. Rafters are moisture-stained because shingle roof was actively leaking. Surface degradation of members had begun. Attic floor was dirty, crisscrossed with wiring, and had incorrectly placed insulation. No support had been given to insulated hot water piping.
- The attic space above the 1927 portion of the building was better designed, but had similar issues as described for the 1870 portion of the building.
- Exterior masonry walls (1870): Structure lacked comprehensive and sound rain water collecting and disposal system. Downspouts discharged directly at foundation. Minor cracks found in some window sills and lintels. Paint had failed. Two lintels and sill in the north elevation were determined to be of concrete/cement construction.
- The second-floor reinforced concrete landing was extensively deteriorated and in poor condition.
- Wood-frame exterior walls (1920): Approximately four types of siding identified. Most siding was moisture saturated with corroded fasteners. Siding was partially detached in some areas. Underlying sheathing was slightly deteriorated and fasteners corroded. Porch floors, posts, and railing were extensively deteriorated and corroded. Ceilings deteriorated and finishes failed. Fasteners corroded.



Figure 42. Exposed framing in the 1927 addition exterior walls and floor, in ca. 1983. Photo: Cape Hatteras National Seashore Archives, Box #4: Cape Hatteras Light Station Photos, Principal Keepers Quarters.



Figure 43. One of the mantel surrounds with enclosed firebox, in ca. 1983. Photo: Cape Hatteras National Seashore Archives, Box #4: Cape Hatteras Light Station Photos, Principal Keepers Quarters.

- Exterior window casements, sills, lower sashes, muntins, trim, and glazing compound deteriorated. Sash cords, sash pulleys, and counterweights inoperable.[77]



Figure 44. The south elevation in ca. 1983. Photo: Cape Hatteras National Seashore Archives, Box #4: Cape Hatteras Light Station Photos, Principal Keepers Quarters.



Figure 45. The east elevation in ca. 1983. Photo: Cape Hatteras National Seashore Archives, Box #4: Cape Hatteras Light Station Photos, Principal Keepers Quarters.



Figure 46. The north elevation in ca. 1983. Photo: Cape Hatteras National Seashore Archives, Box #4: Cape Hatteras Light Station Photos, Principal Keepers Quarters.



Figure 47. The deteriorated roof in ca. 1983. Photo: Cape Hatteras National Seashore Archives, Box #4: Cape Hatteras Light Station Photos, Principal Keepers Quarters.

The following report recommendations were written to restore the exterior of the Principal Keeper's Quarters to its 1927 appearance (when the addition and other alterations had been completed) and to restore the interior to its 1937 appearance (CCC-era alterations):

Exterior:

- Installation of new roof drainage system (gutters and downspouts) which would discharge to north elevation cistern and away from structure.
- Removal of west elevation second-floor exterior stair, modification of the exterior door into a window to match those extant in style, but different in dimension, and installation of a steel fire escape ladder, painted white.
- Blasting the exterior walls with walnut shells to remove paint, while reserving areas for future paint research and analysis.
- Repair of brickwork and joints. Paint white.
- Repair of sills and lintels, including repair of cracks. Paint white.
- Installation of a new shingle roof to match existing.

[77] Nistal-Moret, Benjamin, "Second Narrative and Analytical Report on the Findings of Historic Structure Inspection."

- Repair or in-kind replacement of south porch foundations, floor, posts, rails, ceilings, and roof. Paint white.
- Removal of framed-in utility room at east porch. Repair or in-kind replacement of east porch foundations, floor, rails, ceiling, and roof. Paint white.
- Repair or in-kind replacement of deteriorated portions of windows. Restoration of all lower sash to be operable.
- Removal of all air conditioners from windows.
- Installation of red bronze window and door screens.
- Repair or in-kind replacement of deteriorated sheathing.
- Repair or replacement of deteriorated siding to match north elevation siding.
- Replacement of south porch exterior door to match east elevation main entrance door. Paint white.
- Rebuild 1870 foundations to appear as they did in the 1870 drawing. Repair of 1927 addition foundations. Installation of slate or silicone-based injection waterproofing in all foundation. Clean crawlspace. Removal of wiring. Re-grading.

Interior:
- First floor: Removal of carpet. Removal of wood flooring and subflooring. Repair and in-kind replacement of deteriorated sections.
- Removal and replacement of all floor joists to match 1870 design.
- Removal of all 1937 interior paneling from ceiling and walls. Repair or in-kind replacement of interior paneling. Strip finish. Installation of new furring strips to match existing. Reinstallation of interior paneling on walls and ceiling. Finish with two or three coats of wax as recommended for Double Keepers' Quarters.
- Repair or in-kind replacement of deteriorated structural wall framing members.
- Installation of sill plates to match 1870 design.
- Repair or in-kind replacement of deteriorated window frames and sash. Re-glaze. Restoration of all lower sash to be operable. Paint white.
- Repair of all interior brickwork, as needed, including walls and chimneys.
- Removal of mantles. Repair or in-kind replacement of deteriorated portions. Reinstallation. Paint white.
- Opening of fireboxes to make all chimneys operable.
- Installation of bracing, where necessary.
- Repair or in-kind replacement of all deteriorated second-floor structural floor members.
- Installation of insulation between first-floor floor joists and in exterior frame walls.
- Installation of new electrical and plumbing systems.
- Repair or in-kind replacement of all deteriorated or malfunctioning electric baseboard heating units.
- Redesign of kitchen plan and utilities.
- Removal of janitorial room in stairway.
- Stabilization and conservation of historic plaster and lath in stairwell.
- Removal of carpet in first-floor hall, stair, and landing. Repeat of appropriate preservation steps listed above.
- Repair or in-kind replacement of deteriorated newel post, balusters, and handrail. Paint white.
- Removal exterior door opening at stair landing. Installation of window to match those extant in style, but different in dimension.
- Redesign second-floor bathroom and utilities.
- Repeat of appropriate preservation steps listed above on the second floor.
- Installation of insulation in attic. Clean space and bring utilities up to code.[78]

[78] Nistal-Moret, Benjamin, "Second Narrative and Analytical Report on the Findings of Historic Structure Inspection."

On March 8, 1985, an "Assessment of Actions Having an Effect on Cultural Resources" was signed by the park superintendent for the work planned for the Principal Keeper's Quarters. The action was to restore the building to its 1890s appearance, which would require the demolition of the 1927 addition and other later alterations.[79]

Three weeks later, a separate "Case Report for Section 106 Review of the Principal Light Keepers Quarters, Cape Hatteras Light Station" was signed. This described the action as restoring the Principal Keeper's Quarters to its "1927-1936 U.S. Lighthouse Service Period," with removal of any CCC and NPS alterations to the structure.[80] Section 106 compliance for the work was approved by the State Historic Preservation Office on June 5 of that year.[81]

On June 14, 1985, it was reported that drawings and specifications for a contract were being completed by the Southeast Regional Office's Cultural Resources Preservation Center (figs. 48-54).[82]

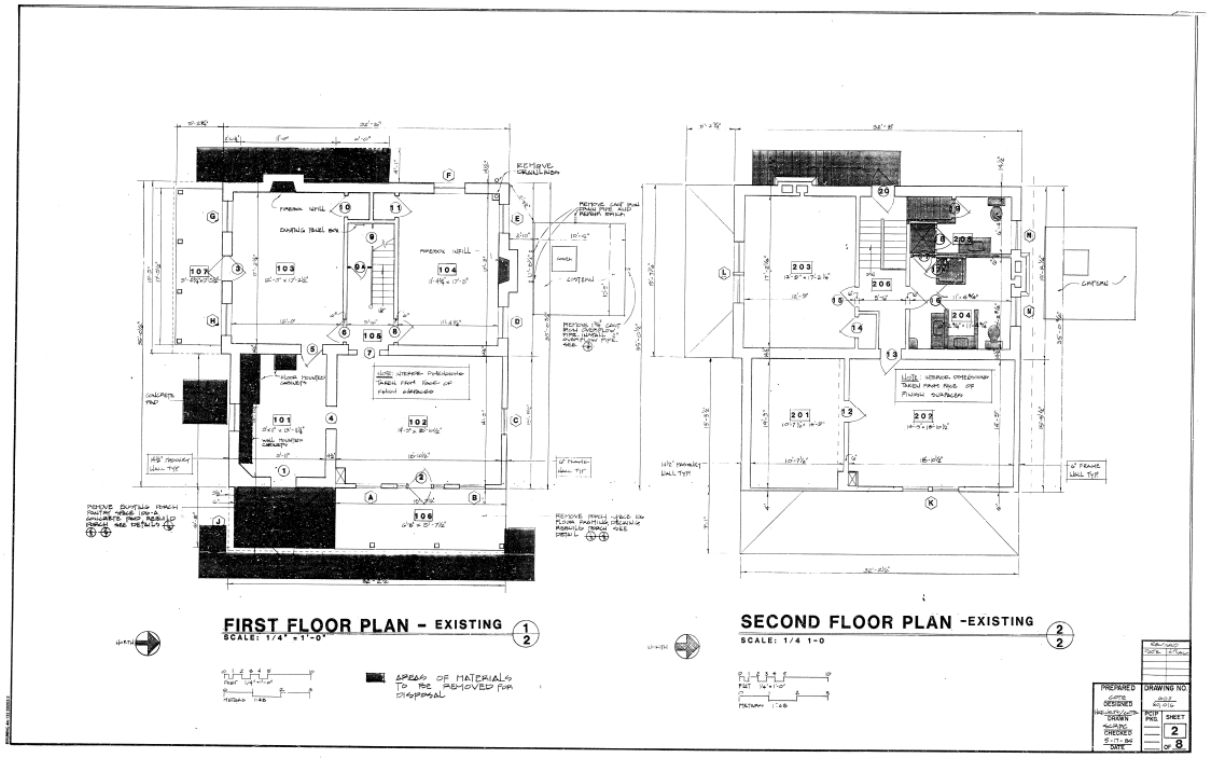


Figure 48. The existing first- and second-floor plans of the Principal Keeper's Quarters. Drawing: Southeast Regional Office Cultural Resources Preservation Center, May 17, 1985. DSC eTIC No. CAHA 603 80016.

[79] Midgette, Bebe B., Resource Management Specialist, NPS. National Park Service. "Assessment of Actions Having an Effect on Cultural Resources." Signed by Thomas L. Hartman (?), Cape Hatteras National Seashore superintendent on March 8, 1985. Box #1: CAHA 5029 Cape Hatteras Light Station Principal Keeper's Quarters Preservation Project Records, 1983- 1988. Folder #2: CAHA - Cape Hatteras Light Station Principal Keepers Quarters. Preservation Project Section 106 Case Report - 1983-1984.
[80] Midgette, Bebe, Cultural Resource Management Specialist, National Park Service. "Case Report for Section 106 Review of the Principal Light Keepers Quarters Cape Hatteras Light Station." Signed by Thomas L. Hartman (?), Cape Hatteras National Seashore superintendent on March 29, 1985. Box #1: CAHA 5029 Cape Hatteras Light Station Principal Keeper's Quarters Preservation Project Records, 1983- 1988. Folder #2: CAHA - Cape Hatteras Light Station Principal Keepers Quarters. Preservation Project Section 106 Case Report - 1983-1984.
[81] Box #1: CAHA 5029 Cape Hatteras Light Station Principal Keeper's Quarters Preservation Project Records, 1983- 1988. Folder #2: CAHA - Cape Hatteras Light Station Principal Keepers Quarters. Preservation Project Section 106 Case Report - 1983-1984.
[82] "Cape Hatteras Light Station, Cape Hatteras National Seashore." *Southeast Region Status Report.* June 14, 1985. Box: CAHA 5031/015 Cape Hatteras Light Station Briefing Book Coll. (c. 1980s). Folder #1: Briefing Statements - 1982-1987.

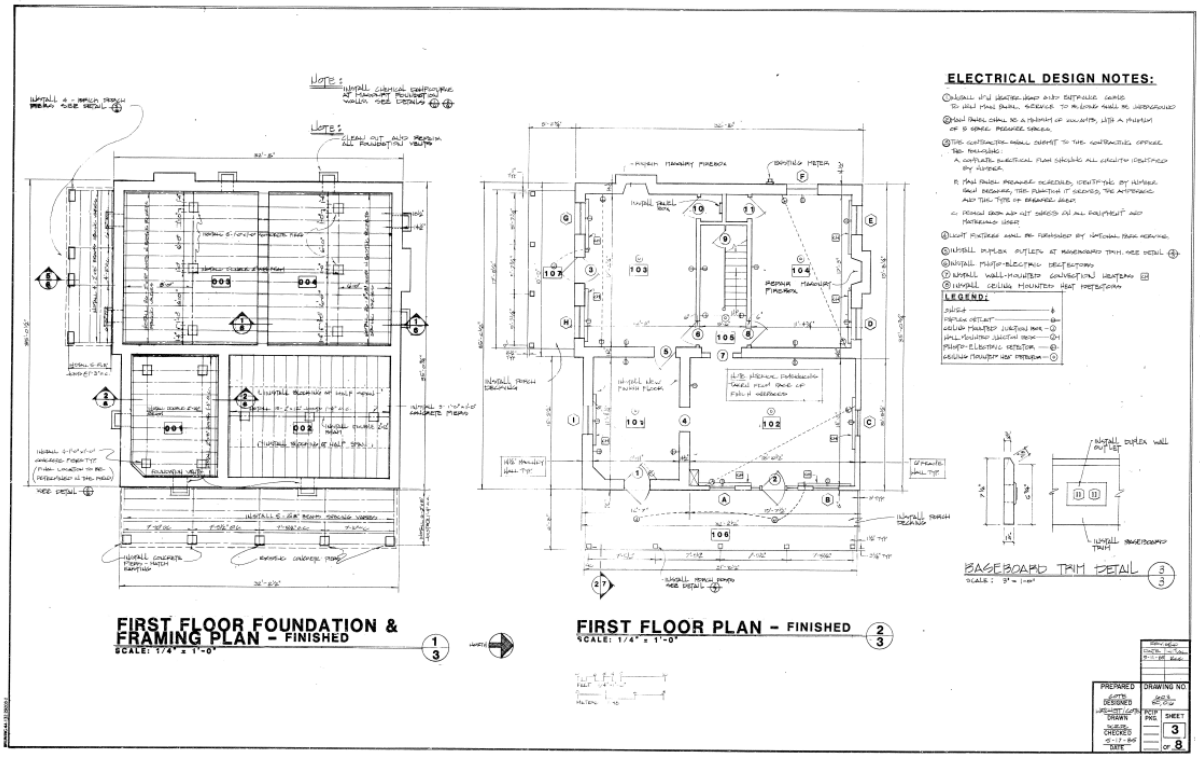


Figure 49. The proposed first-floor foundation and framing plan and first-floor plan of the Principal Keeper's Quarters. Drawing: Southeast Regional Office Cultural Resources Preservation Center, May 17, 1985. DSC eTIC No. CAHA 603 80016.

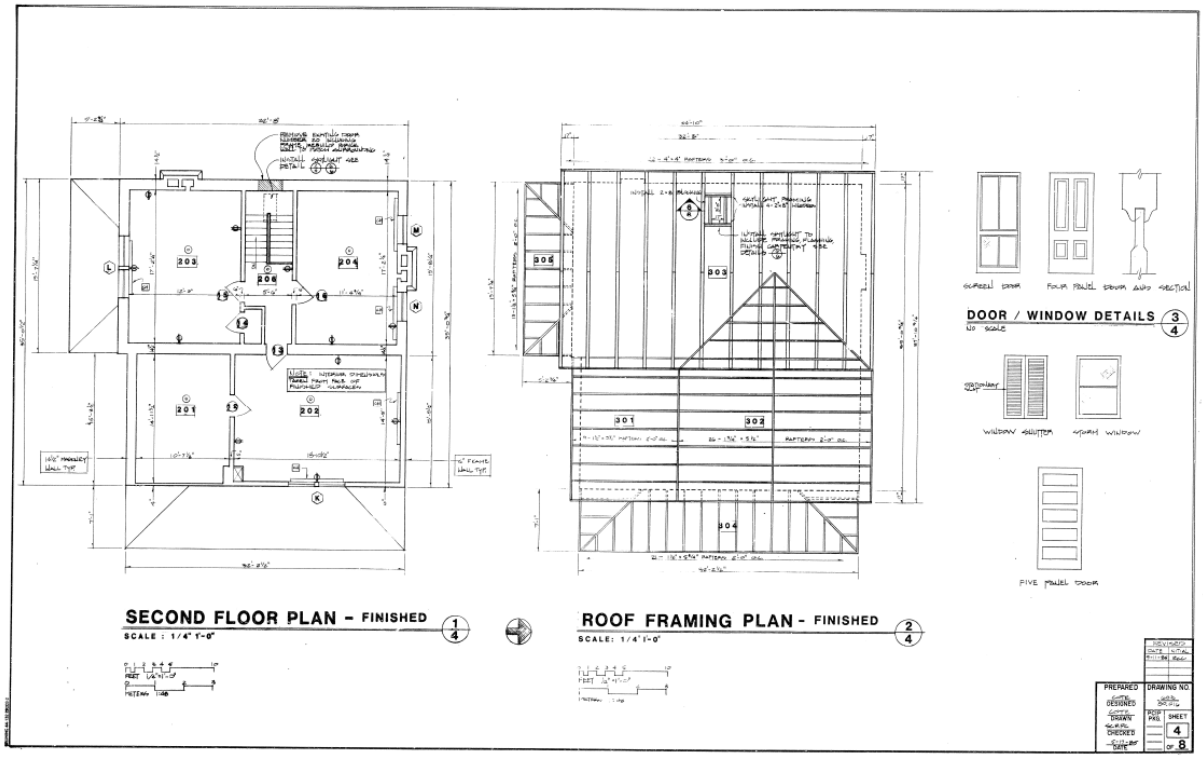


Figure 50. The proposed second-floor and roof framing plans of the Principal Keeper's Quarters. Drawing: Southeast Regional Office Cultural Resources Preservation Center, May 17, 1985. DSC eTIC No. CAHA 603 80016.

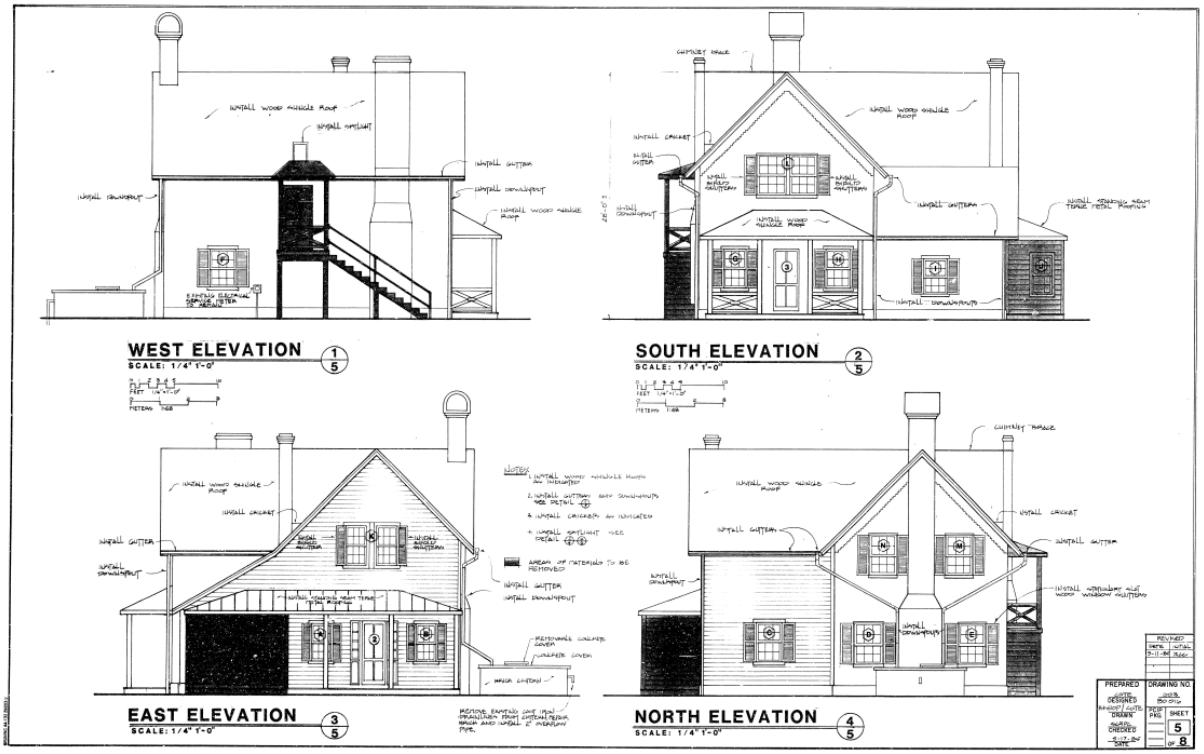


Figure 51. The west, south, east, and north elevations of the Principal Keeper's Quarters. Drawing: Southeast Regional Office Cultural Resources Preservation Center, May 17, 1985. DSC eTIC No. CAHA 603 80016.

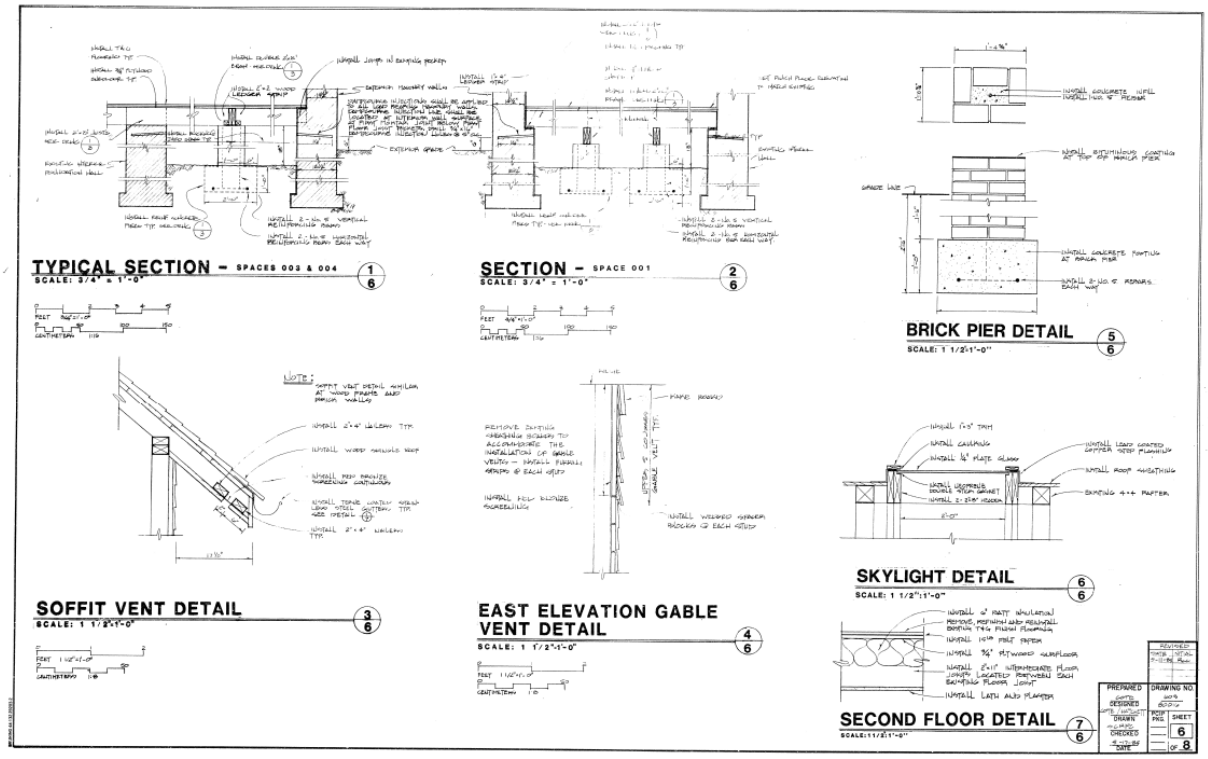


Figure 52. Typical sections of new work in the Principal Keeper's Quarters. Drawing: Southeast Regional Office Cultural Resources Preservation Center, May 17, 1985. DSC eTIC No. CAHA 603 80016.

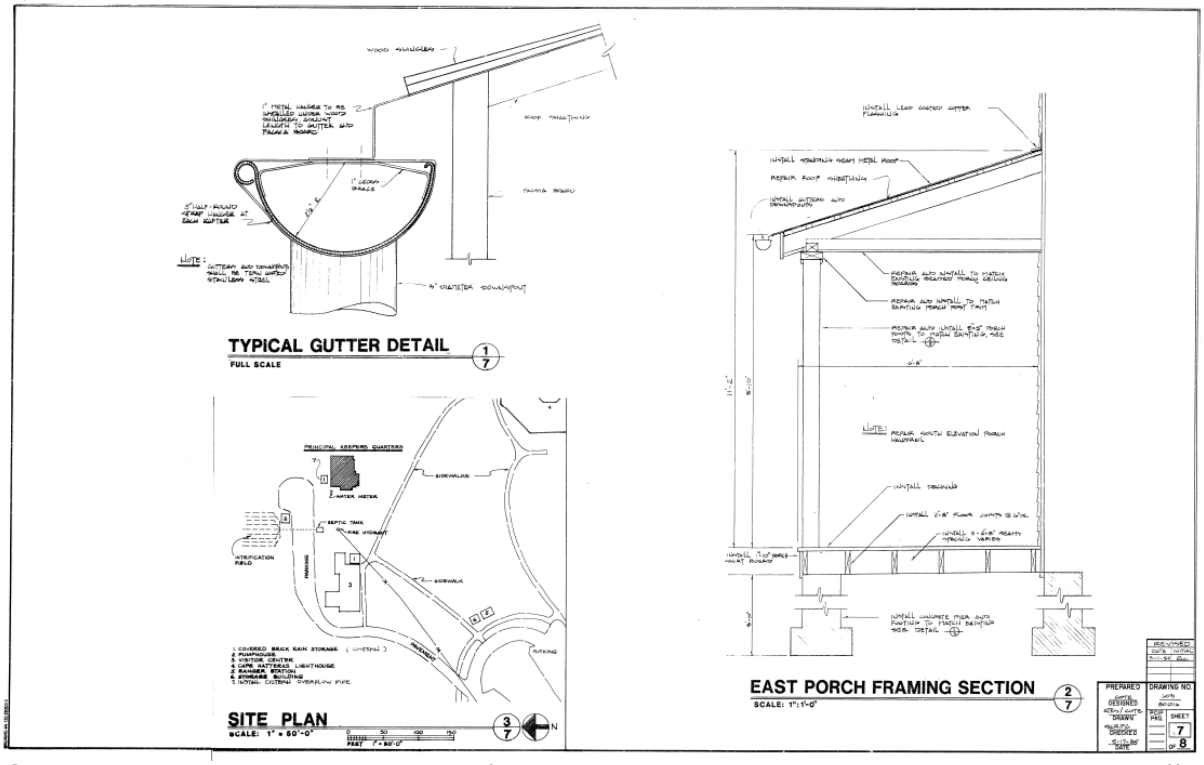


Figure 53. A site plan and other typical details for the Principal Keeper's Quarters. Drawing: Southeast Regional Office Cultural Resources Preservation Center, May 17, 1985. DSC eTIC No. CAHA 603 80016.

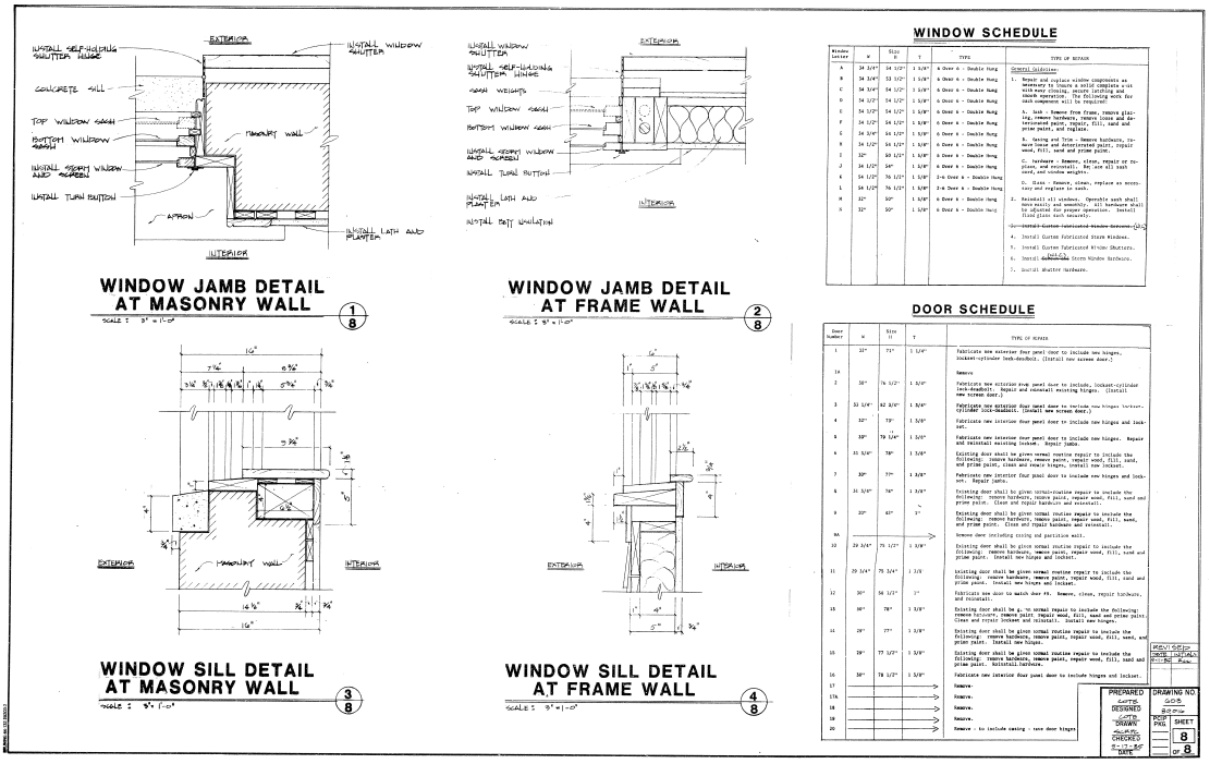


Figure 54. Window and door details for the Principal Keeper's Quarters. Drawing: Southeast Regional Office Cultural Resources Preservation Center, May 17, 1985. DSC eTIC No. CAHA 603 80016.

The preservation contract was awarded to Jacobs Builders, Inc. on September 27, 1985 for $118,966.08.[83] A pre-construction meeting was held on site on October 24, with a construction start date scheduled for November 22.[84] Construction would not actually begin until December 2, 1985. Work that month included removal of interior surfaces to begin reinforcement and restoration of structural members.[85] A month-by-month summary of completed work is as follows:

January 1986:	-	Continuation of December 1985 work.
	-	Damp course injections completed on masonry brick walls and foundation.[86]
February 1986:	-	Replacement of electrical wiring where needed; installation of new circuit box.
	-	Sanding and scraping of interior trim, including stair components and posts.
	-	Installation of footing forms for south porch piers and interior pier foundation.
	-	Replacement of floor joists, where needed, and replacement of subflooring.[87]
	-	Denied approval of Acra-lastic paint for the exterior masonry surfaces. Approval of oil primer and paint for the exterior wood surfaces, exposed metal, and exterior shutters.[88]
March 1986:	-	Chemical cleaning of exterior brickwork.
	-	Framing of east porch, installation of decking, installation and splicing of porch columns.
	-	Installation of furring strips on interior.
	-	Scraping, sanding, patching, and priming of interior and exterior trim.
	-	Pouring of concrete piers and footings for south and east porches.[89]
	-	Denied approval of BMP Masonry Paint on the exterior masonry surfaces.[90]
April 1986:	-	Flashing of all chimneys and valleys. Installation of chimney crickets.
	-	Removal of old shingle roof. Installation of new shingle roof and gutter hangers.
	-	Construction of new skylight.
	-	Rebuilding of soffits.
	-	Repair of masonry fireplaces.
	-	Repair and refinishing of two fireplace mantels and other. [91]
May 1986:	-	Completion of roof re-shingling, repairs of mantels.
	-	Scraping, stripping, and repairing windows, trim, and columns.
	-	Enclosure of west elevation exterior door opening.
	-	Construction of brick piers for south porch.
	-	Installation of south porch floor framing.
	-	Scraping and sanding of wood siding and porch ceilings.
	-	Stripping of brick cistern.
	-	Repointing of masonry walls.
	-	Rewiring and installation of security and fire alarm systems.[92]

[83] Tate, James T. "Certified Notice of Award Contract No. CX 5000-5-0048." *Letter to Ms. Patricia Barlow, Small Business Administration.* September 27, 1985. Box #1: CAHA 5029 Cape Hatteras Light Station Principal Keeper's Quarters Preservation Project Records, 1983- 1988, Folder #4: CAHA - Cape Hatteras Light Station Principal Keepers Quarters Preservation Project - Vol. I - 1984-1988.
[84] "Cape Hatteras Light Station, Cape Hatteras National Seashore." *Southeast Region Status Report.* November 18, 1985. Box: CAHA 5031/015 Cape Hatteras Light Station Briefing Book Coll. (c. 1980s). Folder #1: Briefing Statements - 1982-1987.
[85] "Cape Hatteras Light Station, Cape Hatteras National Seashore." *Southeast Region Status Report.* January 15, 1986. Box: CAHA 5031/015 Cape Hatteras Light Station Briefing Book Coll. (c. 1980s). Folder #1: Briefing Statements - 1982-1987.
[86] "Cape Hatteras Light Station, Cape Hatteras National Seashore." *Southeast Region Status Report.* February 6, 1986. Box: CAHA 5031/015 Cape Hatteras Light Station Briefing Book Coll. (c. 1980s). Folder #1: Briefing Statements - 1982-1987.
[87] "Cape Hatteras Light Station, Cape Hatteras National Seashore." *Southeast Region Status Report.* March 6, 1986. Box: CAHA 5031/015 Cape Hatteras Light Station Briefing Book Coll. (c. 1980s). Folder #1: Briefing Statements - 1982-1987.
[88] Box #1: CAHA 5029 Cape Hatteras Light Station Principal Keeper's Quarters Preservation Project Records, 1983- 1988, Folder #4: CAHA - Cape Hatteras Light Station Principal Keepers Quarters Preservation Project - Vol. I - 1984-1988.
[89] "Cape Hatteras Light Station, Cape Hatteras National Seashore." *Southeast Region Status Report.* April 14, 1986. Box: CAHA 5031/015 Cape Hatteras Light Station Briefing Book Coll. (c. 1980s). Folder #1: Briefing Statements - 1982-1987.
[90] Box #1: CAHA 5029 Cape Hatteras Light Station Principal Keeper's Quarters Preservation Project Records, 1983- 1988, Folder #4: CAHA - Cape Hatteras Light Station Principal Keepers Quarters Preservation Project - Vol. I - 1984-1988.
[91] "Cape Hatteras Light Station, Cape Hatteras National Seashore." *Southeast Region Status Report.* May 15, 1986. Box: CAHA 5031/015 Cape Hatteras Light Station Briefing Book Coll. (c. 1980s). Folder #1: Briefing Statements - 1982-1987.
[92] "Cape Hatteras Light Station, Cape Hatteras National Seashore." *Southeast Region Status Report.* June 23, 1986. Box: CAHA 5031/015 Cape Hatteras Light Station Briefing Book Coll. (c. 1980s). Folder #1: Briefing Statements - 1982-1987.

One major change which occurred during the project was removal of the restoration of lath and plaster from the scope of work. The contract modification stated that the building originally had lath and plaster in the 1870s portion of the building, but when the addition was added in 1927, the lath and plaster was removed from the interior. At that time "furring strips were added to all interior wall and ceiling surfaces. Pressed paperboard (beaver board) was installed at all wall and ceiling surfaces." During the CCC alterations, the beaver board was removed and replaced with "cypress V-joint paneling." Because of this history, and the assigned period of restoration of the interior being 1927-1936, wallboard and battens were installed in the building to be more historically significant.[93]

A Landscape Plan for the Hatteras Light Station was completed in May 1986. The plan studied multiple factors including period of restoration for the site, persistent flooding and hydrology, historic fences and outbuildings, site and building utilities, U.S. Naval Facility to the north, revetment and seawall at the lighthouse, raising the buildings, and moving the buildings. Conclusions of the plan were to continue as existing. After a total of $15,000 for archeological testing and monitoring, the remaining work would cost approximately $60,200 and include:

- Exposed septic lines would remain exposed.
- Approximately 370'-0" of 4'-0"-high, three-rail preservative treated fencing would be constructed south and east of both keepers' quarters and would be located 2'-0" to 5'-0" from location of historic fence to avoid damaging archeological resources. Two gates would control pedestrian traffic.
- Approximately 370'-0" of 5'-0"-wide concrete walk would be needed as a result of the new fence. The walk would be constructed above existing grade with fill materials to provide drainage from walks. A culvert would be constructed under access road to deter ponding in front of the adjacent Double Keepers' Quarters. The existing walk would be demolished.
- Overhead utilities would be relocated underground.
- The U.S. Navy buildings located to the north would be painted in earth tones to blend in with the landscape.
- Existing asphalt access drive and parking would be removed. The access drive and small turn-around would be resurfaced with turf block. No parking would then be provided.
- Cisterns would be reestablished to collect water flowing from the downspouts. Pipes hidden in cisterns would divert water out of each. One pipe would drain to the nearby pond. Other two pipes would drain to drain fields.[94]

This work was never completed.

The contracted restoration work continued as follows:

[93] Cote, Rene, Historical Architect, NPS. "Determination and Findings, Modification of Contract, Contract No. CX 5000-5-0048. Preservation of Principal Keepers Quarters." *Letter to Tom Tate, Contracting Officer, Southeast Region.* Box #1: CAHA 5029 Cape Hatteras Light Station Principal Keeper's Quarters Preservation Project Records, 1983- 1988, Folder #4" CAHA - Cape Hatteras Light Station Principal Keepers Quarters Preservation Project - Vol. I - 1984-1988 - FD. 1 of 2.
[94] Chief, Planning and Compliance Division, Southeast Division. "Report on the Preparation of the Comprehensive Design, Keepers Quarters Landscape Plan for Lighthouse, Cape Hatteras National Seashore." May 2, 1986. Box: CAHA 5567 Keepers Quarters Landscape Plan, 1986. Folder 1 of 1.

June 1986:	-	Completion of security and electrical systems.
	-	Repointing of masonry walls.
	-	Installation of insulation.
	-	Installation of chimney thimbles.
	-	Installation of wall furring and drywall on interior walls.
	-	Installation of wood batten strips on ceilings.
	-	Cleaning of window hardware.
	-	Scraping, stripping, sanding, priming, and repainting of windows, east elevation exterior wood siding, and window and door trim.[95]
July 1986:	-	Completion of drywall and ceiling batten installation.
	-	Stripped, scraped, sanded, and repaired window and door trim.
	-	Installation of new underground electrical service and part of panel box wired.
	-	Installation of salvaged tongue-and-groove flooring in rooms 202-205.
	-	Scraped and primed soffits on north elevation.
	-	Spackled and filled ceiling and wall battens.
	-	Completion of baseboard and wall batten installation in rooms 203-205.
	-	Glazing and installation of windows in rooms 102, 203-204.
	-	Stripped, scraped, and sanded east elevation exterior wood siding.[96]
August 1986:	-	Installation of new tongue-and-groove oak flooring in rooms 101-104, 202.
	-	Reinforcement of stair supports and levelled stairs and landings.
	-	Repair and replacement of door trim.
	-	Repair and glazing of windows.
	-	Installation of new baseboards in rooms 101-105, 202.
	-	Installation of ceiling and wall battens in rooms 101-105.
	-	Spackling and puttying of walls, ceilings, and baseboards.
	-	Priming of walls and ceilings in rooms 100, 103-105, 201, 203-204.
	-	Painting (first coat) of walls, ceilings, and trim in rooms 201, 203-204.
	-	Scraping and sanding of all doors.
	-	Hanging of windows in rooms 102 & 202 and doors in room 203.
	-	Stripping and scraping of stair treads, rails, spindles, and newel post.
	-	Scraping and sanding of east and north wall exterior siding.[97]
September 1986:	-	Installation and priming of baseboard in room 104 and remainder of batten strips in rooms 101-102, 104.
	-	Painting (first coat) of interior walls, ceilings, and trim of rooms 101-105.
	-	Repair and reinstallation of window trim in rooms 101-104.
	-	Sanding, priming, and painting (first coat) of windows.
	-	Stripping, sanding, patching, and priming of all doors. Painting (first coat) and hanging of all doors. Cleaning of some old hardware and installation on doors.
	-	Installation of pulleys, weights, and sash cords in windows of rooms 101-104, 203.
	-	Sanding of floors in rooms 101-104, 203-204.
	-	Installation of shoe molding in rooms 101-103, 202-205.
	-	Installation of main electrical panel and receptacles.
	-	Puttying and sanding of stair treads, railings, balusters, and newel post.
	-	Spackling and puttying of interior walls.
	-	Painting of stair railing, balusters, newel post, and baseboards.
	-	Priming and painting of new storm windows.
	-	Repair, stripping, scraping, and priming of soffits and eaves.
	-	Repair, puttying, and sanding of exterior door frames and trim.
	-	Cutting, hanging, and priming of shutters for windows in rooms 101-104, 202.
	-	Puttying and sanding of exterior window trim.
	-	Scraping and cleaning of excess mortar from repointed joints.
	-	Stripping, scraping, priming, and painting (first coat) of wood siding.
	-	Cleaning of exterior brick work and siding with mildew-preventative solution.
	-	Application of whitewash (two coats) exterior brick walls and chimneys.[98]

[95] "Cape Hatteras Light Station, Cape Hatteras National Seashore." *Southeast Region Status Report.* July 15, 1986. Box: CAHA 5031/015 Cape Hatteras Light Station Briefing Book Coll. (c. 1980s). Folder #1: Briefing Statements - 1982-1987.
[96] "Cape Hatteras Light Station, Cape Hatteras National Seashore." *Southeast Region Status Report.* August 25, 1986. Box: CAHA 5031/015 Cape Hatteras Light Station Briefing Book Coll. (c. 1980s). Folder #1: Briefing Statements - 1982-1987.
[97] "Cape Hatteras Light Station, Cape Hatteras National Seashore." *Southeast Region Status Report.* September 17, 1986. Box: CAHA 5031/015 Cape Hatteras Light Station Briefing Book Coll. (c. 1980s). Folder #1: Briefing Statements - 1982-1987.

October 1986:	-	Painting (second and final coat) of ceilings, walls, and trim in rooms 101-102, 104, 202-205.
	-	Installation of shoe molding in room 104.
	-	Application of mortar around brick fireplace hearths and wood trim.
	-	Installation of heat detectors and security system, including photoelectric eyes.
	-	Finishing of room 104's closet with drywall ceilings and walls, and baseboard, battens, and shoe molding.
	-	Filling and sanding of cracks in old flooring.
	-	Installation and testing of new electric baseboard heaters.
	-	Application of tung oil on floors of rooms 104, 202-205, and stair treads.
	-	Application of whitewash on exterior walls.
	-	Puttying, sanding, and painting of soffits and eaves.
	-	Patching, puttying, and sanding of wood siding.
	-	Scraping and cleaning of first-floor windows.
	-	Installation of south porch and east porch decking. Application of linseed oil on decking.
	-	Construction, painting, and installation of west chimney brace.
	-	Installation of exterior light and switch on south porch.
	-	Reconstruction of south porch, repositioning of columns, railing, and rehabilitation of fascia and boxed-in soffit. Repair and replacement of rafters.
	-	Puttying and sanding of south porch railing, columns, fascia, and soffit.
	-	Installation of south porch ceiling boards.
	-	Re-shingling and re-flashing of south porch roof.
	-	Painting of chimney and step flashing.
	-	Repair and replacement of east porch soffit and fascia.[99]
November 1986:	-	Application of Tung oil to stairs and floors in rooms 102 & 105.
	-	Waxing of floors in rooms 101-102, 104-105, 202-204.
	-	Sanding of floor in room 103.
	-	Painting of walls, ceilings, and trim in rooms 102 & 103.
	-	Installation, priming, and painting of drywall on walls, baseboard, and batten trim in room 103's closet.
	-	Painting of windows.
	-	Scraping, stripping, sanding, puttying, and painting of south porch.
	-	Construction and installation of room 101 exterior door threshold.
	-	Grouting around south porch base flashing and painting of all flashing with two coats of paint.
	-	Painting of exterior window shutters, screen doors, and exterior window trim.
	-	Priming of metal gutters and downspouts.
	-	Installation of east porch decking.
	-	Application of whitewash on exterior walls, chimneys, and cistern.
	-	Stripping and scraping of east porch ceiling boards and trim.
	-	Installation of telephone service for alarm system.[100]

On November 13, 1986, the project's Contracting Officer's Representative threatened the contractor with termination of the contract because work had not been completed by the original end date (August 14, 1986).[101] A response from the contractor eleven days later noted several delays

[98] "Cape Hatteras Light Station, Cape Hatteras National Seashore." *Southeast Region Status Report.* October 14, 1986. Box: CAHA 5031/015 Cape Hatteras Light Station Briefing Book Coll. (c. 1980s). Folder #1: Briefing Statements - 1982-1987.
[99] "Cape Hatteras Light Station, Cape Hatteras National Seashore." *Southeast Region Status Report.* November 12, 1986. Box: CAHA 5031/015 Cape Hatteras Light Station Briefing Book Coll. (c. 1980s). Folder #1: Briefing Statements - 1982-1987.
[100] "Cape Hatteras Light Station, Cape Hatteras National Seashore." *Southeast Region Status Report.* December 8, 1986. Box: CAHA 5031/015 Cape Hatteras Light Station Briefing Book Coll. (c. 1980s). Folder #1: Briefing Statements - 1982-1987.
[101] Tate, James T., Contracting Officer, NPS. "Contract No. CX-5000-5-0048. Preservation of the Principal Keeper's Quarters. Cape Hatteras National Seashore." *Letter to Jacobs Builders, Inc.* November 13, 1986. Box #1: CAHA 5029 Cape Hatteras Light Station Principal Keeper's Quarters Preservation Project Records, 1983- 1988, Folder #4" CAHA - Cape Hatteras Light Station Principal Keepers Quarters Preservation Project - Vol. I - 1984-1988.

accounting for 320 "lost days."[102] A total of eighty-nine days were added to the end of the contract to account for the delays. This changed the end date to November 11, 1986. Documentation also shows a stipulation of liquidated damages in the amount of $100 per day for each calendar day beyond the new completion date.[103] As noted below, work continued for several more months:

December 1986:	-	Installation of locksets and hinges (30% of locksets not available).
	-	Fitting and trimming of storm windows (turn buttons backordered).
	-	Hook up and testing of fire and security alarm systems.
	-	Cleaning of window interiors.
	-	Application of Tung oil to floor in room 103. Waxing of all floors.
	-	Stripping, scraping, and/or sanding of east porch soffit and trim, east elevation eave, and north elevation wood siding. Patching and puttying of east porch.
	-	Painting of east elevation eaves, south porch, east elevation siding, and north elevation siding.
	-	Painting of storm window trim, shutters, exterior door thresholds, and east porch soffit and fascia.
	-	Hanging of three screen doors.
	-	Removal of east porch shingle roof. Installation of new standing-seam metal roof.
	-	Installation of east porch ceiling boards.
	-	Application of linseed oil on the south porch decking.
	-	Trimming, fitting, and installation of window shutters.[104]
January 1987:	-	Installation of remaining shoe molding in room 103's closet.
	-	Reapplication of Tung oil to small section of flooring in room 103, due to staining caused by heavy rains blowing under door.
	-	Replacement of old overflow pipe in cistern.
	-	Installation of last east porch ceiling boards. Priming and painting of porch ceiling.
	-	Painting of east elevation siding boards.
	-	Application of linseed oil to last porch decking and installation on east porch.
	-	Trimming of east porch decking edges and installation of skirt boards.[105]
February 1987:	-	Installation of gutters on east porch, south elevation, and west elevation. Insufficient amount to complete north elevation.
	-	Installation of two of seven downspouts.
	-	Remainder of sheet metal bent to shape.[106]
March 1987:	-	Completion of east porch standing-seam metal roof.
	-	Completion of installation of gutters and downspouts.[107]
April 1987:	-	Repair of exterior and interior door.[108]
May 1987:	-	Installation of remaining storm window turn buttons.
	-	Priming of remaining gutters and downspouts.[109]

[102] Jacobs, Christopher R., President, Jacobs Builders, Inc. "Contract No. CX-5000-5-0048. Preservation of the Principal Keeper's Quarters. Cape Hatteras National Seashore." *Letter to James T. Tate.* November 24, 1986. Box #1: CAHA 5029 Cape Hatteras Light Station Principal Keeper's Quarters Preservation Project Records, 1983- 1988. Folder #4: CAHA - Cape Hatteras Light Station Principal Keepers Quarters Preservation Project - Vol. I - 1984-1988.
[103] Tate, James T., Contracting Officer, NPS. "Contract No. CX-5000-5-0048. Preservation of the Principal Keeper's Quarters. Cape Hatteras National Seashore." *Letter to Jacobs Builders, Inc.* January 8, 1987. Box #1: CAHA 5029 Cape Hatteras Light Station Principal Keeper's Quarters Preservation Project Records, 1983- 1988, Folder #4: CAHA - Cape Hatteras Light Station Principal Keepers Quarters Preservation Project - Vol. I - 1984-1988.
[104] "Cape Hatteras Light Station, Cape Hatteras National Seashore." *Southeast Region Status Report.* January 14, 1987. Box: CAHA 5031/015 Cape Hatteras Light Station Briefing Book Coll. (c. 1980s). Folder #1: Briefing Statements - 1982-1987.
[105] "Cape Hatteras Light Station, Cape Hatteras National Seashore." *Southeast Region Status Report.* February 16, 1987. Box: CAHA 5031/015 Cape Hatteras Light Station Briefing Book Coll. (c. 1980s). Folder #1: Briefing Statements - 1982-1987.
[106] "Cape Hatteras Light Station, Cape Hatteras National Seashore." *Southeast Region Status Report.* March 11, 1987. Box: CAHA 5031/015 Cape Hatteras Light Station Briefing Book Coll. (c. 1980s). Folder #1: Briefing Statements - 1982-1987.
[107] "Cape Hatteras Light Station, Cape Hatteras National Seashore." *Southeast Region Status Report.* April 15, 1987. Box: CAHA 5031/015 Cape Hatteras Light Station Briefing Book Coll. (c. 1980s). Folder #1: Briefing Statements - 1982-1987.
[108] "Cape Hatteras Light Station, Cape Hatteras National Seashore." *Southeast Region Status Report.* May 18, 1987. Box: CAHA 5031/015 Cape Hatteras Light Station Briefing Book Coll. (c. 1980s). Folder #1: Briefing Statements - 1982-1987.
[109] "Cape Hatteras Light Station, Cape Hatteras National Seashore." *Southeast Region Status Report.* June 30, 1987. Box: CAHA 5031/015 Cape Hatteras Light Station Briefing Book Coll. (c. 1980s). Folder #1: Briefing Statements - 1982-1987.

An inspection of the project occurred on July 21, 1987. A report was completed about a month later which included the following concerns:

- Gutters drain directly to the ground causing flooding around and under the structure. Mitigation needed to drain water away from building.
- South side of standing seam metal roof is finished poorly. Contractor was going to try to remedy.
- An exposed area was seen where the house and east porch meet at the northeast corner.
- South elevation screen door "pieced together." Contractor was going to replace the door.
- Cistern was leaking.
- Meter box was intrusive; proposed to be painted.
- Shutters are incorrect design. Shutter hinges rusted.
- Shingle missing on north elevation.
- Water main located above ground creating tripping hazard.[110]

It is assumed these items were completed prior to the completion of the project in September 1987.[111]

The project completion report stated that the Principal Keeper's Quarters preservation project totaled $145,867.53. The project, which had begun on November 22, 1985, and was completed on September 25, 1987, included the following work:

A. Site Preparation: Included trenching, excavating, and regrading.
B. Demolition: Removed and satisfactorily disposed of material.
C. Concrete: Installed concrete footings.
D. Masonry Restoration and Cleaning: Cleaned, repointed, and repaired exterior masonry surfaces. Injected siliconate damp course at foundation level.
E. Carpentry and Millwork: repaired and replaced wood siding, porch posts, sheathing boards, structural framing, flooring, and millwork.
F. Roofs: Replaced wood shingle roofs and flashing. Installed standing seam metal roof on east porch roof.
G. Building Insulation and Caulking: Installed insulation at first and second floors, framed walls, and attic.
H. Gutters and Downspouts: Installed new gutters and downspouts.
I. Wood Doors: Replaced or repaired and made operable, to include proper hardware. Installed new screen doors.
J. Wood Windows: Replaced or repaired and made operable, to include proper hardware. Installed new storm windows.
K. Finish Hardware: Existing [1930s] period hardware was given normal routine maintenance. Missing or later period hardware was replaced to match [1930s] period fabric.
L. Paint: Removed deteriorated surfaces and refinished all surfaces.
M. Interior Finishes: Repaired existing and installed new wood floor, installed fiberboard and wood batten strips to walls and ceiling to match 1927-1933 period interior finish.
N. Cistern Drainage System: Installed cistern overflow pipe.
O. Electrical System: Installed electrical system including all wiring, cables, controls, accessories, other related items and connection to work of other trades for complete and operational system. Also included was all labor and materials required to abandon existing electrical system. Installed electrical baseboard system.
P. Security System: Installed photoelectrical detector system.

[110] CRM Specialist. "Principal Keepers Quarters Inspection - July 21, 1987." August 20, 1987. Box #1: CAHA 5029 Cape Hatteras Light Station Principal Keeper's Quarters Preservation Project Records, 1983- 1988, Folder #4" CAHA - Cape Hatteras Light Station Principal Keepers Quarters Preservation Project - Vol. I - 1984-1988.
[111] "Cape Hatteras Light Station, Cape Hatteras National Seashore." *Southeast Region Status Report.* September 28, 1987. Box: CAHA 5031/015 Cape Hatteras Light Station Briefing Book Coll. (c. 1980s). Folder #1: Briefing Statements - 1982-1987.

Q. Fire Alarm System: Installed heat detectors.

The Release of Claims statement was signed by the contractor, and received by the government on November 28, 1988. Due to nine change orders, the project was completed in 457 calendar days, with a $26,901.45 increase in funding.[112]

Originally planned to begin in October 1987, funding for the implementation of the Historic Furnishings Plan completed for the Principal Keeper's Quarters was never received and the building was never opened to the public or utilized in any way after its restoration,[113] despite the intention to interpret the first floor of the building to the time of the last keeper, Unaka Jennette.[114]

The Historic American Building Survey documented the Hatteras Light Station in September 1989. The photographs show the decaying state of the building as it sat unused (figs. 55-60).



Figure 55. The south elevation of the Principal Keeper's Quarters in October 1989. Photo: HABS, http://www.loc.gov/pictures/collection/hh/item/nc0477/.

[112] Chief, Historic Architecture Division, to Superintendent, Cape Hatteras. Contract No. CX5000-5-0048, Preservation of the Principal Keeper's' Quarters. January 19,1989. Box #2: CAHA 5029 – Cape Hatteras Light Station Principal Keeper's Quarters Preservation Project Records, 1983, 1988, Folder #4: Completion Report – 1987.
[113] Cape Hatteras National Seashore Group, Maintenance & Engineering Services. "Cape Hatteras National Seashore, Cape Hatteras Light Station, Principal Keepers, LCS 00112, 1996 - Preservation Maintenance." Box: CAHA 5039 Cape Hatteras Light Station Principal Keeper's Quarters Preservation Maintenance Project, 1996. Folder 1 of 1.
[114] Division of Interpretive Planning, Harpers Ferry Center. "Interpretive Prospectus – Cape Hatteras National Seashore." December 1988. Harpers Ferry Center library.



Figure 56. The east elevation of the Principal Keeper's Quarters in October 1989. Photo: HABS, http://www.loc.gov/pictures/collection/hh/item/nc0477/.



Figure 57. The west elevation of the Principal Keeper's Quarters in October 1989. Photo: HABS, http://www.loc.gov/pictures/collection/hh/item/nc0477/.



Figure 58. The northwest corner of the Principal Keeper's Quarters in October 1989. Photo: HABS, http://www.loc.gov/pictures/collection/hh/item/nc0477/.



Figure 59, right. The interior stair of the Principal Keeper's Quarters in October 1989. Photo: HABS, http://www.loc.gov/pictures/collection/hh/item/nc0477/.



Figure 60. The southwest room of the Principal Keeper's Quarters in October 1989. Photo: HABS, http://www.loc.gov/pictures/collection/hh/item/nc0477/.

A Historic Furnishings Plan was completed for the Principal Keeper's Quarters in 1991 (figs. 61-64).[115] It recommended a route on the first-floor interior of the building and furnishings dating to the Unaka Jennette family occupation of the house (1919-1933). Implementation of this plan would not happen.

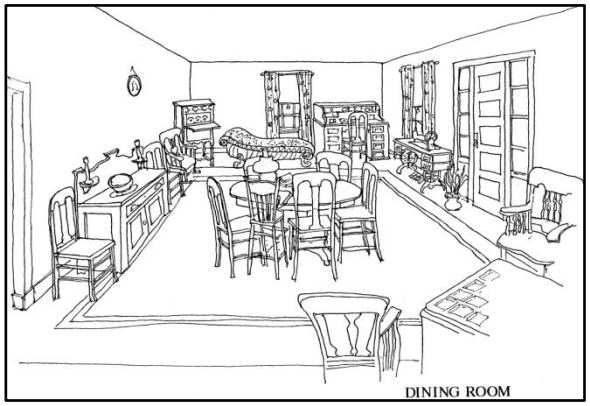


Figure 61. Furnishing plan for the dining room (northeast first-floor room). Drawing: NPS DSC eTIC No. CAHA 603 D109.

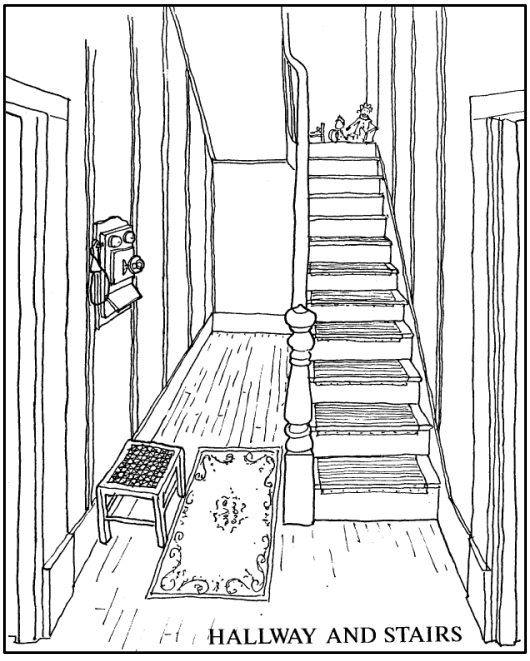


Figure 62, right. Furnishing plan for the first-floor stair hall. Drawing: NPS DSC eTIC No. CAHA 603 D109.

[115] Wallace, David H., Harpers Ferry Center, National Park Service. "Principal Keeper's Quarters, Cape Hatteras Light Station, Cape Hatteras National Seashore, North Carolina." *Historic Furnishing Report.* 1991. NPS DSC eTIC No. CAHA 603 D109.

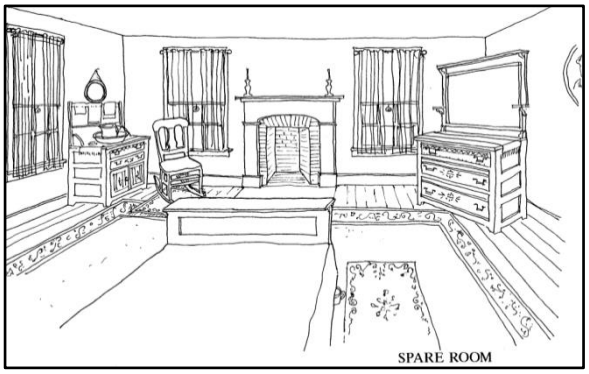


Figure 63. Furnishing plan for the Guest Bedroom (northwest first-floor room). Drawing: NPS DSC eTIC No. CAHA 603 D109.

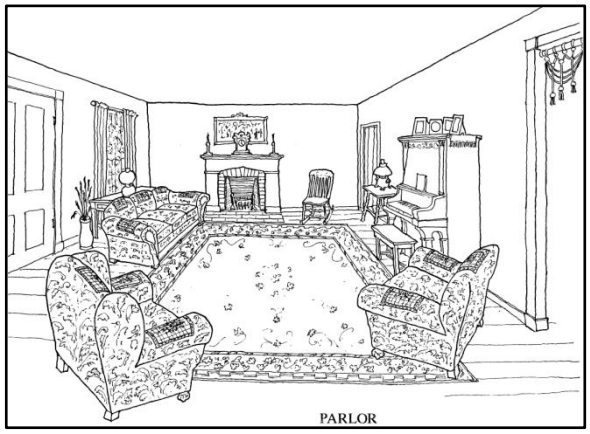


Figure 64. Furnishing plan for the Parlor (southwest first-floor room). Drawing: NPS DSC eTIC No. CAHA 603 D109.

In 1991, the poplar exterior window shutters and some hinges, installed just four years prior, needed to be replaced because the wood had deteriorated beyond repair (figs. 65-68). The juniper replacement shutters were needed to protect the windows from storm conditions.[116]



Figure 65. Deteriorated shutter hinge, ca. 1991. Photo: Cape Hatteras National Seashore Archives.

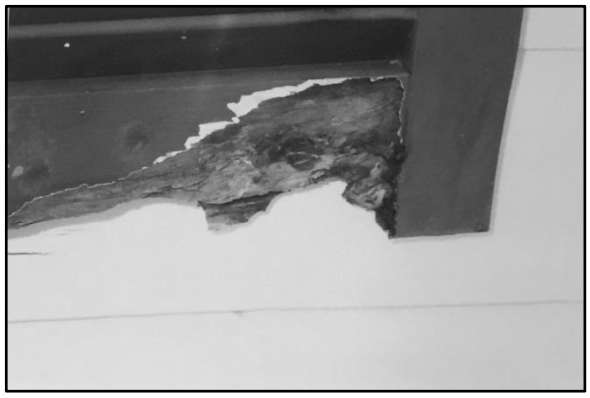


Figure 66. Deteriorated shutter bottom rail, ca. 1991. Photo: Cape Hatteras National Seashore Archives.



Figure 67. Deteriorated shutter hinge and stile, ca. 1991. Photo: Cape Hatteras National Seashore Archives.



Figure 68. Deteriorated shutter slats, ca. 1991. Photo: Cape Hatteras National Seashore Archives.

[116] Deputy Associate Regional Director, Cultural Resources, Southeast Region. *Letter to Superintendent Cape Hatteras National Seashore.* August 30, 1991. Box: CAHA 5604 CAHA Compliance, Box 1 of 1, Folder 1 of 1.

Around the same time, an "Assessment of Actions Having an Effect on Cultural Resources" was completed for: pressure washing with 1200 psi nozzle, re-washing with TSP and bleach, priming with an oil-based primer which contains sealer, and painting with and elastomeric/acrylic-based paint (figs. 69-72).[117]



Figure 69. The south elevation, ca. 1991. Photo: Cape Hatteras National Seashore Archives.



Figure 70. The east elevation, ca. 1991. Photo: Cape Hatteras National Seashore Archives.



Figure 71, left. The north elevation, ca. 1991. Photo: Cape Hatteras National Seashore Archives.



Figure 72, above. The west elevation, ca. 1991. Photo: Cape Hatteras National Seashore Archives.

[117] National Park Service "Assessment of Actions Having an Effect on Cultural Resources." *XXX Form.* Box: CAHA 5604 CAHA Compliance, Folder 1 of 1.

In 1992, due to the deterioration of the unoccupied building so soon after its restoration, the Southeast Regional Office planned to complete destructive investigation of the Principal Keeper's Quarters, to include:

- Removal of the trim around a single-window opening and a double-window opening (interior and exterior) on the north and south elevations.
- Dismantling and removal of a single window and double window located on the north and south elevations.
- Removal of interior drywall adjacent to windows to determine condition of inner wall cavities.
- Removal of trim around skylight and skylight to investigate leaks. Reinstall after investigation.
- Investigation and documentation of condition of foundations, piers, floor joists, and sills.
- Marking, recording, and storing of all fabric removed.
- Replacement of windows and fabric after investigation work is completed until Scope of Work, plans, and specifications can be developed to correct problems and compliance approval is received from Southeast Regional Office.[118]

The conclusions of this investigatory work are unknown.

Planning for the use of the building began in 1993, when Eastern National proposed using the first floor of the building. The two eastern rooms would be used for sales, the northwest room would be used for storage, and the southwest room would be used for a National Park Service exhibit. Eastern National required some alterations to the building including: repainting the exterior, constructing an accessible ramp, adding exterior signage, adding interior light fixtures, adding additional electrical outlets, installing a telephone line, installing an air conditioning or ventilation system to move air throughout the first floor, and repairing the skylight, if necessary.[119]



Figure 73. Principal Keeper's Quarters, 1995. Photo: Cape Hatteras National Seashore Archives.

[118] Deputy Associate Regional Director, Cultural Resources, Southeast Region. *Letter to Superintendent Cape Hatteras National Seashore.* September 9, 1992. Box: CAHA 5604 CAHA Compliance, Folder 1 of 1.
[119] Moroz, Chesley A. (Eastern National). *Letter to Tom Hartman, Superintendent, Cape Hatteras National Seashore.* September 23, 1993. Box: CAHA 5604 CAHA Compliance, Folder 1 of 1.

A small preservation maintenance project was then planned in order to open the building as either an Eastern National store or as offices for park staff. The summary of work included:

Masonry restoration and cleaning:
- Cleaning and preparation for painting.
- Re-pointing mortar only where necessary.

Carpentry and millwork:
- Repair or replacement of wood siding, porch posts and rail work, sheathing boards, structural framing, flooring and millwork.

Roofs:
- Replacement of wood shingle or standing-seam metal roof only where necessary.
- Preparation of metal roof for painting.

Roof Drainage System:
- Repair or replacement of gutters and downspouts only where necessary.
- Preparation for painting.

Wood Doors:
- Repair and make operable, including all proper hardware.
- Repair screen doors; installation of lexan glass on interior of all.

Wood windows:
- Repair to make operable or replacement of windows and storm windows, to include proper hardware. Re-glazing where necessary.
- Preparation for painting.

Finish hardware:
- Preservation maintenance to 1930s period hardware.
- Replacement of missing or later-period hardware to match 1930s period fabric.

Paint:
- On exterior, removal of deteriorated surfaces. Preparation and repainting of all surfaces scheduled for painting.

Interior Finishes:
- Repair of all existing, flooring, ceilings, walls, trim.
- Touch up or repainting only where necessary.[120]

This work was completed Fiscal Year 1996.

Funding for an additional rehabilitation project for the Principal Keeper's Quarters was approved for Fiscal Year 1997. The rehabilitation work was required to make the building suitable for use by Eastern National, restoration of one room for exhibition (period furniture), and reconstruction of an outbuilding for storage and an employee restroom. The rehabilitation was estimated to cost $95,216 and would include:

Exterior:
- Installation of concrete and wood ramp at south entrance.
- Repair of exterior doors and installation of storm doors.

[120] Cape Hatteras National Seashore Group, Maintenance & Engineering Services. "Cape Hatteras National Seashore, Cape Hatteras Light Station, Principal Keepers, LCS 00112, 1996 - Preservation Maintenance."

- Repair of the skylight, to include replacement of broken glass and waterproofing.
- Installation of rain caps on chimneys.
- Installation of portable air conditioning and baseboard heat units.

Interior:
- Repair of firebox masonry.
- Repair of area around skylight area.
- Clean, prepare, and repaint windows and interior storm windows.
- Repair doors and hardware.
- Clean, prepare, and repaint walls.
- Repair wood floors and wood trim.
- Removal of old electric heaters.
- Furnishings for bedroom unit.

Addition of outbuildings:
- Construction of sales/storage outbuilding.
- Construction of NPS restroom outbuilding.
- Construction of cistern enclosure.[121]

During the spring of 1996, an elevated concrete sidewalk was proposed to the south porch of the Principal Keeper's Quarters. Sketches and drawings were completed (fig. 74-75). The feature was not implemented until after the building's move in ca. 2001.

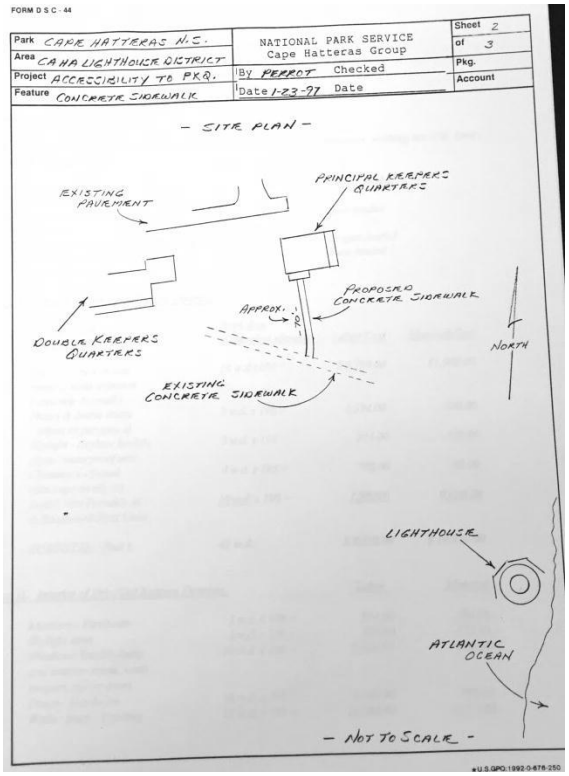


Figure 74. The new concrete sidewalk was to be located on the south elevation of the quarters. Drawing: Cape Hatteras National Seashore Archives.

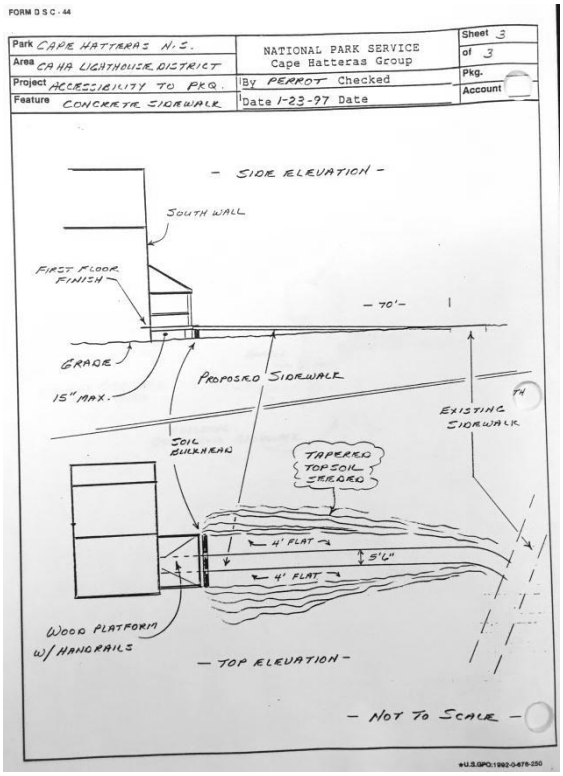


Figure 75. A side elevation of the new concrete sidewalk. Drawing: Cape Hatteras National Seashore Archives.

[121] Cape Hatteras Group, Maintenance & Engineering Services. "Cape Hatteras National Seashore, Cape Hatteras Light Station, Principal Keeper's Quarters, LCS 00112, 1997- Rehabilitation." Box: CAHA 5045 CHLS PKQ Rehabilitation Project, 1997.

Moving a Landmark Light Station

In late 1997, after several decades of planning and studies by the federal government, independent parties, and others, the National Park Service Denver Service Center (DSC) issued a request for Qualification for firms interested in bidding on the Design-Build project to move the Cape Hatteras Light Station. A total of six firms responded. In January 1998, after a technical evaluation panel of three evaluating DSC employees and two non-evaluating advisors chose two firms to respond to the Request for Proposal (RFP). The RFP was issued in February 1998. Six amendments were issued between March and May of that year. The final scope of work, as amended, follows:

1. Inspect all structures prior to any disturbance. Provide documentation of pre-move conditions.... Documentation will provide:
   - Basis for documentation of required repairs under this contract of damage resulting from move (e.g., cracked plaster, opened mortar joints, etc.)
   - Basis for precise reconstruction of dismantled components, if any, under this contact.
   - Basis for future reconstruction of granite fence footing by others. Specifically document the location of each granite block and mark blocks accordingly for future reconstruction.
2. Determine (within one tenth of a foot) physical relationship (horizontal coordinates and elevation of all (Lighthouse, Principal Keepers [sic] Quarters and Double Keepers [sic] Quarters, cisterns, fence footing and oil house) to one another.
3. Design support systems in preparation of moving each structure.
4. Design transportation system for lighthouse, other buildings and cisterns. Dismantling and reconstruction of cisterns may be considered. However, the preference is that the contractor should move the buildings intact to greatest extent feasible. Granite fence footing will be dismantled and placed in storage.
5. Specify techniques for clearing along move corridor and new site clearing (Historic Management Zone). This is approximately a total of 10 acres. Clean fill should be wasted within the project area to the maximum extent possible. Excess clean fill may be disposed of at a site available within 1 mile of project site. Unsuitable material and grubbing debris may be disposed of at a nearby landfill (within 80-90 miles of site.
6. Design new foundations at new site. Use the designated lighthouse position as base for locating other structures. New locations for buildings to match within one tenth of a foot existing relative positions (horizontal coordinates, vertical elevation and orientation relative to true north). Relocate all structures to finish elevations to avoid building flooding. Specific finish elevations will be determined during the design process. Provide design for rough grading at new site that will minimize wind and water erosion. Final grading will be included in a separate contract.
7. Submit design development and construction documents for all design work. NPS will review for compliance with proposal evaluation factors and contract requirements.
8. Secure the work site.
9. Schedule lighthouse move to minimize risk of exposure during move to nor'easters and hurricanes (late March to late May safest period for move). Schedule other moves at contractor's convenience within contract time frame. Schedule all other work (including demolition of most of the light house transportation system) so that contractor is clear of site by September 30, 1999.
10. Prepare old site for relocating the buildings. Cap and abandon existing connected utilities. Relocate (or demolish) existing aerial utilities at existing site as needed to accomplish work. Remove and salvage sidewalk material (from gate to lighthouse) and provide to the Park for storage.
11. Prepare route for move.
12. Implement stabilization system in preparation of moving each structure.

13. Construct move pathway and assemble equipment for transportation system for lighthouse and other buildings. Sand dunes may be removed as needed to accomplish the move. Rebuilding of the dunes will be accomplished by others. . . .
14. Document locations and top face elevation above grade of each block of granite footing surrounding the lighthouse. Remove footing and store at park where directed...for reinstallation under a separate contract. All portions of the granite block footing shall be removed, including the portion under the sand dune. Sand dunes may be removed as needed to accomplish the move.
15. Move lighthouse. At a minimum, move all portions of the lighthouse exposed at and above existing grade line.
16. Move Double Keeper's [sic] Quarters, Principal Keeper's Quarters, and Oil House. At a minimum, move all building portions exposed at and above existing grade line. The concrete pedestal in the oil house is to be removed by the contractor and provided to the Park for storage. The floor in the oil house is to be relocated intact, if feasible. If not, reconstruct with existing salvaged materials. If material cannot be salvaged, reconstruct with similar new material. Piers under the Double Keepers [sic] Quarters are to be moved intact, if feasible. If not, the piers should be dismantled, salvaged, and reconstructed with salvaged materials. If material cannot be salvaged, reconstruct with new material to achieve similar appearance.
17. Move two rain water cisterns associated with the Double Keeper's [sic] Quarters and the one cistern associated with Principal Keeper's Quarters. At a minimum, remove all portions of the cisterns, including all portions below grade. It is the Government's preference to relocate cisterns intact. If this is not feasible, reconstruct with existing or similar materials. Offeror's proposal should reflect if it is not feasible or unreasonable to relocate the cisterns intact and demonstrate means of reconstructing the cisterns in kind. Grades around relocated cisterns may be left rough and full exposure of cistern is acceptable.
18. Construct new foundations at new site and set structures onto them. Use the designated lighthouse position as base for locating other structures within one tenth of a foot of existing conditions (horizontal coordinates and elevation). New locations for all structures to match existing orientation to each other and to true north.
19. Provide final documentation of the condition of the Light Station after the move.
20. Closely inspect all buildings for damage occurring as result of preparation, moving, and placement on new foundation. Pre-move inspection, documentation will be baseline for determination of damages. The contractor shall repair all such damage under this contract.
21. Demolish and remove ...most of the lighthouse transportation system. NPS may choose to retain a representative portion of the transportation system, (approximately 100 feet) adjoining the old lighthouse site for future interpretation. NPS will make this determination after considering if system is suitable for this purpose.
22. Leave any below-grade foundation remnants in place at old site. Back fill and level excavations at old site. Leave old site in safe condition. NPS expects damage to existing parking lots. Existing parking lots need not be rebuilt. Contractor will be required to leave existing park lot areas in a safe condition after the relocation has been accomplished.
23. Provide electrical service to lighthouse at new site. This may be a temporary aerial service. Connect service and make light functional. Design and construction for the electrical service entry into the lighthouse will be concealed. Remove existing exterior conduit mounted on the exterior of the lighthouse.
24. Provide a permanent lightning protection system for the lighthouse. Provide temporary lightning protection to the lighthouse during the move.
25. Provide as-built record drawings of move preparations, move pathway construction, and new foundations.
26. Provide temporary aircraft lighting during the move and permanent after the move.[122]

[122] The following resources were supplied by Paul Cloyd, NPS DSC Historical Architect and Project Supervisor for the move:
National Park Service, Denver Service Center. "Relocate the Cape Hatteras Light Station, Package CAHA 175." *Request for Proposal.* February 20, 1998.
National Park Service, Denver Service Center. "Minutes of Cape Hatteras Light Station Pre-Proposal Conference/Site Visit." March 4, 1998.
National Park Service, Denver Service Center. "Amendment/Modification No. 1." *Amendment of Solicitation/Modification of Contract.* March 16, 1998.

As part of the RFP process, DSC released solicitation-for-bid drawings (four-sheet set) entitled "Existing Conditions/Proposed Building Relocation" (figs. 76-78).[123] Remaining design work and specifications for the move would be provided by the contractor.

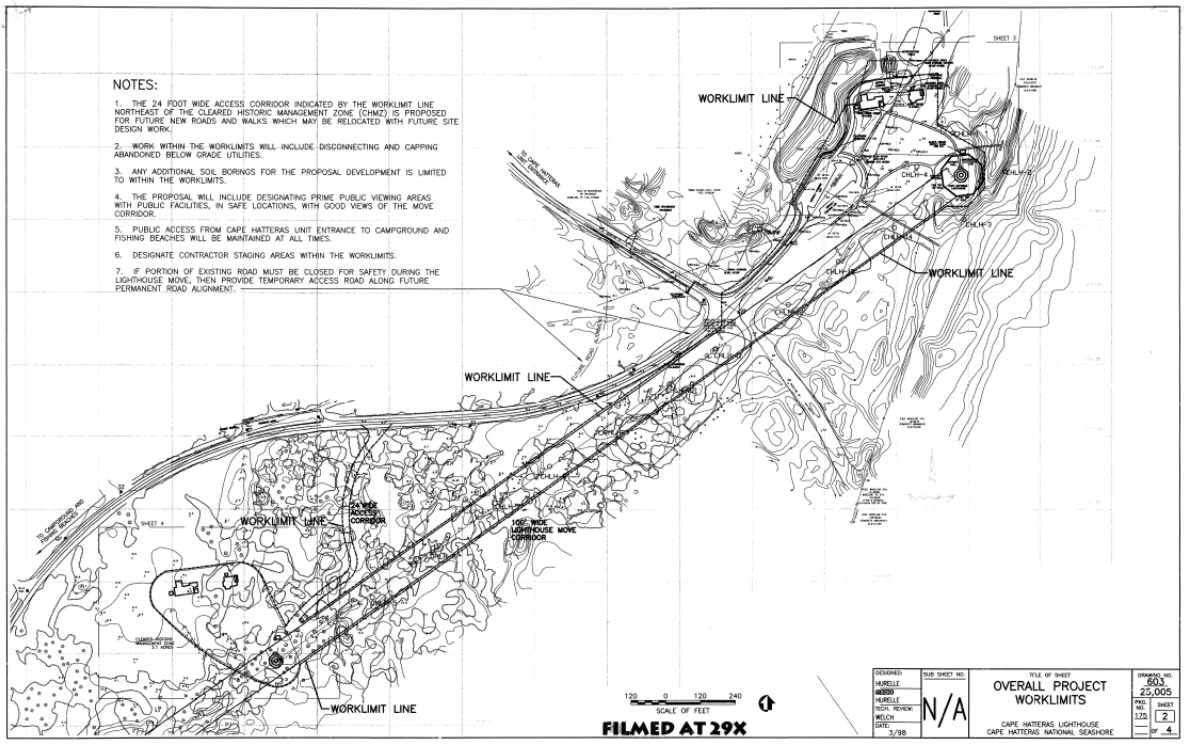


Figure 76. The overall project work limits in the solicitation for bid drawings, March 1998. Drawing: NPS DSC eTIC No. CAHA 603 25005.

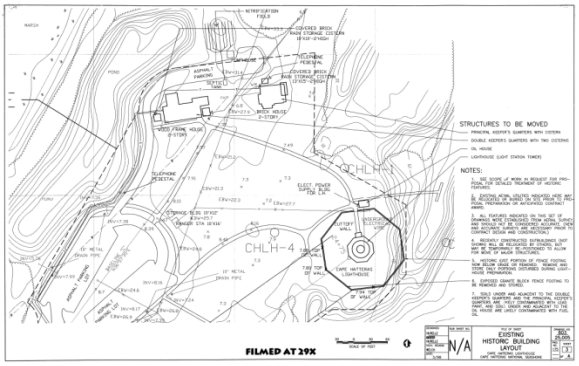


Figure 77. The existing historic building layout. Drawing: NPS DSC eTIC No. CAHA 603 25005.

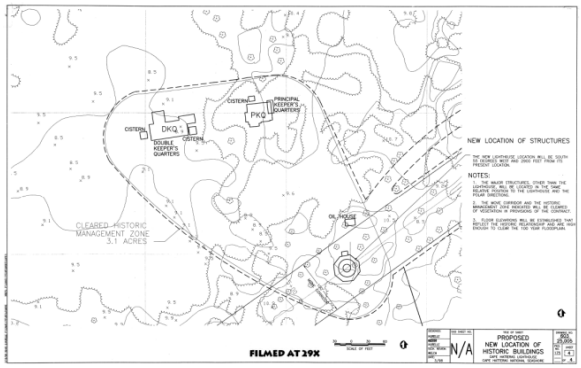


Figure 78. The proposed new location of historic buildings. Drawing: NPS DSC eTIC No. CAHA 603 25005.

National Park Service, Denver Service Center. "Amendment/Modification No. 2." *Amendment of Solicitation/Modification of Contract.* March 24, 1998.
National Park Service, Denver Service Center. "Amendment/Modification No. 3." *Amendment of Solicitation/Modification of Contract.*
National Park Service, Denver Service Center. "Amendment/Modification No. 4." *Amendment of Solicitation/Modification of Contract.* April 9, 1998.
National Park Service, Denver Service Center. "Amendment/Modification No. 5." *Amendment of Solicitation/Modification of Contract.* May 12, 1998.
National Park Service, Denver Service Center. "Amendment/Modification No. 6." *Amendment of Solicitation/Modification of Contract.* May 20, 1998.
[123] Denver Service Center, National Park Service. "Existing Conditions/Proposed Building Relocation." March 1998. NPS DSC eTIC No. CAHA 603 25005.

International Chimney Corporation (ICC) won the contract to move the light station for their familiarity with the lighthouse and "significant advantages in their move technology."[124] Their final proposal supplementation for the move was submitted in May 1998.[125] Several additional studies and reports were completed in the fall of the same year.

In October, the first draft Design Development Drawings for the relocation were completed by DSC.[126] In April 1999, Final Construction Drawings for the relocation were completed (figs. 79-85).[127]

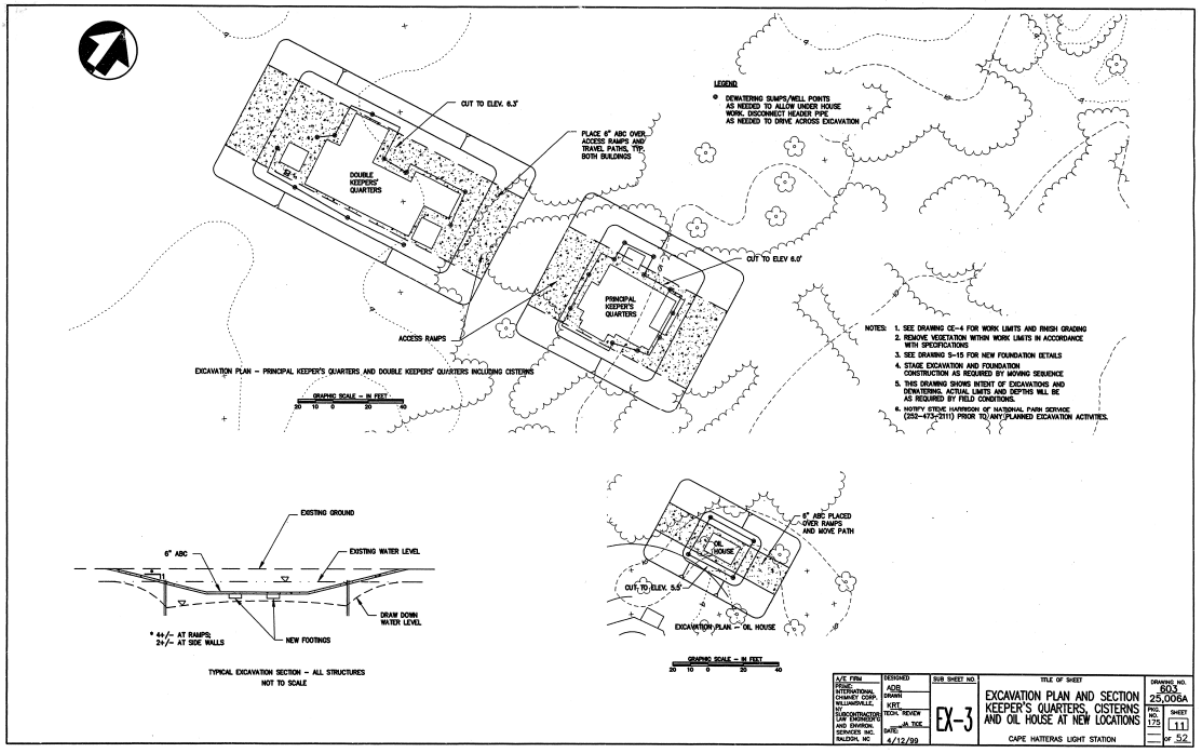


Figure 79. Excavation Plan and Section for the Keepers' Quarters, Cisterns, and Oil House at new locations. Drawing: NPS DSC eTIC No. CAHA 603 25006A.

[124] Cloyd, Paul C., PE/RA. "Cape Hatteras Lighthouse HSR 100% draft review." January 2016.
[125] International Chimney Corporation. "Supplemental Technical and Price Proposal: Final Proposal – Design and Construction (Design/Build) Contract to Relocate Cape Hatteras Light Station, Cape Hatteras National Seashore, Dare County, North Carolina, package CAHA 175/Request for Proposal." May 29, 1998. NPS DSC eTIC No. CAHA 603 D156.
[126] Denver Service Center, National Park Service. "Relocate the Cape Hatteras Light Station." *Design Development Drawings.* October 1, 1998. NPS DSC eTIC No. CAHA 603 25006.
[127] Denver Service Center, National Park Service. "Relocate the Cape Hatteras Light Station." *Final Construction Drawings.* October 1, 1998. NPS DSC eTIC No. CAHA 603 25006A.

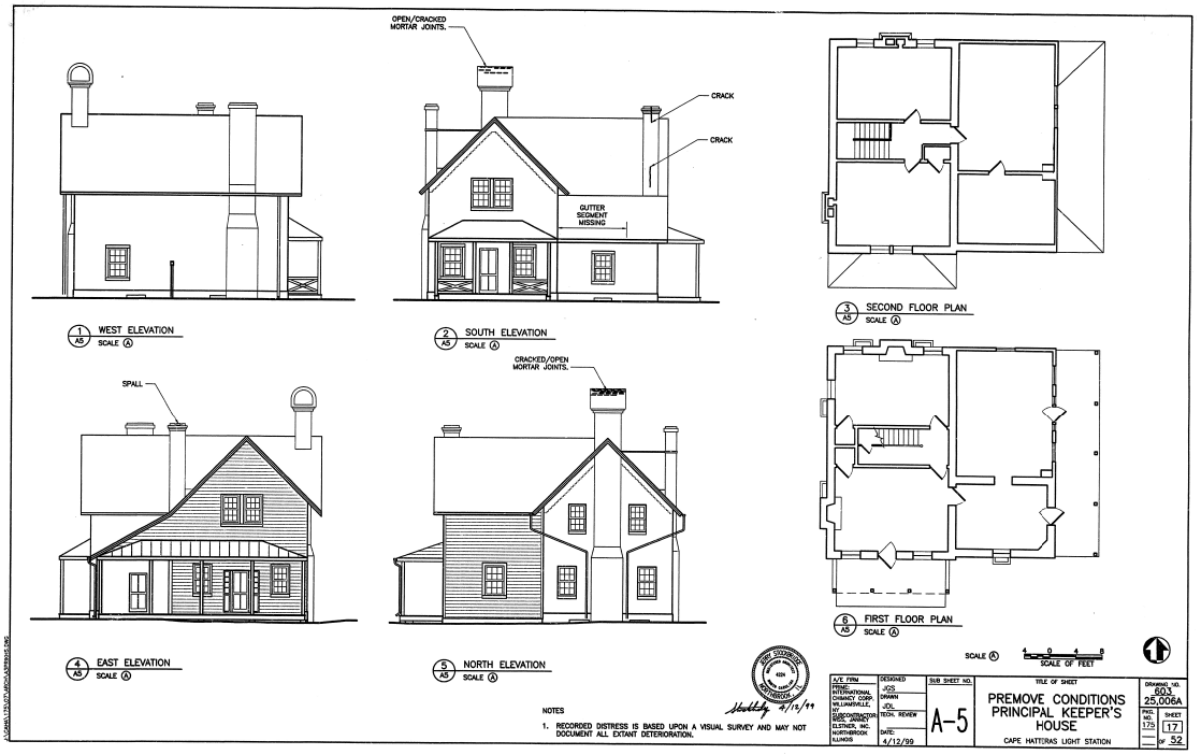


Figure 80. Pre-move condition of the Principal Keeper's Quarters. Drawing: NPS DSC eTIC No. CAHA 603 25006A.

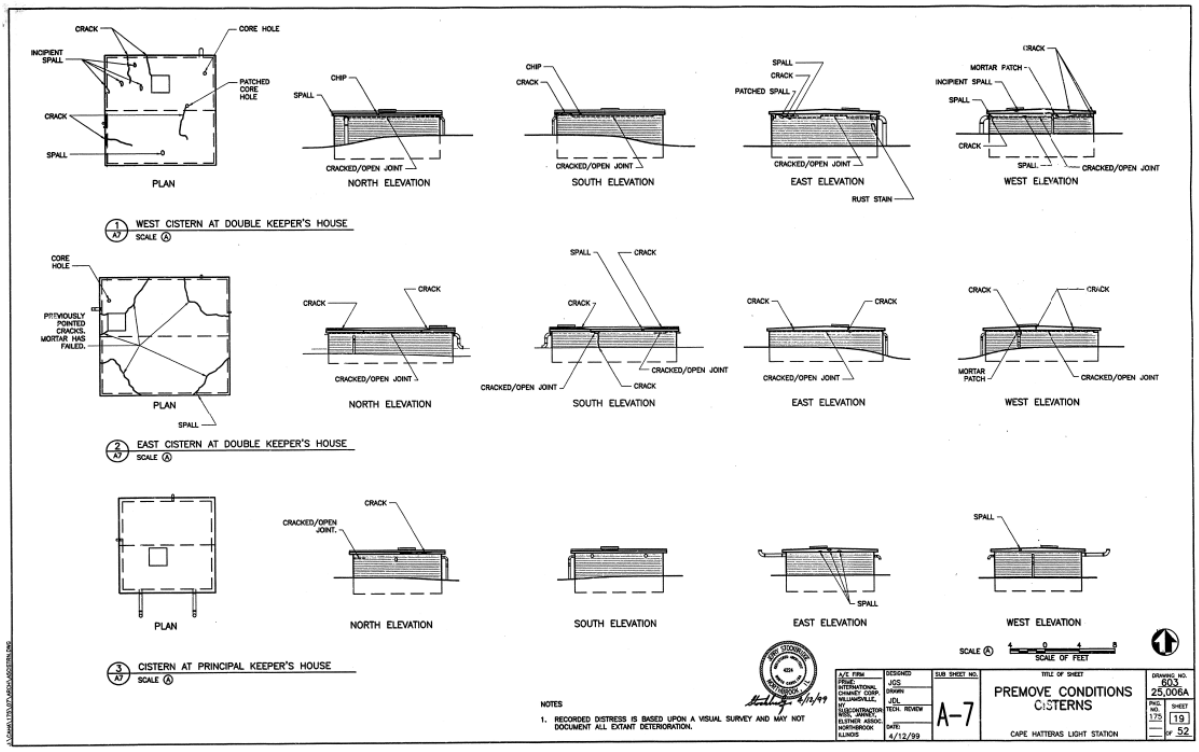


Figure 81. Pre-move conditions of the cisterns. The cistern at the Principal Keeper's Quarters is represented in the bottom row. Drawing: NPS DSC eTIC No. CAHA 603 25006A.

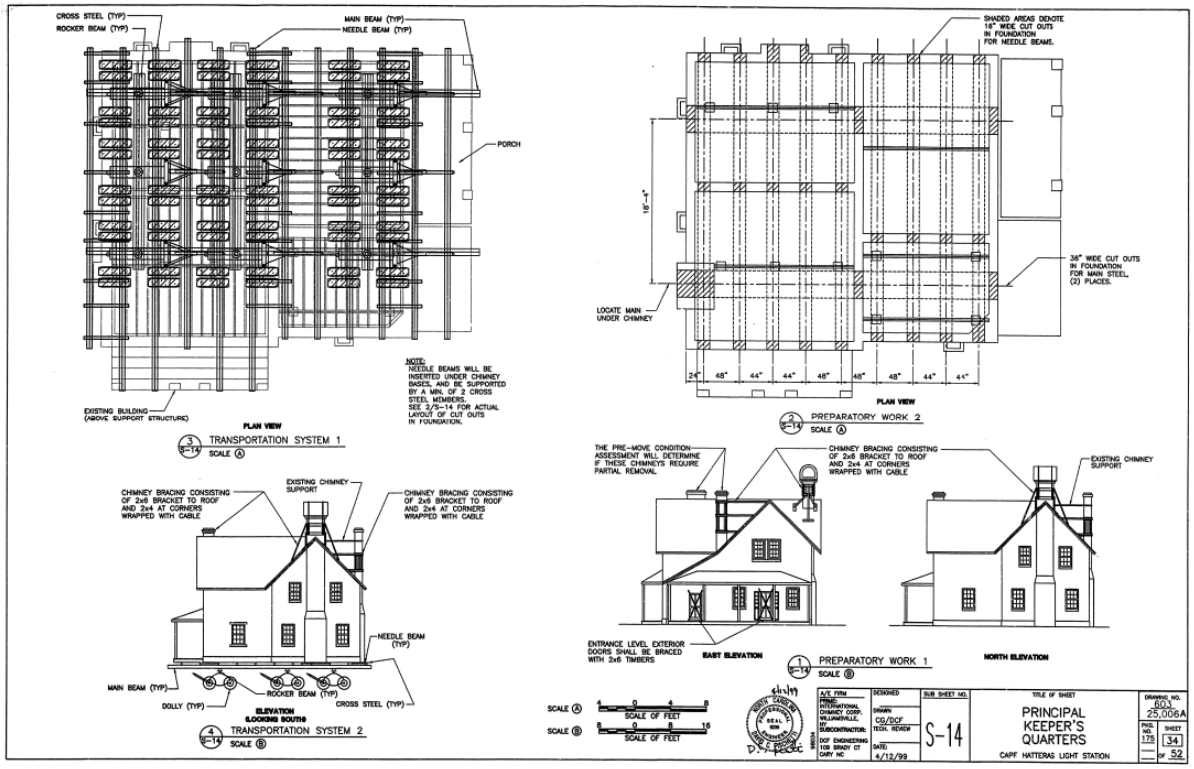


Figure 82. Drawing of preparatory work and transportation system for the Principal Keeper's Quarters. Drawing: NPS DSC eTIC No. CAHA 603 25006A.

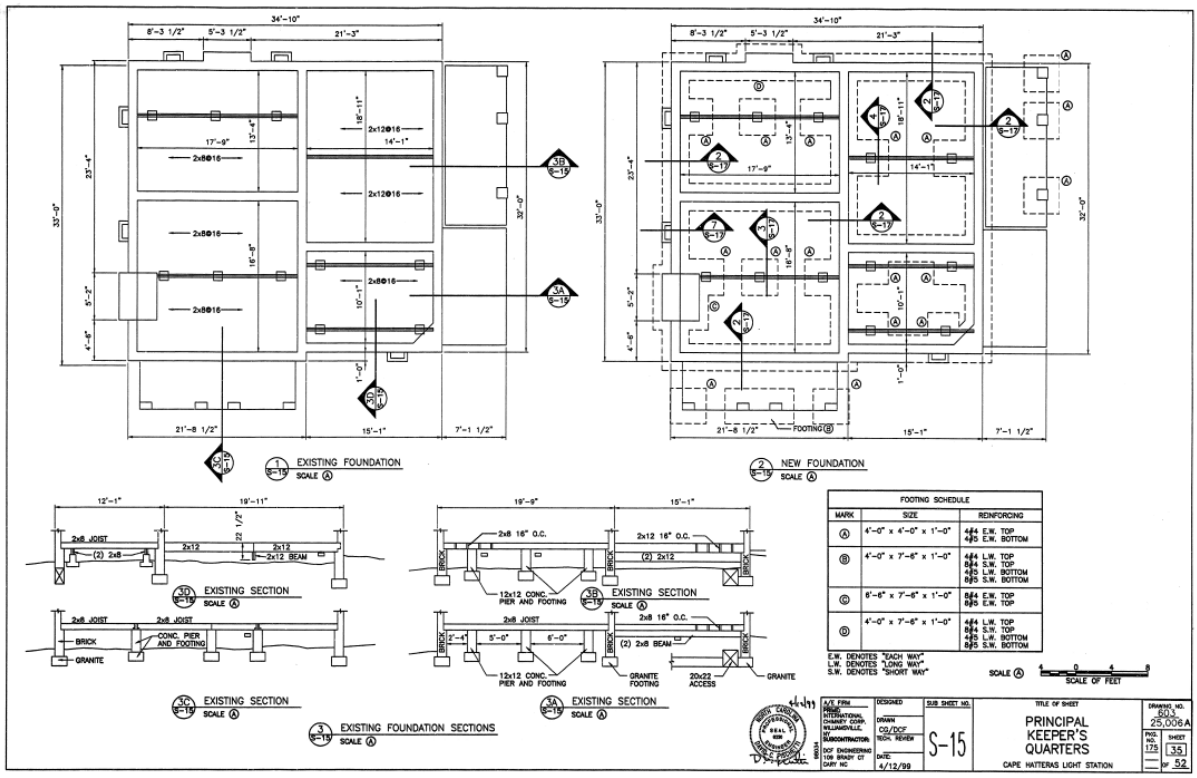


Figure 83. Drawings of the existing foundation and the proposed foundation. Drawing: NPS DSC eTIC No. CAHA 603 25006A.

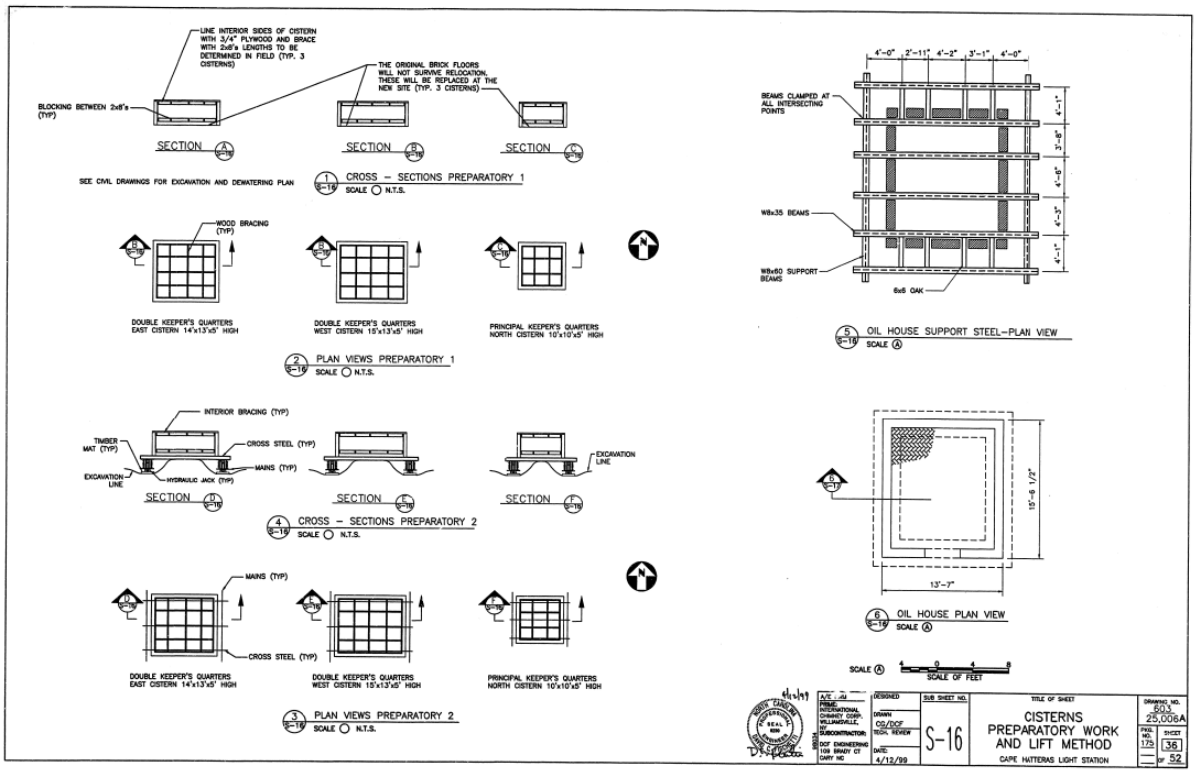


Figure 84. Preparatory work for the cisterns and oil house. Drawing: NPS DSC eTIC No. CAHA 603 25006A.

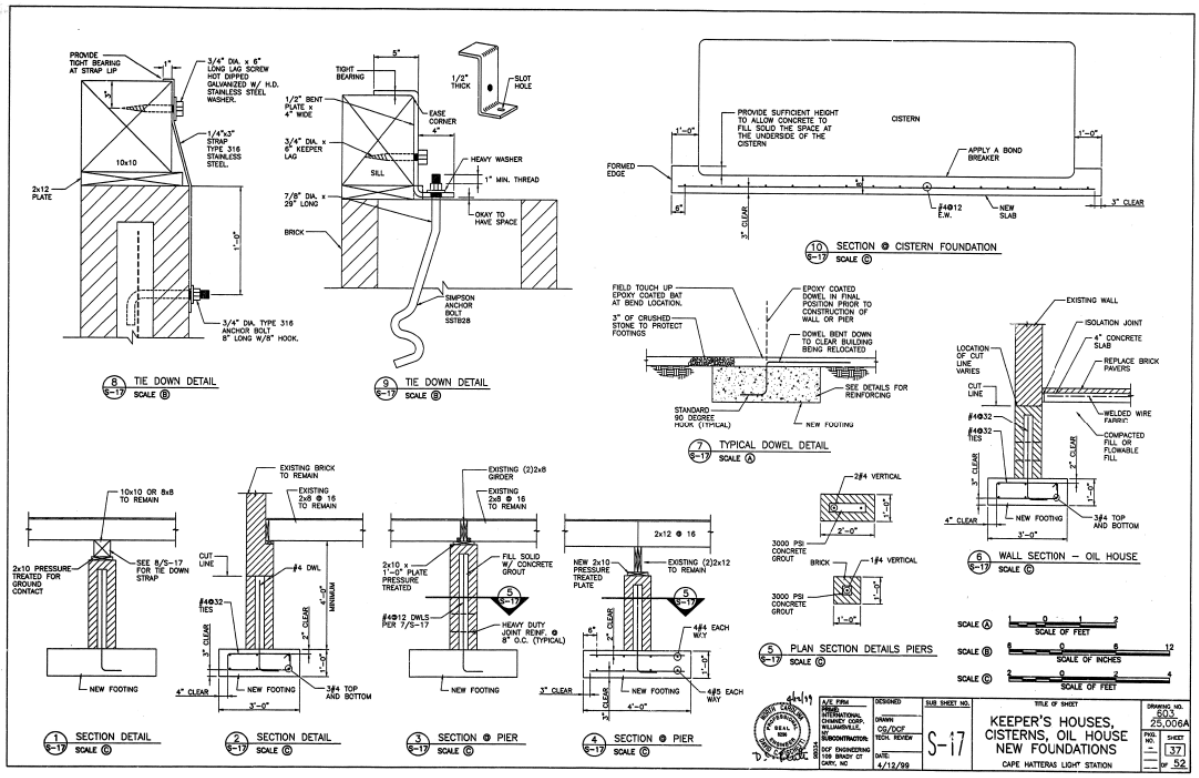


Figure 85. New foundation for cisterns. Drawing: NPS DSC eTIC No. CAHA 603 25006A.

ICC worked with Expert House Movers, Inc. of Maryland (John Matyiko, Sr. with sons John, Jr., Joe, Jim, Jerry, and consultant Pete Friesen) to develop a plan and execute the work, with the help of architects, structural engineers, and other experts.

ICC first arrived at Cape Hatteras on December 15, 1998 to begin preparations for moving the lighthouse.[128] In January 1999 "work began in earnest." The first step was to ready the site for excavation. NPS archeologists were on site every day in order to monitor the proceedings, especially once excavation began. In order to create a temporary roadway, or "move corridor," trees were removed. The road would eventually be graded, laid with gravel, compacted, and rolled in preparation. During this month, the chimneys of the Principal Keeper's Quarters were stabilized with 2x6 brackets and 2x4 corners wrapped with cable for the building's move (fig. 86); the first-floor exterior doors were braced with 2x6 timbers.



Figure 86. Stabilization of the southwest chimney of the Principal Keeper's Quarters. Photo: Cape Hatteras National Seashore Archives, 01/11/99.

Also in January, the cisterns (one located at the Principal Keeper's Quarters and two located at the Double Keepers' Quarters) were prepared for their moves. The interior of each was lined with ¾" plywood and braced with 2x8s (fig. 87). The original brick floor of each cistern would not be transported with the structures and would be replaced at the new site. On the exterior, wood corner boards were added at each corner so that steel cable straps could be wrapped around the structure to support the walls during the move, since the structure has no integral floor framing system. Three east-west trenches were dug below the cistern of the Principal Keeper's Quarters. Cross steel beams were slid into place in these trenches. Perpendicular to this, a pair of north-south trenches were dug adjacent to the walls of the cistern. Main steel beams were inserted to support the cross beams. Cribbing was then systematically placed under the main beams in order to excavate fully from around the cistern and sever the brick walls at a continuous plane. In early February, the cistern and its supportive structure were transported as a unit atop a flatbed trailer to a temporary site to rest on cribbing until its permanent site was ready for occupation (fig. 88).

[128] The creation of the this section of the move narrative was developed from several sources:
Cape Hatteras National Seashore Archives.
Duffus, Kevin (producer). "Move of the Century: Cape Hatteras Light." *Film.* Looking Glass Productions, Inc.: 2004.
Shelton-Roberts, Cheryl, and Bruce Roberts. "Moving Hatteras: Relocating the Cape Hatteras Light Station to Safety." Lighthouse Publications, 2015.
Cloyd, Paul C., PE/RA. "Cape Hatteras Lighthouse HSR 100% draft review." January 2016.



Figure 87. The interior of a cistern being braced for its move. Photo: Cape Hatteras National Seashore Archives, 01/28/99.



Figure 88. Two of the braced cisterns at their temporary site awaiting their permanent foundation. Photo: Cape Hatteras National Seashore Archives, 01/28/99.

Preparations for the move of the Double Keepers' Quarters and the Principal Keeper's Quarters were completed in March. A new foundation was constructed at the building's new location (fig. 89). This foundation consisted of a continuous reinforced concrete footing (3'-0" or 4'-0" wide and 1'-0" deep), the top of which was approximately 6'-0" below grade, and new 1'-0"-thick reinforced and concrete block-filled brick foundation walls and piers between the foundation and the severed brick foundation walls which would move with the building.



Figure 89. The new continuous reinforced concrete footing at the new site of the Principal Keeper's Quarters. Photo: Cape Hatteras National Seashore Archives, 03/22/99.

Nine north-south trenches measuring 2'-0" wide and 1'-6" deep were dug below the Principal Keeper's Quarters. At the north and south brick foundation walls 1'-4"-wide cuts were made for needle beams, which were slid into place (fig. 90). Perpendicular to this, east-west trenches measuring 2'-0" wide and 2'-6" deep were dug. At the east and west foundation walls 3'-0"-wide cuts were made for main steel beams (two in each trench), which were slid into place under the needle beams (fig. 91). Cribbing was then systematically placed under the main beams in order to excavate fully from around the building and sever the brick foundation walls at a continuous plane.

Underneath and perpendicular to the main beams, rocker beams were inserted, which would be directly attached to dolly wheels to be driven to its new site (figs. 92-93). On March 23, 1999 the Principal Keeper's Quarters was completely moved from its original site to its new site (figs. 94-95).



Figure 90. A steel needle beam is slid into place under the Principal Keeper's Quarters. Photo: Cape Hatteras National Seashore Archives, 03/17/99.



Figure 91. Main beams (grey in picture) were slid under the needle beams (red in picture). The severed foundation is supported by cribbing. Photo: Cape Hatteras National Seashore Archives, 03/18/99.



Figure 92. The rocker beams have been inserted, and the entire structure rests on dolly wheels. Photo: Cape Hatteras National Seashore Archives, 03/19/99.



Figure 93. A truck is ready to tow the structure to its new location. Photo: Cape Hatteras National Seashore Archives, 03/19/99.



Figure 94. The Principal Keeper's Quarters begins its move to its new site. Photo: Cape Hatteras National Seashore Archives, 03/23/99.



Figure 95. The Principal Keeper's Quarters is moved atop its new foundation (left) while the Double Keepers' Quarters waits. Photo: Cape Hatteras National Seashore Archives, 03/23/99.

The final placement of the Principal Keeper's Quarters on the new concrete foundation occurred in reverse of its removal from the original foundation. Once the dwelling was positioned over the new concrete footings, wood cribbing was built up to meet and support the main beams. The building was positioned approximately 2'-0" above its previous elevation (the Double Keepers' Quarters, Oil House, and Lighthouse were also placed at their original elevations relative to the new Principal Keeper's Quarters elevation). This new elevation was to provide additional protection against flooding and shoreline erosion.

Once the cribbing fully supported the building, the rocker beams and dolly wheels could be removed. New brick and concrete block foundation walls were constructed around the cribbing, main beams, and needle beams (fig. 96). When the building could be fully supported by the almost-complete foundation walls, the main beams and the needle beams were slid out from under the building (fig. 97) and the foundation walls were completed (fig. 98).



Figure 96. New concrete footings and brick and concrete block foundation walls now support the Principal Keeper's Quarters. Photo: Cape Hatteras National Seashore, 04/13/99.



Figure 97. One of the steel needle beams is slid out from under the Principal Keeper's Quarters. Photo: Cape Hatteras National Seashore, 04/13/99.



Figure 98. The Double Keepers' Quarters, left, and Principal Keeper's Quarters, right, fully sitting atop their new foundations. Photo: Cape Hatteras National Seashore Archives, 06/03/99.



Figure 99. A footer is poured for the west cistern at the Double Keepers' Quarters. A similar reinforced footer supports the cistern at the Principal Keeper's Quarters. Photo: Cape Hatteras National Seashore Archives, 05/29/99.

After the foundations were completed for the Principal Keeper's Quarters and Double Keepers' Quarters, the foundations were completed for their three associated cisterns. The new foundations were composed of a continuous, reinforced cast-in-place concrete footer (fig. 99). The final placement of the cisterns on the new concrete footers occurred in reverse of their removal from their original locations. Once a cistern was positioned over the new concrete footings, wood cribbing was built up to meet and support the main beams. The cisterns were also positioned approximately 2'-0" above their previous elevations (relative to the other buildings on site). Once the cribbing fully supported the cistern, the beams could be removed from under the cistern.



Figure 100. After Hurricane Dennis struck, the dwellings were elevated above the flood waters. Photo: Cape Hatteras National Seashore Archives, 09/04/99.

With all of the buildings and structures in place, final grading was completed. The grading would slope the grade away from the base of the buildings. This was truly tested a few months later when Hurricane Dennis struck in September 1999. Flood waters were kept at bay due to the buildings' new, higher elevations (part of the original design process to mitigate future flooding) (fig. 100).

The final inspection of the Light Station occurred on October 1, 1999. Very few punch list items remained to be completed. The Letter of Final Acceptance was issued in July 2000.[129]

The final cost for relocating the Hatteras Light Station totaled $9,518,042. This figure included the following:

$1,454,000	Design Services (combined)
$7,507,000	Relocation (all buildings)
$480,000	New Foundations (all buildings)
$20,000	Lightning Protection System (lighthouse)
$28,000	Temporary Electrical Service
$24,020	Public Viewing Area (change order)
$4,872	Disposal of Fuel Tank Contents & Contaminated Soil (change order)[130]

In November 1999, the design drawings were updated to include as-built conditions (figs. 101-102).[131]

[129] Cloyd, Paul C., PE/RA. "Cape Hatteras Lighthouse HSR 100% draft review." January 2016.
[130] Cloyd, Paul C., Contracting Officer's Representative/Project Manager, DSC, NPS. "Relocate Cape Hatteras Light Station , Phase 1." *Fact Sheet for Completion Report.* December 22, 1999.
Cloyd, Paul C., Project Supervisor, DSC, NPS. "Relocate Cape Hatteras Light Station." *Lump Sum Price Contract.* August 21, 2000.
[131] Denver Service Center, National Park Service. "Relocate the Cape Hatteras Light Station." *Project Record Drawings.* November 8, 1999. NPS DSC eTIC No. CAHA 603 25006B.

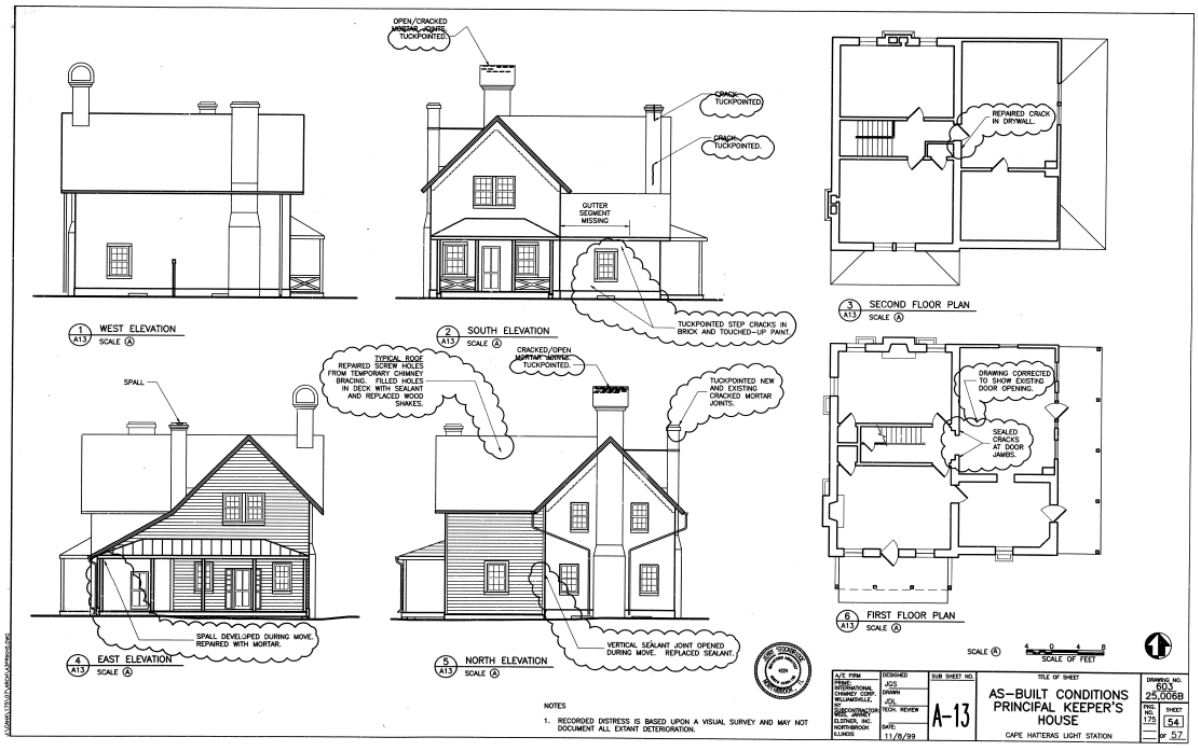


Figure 101. The condition of the Principal Keeper's Quarters after its move. Drawing: NPS DSC eTIC No. 603 25006B.

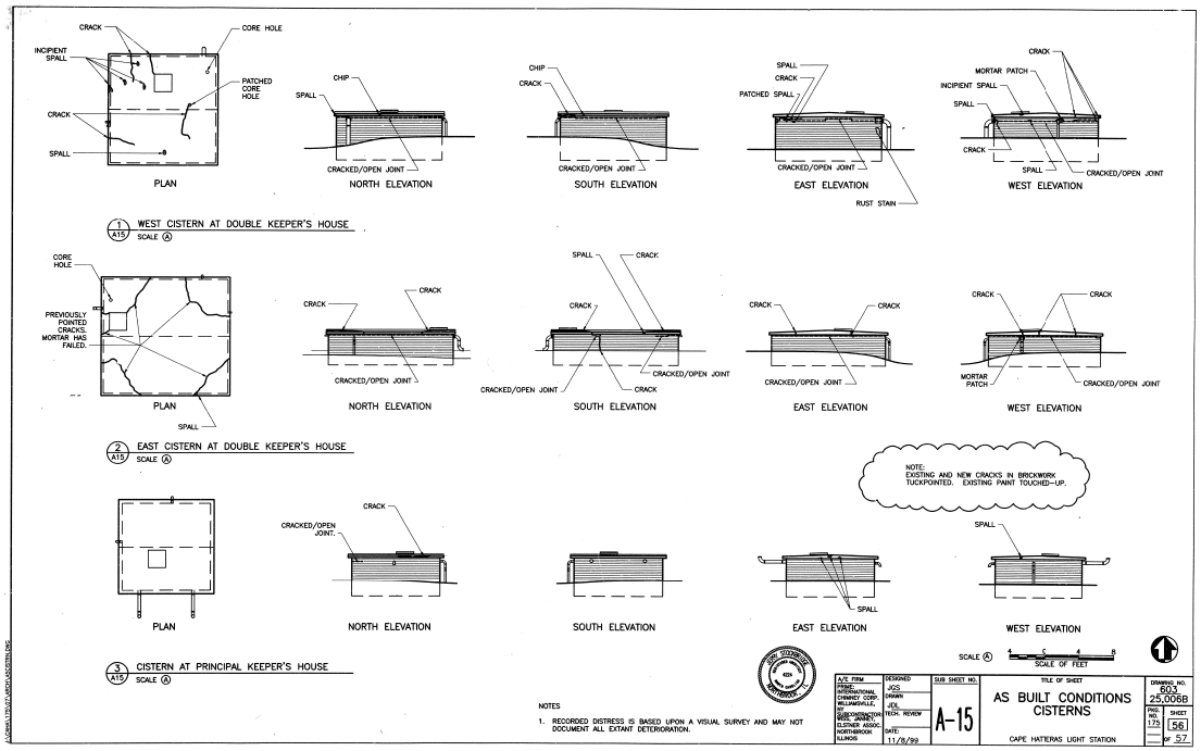


Figure 102. The condition of the cisterns after their move. The cistern associated with the Principal Keeper's Quarters is represented on the bottom row. Drawing: NPS DSC eTIC No. 603 25006B.

Phase II of the project, which included development of the new site and redevelopment of the old site, was completed by August 2000 by JHC Construction, Inc.[132] New site development included providing electrical service, a new HVAC system (with closet enclosures), a new sprinkler system, brick walkways/ramps, and stabilized turf to the Principal Keeper's Quarters (figs. 103-106).

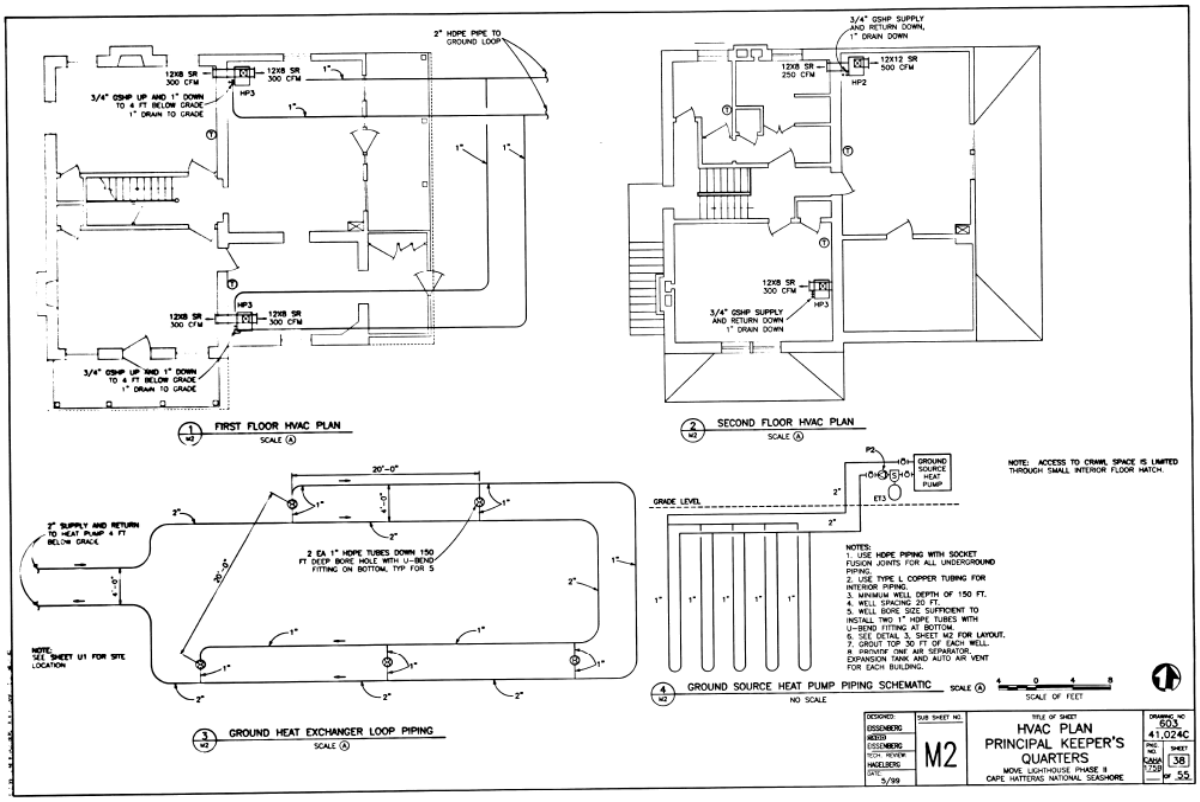


Figure 103. The new HVAC system in the Principal Keeper's Quarters. Drawing: NPS DSC eTIC No. CAHA 603 41024C.

[132] Denver Service Center, National Park Service. "Lighthouse Move Phase II." *As-Constructed Drawings.* December2000. NPS DSC eTIC No. CAHA 603 41024C.
In September 1997, DSC finalized drawings for the Phase II of the lighthouse move project. Phase II outlined the development of the area around the relocated historic district and redevelopment of the area where the light station had been. (Denver Service Center, National Park Service. "Lighthouse Move Phase II." *8 sheets.* September 1997. NPS DSC eTIC No. CAHA 603 41024.) On December 9-11, 1997, DSC conducted a value study for the Phase II drawings in order to provide guidance to the design team (also DSC) on the final drawings of the preferred design alternative. The value study suggested many alternatives, none of which directly affected the lighthouse or its move. (Denver Service Center, National Park Service. "Value Analysis Study for Cape Hatteras Lighthouse Site Redevelopment." *Final Report.* n.d. (likely early 1998). NPS DSC eTIC No. CAHA 603 D146.) Based on these suggestions, the DSC design team edited their Phase II design, which was re-released in June 1998. (Denver Service Center, National Park Service. "Lighthouse Move Phase II." *15 sheets.* June 1998. NPS DSC eTIC No. CAHA 603 41024A.) A final design analysis for the Phase II work was completed in August 1998 with final drawings being completed in January 1999. (Unknown. "Design Analysis: Lightstation Move – Phase II, Historic District Contact Station & Site Development, Cape Hatteras National Seashore." May 1998, Rev. June 1998, Rev. August 1998. NPS DSC eTIC No. CAHA 603 D145. -- Denver Service Center, National Park Service. "Lighthouse Move Phase II." *Construction Drawings.* January 1, 1999. NPS DSC eTIC No. CAHA 603 41024B.) Phase II work would cause little impact to the lighthouse structure itself.

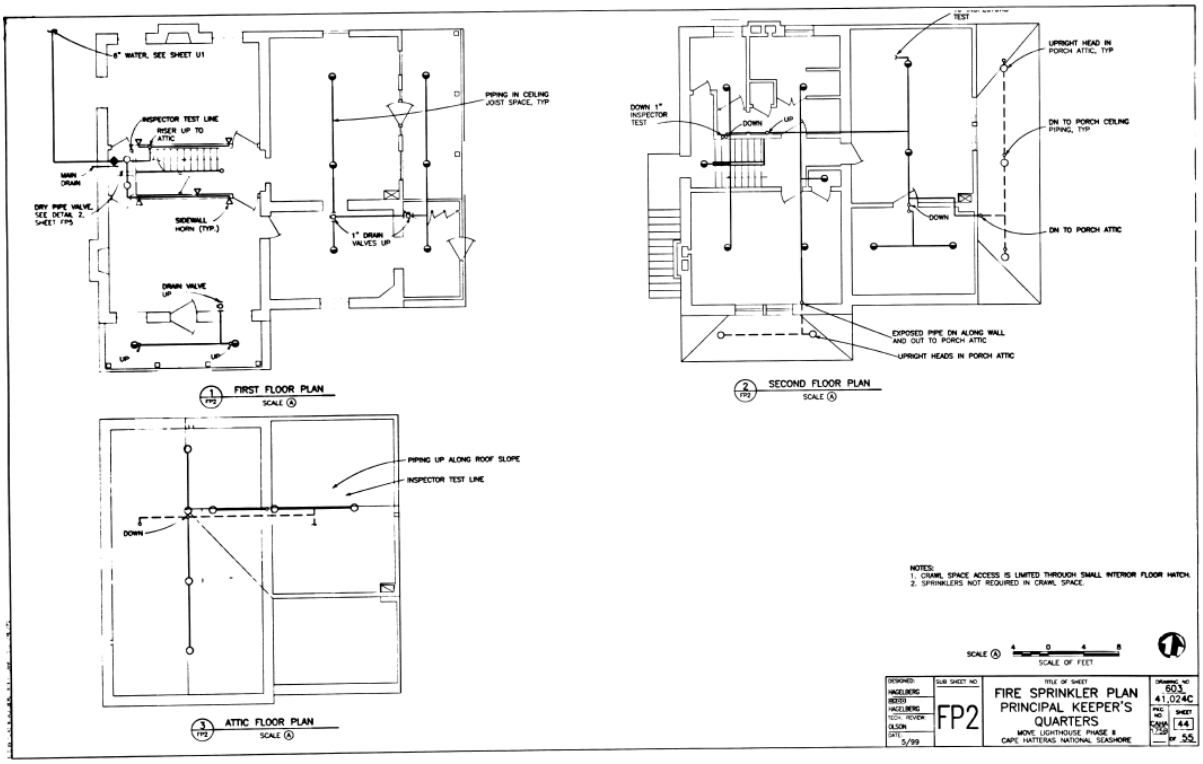


Figure 104. The new sprinkler system in the Principal Keeper's Quarters. Drawing: NPS DSC eTIC No. CAHA 603 41024C.

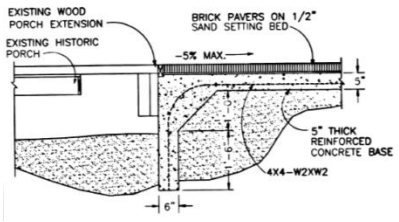


Figure 105. Detail drawing of the brick ramp walk abutting the south porch of the Principal Keeper's Quarters. Drawing: NPS DSC eTIC No. CAHA 603 41024C.

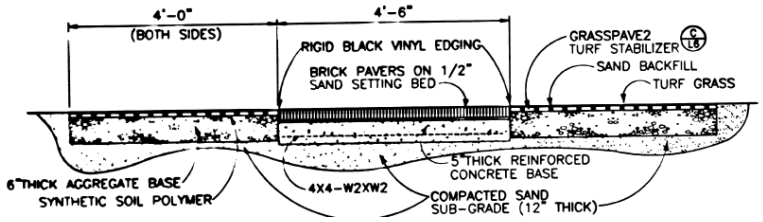


FIgure 106. Detail drawing of the new brick walks and stabilized turf on each side. Drawing: NPS DSC eTIC No. CAHA 603 41024C.



Figure 107. The light station about a year after the move project is complete. Photo: Cape Hatteras National Seashore Archives, 09/00.

Continuing Its Service

Since the Principal Keeper's Quarters' move, the building has been used by Cape Hatteras National Seashore permanent and seasonal interpretive staff as offices, a library, and break room space.

Sometime between September 2000 and August 2005, a pair of outbuildings was completed to the north side of the Principal Keeper's Quarters (fig. 108). Their function is unknown. At some point they were removed to their current location adjacent the visitor contact station for use as storage by Eastern National.

Sometime after June 8, 2005, the roof was replaced (fig. 109). After Hurricane Irene in August 2011, the roof was again replaced.[133]

In 2015 and 2016, the Hatteras Light Station was again photographed and documented by the Historic American Building Survey. In addition, due to expanded technology not available in 1989 when the complex was first documented, HABS was able to digitally scan the buildings and site to create 3D models of the buildings and produce incredibly accurate drawings of each. See Appendix E for further information.

[133] HPTC conversation with CAHA maintenance staff in May 2016.



Figure 108. The exterior of the Principal Keeper's Quarters on June 8, 2005. Photo: List of Classified Structures.



Figure 109. The exterior of the Principal Keeper's Quarters on May 12, 2016. Photo: HPTC.

Table 1. **Hatteras Light Station Principal Keeper's Quarters Timeline**	
1802	First lighthouse completed; first keeper begins role
1854	First lighthouse elevated
1868-1870	New lighthouse constructed
1870-1871	Principal Keeper's Quarters (PKQ) constructed
1875	Request made for brick cistern
1927	Two-story frame addition constructed on east elevation of PKQ, within the ell; windows altered in main block; wall and ceiling coverings altered.
1932	Principal keeper and his family permanently move out of quarters
1935	CCC arrives on site, uses dwellings for workers
1936	New skeletal lighthouse lit; 1870 lighthouse extinguished
1937	CCC Rehabilitation work approved for PKQ to include: removal of all plaster; installation of cypress on ceilings and walls; cleaning floors and stairs; building cabinets and closets; staining walls and stairs; replacing roof shingles where missing; repairing fireplaces and hearths; installing new gutters; cisterns cleaned; sewer and water roughed in; exterior painted Cape Hatteras Light Station transferred to National Park Service
1939	Concrete stair added to the west elevation of the PKQ
1940	CCC camp removed from Buxton NPS director recommends changes to the PKQ to include: screening north and south porches; installing rubber mats and stainless steel nosing to interior stair treads; installation of electric generating plant (completed in 1941)
1941-1942	"Conscientious Objectors" camp located at Hatteras Light Station
ca. 1947	After cosmetic repairs, PKQ used to accommodate overnight visitors under concessions contract
1949	West chimney falls, but likely quickly rebuilt
1950	Lighthouse reactivated with new modern lens
1952	South and east porches screened
1953	Cape Hatteras National Seashore formed; site altered to accommodate visitors
by 1956	Southern portion of east porch enclosed for utility room
1956/57	PKQ painted pink; screens removed from porches (utility room remains); cistern superstructure removed; exterior concrete stair (west elevation) removed
1958	Formal dedication of Cape Hatteras National Seashore
by 1959	PKQ used as "Bachelor Quarters"
by 1971	PKQ painted white
by 1977	PKQ used as "VIP Quarters"
1980	Ceased use for volunteer and guest housing
1983	SERO performs condition assessment
1985	SERO completes restoration drawings
1985-1987	Restoration work completed
1989	HABS documentation
1991	Historic Furnishings Plan completed (never implemented) Shutters replaced
1992	SERO performs destructive investigation based on expedited deterioration
1993	Preservation work planned (completed in 1996)
1998	International Chimney Corporation wins contract to move lighthouse; in December, site work and preparations begins
1999	Lighthouse (Jun-Jul) and other structures (Feb & Mar) moved 2,900'-0"
2000	New site redeveloped, including Electrical, HVAC, and Sprinkler systems, walks/ramps, and turf stabilization at the PKQ; began use as park offices
2015-2016	HABS documentation
End of Table 1.	

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Architectural Description

The Historic Preservation Training Center visited the Hatteras Light Station once over the course of research for this Historic Structure Report. This trip occurred May 9-13, 2016. A large collection of field photographs, notes, and drawings were compiled during the visit. Through this work, detailed physical descriptions of features, condition assessments, and a compilation of character-defining and non-character-defining features have been made. Additional visits were coordinated with the Historic American Building Survey for documentation of the light station (April and June 2016). Park logistical assistance was provided by the Cape Hatteras National Seashore Resource Management Division and the Southeast Regional Office of the National Park Service.

Building Feature Master List

The Building Feature Master List (BFML) is an overall outline-format checklist used for creating a physical description of the Principal Keeper's Quarters. The BFML describes features using a hierarchal structure based on industry standards adopted by the federal government—the UNIFORMAT II (ASTM E1557 Standard, 2008) used by many facility management industry leaders, including the National Park Service's Park Facility Management Division (PFMD). The BFML uses headings and sub-headings to divide architectural components, structural systems, mechanical systems, etc. into a simple organizational tool (Table 1).

A	Substructure
A10	Foundations
B	Shell
B10	Superstructure
B20	Exterior Enclosure
B30	Roof Closure
C	Interiors
C10	Interior Construction
C20	Stairs
C30	Interior Finishes
D	Services
D20	Plumbing
D30	HVAC
D40	Fire Protection Services
D50	Electrical
G	Building Sitework
G20	Site Improvements
G90	Other Site Work

Table 2. The basic UNIFORMAT II Building Feature Master List includes the above headings and subheadings.

Physical Description Summary

The Hatteras Light Station has undergone periods of use and non-use since its completion in 1871. The original design and construction methodology is readily apparent and has resisted attempts at modernization by retaining most of its exterior character-defining features. Despite the removal of some important exterior character-defining features (window shutters, related outbuildings, original grading at south porch, fencing around building site, etc.), the basic character-defining materials and architectural features of the exterior of the Principal Keeper's Quarters remains intact and can instruct the nature of its care. The interior of the building lacks many of its character-defining features due to a vast history of interior alterations, covering up of elements (like new flooring over old flooring), and the addition of modern building features (like HVAC closets). Future care of the building should be based on the sustainable preservation maintenance of the traditional construction materials and methodologies, not on covering or replacing historic materials with inferior imitations. Significant

character-defining features which have been removed should be installed as part of any future treatment of the Principal Keeper's Quarters.

Principal Keeper's Quarters Physical Description

Location within the Park

Cape Hatteras National Seashore (CAHA), the nation's first national seashore, is located along the Outer Banks of North Carolina, a series of barrier islands which separate the Atlantic Ocean from Pamlico Sound and the mainland. The park stretches from Nags Head in the north to Ocracoke in the south (fig. 110). The park currently oversees the care of three light stations, including the Hatteras Light Station.

Hatteras Island, one of the barrier islands, is located about halfway between the northern and southern reaches of the park (fig. 110 inset). Just offshore of the cape (an elbow-like jut of the Outer Banks into the ocean), the Gulf Stream and the Virginia Drift, a branch of the Labrador Current, collide. The collision of currents directs southbound ships towards the Diamond Shoals, a dangerous twelve-mile-long sandbar. Hundreds, if not thousands, of shipwrecks are located within the vicinity of the Diamond Shoals, giving the area the name of *Graveyard of the Atlantic*. The Hatteras Light Station was constructed on Hatteras Island to warn ships of the Diamond Shoals. The light station comprises the Lighthouse, Oil House just to the north, Principal Keeper's Quarters to the north-northwest, and Double Keepers' Quarters to the northwest.

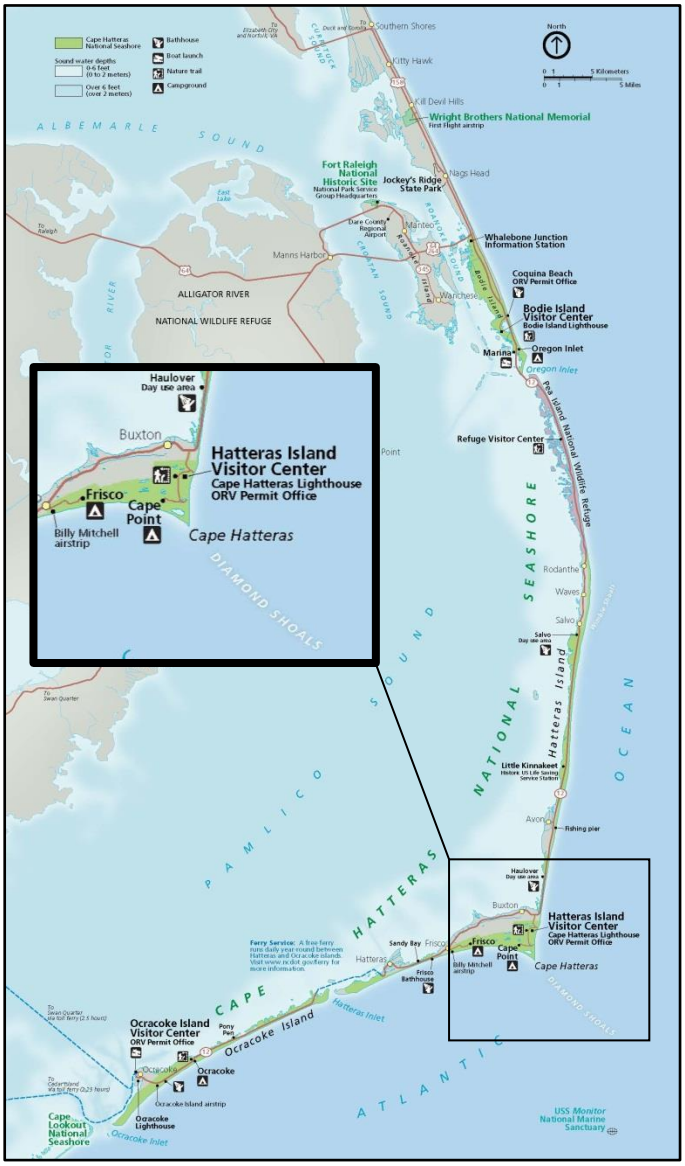


Figure 110. Cape Hatteras National Seashore is located on the Outer Banks of North Carolina. Inset: Cape Hatteras Lighthouse is located on Hatteras Island. Map: Harpers Ferry Center, 2008.

When completed in 1870, the light station was located 1,600'-0" from the Atlantic Ocean. By 1980, 110 years later, the ocean was seventy feet away from the tower on the south. Due to the encroaching sea, all of the light station buildings were moved 2,900'-0" southwest in 1999 to remove them from the ocean's reach. Since the move, the buildings are once again 1,600'-0" from the Atlantic Ocean and in their exact spatial relationship to one another as they were in their original locations (fig. 111).[1]

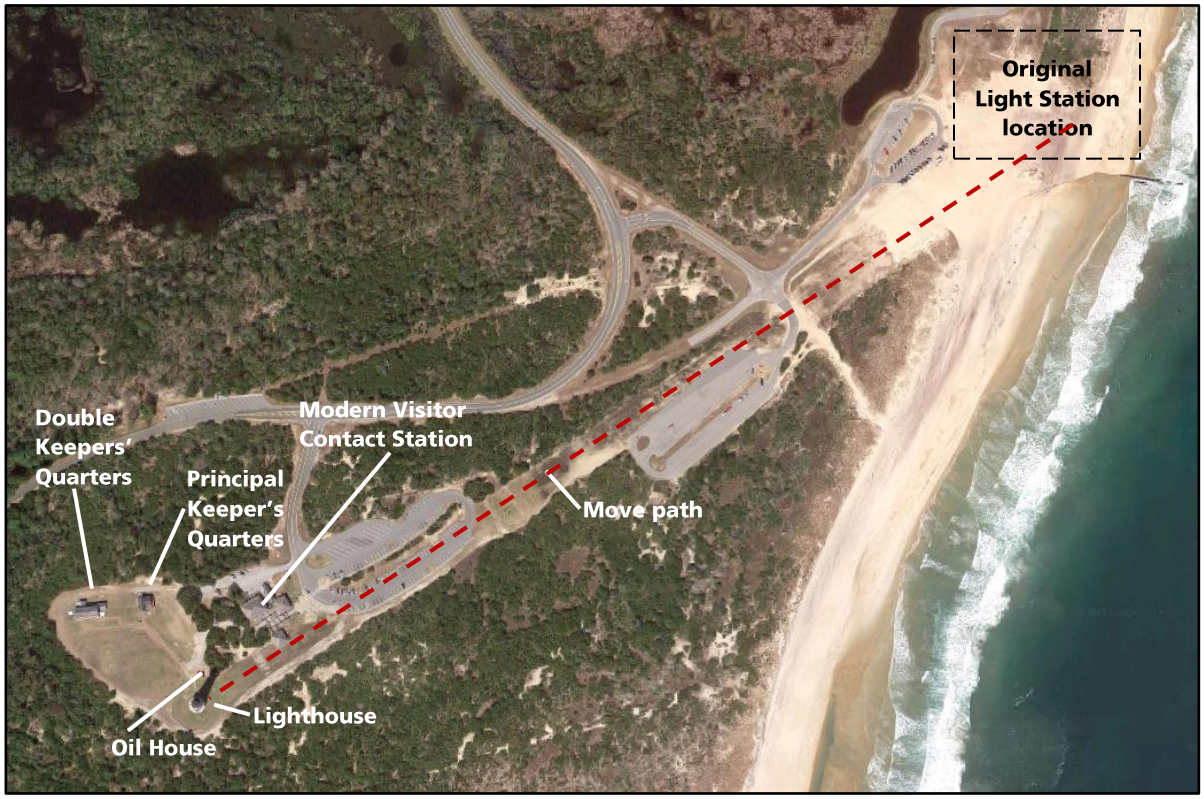


Figure 111. A Google Earth aerial view of the light station. The new location is at the bottom left, the original location is at the top right, and the move path joins the two sites. Photo: Google ©2015.

[1] The Request for Proposal required a tolerance of 0.1 foot for matching the relative positions (x, y, and z coordinates) of the light station buildings. After being positioned, one end of the Double Keepers' Quarters exceeded this tolerance due to a 0'-6" discrepancy in the x-y plane. The NPS concluded the risks of moving the building again outweighed the benefit to correct the position. For more information, see Paul Cloyd's comments on the Cape Hatteras Lighthouse HSR 100% draft, January 2016.

Exterior Overall

The prominent overall visual aspects of the Principal Keeper's Quarters are its two-story square massing with brick foundation walls, painted brick and wood-sided exterior walls, and wood-shingle-clad gable roofs with three unpainted brick chimneys (figs. 112-115). One-story wood porches are located on the south and east elevations of the building and have wood-shingle-clad (south porch) or standing-seam metal-clad (east porch) hipped roofs. A painted brick cistern, with painted concrete cap, is located north of the building. A brick sidewalk ramps up to south porch, where a platform was built to eliminate the step up into the building. A gravel, limited-access road is located north of the dwelling and cistern.



Figure 112. The Principal Keeper's Quarters from the southeast corner. A brick ramp provides access to the south porch. The Double Keepers' Quarters is located to the west (left). Photo: HPTC, 05/12/16.



Figure 113. The Principal Keeper's Quarters and cistern from the northeast corner. An access road is located to the north (right). The Double Keepers' Quarters is located to the west (background). Photo: HPTC, 05/12/16.



Figure 114. The Principal Keeper's Quarters and cistern from the northwest corner. The lighthouse is located to the southeast. Photo: HPTC, 05/12/16.



Figure 115. The Principal Keeper's Quarters from the southwest corner. Photo: HPTC, 05/12/16.

South Elevation (fig. 116)



Figure 116. South elevation. Drawing: NPS DSC eTIC No. CAHA 603 25006B, Sheet A-5. Cropped by author.

The west half of the south elevation is one room wide (19'-9") and two stories tall, and sits on a raised brick foundation under a front-facing gable roof. This half is symmetrical with a hipped first-floor porch, a centered door, flanked by 6/6 double-hung windows on the first floor, and centered, paired 6/6 double-hung windows on the second floor. A chimney is located on the west side of the front-facing gable roof. The east half of the south elevation is recessed from the west half by approximately 1'-0". This half is one room wide (15'-3½") and one-and-a-half stories tall, and sits on a raised brick foundation, under a side facing gable and shed roof extension. A single window is centered in the first-floor wall. A 6'-8"-deep open-air porch is located at the east side. A chimney is located at the east end of the roof. A small brick vent is centered in the foundation.

East Elevation (fig. 117)



Figure 117. East elevation. Drawing: NPS DSC eTIC No. CAHA 603 25006B, Sheet A-5. Cropped by author.

The east elevation is asymmetrical. The south half is composed of the original one-room-wide (12'-7") brick kitchen wing which is one-and-a-half stories tall, and sits on a raised brick foundation under a front-facing shed roof. A single door is located just north of center. The north half is composed of the 1927 one-room-wide (19'-7½") frame addition which is two stories tall, and sits on a raised brick foundation under a front-facing gable roof. This half is symmetrical with a centered door and paired sidelights, flanked by 6/6 double-hung windows on the first floor, and centered paired 6/6 double-hung windows on the second floor. A wood porch is located across the front of the entire elevation under a hipped roof. A brick chimney visually separates the two sides.

North Elevation (fig. 118)

The east half of the north elevation is composed of the 1927 one-room-wide (15'-5½") frame addition which is two stories tall, and sits on a raised brick foundation under a side-facing gable roof. This half includes a centered 6/6 double-hung window on the first floor. A 6'-8"-deep open-air porch is located at the east side. The west half of the north elevation is part of the original structure (1871) and is one room wide (19'-8¼") and sits on a raised brick foundation under a front-facing gable roof. This portion is symmetrical with a central projected, but attached chimney flanked by 6/6 double-hung windows on the first floor and second floor. Two foundation vents flank the foundation of the brick chimney.



Figure 118. North elevation without cistern. Drawing: NPS DSC eTIC No. CAHA 603 25006B, Sheet A-5. Cropped by author.

West Elevation (fig. 119)

The west elevation is the original structure (1871). It is two rooms wide (32'-8") and two stories tall, and sits on a raised brick foundation under a side-facing gable roof. A chimney projects through the roof at the north end, a single 6/6 double-hung window is located toward the northern end of the first floor, a projected, but attached chimney is located toward the south end, and a 5'-2"-deep open-air porch is located at the south side. Two foundation vents are evenly spaced along this elevation. A skylight (an original feature which has been reconstructed) is centered in the roof at the eave line.

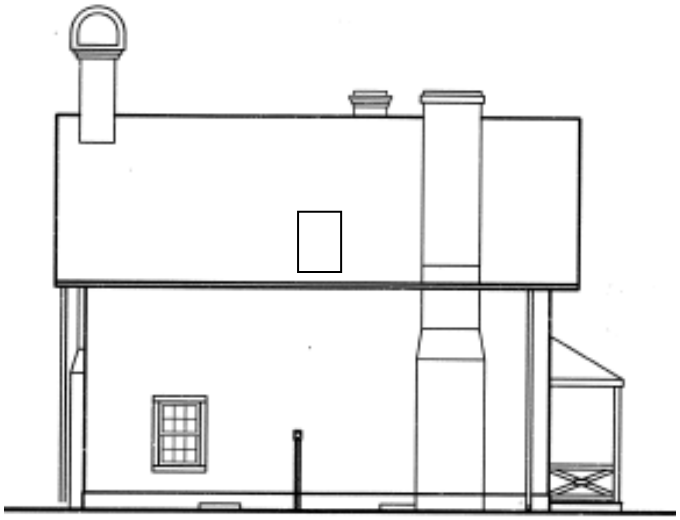


Figure 119. West elevation. Drawing: NPS DSC eTIC No. CAHA 603 25006B, Sheet A-5. Cropped by author.

Interior Organization

First Floor (fig. 120)

The first floor is composed of its original (1871) room layout: two rooms (103 and 104) flanking the central stair hall (Room 105) on the west with attached kitchen wing (Room 101) at the southeast corner; and the 1927 addition (Room 102) at the northeast corner. Original closets exist under the stair. Modern HVAC closets have been added to Rooms 101 and 102. The foundation crawl space access is located in Room 103's closet. Original fireplaces are located in Rooms 103 and 104. An original chimney is located in Room 101. The 1927 chimney is located in Room 102.

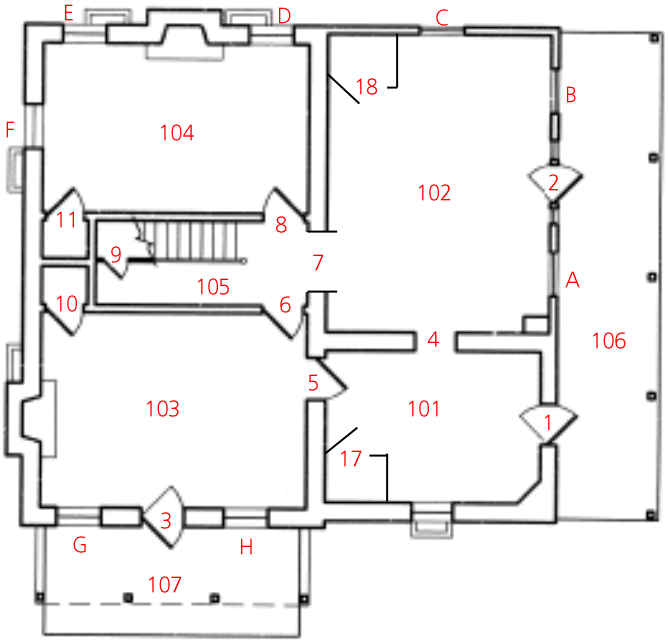


Figure 120. The first-floor plan. Letters denote windows, single-digit numbers denote doors, and three-digit numbers denote rooms. Drawing: NPS DSC eTIC No. CAHA 603 25006B, Sheet A-5. Cropped by author.

Second Floor (fig. 121)

The second floor is also composed of its original room layout: two rooms (203 and 204) flanking the central stair hall (Room 205) on the west, and the 1927 addition (Room 202) at the northeast corner. Due to roof alterations related to the 1927 addition, the modified attic space over the original kitchen wing (southeast corner) is accessible at this level (Room 201) through Door 12. The attic spaces above the original portion of the dwelling and the 1927 addition are accessible through a ceiling hatch in Room 204. An original closet is located in Room 205. Modern HVAC closets have been added to Rooms 202 and 205. The 1927 chimney is located at the southeast corner of Room 202.

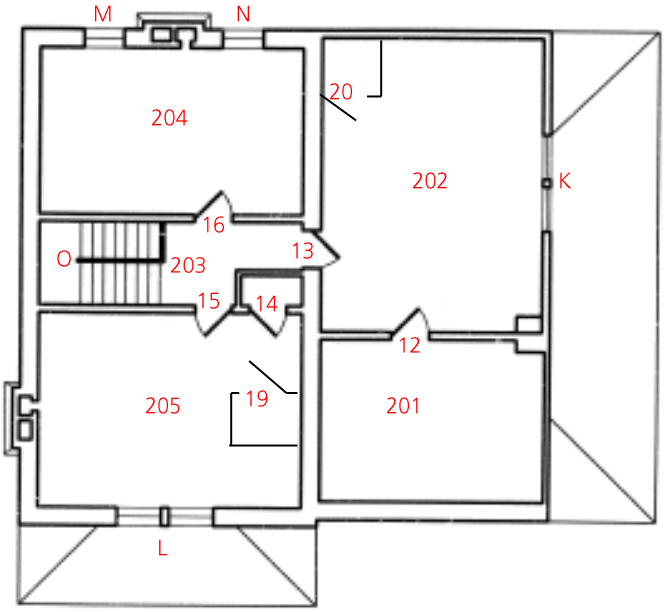


Figure 121. The second-floor plan. Letters denote windows, single-digit numbers denote doors, and three-digit numbers denote rooms. Drawing: NPS DSC eTIC No. CAHA 603 25006B, Sheet A-5. Cropped by author.

Attic

The attic is accessible through a ceiling hatch in Room 204. The attic includes the space under the gable roof of the main block of the original dwelling, and the space under the gable roof of the 1927 addition (northeast corner).

Building Feature Master List Descriptions

A	SUBSTRUCTURE
A10	FOUNDATIONS
A1010	Standard Foundations

Original Foundation

The original foundation was constructed of leftover granite and brick from the construction of the lighthouse (fig. 122). The depth of the original foundation walls is unknown. During excavation, in preparation for the move of the dwelling, the original below-grade foundation walls were exposed (fig. 123). These below-grade portions were left in place after the building was moved.

Concrete footings and foundation piers were added to the dwelling during the building's 1985-87 preservation work. These piers supported new summer beams placed perpendicular to the historic floor joists of the first-floor structural floor frame.

It should be noted that no foundation vents were included in the original drawings. One can be seen in one of the May 1893 photographs at the east elevation of kitchen wing, but none are seen on the west elevation, where two are extant today. Later photographs are obscured around the foundation. The date of all of the foundation vents is unknown.

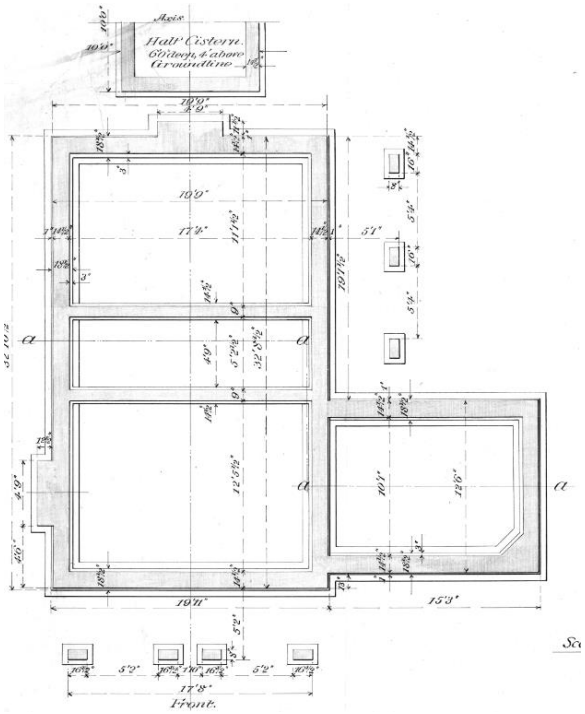


Figure 122. The original foundation plan shows the layout of the walls. Photo: NARA. Cropped by author.



Figure 123. Portions of the original below-grade brick and granite foundation walls exposed during excavation and left in place after the building was moved. Photo: Cape Hatteras National Seashore Archives, 03/99. Cropped by author.

Modern Foundation

The modern foundation is composed of a continuous reinforced concrete footing (3'-0" or 4'-0" wide and 1'-0" deep), the top of which is approximately 6'-0" below grade. The finished footing is different than what was originally designed—this included changing the location and number of piers (figs. 124-125). This footing supports new 1'-0"-thick reinforced, grout-filled concrete block foundations walls faced with modern brick (figs. 126-127). Atop the modern brick-faced concrete block rests the portions of the brick foundation walls that were moved with the Principal Keeper's Quarters (fig. 128); the exterior plane is flush. The foundation walls surround a sunken crawlspace. The crawlspace "floor" is approximately 1'-0" to 2'-0" below the surrounding exterior grade. As a note, the historic brick vents travelled with the buildings.

Several reinforced, grout-filled concrete block piers are located throughout the plan. These piers are supported by reinforced concrete footings and support joists at critical points in the first-floor structural floor framing above (fig. 129). Piers were also constructed for the south and east porches (four and three respectively).

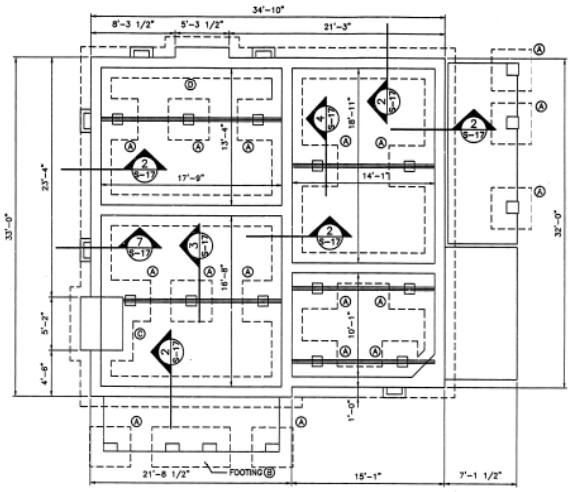


Figure 124. New foundation plan. Drawing: NPS DSC eTIC No. CAHA 603 25006A, Sheet S-15. Cropped by author.



Figure 125. The new continuous reinforced concrete footing at the new site of the Prinicipal Keeper's Quarters. Photo: Cape Hatteras National Seashore Archives, 03/22/99.

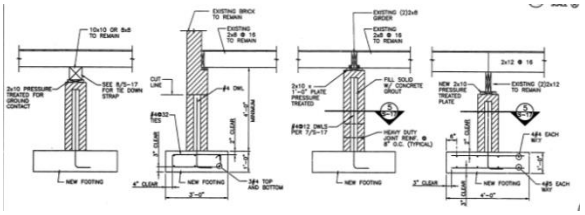


Figure 126. Sections through several new foundation wall configurations. Drawing: NPS DSC eTIC No. CAHA 603 25006A, Sheet S-17. Cropped by author.



Figure 127, right. New concrete footings and concrete block foundation walls now support the Principal Keeper's Quarters, shown here at the southwest corner. Photo: Cape Hatteras National Seashore Archives, 03/22/99.



Figure 128. The crawlspace below the Principal Keeper's Quarters shows the modern concrete block foundation walls supporting the historic brick walls which were moved with the dwelling. Photo: HPTC, 05/10/16.



Figure 129. Modern concrete block piers support first-floor structural floor framing above. Photo: HPTC, 05/10/16.

B	SHELL
B10	SUPERSTRUCTURE
B1010	Floor Construction
B101001	Structural Frame

First-Floor Structural Floor Frame

The first-floor structural floor frame was completely replaced during the building's 1985-87 preservation work with pressure-treated framing members (fig. 130). It is fully exposed in the crawlspace underneath the building (fig. 131).

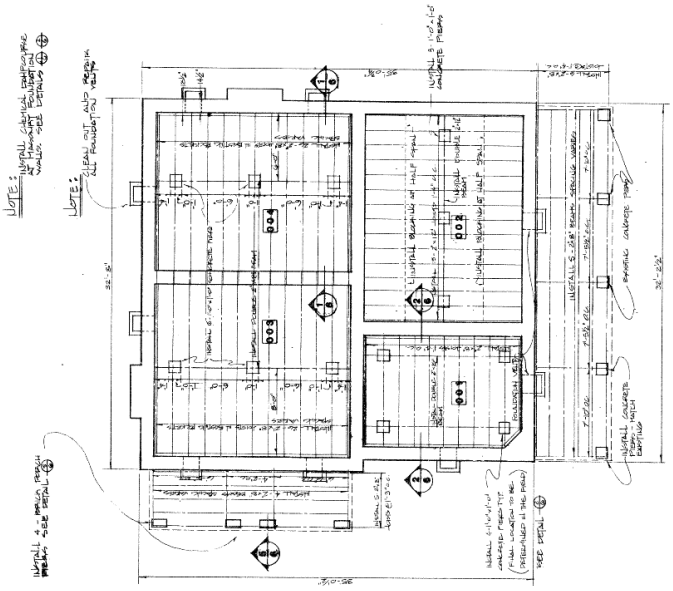


Figure 130. The first-floor structural floor frame replacement plan dating to the 1985-87 preservation work. Drawing: NPS DSC eTIC No. CAHA 603 80016, Sheet 3. Cropped by author.

In the 1871 main block, the floor frame was replaced with 2x8 (nominal) joists placed north-south at 16" on center. The joists overlap at the approximate center of the space, where they are supported by a large beam which corresponds with the wall between Room 104 and the stair hall in the first floor, and attached via metal straps (fig. 132). The ends of the joists adjacent the brick foundation walls are supported by modern rim joists and attached with small ledgers and nails. (It appears that the original joist pockets in the exterior foundation walls were not reused despite the drawings noting they were). Stringers (perpendicular to joists), supported by concrete-block piers, are located at the halfway points between the brick foundation walls and center beam (fig. 133).

In the 1871 kitchen wing, the floor frame was replaced with 2x8 (nominal) joists, placed north-south at 16”on center. The joists are supported by two perpendicular beams located approximately 1’-6” from the adjacent foundation walls. As a note, during exploratory observations by the SERO prior to the 1986-89 preservation work, the team discovered the kitchen wing originally had a lower floor than the rest of the main block, as designed in the original drawings. It is unknown when the floor was raised, but could have occurred in 1927 when multiple other changes occurred to the building.

In the 1927 addition, the floor frame was replaced with 2x12 (nominal) joists at 16” on center. The joists overlap at the approximate center of the space, where they are supported by a beam (composed of two 2x12s (nominal). The ends of the joists adjacent the brick foundation walls are supported by modern rim joists fastened via modern metal straps.

Large metal hurricane straps attach the foundation walls to the first-floor structural floor framing (fig. 134).

There is no extant insulation at the first-floor structural floor frame (see figs. 131-134). There is evidence that insulation once existed in this space: errant fiberglass fibers are attached to some of the floor joists. It is unknown when the insulation was removed, but may have corresponded with the building’s move in 1999. It is unknown if a vapor barrier was ever present in this location.



Figure 131. Framing of the first-floor is exposed in the crawlspace under the building. It was all replaced during the 1985-87 preservation work. Photo: HPTC, 05/10/16.



Figure 132. The joists are supported at mid-span by a beam, attached with metal straps. Photo: HPTC, 05/10/16.



Figure 133. Modern framing joists are supported by modern stringers, attached by nails and small ledgers. Photo: HPTC, 05/10/16.



Figure 134. Hurricane straps can be seen periodically around the perimeter of the building. Photo: HPTC, 05/10/16.

South Porch Structural Floor Frame

The south porch structural floor frame is inaccessible from the crawlspace or the exterior. During the 1985-87 preservation work the structure was replaced with four 2x8 (nominal) beams perpendicular to the dwelling's south exterior wall. Perpendicular to the beams (parallel to the exterior wall) are five 2x8 (nominal) joists at 15" on center (this includes one ledger joist at the wall and one breast joist at the piers). Refer to fig. 130.

East Porch Structural Floor Frame

The east porch structural floor frame is inaccessible from the crawlspace or the exterior. During the 1985-87 preservation work the structure was replaced with five 2x8 (nominal) beams perpendicular to the dwelling's east exterior wall. Perpendicular to the beams (parallel to the exterior wall) are six 2x8 (nominal) joists at 16" on center (this includes one ledger joist at the wall and one breast joist at the piers). Refer to fig. 130.

Second-Floor Structural Floor Frame

The second-floor structural floor frame is inaccessible due to finished spaces on the first and second floors. No resources could be found which mention any alterations to this framing system. It is therefore assumed that the framing in the 1871 main block is consistent with the original drawings: 0'-3"x 0'-8" (dimensional) joists running north-south (spacing unknown). No details are known about the framing in the 1927 addition, including alterations to the room located above the kitchen wing, added at the same time.

Attic Structural Floor Frame

The attic structural floor frame (or second-floor ceiling frame) is original. No resources could be found which mention any alterations to this framing system. The framing in the 1871 main block is consistent with the original drawings: 0'-3" x 0'-8" (dimensional) joists running north-south at approximately 36" on center (fig. 135). No details are known about the framing in the 1927 addition, due to inaccessible conditions and large amount of insulation covering the framing members (fig. 136). Insulation was added to the attic structural floor frame during the 1985-87 preservation work; this fiberglass insulation is likely that which is extant in the attic (see figs. 135-136). The insulation takes up the full depth of the 0'-8"-deep joists, or an approximate R-25.

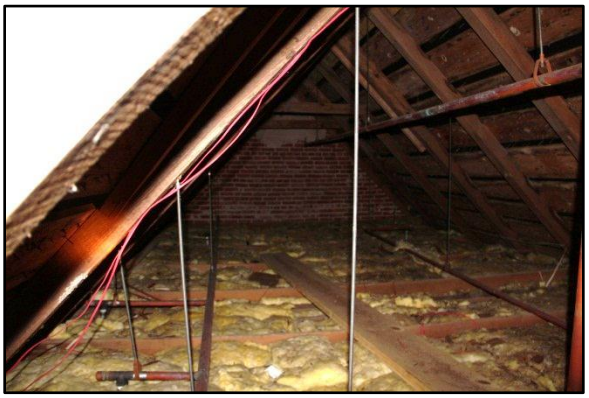


Figure 135. The attic structural floor frame of the 1871 main block is partially exposed and is original. Photo: HPTC, 05/10/16.



Figure 136. The attic structural floor frame of the 1927 addition is covered with fiberglass and is inaccessible. Photo: HPTC, 05/10/16.

B101002	Structural Interior Walls

There are several structural interior walls in the Principal Keeper's Quarters (figs. 137-138).

The first is the north-south wall which runs between the main block and the kitchen wing/addition (fig. 139). It extends from the foundation through the top of the second floor. The wall is composed of brick masonry, and is covered with modern drywall. The side facing into the addition (east) once faced the exterior.

The second is the east-west wall which runs between the kitchen wing and the addition. It extends from the foundation through the second floor. The wall is composed of brick masonry on the first floor; the side facing into the addition (north) once faced the exterior (fig. 140). The wall is stick-framed on the second floor and dates to the 1927 addition; it has always been an interior wall (fig. 141). All finished portions of this wall are covered with modern drywall (1985-87).

The third is the east-west wall supporting the lower run of the stair and its south side (fig. 142). The wall is stick-framed and is original to 1871; it has always been an interior wall. All portions of this wall are covered with modern drywall.

The two remaining are the east-west walls which divide the stair hall (Rooms 105 and 205) from the adjacent rooms to the north and south (Rooms 104 and 204 and Rooms 103 and 203, respectively). The walls are stick-framed, and are covered with modern drywall (1985-87). These walls have always been interior walls.

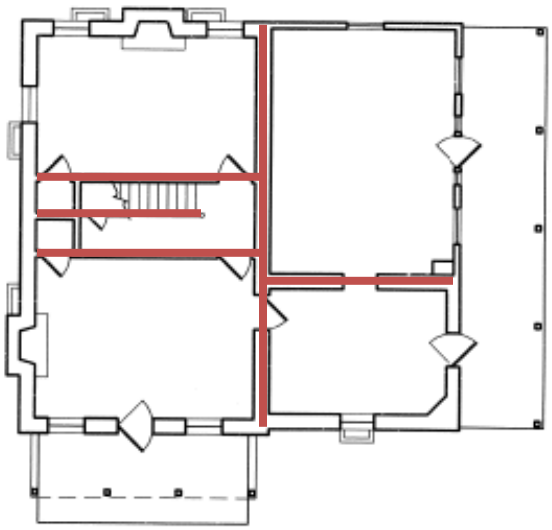


Figure 137. The first-floor plan with structural interior walls highlighted in red. Drawing: NPS DSC eTIC No. CAHA 603 25006B.

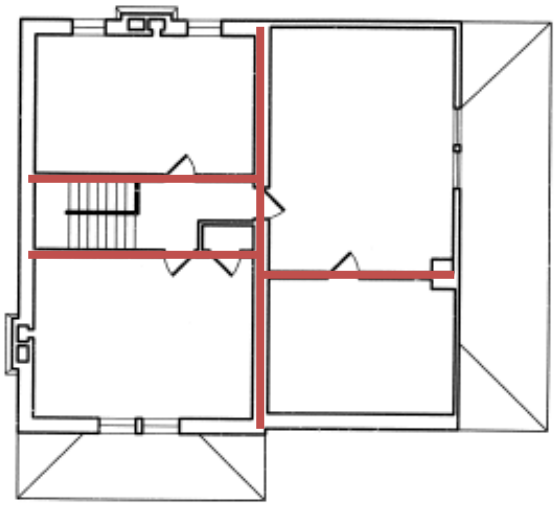


Figure 138. The second-floor plan with structural interior walls highlighted in red. Drawing: NPS DSC eTIC No. CAHA 603 25006B.

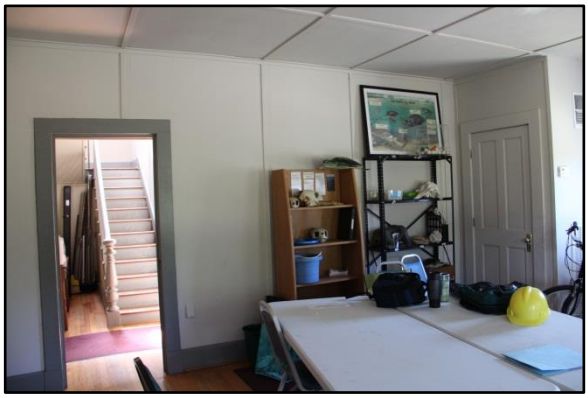


Figure 139. The side that faces into the addition was once an exterior wall. This wall is composed of brick masonry. Beyond the door is the 1871 main block. Photo: HPTC, 05/11/16.

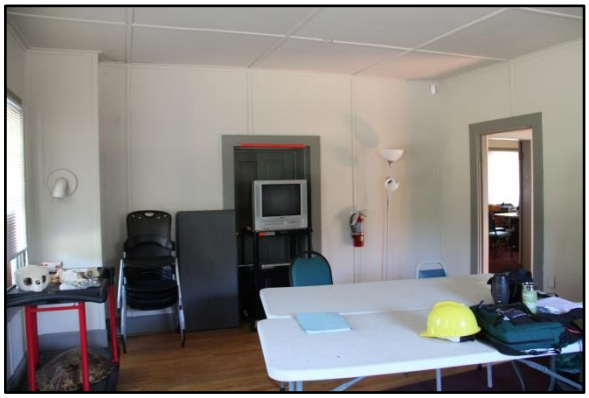


Figure 140. The side that faces into the addition was once an exterior wall. This wall is composed of brick masonry. Beyond the door is the 1871 kitchen wing. Photo: HPTC, 05/11/16.



Figure 141. The structural wall on the second floor between the addition and the attic space above the kitchen wing. Photo: HPTC, 05/11/16.

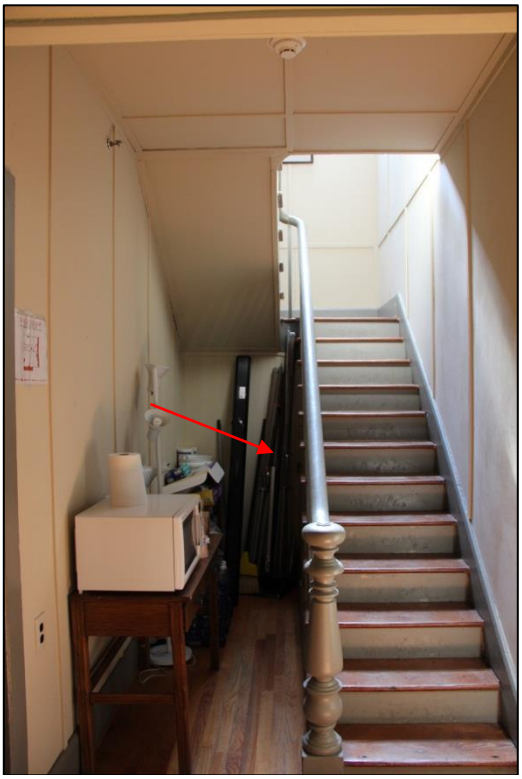


Figure 142, right. The walls on either side of the stair hall are structural, as well as the wall supporting the south side of the stair (arrow denotes location). Photo: HPTC, 05/11/16.

B1020	Roof Construction
B102001	Structural Frame

1871 Main Block Structural Roof Frame

The structural roof frame of the 1871 main block gable roof is original. It is composed of 0'-4" x 0'-4" (dimensional) rafters at 36" on center (fig. 143). There is no ridge beam. Original skip sheathing boards are located atop of the rafters. A few rafter ties have been added to pairs of rafters (fig. 144).

South & East Porch Structural Roof Frames

It is unknown if the structural roof frames of the south and east porch hipped roofs were replaced during the 1985-87 preservation work. At that time, the roof frames were identified to be composed of 0'-1½" x 0'-5¾" (dimensional) rafters at 24" on center. Both roof frames were inaccessible by HPTC.

1927 Addition Structural Roof Frame

The structural roof frame of the 1927 addition gable roof and shed roof extension is original (figs. 145-146). It is composed of 0'-1¾" x 0'-5½" (dimensional) rafters at 24" on center. A 1x6 (nominal) ridge beam is present. It is unknown how the two sections of the roof tie together, but may simply overlap one another.

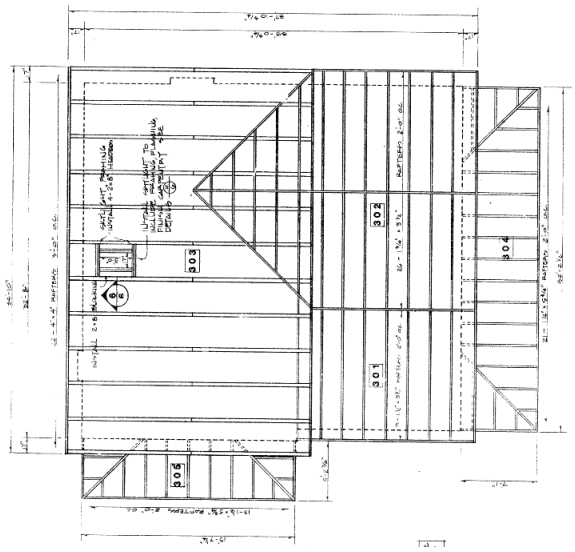




Figure 144, above. The structural roof framing of the 1871 main block is original and can be seen in the attic. Photo: HPTC, 05/10/16.

Figure 143, left. The structural roof framing plan for the Principal Keeper's Quarters. Drawing: NPS DSC eTIC No. CAHA 603 80016, Sheet 3. Cropped by author.

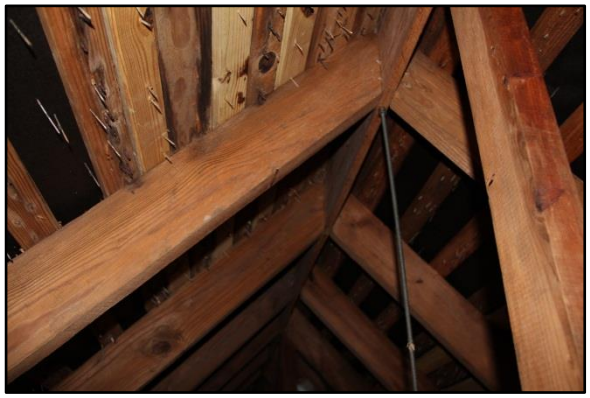


Figure 145. The roof framing of the 1927 addition. Photo: HPTC, 05/10/16.



Figure 146. The roof framing of the 1927 shed roof over the 1871 kitchen wing. Photo: HPTC, 05/10/16.

B20	EXTERIOR ENCLOSURE
B2010	Exterior Walls

Brick Exterior Walls

The brick exterior walls of the 1871 main block and kitchen wing are original. They were constructed of brick leftover from the construction of the lighthouse. The original drawings state that the walls were to be 1'-2½" thick (about four withes); the brick is laid in 5:1 common bond (five rows of stretchers to one row of headers) (fig. 147). The 1893 photographs of the exterior of the walls show they were painted in a red color (fig. 148). A portion of the wall which originally faced the exterior, and was encapsulated by the attic over the kitchen wing during the 1927 alterations, exhibits this red coating (fig. 149). Because of this, it is assumed that the dwelling was not painted white until after the 1927 alterations occurred. The current paint is likely latex based. It is unknown when the building was last painted.

Brick jack arches are located over all original door and window openings (fig. 150). Window openings which have been altered or added (likely in 1927) have what are likely steel lintels.



Figure 147. The exterior walls of the Principal Keeper's Quarters are constructed of brick laid in a 5:1 common bond. Photo: HPTC, 05/12/16.



Figure 148. The exterior of the Principal Keeper's Quarters had a red coating in 1893. Photo: Cape Hatteras National Seashore Archives; Box #4: Cape Hatteras Light Station Photos, Principal Keepers Quarters. Cropped by author.



Figure 149. A portion of a wall which once faced the exterior retains its red coating. Photo: HPTC, 05/11/16.



Figure 150. A brick jack arch located over an exterior door opening. Photo: HPTC, 05/12/16.

Frame Exterior Walls

The 1927 addition is constructed with frame exterior walls. Prior to the 1985-87 preservation work, the walls were noted to be constructed with balloon-frame techniques. This could not be verified by HPTC due to the finished surfaces on the interior and exterior of the building. The exterior surfaces of these frame walls, which include the entire addition and altered space above the original kitchen wing, are clad with painted wood dutchlap siding (fig. 151). The current exterior paint is likely latex based. It is unknown when the building was last painted. Diagonal sheathing is located behind the siding (which can be seen in the attic space above the 1871 kitchen wing and gable end of the addition) (fig. 152).

During the 1985-87 preservation work, the siding was repaired or replaced in-kind. The frame walls were also insulated at this time; however it is not present within the attic space above the 1871 kitchen wing (see fig. 152). The type of insulation is unknown, but if it exists is likely fiberglass. Based on the thickness of the walls, and assuming it is fiberglass batts, the R-value would be approximately 11.



Figure 151. The exterior of the 1927 exterior walls are clad with painted wood siding. Photo: HPTC, 05/12/16.

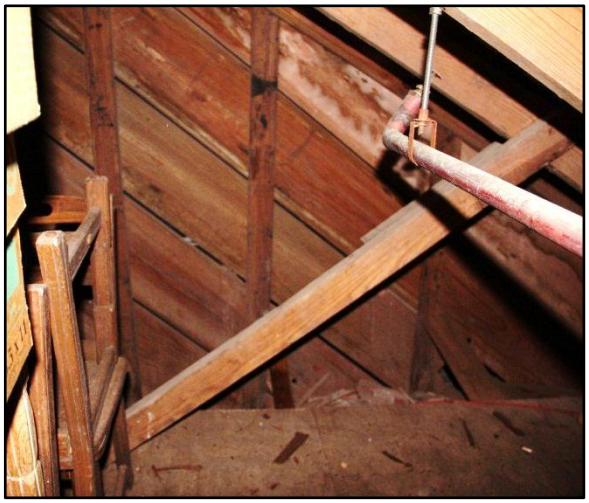


Figure 152. Diagonal sheathing is present under the exterior wood siding of the 1927 portions of the building. Photo: HPTC, 05/11/16.

Chimneys

There are three brick chimneys present on the exterior of the building.

The chimney located on the west elevation of the building is partially original (figs. 153-154). The lower portion (engaged with the exterior walls and below the roof eave) is original. The upper portion (above the roof eave), having been altered a few times, fell in 1949. It was reconstructed soon after (definitely by 1952) and very closely matches its original shape and detail, with only a couple extra courses added to the top. The lower portion of the west chimney was painted with the rest of the exterior walls in 1927. The upper portion retained its red color until about 1956, when it first appeared painted white. The white color was retained through at least 1995, but returned to unpainted by 1999 (which has remained). By 1963, painted metal straps appeared to secure the chimney to the adjacent roof structure and maintain its upright position. This strap system was replaced during the 1985-87 preservation work. The extant strap system likely dates to this time. The west chimney, which includes two flues, does not include a cap of any kind (fig. 155).

The chimney located on the north elevation of the building is original (see figs. 43-44), including its arched brick top. Like the west chimney, the north chimney was painted with the rest of the exterior walls in 1927. The upper portion retained its red color until about 1956, when it first appeared painted white. The white color was retained through at least 1995, but returned to unpainted by 1999 (which has remained). It is unknown if the north chimney, which likely has two flues, has been capped below its brick arch (see fig. 155).



Figure 153. The Principal Keeper's Quarters in May 1893 with two of its original chimneys: the north (left) and west (right). Photo: NARA, RG 26, LG 26 82A. Copies found in NPS Harpers Ferry Center Photographic Archives and Cape Hatteras National Seashore Archives. Cropped by author.



Figure 154. The exterior of the dwelling today exhibiting its north (left) and west (right) chimneys. Note the support system securing the west chimney to the roof. Photo: HPTC, 05/12/16.



Figure 155. A view from the lighthouse shows the west chimney has not been capped and the east chimney has been capped. It is unknown if the north chimney has been capped. Photo: HPTC, 05/12/16.

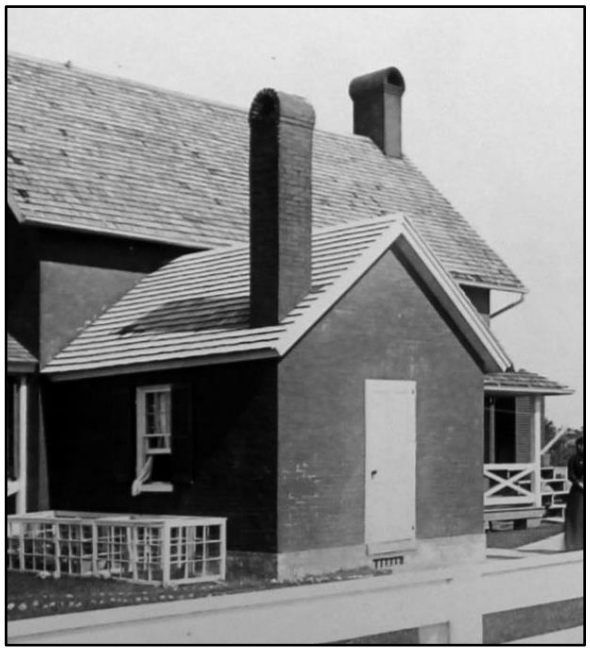


Figure 156. The Principal Keeper's Quarters in 1893 with two of its original chimneys: the east (foreground) and north (background). Photo: Cape Hatteras National Seashore Archives; Box #4: Cape Hatteras Light Station Photos, Principal Keepers Quarters. Cropped by author.



Figure 157. The 1927 east chimney as it is seen today. Photo: HPTC, 05/12/16.

The chimney located on the east elevation of the building is not original to 1871. The original 1871 east chimney was formerly located at the southeast corner of the kitchen wing. It was similar in design to, but smaller than the north chimney (fig. 156). The former east chimney was removed when the 1927 addition was added. This addition included a new chimney located at the southeast corner of the addition. This chimney still stands today (fig. 4157). Like the other two chimneys at the building, the east chimney retained its red color until about 1956, when it first appeared painted white. The white color was retained through at least 1995, but returned to unpainted by 1999 (which has remained). A metal support strap was in place in 1937; it is unknown when it was first put into place (after 1927) or when it was removed (before 1949). The single-flue east chimney has been capped with a metal flue cover and concrete wash (see fig. 155).

All three chimneys were maintained in place during the building's move in 1999. Temporary framing was used to secure them in place.

Porches

The extant south porch is not composed of the original porch components (except roof framing members); most, if not all, have been replaced at some point, much during the 1985-87 preservation work. The extant porch closely matches the original seen on the building in 1893 including the horizontal rails and cross members between square posts (figs. 158-159). Photographs dated 1937 first show the porch as screened (fig. 160); this was removed between 1956 and 1958. An additional floor deck has been added atop the 1985-87 floor deck to make the porch and interior of the building ABAAS compliant. All of the porch components are painted, except the porch floorboards.



Figure 158. The original south porch, as seen in 1893. Photo: Cape Hatteras National Seashore Archives; Box #4: Cape Hatteras Light Station Photos, Principal Keepers Quarters.



Figure 159. The extant south porch does not retain much original material, but matches the original. Photo: HPTC, 05/12/16.



Figure 160. The screened-in south porch in March 1937. Photo: Cape Hatteras National Seashore Archives, Box #4: Cape Hatteras Light Station Photos, Principal Keepers Quarters. Cropped by author.

The extant east porch is also not composed of the original porch components (except roof framing members); most, if not all, have been replaced at some point, much during the 1985-87 preservation work. The extant porch closely matches the 1927 original seen in photographs dating to 1937 (figs. 161-162). In 1940, the porch was screened. Between 1952 and 1956 the southern one-and-a-half bays were enclosed for a utility room; the remaining portion was screened (fig. 163). The screening was removed by 1968 and the utility room enclosure was removed during the 1985-87 preservation work. All of the porch components are painted, except the porch floorboards.



Figure 161, above. The east porch as seen in its earliest known photograph, 1937. Photo: Cape Hatteras National Seashore Archives, Box #4: Cape Hatteras Light Station Photos, Principal Keepers Quarters.



Figure 162, above right. The east porch does not retain much original material, but matches the original. Photo: HPTC, 05/12/16.



Figure 163, right. The east porch in February 8, 1956. The southern portion has been enclosed for use as a utility room; the northern portion is screened. Photo: Cape Hatteras National Seashore Archives. Cropped by author.

B2020	Exterior Windows

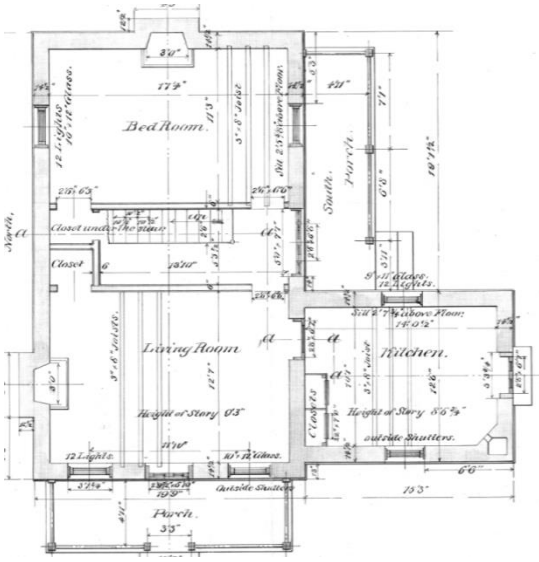


Figure 164. The original first-floor plan with layout of windows. Drawing: National Archives and Records Administration. Cropped by author.

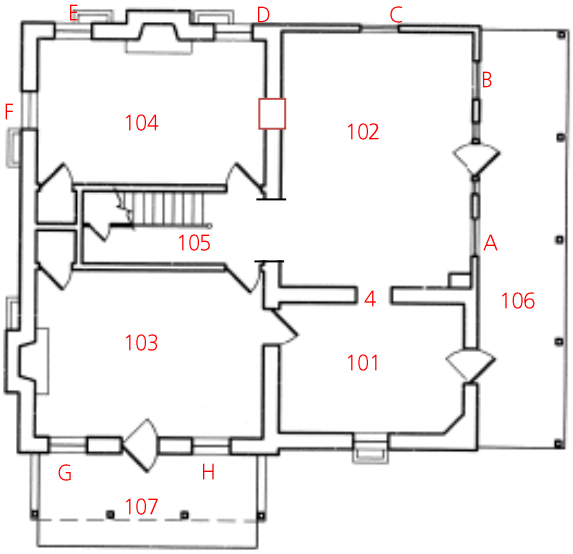


Figure 165. The first-floor plan. Letters denote windows, single-digit numbers denote doors, and three-digit numbers denote rooms. Drawing: NPS DSC eTIC No. CAHA 603 25006B, Sheet A-5. Cropped and labelled by author.

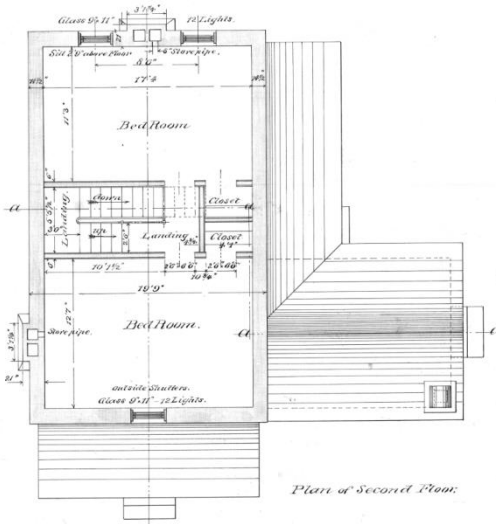


Figure 166. The original second-floor plan with layout of windows. Drawing: National Archives and Records Administration. Cropped by author.

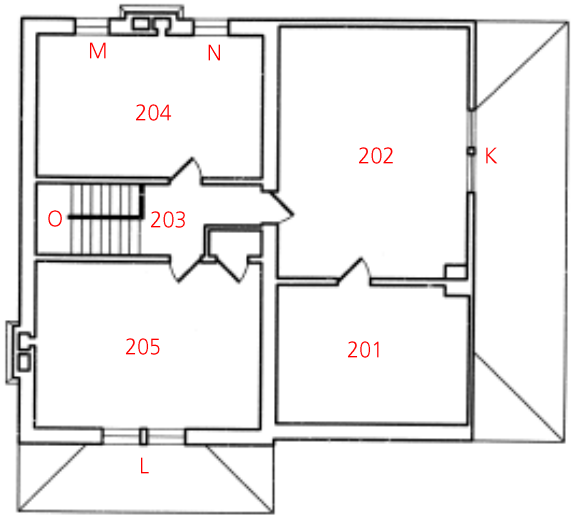


Figure 167. The second-floor plan. Letters denote windows, single-digit numbers denote doors, and three-digit numbers denote rooms. Drawing: NPS DSC eTIC No. CAHA 603 25006B, Sheet A-5. Cropped and labelled by author.

The original drawings stated the windows were to be 12 lights (6/6 double hung), with glass 9”x11”, and exterior shutters (figs. 164, 166). Only Windows F, G, H, and I exist as they did in 1871 (figs. 165, 167). Substantial changes to the openings occurred when the addition was constructed in 1927 (figs. 168-171). At that time the following occurred:

- Windows A, B, C, and double Window K (fig. 173) included with the new addition.
- Windows D and E (fig. 172) were added to the north elevation and double Window L replaced a single window on the south elevation of the 1871 main block (no jack arches are now present).
- An original window in the north elevation of the kitchen wing was turned into Door 4.
- An exterior window in the east wall of Room 104 was removed and bricked in.

It is possible that all of the window sash were replaced during this work, but that has not been determined (fig. 174). It is unknown if any substantial work occurred to the windows during the CCC-era projects.



Figure 168. The dwelling in 1893 with original window configuration. Photo: Cape Hatteras National Seashore Archives; Box #4: Cape Hatteras Light Station Photos, Principal Keepers Quarters. Cropped by author.



Figure 169. The dwelling today with window configuration which dates to 1927 alterations. Photo: HPTC, 05/12/16.



Figure 170. The dwelling in 1893 with original window configuration. Photo: NARA, RG 26, LG 26 82A. Copies found in NPS Harpers Ferry Center photographic archives and Cape Hatteras National Seashore archives. Cropped by author.



Figure 171. The dwelling today with window configuration which dates to 1927 alterations. Photo: HPTC, 05/12/16.



Figure 172. Window E dates to 1927 work. Photo: HPTC, 05/12/16.



Figure 173. Double Window K dates to 1927 addition. Photo: HPTC, 05/12/16.



Figure 174. Windows M (left) and N (right) are original to 1871, but may have been replaced during 1927 work. Photo: HPTC, 05/12/16.

Substantial work was completed on the windows during the 1985-87 preservation work. This work included repair to the wood sills and brick jack arches or lintels, repair or in-kind replacement of deteriorated portions of the extant wood windows to include the restoration of all lower sash to be operable with proper hardware, installation of new interior storm windows and exterior wood shutters. In 1991, the shutters were replaced again and were extant on the building through at least 1995. Some work occurred to the windows again in FY1996, to include repair or in-kind replacement of windows and storm windows, to include proper hardware, re-glazing of sash, and painting. Currently interior *and* exterior storm windows are extant at all of the window openings (only Window A is missing its interior storm) (figs. 175-176). Based on photographic evidence, the exterior storm windows were installed between 1995 and 1999.



Figure 175. Window I with exterior storm window extant. Photo: HPTC, 05/12/16.



Figure 176. Window I with interior storm window extant. Photo: HPTC, 05/11/16.

Exterior louvered wood shutters were extant on the building in 1893, but had been removed by 1937. Shutters were restored to the building during the 1985-87 preservation and replaced in ca. 1991. The shutters were removed between 1995-1999, likely to accommodate the installation of exterior storm windows.

The skylight (Window O) over the stair hall was an original feature of the Principal Keeper's Quarters (see fig. 173) and appears in section on the original drawings as a 1'-5" x 3'-6" opening (fig. 177). The original skylight remained extant through at least May 1949. Photographs show that by October 1957 the skylight had been removed. The skylight was restored during the 1985-87 preservation work, but was slightly smaller at 1'-5" x 3'-0" (fig. 178). In 1992, the skylight was partially dismantled to investigate leaks; it was likely fixed in FY1997.

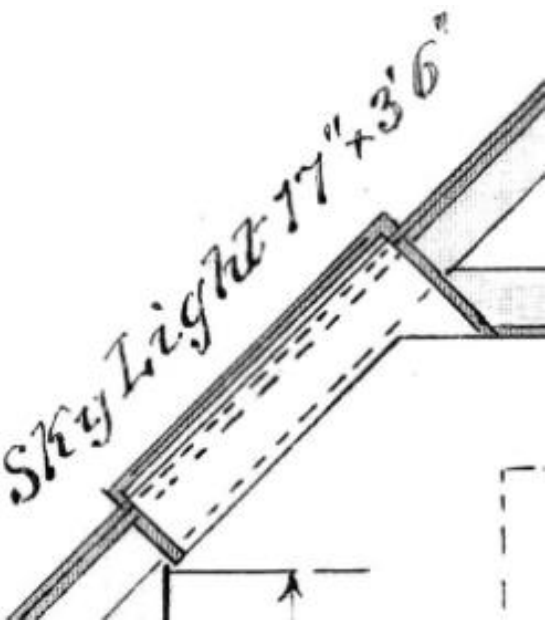


Figure 177, left. The skylight appears in the original drawings. Drawing: National Archives and Records Administration. Cropped by author.



Figure 178, above. The restored skylight as it exists today. Photo: HPTC, 05/12/16.

A summary of the extant windows is as follows:

Window ID	Floor	Room	Type	Opening Date	Sash Date	Interior Storm?	Exterior Storm?
A	1	102	6/6 DH	1927	1927?	Missing	Y
B	1	102	6/6 DH	1927	1927?	Y	Y
C	1	102	6/6 DH	1927	1927?	Y	Y
D	1	104	6/6 DH	1927	1927?	Y	Y
E	1	104	6/6 DH	1927	1927?	Y	Y
F	1	104	6/6 DH	1871	1871?	Y	Y
G	1	103	6/6 DH	1871	1871?	Y	Y
H	1	103	6/6 DH	1871	1871?	Y	Y
I	1	101	6/6 DH	1871	1871?	Y	Y
K	2	202	Paired 6/6 DH	1927	1927?	Y	Y
L	2	203	Paired 6/6 DH	1927	1927?	Y	Y
M	2	204	6/6 DH	1927	1927?	Y	Y
N	2	204	6/6 DH	1927	1927?	Y	Y
O	Roof	206	Skylight	1871/1985-87	1985-87	N/A	N/A

B2030	Exterior Doors

Two of the original three door openings are extant; these are Doors 1 and 3. The third original exterior opening is also extant, but is now located on the interior of the building as Door 7. The third extant exterior opening, Door 2, is located in the 1927 addition. Refer to fig. 179.

All three exterior doors were replaced during the 1985-87 preservation work. The work for each was as follows:

- Door 1 (fig. 180): "Fabricate new exterior four panel door to include new hinges, lockset-cylinder lock-deadbolt. (Install new screen door.)"
- Door 2 (fig. 181): "Fabricate new exterior five panel door to include, lockset-cylinder lock-deadbolt. Repair and reinstall existing hinges. (Install new screen door.)" It is assumed that the sidelights are original.
- Door 3 (fig. 182): "Fabricate new exterior four panel door to include new hinges lockset-cylinder lock-deadbolt. (Install new screen door.)"

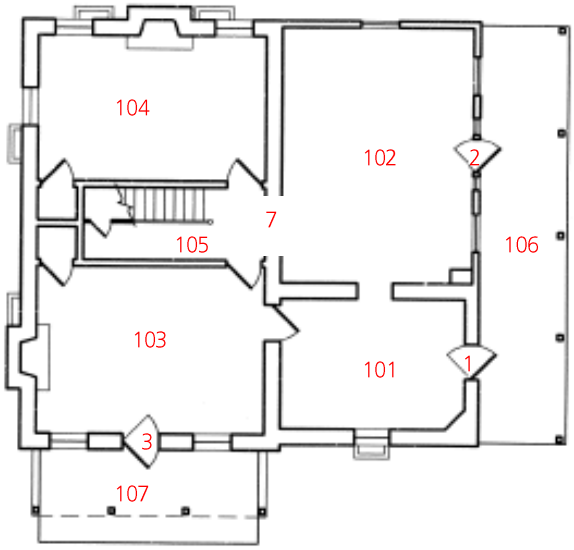


Figure 179. The first-floor plan. Single-digit numbers denote doors and three-digit numbers denote rooms. Drawing: NPS DSC eTIC No. CAHA 603 25006B, Sheet A-5. Cropped by author.



Figure 180, right. Door 1 was replaced in 1985-87. The screen door dates to that period as well. Photo: HPTC, 05/12/16.



Figure 181. Door 2 was replaced in 1985-87. The screen door dates to that period as well. The sidelights are likely original. Photo: HPTC, 05/12/16.



Figure 182. Door 3 was replaced in 1985-98. The screen door dates to that period as well. Photo: HPTC, 05/12/16.

A summary of the extant exterior doors is as follows:

Door ID	Elevation	Room	Type	Opening Date	Door Date	Hardware	Screen Door?
1	East	101	4-panel exterior	1871	1985-87	New hinges, lockset & deadbolt	Y
2	East	102	5-panel (horizontal) exterior w/ 4-lite, 1-panel SLs	1927	1985-87	New lockset & deadbolt; old hinges	Y
3	South	103	4-panel exterior	1871	1985-87	New hinges, lockset & deadbolt	Y

B30	ROOFING
B3010	Roof Coverings
B301001	Roof Finishes

Main Roof Finishes

The main roof covers the 1871 main block and the 1927 roof over that addition and the original kitchen wing. The roof has always been covered in wood shingles, which today are likely western red cedar (the most common wood shingle used today), eastern white cedar, or Alaskan yellow cedar.[2] Shingles dating to before 1927 are encapsulated in the attic (figs. 183-184). The current roof was installed in ca. 2011 (based on HPTC conversation with CAHA maintenance employees) (fig. 185). The wood-shingle roof is laid atop original skip sheathing (in 1927 addition) and sheathing boards (in 1871 portion) using modern ring-shank nails (fig. 186). Some modern wood has been installed between the skip sheathing and the sheathing boards (not a proper installation technique). A modern impregnated tar paper was installed between the original sheathing and new shingles (not a proper installation technique). The starter course has two shingles (three is best). No metal flashing strips can be detected within the field of the roof (not required). Modern metal drip edge has been installed along the perimeter of the roof (not detrimental).



Figure 183. Shingles dating to before 1927 are extant in the attic. Photo: HPTC, 05/10/16.



Figure 184. Shingles dating to before 1927 are extant in the attic. Photo: HPTC, 05/10/16.



Figure 185. The extant wood shingle roof was installed in ca. 2011, seen here from the lighthouse. Photo: HPTC, 05/12/16.

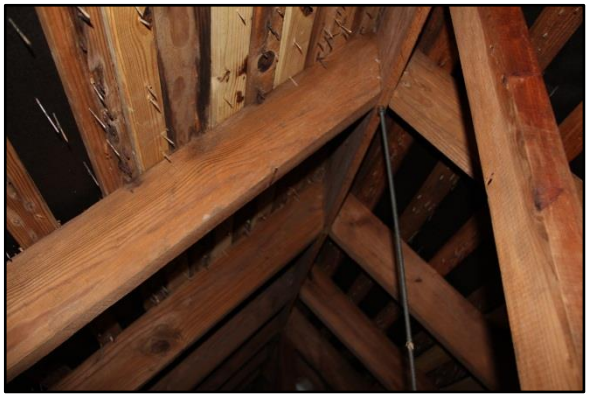


Figure 186. Modern wood has been added between the historic skip sheathing in the 1927 roof. Note the modern ring-shank nails. Photo: HPTC, 05/10/16.

[2] Extant type of cedar cannot be determined as the shingles are too weathered at this point in time.

South Porch Finishes

The south porch roof has always been covered with wood shingles, which today are likely western red cedar (the most common wood shingle used today), eastern white cedar, or Alaskan yellow cedar.[3] The current roof was installed in ca. 2011 (based on HPTC conversation with CAHA maintenance employees) (fig. 187). It is assumed that this roof was installed similarly to the main roof: atop original sheathing boards using modern ring-shank nails, inclusion of some modern wood installed between the sheathing boards (not a proper installation technique), and installation of modern impregnated tar paper between the original sheathing and new shingles (not a proper installation technique). The starter course has two shingles (three is best). No metal flashing strips can be detected within the field of the roofs (not required). Modern metal drip edge has been installed along the perimeter of the roof (not detrimental) (fig. 188).



Figure 187. The modern wood shingle roof atop the south porch. Photo: HPTC, 05/12/16.

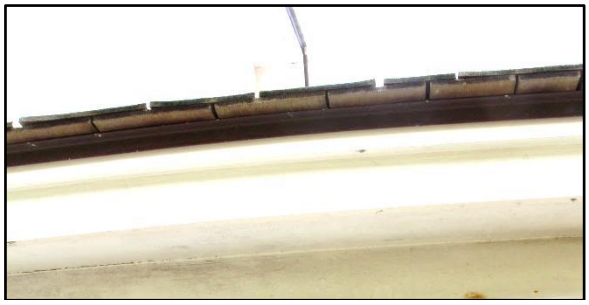


Figure 188, right. The roof has a metal drip edge along its perimeter and only a two-shingle started course. Photo: HPTC, 05/12/16.

East Porch Roof Finishes

The east porch roof was likely originally covered with standing-seam metal: photographs from 1937 and 1952 show standing-seam metal extant. Wood shingles were installed on the roof as early as 1956 (definitely by 1968). The current painted standing-seam metal roof was installed during the 1985-87 preservation work (fig. 189).



Figure 189. The painted standing-seam metal roof atop the east porch was installed in 1985-87. Photo: HPTC, 05/12/16.

[3] Extant type of cedar cannot be determined as the shingles are too weathered at this point in time.

Valley Flashing

The valley flashing located between the 1871 main block roof and the 1927 addition roof is modern (date unknown). It is likely composed of painted aluminum (fig. 190).

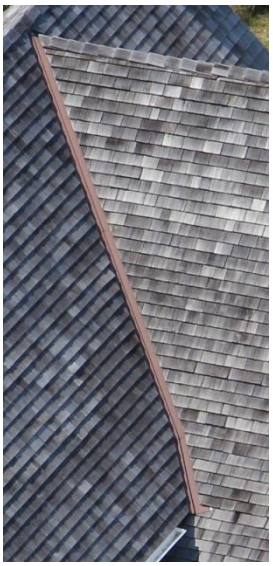


Figure 190. Modern painted aluminum valley flashing. Photo: HPTC, 05/12/16.

Chimney Flashing

All three chimneys have metal step flashing (figs. 191-193). The metal is likely lead-coated tin or copper. Both the west and east chimneys have crickets, which were installed during the 1985-87 preservation work (see figs. 191-192).

Roof-Side Wall Flashing

Painted metal step flashing is located at the junctions between the south porch wood shingle roof, the kitchen wing wood shingle roof, and their associated main block brick exterior walls (figs. 194-195). The date of installation is unknown, but likely was completed during the 1985-87 preservation work.

Painted metal flashing is located at the junction between the east porch metal roof and the addition sided wall (fig. 196). The flashing was installed behind the wood siding (a proper technique) and dates to the 1985-87 preservation work.



Figure 191. The west chimney with metal step flashing and cricket. Photo: HPTC, 05/12/16.



Figure 192. The east chimney with metal step flashing and cricket. Photo: HPTC, 05/12/16.



Figure 193. The north chimney with metal step flashing. Photo: HPTC, 05/12/16.

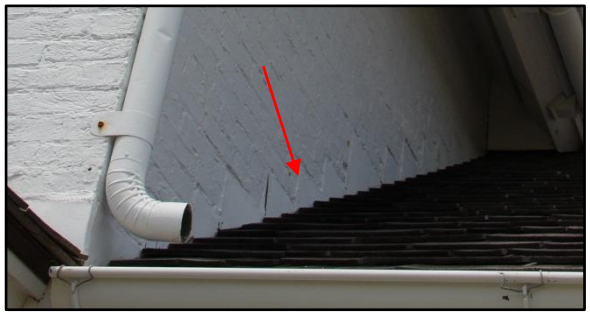


Figure 194. Painted metal step flashing located beween the kitchen wing roof and brick exterior side wall. Photo: HPTC, 05/12/16.



Figure 195. Painted metal step flashing located beween the south porch roof and brick exterior side wall. Photo: HPTC, 05/12/16.



Figure 196. Metal flashing located between the east porch roof and the sided exterior side wall. Photo: HPTC, 05/12/16.

Roof Transition Flashing

No flashing can be seen at the transition between the upper, steeper gable roof of the addition and the lower, shallower shed roof of the kitchen wing (fig. 197). It is assumed no traditional flashing is extant in this location, and the tar paper underlayment acts as a flashing layer.

Skylight Flashing

The details of the flashing around the skylight are unknown, but do not appear to employ traditional flashing details (i.e. flashing and counterflashing) (fig. 198). Based on the condition on the interior of the building, the flashing seems sufficient.



Figure 197. Traditional flashing is missing from the transition (dotted line) from the ktichen wing shed roof to the addition gable roof. Photo: HPTC, 05/12/16.



Figure 198. It appears that traditional flashing techniques were no employed at the kiylight opening. Photo: HPTC, 05/12/16.

The entire roof drainage system was replaced during the 1985-87 preservation work. The half-round gutters and round downspouts are composed of terne-coated stainless steel.

The west slope of the 1871 main block drains into a 0'-5" gutter which extends the entire length of the roof (red in fig. 199; fig. 200). A 0'-3" downspout is located at each end of the gutter. The north downspout originally drained into the cistern on the north elevation, but now drains at grade. The south downspout also drains at grade.

The section of the east slope of the 1871 main block north of the 1927 roof and the northern slope of the 1927 roof drain into a 0'-5" gutter which extends the length of the 1927 portion of the roof (orange in fig. 199; fig. 201). A 0'-3" downspout is located at the west end of the gutter. It originally drained into the cistern on the north elevation, but now drains at grade.

The section of the east slope of the 1871 main block south of the 1927 roof drains into a 0'-5" gutter which extends the length of this portion of the roof. A 0'-3" downspout is located at the south end of the gutter. The downspout drains onto the kitchen wing roof. The southern slope of the 1927 roof and the kitchen wing roof (including that of the adjacent downspout from the main block roof) drain into a 0'-5" gutter which extends the length of the kitchen wing (blue in fig. 199; fig. 202). A 0'-3" downspout is located at the east end of the gutter; it drains to grade.

The east porch hipped roof drains into a 0'-5" gutter which extends the length of the east slope only (the north and south slopes do not drain into a gutter, but instead drain directly to the ground) (purple in fig. 199; fig. 203). The 0'-3" downspout is located at the north end of the gutter; it drains to grade.

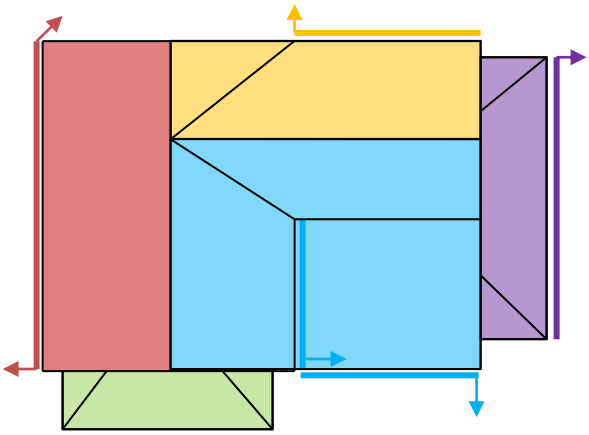


Figure 199. Different areas of the roof and their associated roof drainage system. Solid colored lines represent gutters for associated colored roof areas. Colored arrows represent downspouts for associated colored gutters. Drawing: HPTC.



Figure 200. The roof drainage system located on the west elevation. Photo: HPTC, 05/12/16.



Figure 201. The roof drainage system located on the north elevation. Photo: HPTC, 05/12/16.

The south porch does not include a roof drainage system, but instead drains directly to the ground (green in fig. 199; fig. 204).

At the base of all downspouts, park maintenance staff has installed wood frames filled with stone to slow down the flow of draining water (fig. 205).





Figure 204. The south porch does not have a roof drainage system. Photo: HPTC, 05/12/16.



Figure 203, above. The roof drainage system located on the east porch. Photo: HPTC, 05/12/16.

Figure 202, left. The roof drainage system located on the south elevation. Photo: HPTC, 05/12/16.



Figure 205. A modern drainage frame located at the base of the downspout on the west elevation. Photo: HPTC, 05/12/16.

C	INTERIORS
C10	INTERIOR CONSTRUCTION
C1020	Interior Doors

Several of the original four-panel wood interior doors are original; these include Doors 6, 8, 10, and 11 on the first floor and Doors 14 and 15 on the second floor (fig. 206). The remaining four-panel wood interior doors were replaced during the 1985-87 preservation work; these include Doors 4 and 5 on the first floor and Doors 13 and 16 on the second floor (fig. 207).

Door 4 was originally a window opening, but became an interior door opening during the 1927 alterations (fig. 208).

The wood beadboard door located under the stair is original (Door 9) (fig. 209). Door 12 was replaced to match Door 9 in 1985-87 (fig. 210).

Door 7 was originally an exterior door opening. There is currently no door in this opening.

Doors 17-20 were installed in ca. 2000 when the modern HVAC closets were installed in the dwelling (fig. 211).

There is a mix of historic and modern (1985-87 and ca. 2000) hardware located in the dwelling (figs. 212-213).

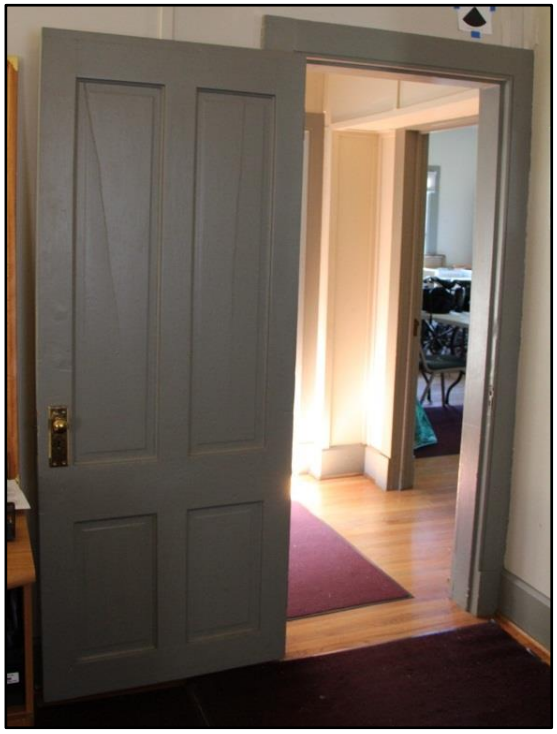


Figure 206. Door 6 is an original interior four-panel door. Photo: HPTC, 05/11/16.

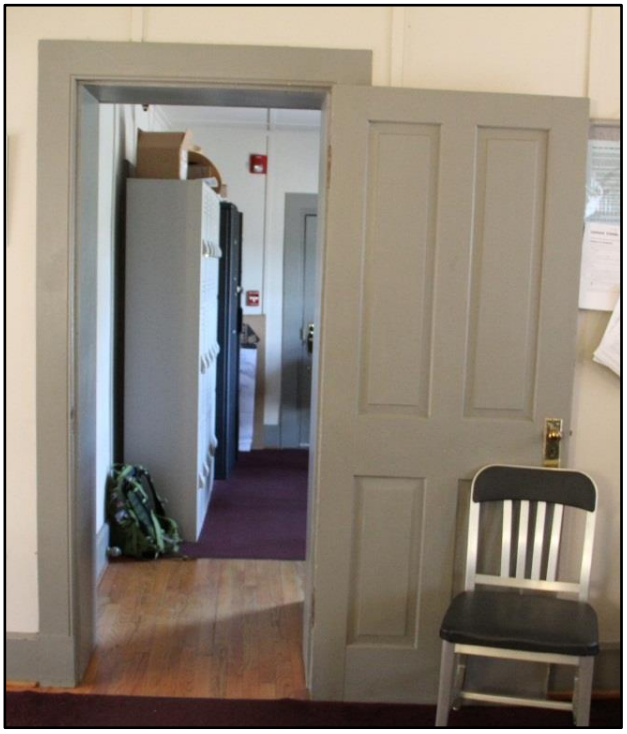


Figure 207. Door 5 is a replacement interior door which dates to 1985-87. Photo: HPTC, 05/11/16.

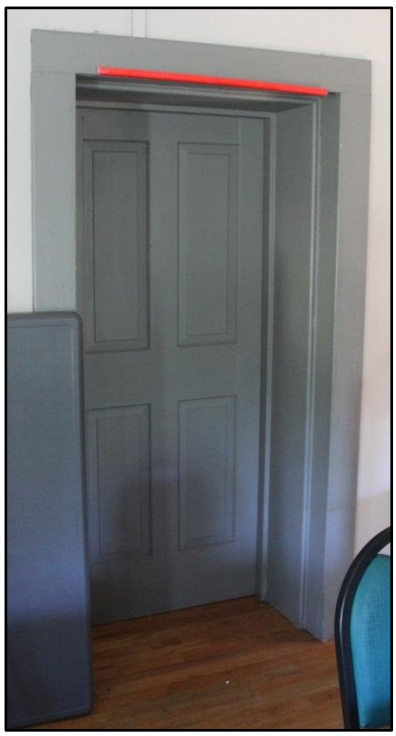


Figure 208. Door 4 was originally a window opening, but became a door in 1927. The door dates to 1985-87. Photo: HPTC, 05/11/16.

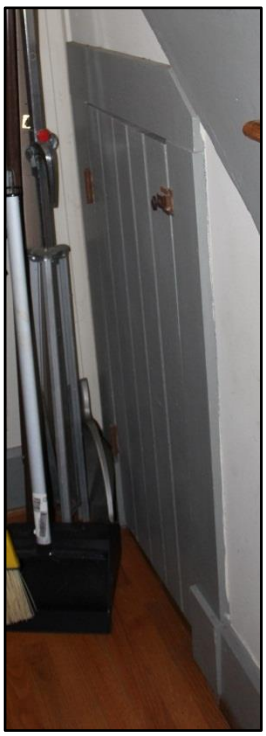


Figure 209. Door 6, under the stair, is original. Photo: HPTC, 05/11/16.



Figure 210. Door 12 was built in 1985-87 to match Door 6. Photo: HPTC, 05/11/16.

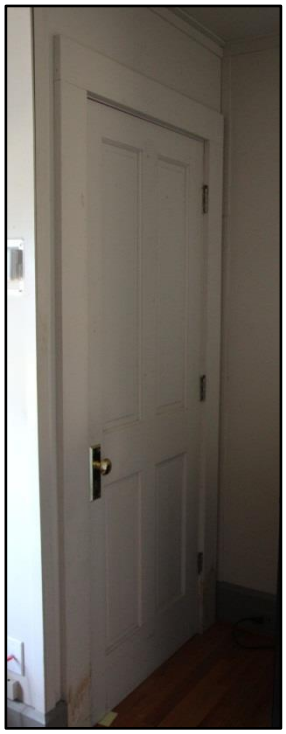


Figure 211. A modern door with modern hardware located at the HVAC closet in Room 101. Photo: HPTC, 05/11/16.



Figure 212. A historic lockset located on historic Door 11. Photo: HPTC, 05/11/16.

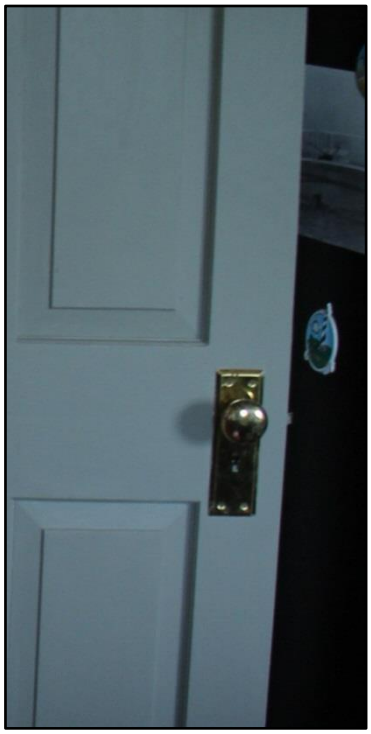


Figure 213. A modern lockset on modern Door 16. Photo: HPTC, 05/11/16.

The following chart summarizes the features of the interior doors:

Door ID	Room	Type	Opening Date	Door Date	Hardware
4	101-102 (originally a window)	4-panel interior	1927	1985-87	New hinges & lockset
5	101-103	4-panel interior	1871	1985-87	New hinges, old lockset
6	103-105	4-panel interior	1871	1871	Old hinges, new lockset
7	102-105	Opening (originally an exterior door)	1871	N/A	N/A
8	104-105	4-panel interior	1871	1871	Old hinges & lockset
9	105 cl.	Beadboard	1871	1871	Old hinges & lockset
10	103 cl.	4-panel interior	1871	1871	New hinges & lockset
11	104 cl.	4-panel interior	1871	1871	New hinges & lockset
12	201-202	Beadboard	1927	1985-87	Old hinges & lockset
13	202-205	4-panel interior	1927	1927	New hinges, old lockset
14	203 cl	4-panel interior	1871	1871	New hinges, old lockset
15	203-205	4-panel interior	1871	1871	Old hinges & lockset
16	204-205	4-panel interior	1871	1985-87	New hinges & lockset
17	101 cl.	4-panel interior	ca. 2000	ca. 2000	New hinges & lockset
18	102 cl.	4-panel interior	ca. 2000	ca. 2000	New hinges & lockset
19	203 cl.	4-panel interior	ca. 2000	ca. 2000	New hinges & lockset
20	202 cl.	4-panel interior	ca. 2000	ca. 2000	New hinges & lockset

C1030	Fittings
C103010	Closets

Historic Closets

The space under the stair is divided into two closets: one which can be accessed from under the stair and Room 104 (fig. 214), and one which is accessed only from Room 103 (fig. 215). These closets retain their historic configuration (fig. 216).

A single historic closet is extant on the second floor (fig. 217). Originally a twin closet was located adjacent, but was removed in 1927 when the addition was constructed.

Modern Closets

The modern closets were installed in ca. 2000 when the modern HVAC system was first installed. Two closets are located on the first floor in Rooms 101 and 102 (fig. 218). Two closets are also located on the second floor in Rooms 202 and 203 (fig. 219).

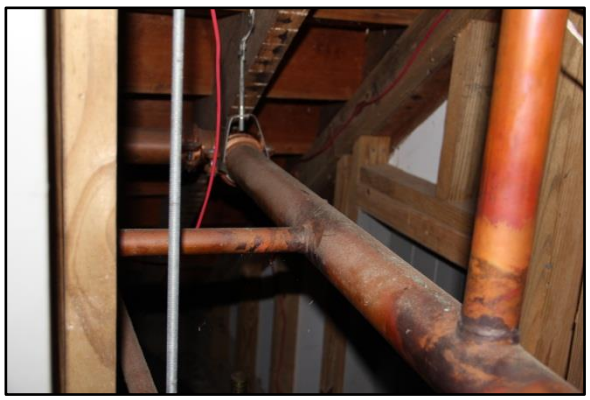


Figure 214. The interior of the original closet under the stair, as seen from Room 104, looking toward the door under the stair. Photo: HPTC, 05/11/16.

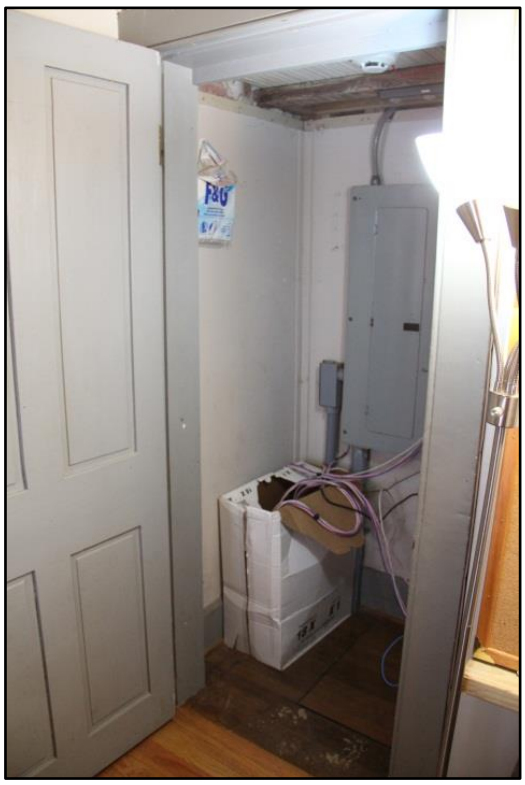


Figure 215, right. The interior of the original closet under the stair, as seen from Room 103. Photo: HPTC, 05/11/16.

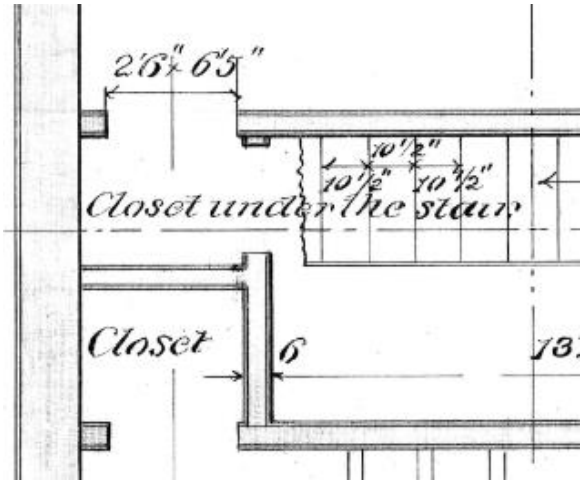


Figure 216. The original configuration of the closets under the stair has been retained. Drawing: National Archives and Records Administration. Cropped by author.



Figure 217, right. The interior of the original closet located in Room 203. Photo: HPTC, 05/11/16.

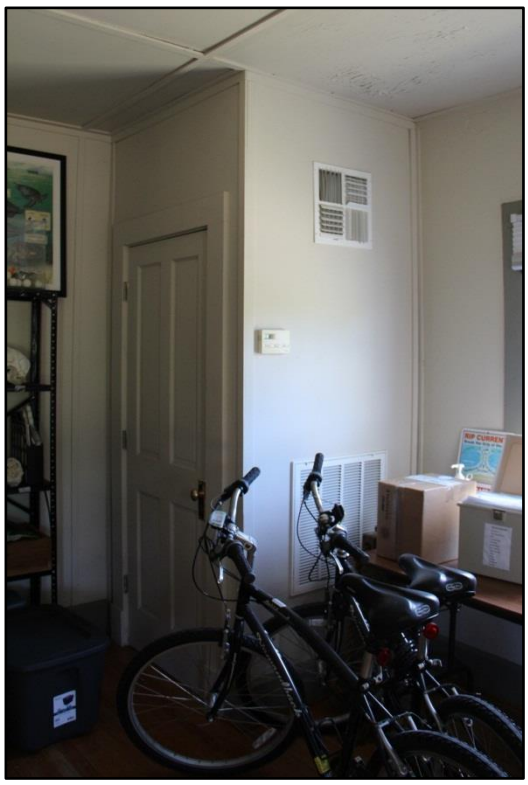


Figure 218. A modern HVAC closet located in Room 102, installed in ca. 2000. Photo: HPTC, 05/11/16.

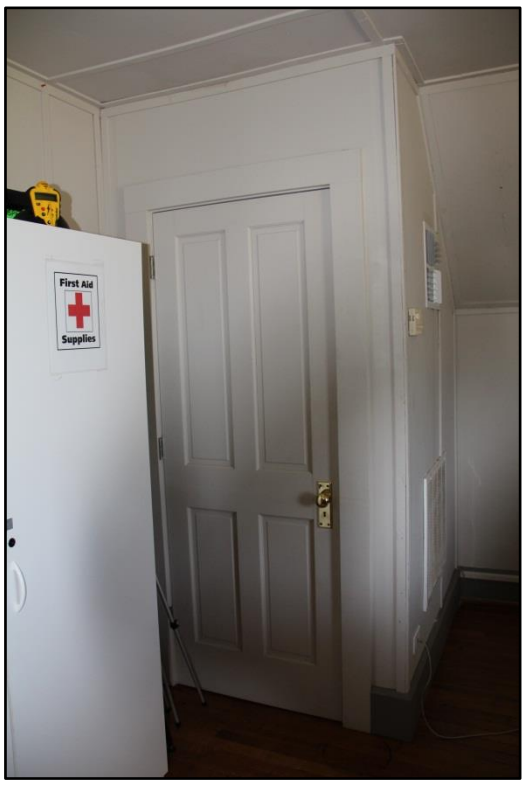


Figure 219. A modern HVAC closet located in Room 202, installed in ca. 2000. Photo: HPTC, 05/11/16.

C103098	Other Casework

Trim

It is unknown to what extent the original trim was replaced during the 1985-87 preservation work. It is assumed that most of the baseboard on the first floor and the exterior doors is new (figs. 220-221), and the rest of the trim in the entire house was retained where possible or replaced in kind (figs. 222-223). All of the interior wood trim is painted.

Fireplaces

The two mantels are likely original to the 1871 main block (figs. 224-225). The mantels were removed, repaired, painted, and reinstalled during the 1985-87 preservation work. Also at that time the fireboxes were reopened. Currently the bottom of each flue is covered with insulation and plywood, evidence that the flues are not capped at the top of the chimneys.



Figure 220. Replacement baseboard on the first floor and historic interior door casing. Photo: HPTC, 05/11/16.



Figure 221. Replacement exterior door casing. Photo: HPTC, 05/11/16.



Figure 222. Likely original trim around Door 9 under the stair. Photo: HPTC, 05/11/16.

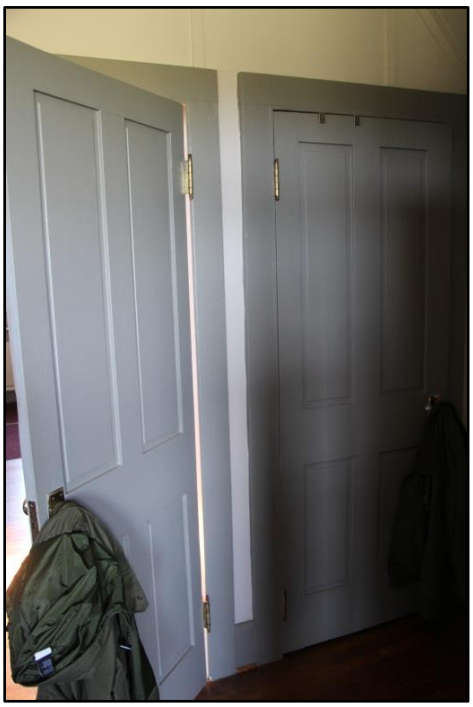


Figure 223, right. Likely original door casing and baseboard on the second floor. Photo: HPTC, 05/11/16.



Figure 224. The fireplace and mantel in Room 103 was restored in 1985-87. Photo: HPTC, 05/11/16.

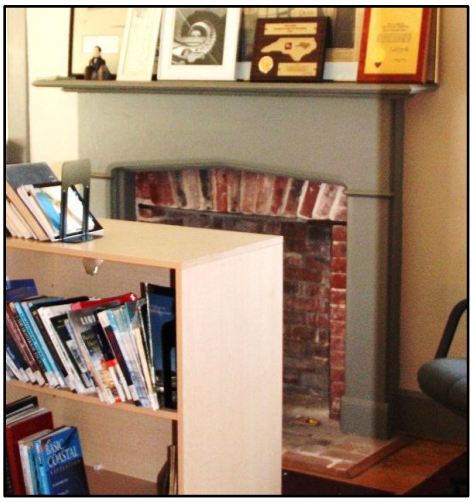


Figure 225. The fireplace and mantel in Room 104 was restored in 1985-87. Photo: HPTC, 05/11/16.

C20	STAIRS
C2010	Stair Construction
C201001	Interior Stair Construction

The interior stair is original to the 1871 main block and was repaired during the 1985-87 preservation work.

The dogleg stair consists of twelve treads up to a landing and six additional treads up to the second floor (figs. 226-227). The newel post, railing, balusters, stringers, and risers are painted; the treads are unpainted and finished with tung oil.

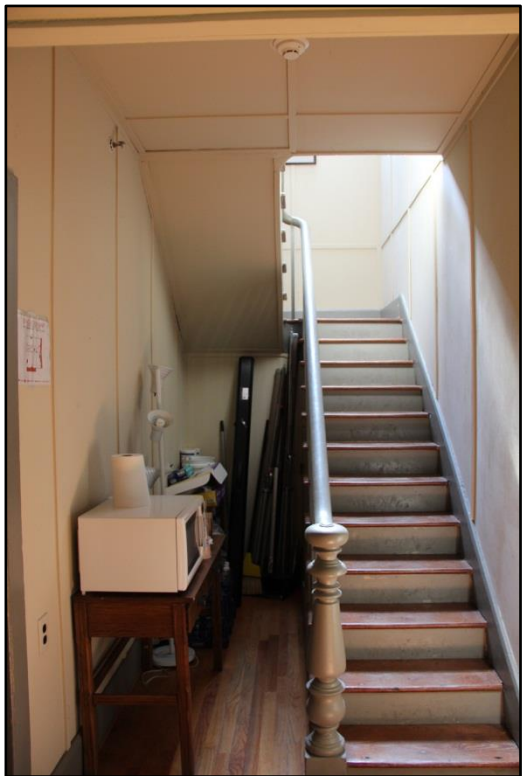


Figure 226, left. The stair as seen from the first floor. Photo: HPTC, 05/12/16.

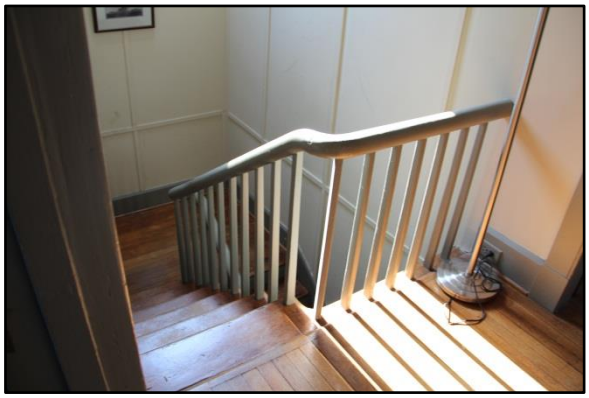


Figure 227, above. The stair as seen from the second-floor landing. Photo: HPTC, 05/12/16.

C30	INTERIOR FINISHES
C3010	Wall Finishes

The interior wall finishes of the 1871 main block and kitchen wing were originally lath and plaster. During the 1927 alterations, the lath and plaster were removed and beaverboard was installed (a kind of gypsum board). During the 1937-39 CCC work, the beaverboard was removed and V-joint cypress paneling was installed. During the 1985-87 preservation work, the cypress paneling was removed and painted drywall with batten strips was installed (figs. 228-229).

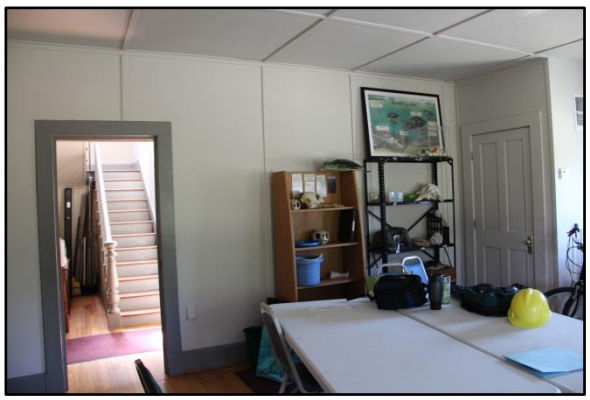


Figure 228. Drywall and batten strips in Room 102. Photo: HPTC, 05/12/16.



Figure 229. Drywall and batten strips in Room 202. Photo: HPTC, 05/12/16.

C3020	Floor Finishes

The oak strip flooring of the first-floor was installed during the 1985-87 preservation work (fig. 230). Modern floor mats have been laid over most of the floors (fig. 231).

Modern oak strip flooring has been installed over historic flooring on the second-floor. A transition is located at the top of the stair (fig. 232). It is assumed that the strip flooring was installed during the 1985-87 preservation work. Modern floor mats have been distributed over some of the second-floor floors (fig. 233).

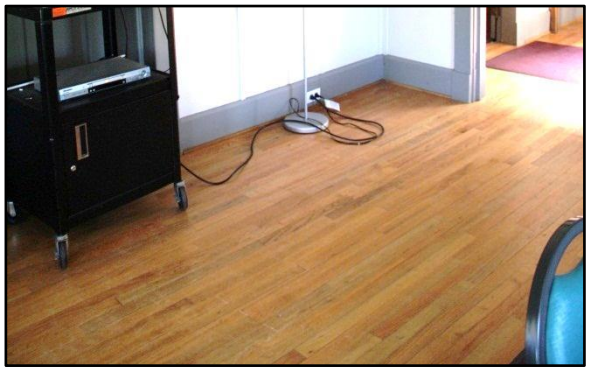


Figure 230. The oak strip flooring on the first floor is not original. Photo: HPTC, 05/12/16.



Figure 231. Modern mats cover most of the first-floor wood floors. Photo: HPTC, 05/12/16.



Figure 232. Oak strip flooring was installed over the historic flooring on the second floor. Arrow marks transition from the old flooring to the new flooring. Photo: HPTC, 05/12/16.

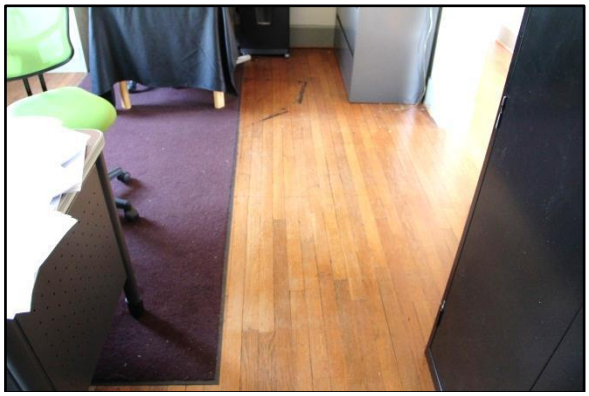


Figure 233. Modern mats cover some of the second-floor wood floors. Photo: HPTC, 05/12/16.

C3030	Ceiling Finishes

The interior ceiling finishes of the 1871 main block and kitchen wing were originally lath and plaster. During the 1927 alterations, the lath and plaster were removed and beaverboard was installed (a kind of gypsum board). During the 1937-39 CCC work, the beaverboard was removed and V-joint cypress paneling was installed. During the 1985-87 preservation work, the cypress paneling was removed and painted drywall with batten strips was installed (figs. 234-235).

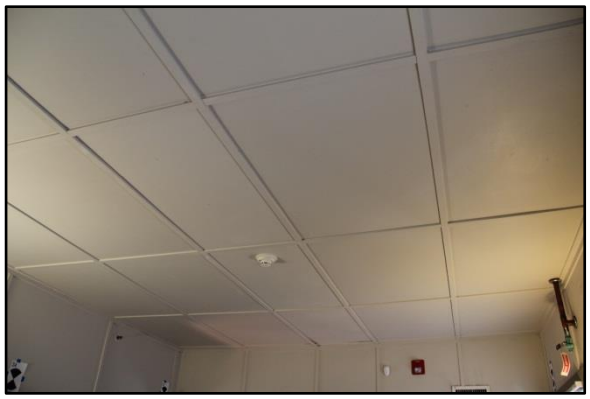


Figure 234. Drywall and batten strips in Room 103. Photo: HPTC, 05/12/16.

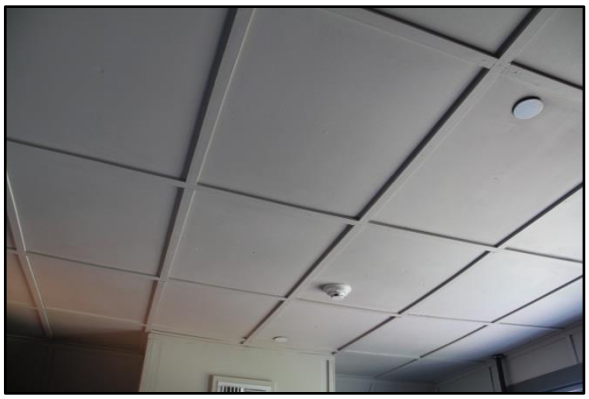


Figure 235. Drywall and batten strips in Room 203. Photo: HPTC, 05/12/16.

D	SERVICES
D20	PLUMBING

No plumbing system is currently extant within the Principal Keeper's Quarters.

D30	HVAC

A modern HVAC system was first installed in the Principal Keeper's Quarters after its move in 1999 (ca. 2000). The system was replaced in 2015. There are two units on the first floor: the unit in Room 101 serves that room and Room 103 (fig. 236); the unit in Room 102 serves that room and Room 104 (fig. 237). There are two units on the second floor: the unit in Room 203 serves only that room (fig. 238); the unit in Room 202 serves that room and Room 204 (fig. 239).



Figure 236. The unit is Room 101. Photo: HPTC, 05/12/16.

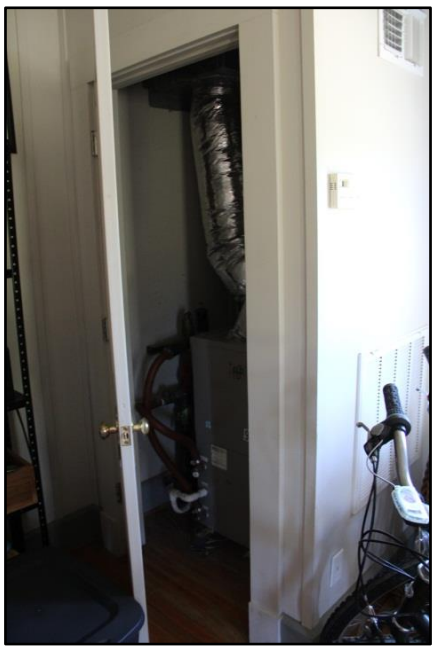


Figure 237. The unit in Room 102. Photo: HPTC, 05/12/16.

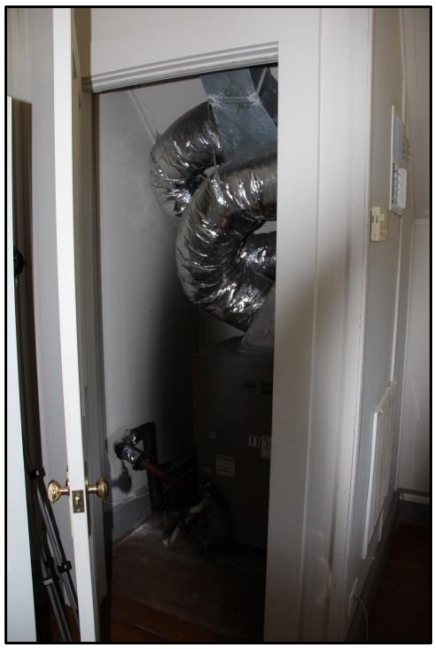


Figure 238. The unit in Room 202. Photo: HPTC, 05/12/16.

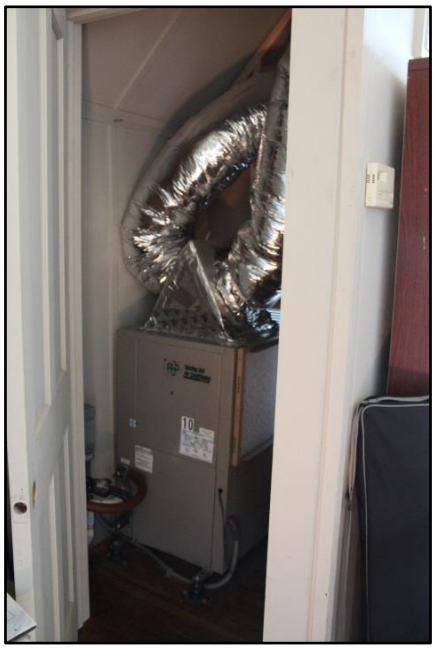


Figure 239. The unit in Room 203. Photo: HPTC, 05/12/16.

D40	FIRE PROTECTION SYSTEMS
D4010	Sprinklers

A wet-pipe sprinkler system was installed in the Principal Keeper's Quarters after its move in 1999 (ca. 2000). The system's main controls are located in the closet under the stair (fig. 240). Pop-up heads are located in every first- and second-floor room (figs. 241-242); standard heads are located in the attic (fig. 243).



Figure 240, left. The main controls for the wet-pipe sprinkler system. Photo: HPTC, 05/12/16.



Figure 241, above. A pop-up head in the ceiling of Room 101. Photo: HPTC, 05/12/16.

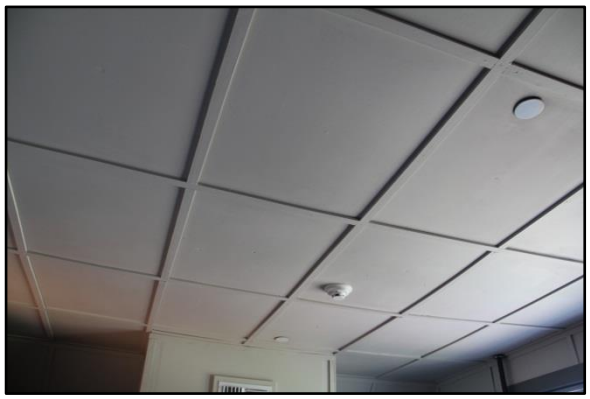


Figure 242. Two pop-up heads in Room 203. Photo: HPTC, 05/12/16.



Figure 243. A standard sprinkler head in the attic. Photo: HPTC, 05/12/16.

D4030	Fire Protection Specialties
D403001	Fire Extinguishers

A fire extinguisher is located on each finished level. On the first floor, it is located on the south wall of Room 102. On the second floor, it is located on the east wall of Room 205 (stair hall).

D50	ELECTRICAL
D5010	Electrical Service & Distribution
D5020	Lighting & Branch Wiring

The modern electrical system, including panel, wiring, outlets, switches, and lighting were installed during the ca. 1985-87 preservation work. The 200-amp electrical panel is located in the closet of Room 103 (fig. 244).



Figure 244, right. The modern 200-amp electrical panel, fire alarm system control panel, and security alarm system control panel. Photo: HPTC, 05/11/16.

D5030	COMMUNICATIONS & SECURITY
D503001	Fire Alarm Systems

A fire alarm system was installed in the Principal Keeper's Quarters after its move in 1999 (ca. 2000). The system includes hardwired smoke detectors, pull stations, and strobes throughout the first and second floors. The main control panel is located in the closet of Room 103 (see fig. 244).

D503008	Security Alarm Systems

A security system was first installed in the Principal Keeper's Quarters during the 1985-87 preservation work. The system was updated after the building's move in 1999 (ca. 2000). The main control panel is located in the closet of Room 103 (see fig. 244).

D5090	OTHER ELECTRICAL SYSTEMS
D509004	Lightning Protection System

No lightning protection system is currently extant at the Principal Keeper's Quarters. Historic photographs do not show such a system ever in place at the dwelling.

G	BUILDING SITEWORK
G20	SITE IMPROVEMENTS
G2030	Trail
G203003	Paved Surfaces

The modern brick-paved ramped walkway leading to the south porch was installed after the building's move in 1999 (ca. 2000) (fig. 245).



Figure 245, right. The modern brick ramped sidewalk leading to the Principal Keeper's Quarters makes the first-floor of the building ABA compliant. Photo: HPTC, 05/12/16.

G2040	Site Development
G204001	Fencing & Gates

Fencing and gates surrounded the Principal Keeper's Quarters throughout its history (see Chronology of Development and Use section for more information). None are currently extant.

G204008	Storm Water Collection & Storage

A historic cistern, dating to 1871, is located to the north of the building. It is no longer used to collect water from the building's roof drainage system. It is constructed of brick exterior walls; the top is composed of a concrete slab (fig. 246). The original wood enclosure atop the cistern was removed between May 1948 and October 1957.



Figure 246, right. The historic brick cistern is located to the north of the building. Note also the neutral drainage along this elevation, where water does not drain away or toward the building, but rather ponds around it. Photo: HPTC, 05/12/16.

G204099	Miscellaneous Structures

Several accessory structures surrounded the Principal Keeper's Quarters throughout its history (see Chronology of Development and Use section for more information). None are currently extant.

G90	OTHER SITE WORK
G9087	Overall Building Site Drainage

The site drainage around the dwelling includes areas of neutral and negative drainage, meaning draining water either remains standing at the foundation or flows back towards the building rather than away (figs. 247-248). Furthermore, the area in the crawlspace is significantly lower than the area surrounding the building, causing a "pool" within the building.



Figure 247. Negative drainage along the south elevation. Photo: HPTC, 05/12/16.



Figure 248. Negative drainage along the west elevation. Photo: HPTC, 05/12/16.

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Character-Defining Features

Each historic building is unique, with its own identity and its own distinctive character. Character refers to the visual aspects and physical features that comprise the appearance of historic buildings. Character-defining features include the overall shape of the building, its materials, craftsmanship, decorative details, interior spaces and features, as well as the various aspects of its site and environment. Identifying and preserving a building's character-defining features is essential.

A character-defining feature (CDF) is defined in Director's Order 28, *Cultural Resources Management Guidelines*, (Appendix A: Glossary) as:

> A prominent or distinctive aspect, quality, or characteristic of a historic property that contributes significantly to its physical character. Structures, objects, vegetation, spatial relationships, view, furnishings, decorative details, and materials may be such features.

In order to ascertain the important aspects of a building for future reference and analysis, character-defining features must be recorded. These are prominent or distinctive aspects, qualities, and characteristics of a historic property that contribute significantly to its physical character as represented at the time of intervention or treatment.

The process used in this assessment for determining the character-defining features was adapted from the NPS Preservation Brief #17: "Architectural Character: Identifying the Visual Aspects of Historic Buildings as an Aid to Preserving Their Character," and are in accordance with *The Secretary of the Interior's Standards for the Treatment of Historic Properties* and NPS Management Policies and Guidelines, specifically Director's Order 28, *Cultural Resource Management Guidelines.*

Preservation Brief #17 divides the assessment of character-defining features into three steps:

1. Identify the Overall Visual Aspects,
2. Identify the Visual Character at Close Range,
3. Identify the Visual Character of Interior Spaces, Features, and Finishes.

The purpose of Preservation Brief #17 is to help the owner or the architect identify those features or elements that give the building its visual character and that should be taken into account in order to preserve them to the maximum extent possible. The Brief states:

> There are different ways of understanding old buildings. They can be seen as examples of specific building types, which are usually related to a building's function.... Buildings can be studied as examples of using specific materials....They can also be considered as examples of an historical period, which is often related to a specific architectural style....
>
> There are many other facets of an historic building besides its functional type, its materials, or construction or style that contribute to its historic qualities or significance. Some of these qualities are feelings conveyed by the sense of time and place or in buildings associated with events or people. A complete understanding of any property may require documentary research about its style, construction, function, its furnishings or contents; knowledge about the original builder, owners, and later occupants; and knowledge about the evolutionary history of the building. Even though buildings may be of historic, rather than architectural significance, it is their tangible elements that embody its significance for association with specific events or

persons and it is those *tangible elements* both on the exterior and interior that should be preserved.

Therefore, the approach taken in this Brief is limited to identifying those visual and tangible aspects of the historic building. While this may aid in the planning process for carrying out any ongoing or new use or restoration of the building, this approach is not a substitute for developing an understanding about the significance of an historic building and the district in which it is located.

If the various materials, features, and spaces that give a building its visual character are not recognized and preserved, then essential aspects of its character may be damaged in the process of change.

A building's character can be irreversibly damaged or changed in many ways, for example, by inappropriate repointing of the brickwork, by removal of a distinctive side porch, by changes to the window sash, by changes to the setting around the building, by changes to the major room arrangements, by the introduction of an atrium, by painting previously unpainted woodwork, etc.

In summary, the Secretary of the Interior's Standards for the Treatment of Historic Properties embody two important goals:

1. Preservation of historic materials.
2. Preservation of a building's distinguishing character.

By succeeding at these two goals, it is likely that a building's historic integrity will be preserved.

Extant Character-Defining Features (to be retained)

Overall Visual Aspects

Shape and Mass (fig. 249)

- Shape and mass of the original, 1871 main block (rectangular, two stories with front-facing gable roof) with south-facing one-story front porch (hipped roof).
- Shape and mass of the original, 1871 eastern kitchen wing (rectangular, one story); roof was altered from side-facing gable to lower shed slope of the 1927 addition roof, which is also character-defining.
- Shape and mass of the 1927 northeast addition (square, two stories, with side-facing gable roof and lower shed roof over original kitchen wing) with east-facing one-story side porch (hipped roof).



Figure 249. The Principal Keeper's Quarters retains its character-defining shape and mass in the original main block and south porch, altered original kitchen wing, and northeast addition and east porch. Photo: HPTC, 05/12/16.

Roof and Related Features (see fig. 249)

- Main block front-facing gable roof clad with cedar shingles (fig. 250).
- Altered kitchen wing side-facing shed roof clad with cedar shingles (fig. 251).
- Northeast addition side-facing gable roof clad with cedar shingles (see fig. 251).
- South porch hipped roof clad with cedar shingles (see fig. 250).
- East porch hipped roof clad with standing-seam metal (see fig. 251).



Figure 250. The main block retains its front-facing gable roof and hipped-roof south porch. Photo: HPTC, 05/12/16.



Figure 251. When the northeast addition was constructed in 1927, the side-facing gable roof was carried over the original kitchen wing to create a shed roof. The east porch, with its hipped roof, was constructed at the same time. Photo: HPTC, 05/12/16.

Openings

- Ventilation openings in the foundation level (fig. 252).
- All window and door placements and openings in the original main block and kitchen wing and northeast addition.
- Alterations to original door and window openings in original main block and kitchen wing to accommodate the northeast addition.
- Alterations of original single-window openings and additions of double-window openings in the main block concurrent with the construction of the northeast addition (fig. 253).
- Reconstructed skylight in main block roof (fig. 254).
- Six-over-six double-hung wood windows (likely replacement) in all window openings (see fig. 253).
- Four-panel exterior wood doors (replacement) in original main block and kitchen wing (fig. 255). Five-panel (horizontal) exterior wood door (replacement), with four-lite, one-panel sidelights in northeast addition.



Figure 252. This historic foundation vent is a character-defining feature. Photo: HPTC, 05/12/16.



Figure 253. The second-floor, south-elevation main block window was altered in 1927 to accommodate two windows openings. All of the windows in the Principal Keeper's Quarters are composed of wood and have a 6/6 configuration. Photo: HPTC, 05/12/16.



Figure 254. The skylight in the main block roof is a reconstruction of an original character-defining feature. Photo: HPTC, 05/12/16.



Figure 255, right. The exterior doors of the Principal Keeper's Quarters are not original, but reflect the original doors which would have been present in the original openings. Photo: HPTC, 05/12/16.

Projections

- Three brick chimneys (combination of original, addition, and reconstructed to match original) (fig. 256).
- South porch and east porch (largely reconstructed to match original) (figs. 257-258).
- Slightly projected eaves and soffits (fig. 259).



Figure 256. The west chimney, left, was reconstructed above the roof line to match the original, after it fell in 1949. The north chimney, top, is believed to be original. The east chimney, right, is original to the 1927 construction of the addition. Photo: HPTC, 05/12/16.



Figure 257, right. The south porch matches the original porch constructed in 1871, but has been reconstructed in sections throughout the years. Photo: HPTC, 05/12/16.





Figure 259, above. Throughout the building, the eaves and soffits project out from the exterior walls. Photo: HPTC, 05/12/16.

Figure 258, left. The east porch matches the original porch constructed in 1927, but has been altered and reconstructed in sections throughout the years. Photo: HPTC, 05/12/16.

Trim and Secondary Features

- Skilled use of brick, including limited decorative brick features (figs. 260-261).
- Simple use of wood trim, siding, and other components (fig. 262-263).



Figure 260. The original main block is constructed of brick. Simple, decorative detailing in the brick is located under the gable rakes. Photo: HPTC, 05/12/16.



Figure 261, right. The original window openings in the main block retain their simple brick jack arches; altered window openings (1927) have metal lintels. Photo: HPTC, 05/12/16.



Figure 262. The wood siding and trim on the 1927 addition are likely not original, but are character-defining features. Photo: HPTC, 05/12/16.



Figure 263. The wood trim of the porches, while slightly degraded, is still a character-defining feature. Photo: HPTC, 05/12/16.

Setting (fig. 264)

- Configuration of Principal Keeper's Quarters in relation to other extant buildings (associated cistern at rear, Double Keepers' Quarters to the west, and Oil House and Lighthouse to the south) at Hatteras Light Station.
- Rural, coastal location.



Figure 264. After the building's move, the Principal Keeper's Quarters retained its relation to other historic buildings on site and its coastal setting. Photo: Cape Hatteras National Seashore Archives, 09/00.

Character, Materials & Craft Details at Close Range

- Brick foundation walls and exterior walls of the main block and kitchen wing (fig. 265).
- Brick chimneys (fig. 266).
- Wood-framed and sided exterior walls of the 1927 addition (fig. 267).
- Wood porches, windows, doors, and other trim components (figs. 267-268).
- Wood shingles on main block, kitchen wing and addition, and south porch roofs (fig. 269).
- Standing-seam metal on the east porch roof (fig. 270).



Figure 265. The brick exterior walls and foundation walls of the main block are original and character-defining. Photo: HPTC, 05/12/16.



Figure 266, right. The original north chimney is representative of the character-defining brickwork which composes each of the three chimneys extant at the building. Photo: HPTC, 05/12/16.





Figure 268, above. The wood porches are character-defining features. Photo: HPTC, 05/12/16.

Figure 267, left. The wood components of the exterior windows, trim, siding, and porches are important character-defining features. Photo: HPTC, 05/12/16.



Figure 269. Despite the poor installation details of the wood shingled roofs, the coverings are similar to what was in place on the building originally. Photo: HPTC, 05/12/16.



Figure 270, right. The standing-seam metal is not original but is similar to what was in place on the east porch roof originally (1927). Photo: HPTC, 05/12/16.

Interior Visual Character

Individual Spaces, Related Spaces & Sequence of Spaces

- Retention of major room configurations in all parts of the building (1871 main block and kitchen wing, and 1927 addition).
- Flow between individual rooms is extant in the form of original and historic doors openings.
- Gathering places, like fireplaces, are intact.

Interior Features

- Fireplaces in the two main block first-floor rooms (fig. 271).
- Original stair between first and second floors of the main block (fig. 272).
- Interior doors and trim work, though not original, match original components (fig. 273).
- Original closets extant (see fig. 273); modern HVAC closets are hot character-defining features.

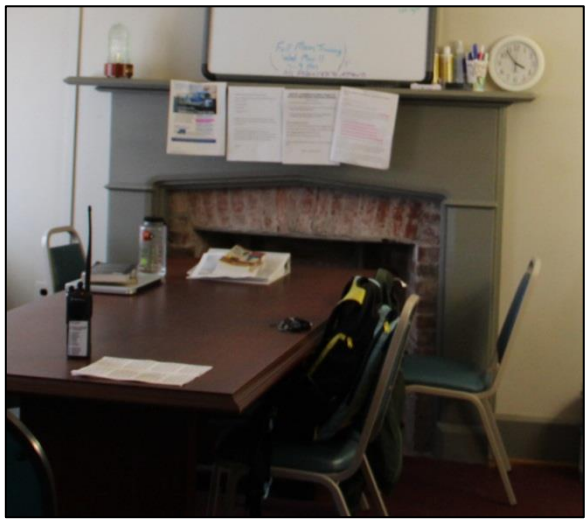


Figure 271. One of the original fireplaces in the main block. Photo: HPTC, 05/11/16.

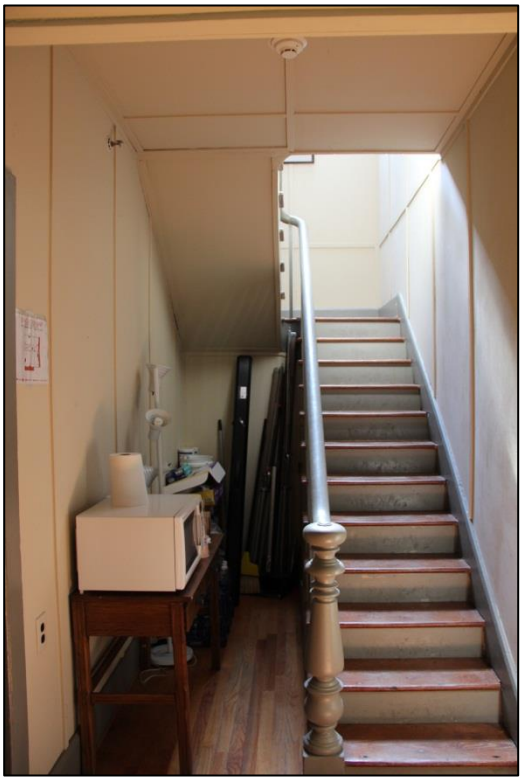


Figure 272. The original stair in the main block. Photo: HPTC, 05/11/16.

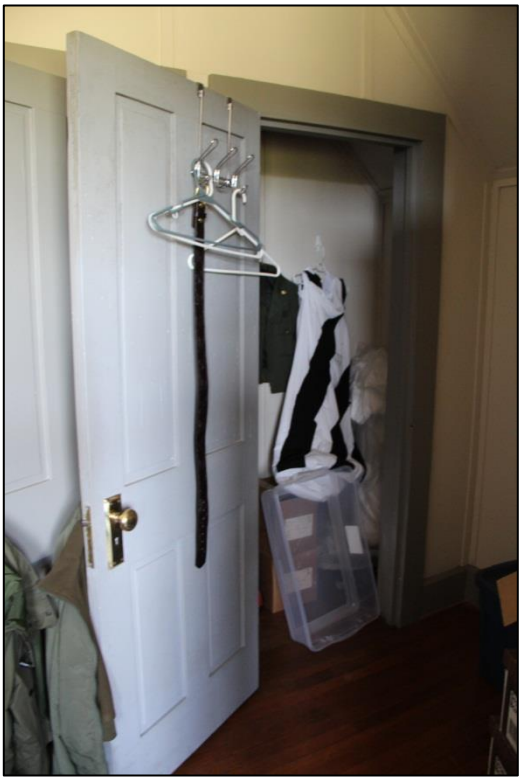


Figure 273. One of the original closets; this one is located on the second floor. Note also the painted interior doors and trim. Photo: HPTC, 05/11/16.

Surface Materials and Finishes

- Painted wood surfaces and unpainted wood stair components to match historic appearance (fig. 274).
- Painted drywall and batten strips on walls and ceilings to mimic historic beaverboard appearance (fig. 275).
- Replacement hardwood floors on the first floor (fig. 276) and hardwood floors covering the historic floor boards on the second floor completed in 1980s.

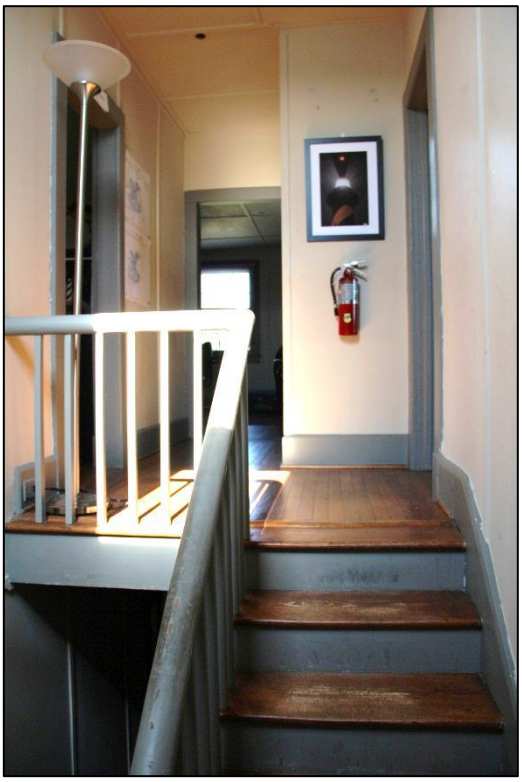


Figure 274. All interior wood trim and certain stair components are painted; the stair treads are unpainted. Photo: HPTC, 05/11/16.



Figure 275. The interior walls and ceilings were refinished with painted drywall and batten strips to mimic the beaverboard which was installed in 1927. Photo: HPTC, 05/11/16.

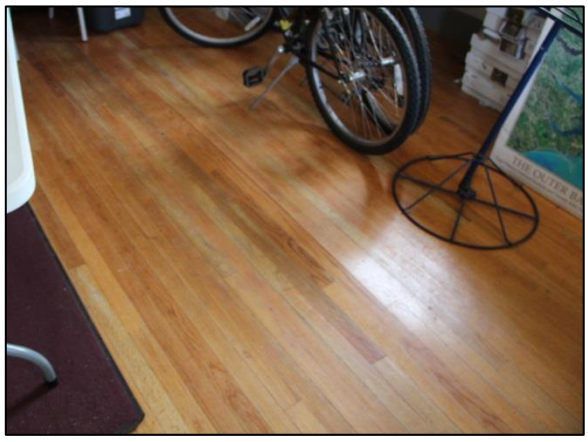


Figure 276. The first-floor flooring was replaced during the 1985-887 preservation work. It likely does not exactly match the original wood flooring, but is an adequate replacement. Photo: HPTC, 05/11/16.

Missing Character-Defining Features
(to be reconstructed in future phases of treatment)

- Shutters on all exterior window openings.
- Associated, adjacent buildings to match 1932 photograph (fig. 277), and to include wooden structure over cistern (not seen in 1932 photograph, but is known to have existed from 1871 through the 1950s).
- Concrete posts and wire fence around perimeter of building site to match 1932 photograph (also recommended in Cultural Landscape Report for Hatteras Light Station[1]).
- Walks and circulation paths associated with the Principal Keeper's Quarters within its fenced building site (as recommended in Cultural Landscape Report).



Figure 277. Hatteras Light Station in 1932, around the time the last keeper vacated the Principal Keeper's Quarters. Exterior buildings and fences associated with the cultural landscape should be reconstructed. Photo: Cape Hatteras National Seashore Archives. Cropped by author.

Non-Character Defining Features
(to be removed in future phases of treatment)

- Modern interior HVAC closets

[1] National Park Service. "Cape Hatteras Light Station." *Cultural Landscape Report.* Cultural Resources, Southeast Region. June 15, 2004. DSC eTIC No. CAHA 603 D214.

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Condition Assessment

The conditions assessment definitions used for this HSR are based on those outlined in the NPS PFMD's Asset Management Process (AMP), the Facilities Management Software System (FMSS), and the Facility Condition Assessment Survey (FCAS) and adapted for use by HPTC. For the purpose of this report, these definitions were strictly adhered to as a way to qualitatively assess the current condition of the Hatteras Light Station Principal Keeper's Quarters.

Qualitative Condition Ratings

Good

- Routine maintenance should be sufficient to maintain the current condition; and/or
- A cyclic maintenance or repair/rehabilitation project is not specifically required to maintain the current condition or correct deficiencies.

Fair

- The feature generally provides an adequate level of service to operations, but
- The feature requires more than routine maintenance, and
- Cyclic maintenance or repair/rehabilitation work may be required in the future.

Poor

- Feature requires immediate attention;
- Routine maintenance is need at a much higher level of effort to meet significant safety and legal requirements;
- Cyclic maintenance should be scheduled for the current year; and/or
- A special repair/rehabilitation project should be requested consistent with park requirements, priorities, and long-term management objectives.

Maintenance Deficiency Priority Ratings (10-Year Rating Period)

Minor – Short-Term/Long-Term Priority

- This rating indicates standard preventative maintenance priorities and preservation methods have not been follow; or
- There is reduced life expectancy of affected adjacent or related materials and/or systems within 5 to 10 years and beyond; or
- There is condition with a long-term impact within 5 to 10 years and beyond.

Serious – Immediate/Short-Term Priority

- This rating defines a deteriorated condition that if not corrected within 1 to 5 years will result in the failure of the feature; or

- A threat to the health and/or safety of the user may occur within 1 to 5 years if the ongoing deterioration is not corrected; or
- There is ongoing deterioration of adjacent or related materials and/or features as a result of the feature's deficiency.

Critical – Immediate Priority

- This rating defines an advanced state of deterioration which has resulted in the failure of a feature or will result in the failure of a feature if not corrected within 1 year; or
- There is accelerated deterioration of adjacent or related materials or systems as a result of the feature's deficiencies if not corrected within 1 year; or
- There is immediate threat to the health and/or safety of the user; or
- There is failure to meet a legislated requirement.

Not Rated

- The feature was not rated as it was not extant at the time of the report or is non-contributing, removed, and not planned to be replaced.

Code Compliance

Both NPS policies and federal regulations stipulate that when an historic structure is preserved and/or rehabilitated, attempts should be made to meet applicable nationally-accepted model building codes to the maximum extent feasible. Compliance with nationally-accepted codes does not automatically trigger a complete code-based upgrade. Alternative criteria exist for alterations to historic structures; these typically encourage flexibility in the literal application of the code intent.

The *Public Buildings Amendment of 1988* instructs Federal agencies to follow "to the maximum extent feasible," as determined by the administrator or head of the agency, the "…nationally recognized model building codes and other applicable nationally recognized codes such as electrical codes, and fire and life safety codes." The National Park Service intends to consult pertinent national, state, and local codes, and typically applies to most strident code requirements. The Southeast Regional Office (NPS) Structural Fire Safety leader will be the Authority Having Jurisdiction (AHJ) for final determination of code applications for these structures.

The National Park Service has prepared Design Standards for all construction projects, including those affecting historic structures.[1] The design standard presents all codes that should be reviewed and includes the most recent copies of the following major codes and applicable laws, policies, codes, directives, standards, and NPS guidelines. The design standards present requirements for accessibility, civil, and environmental engineering, landscape architecture, architecture, including roofing and waterproofing, structural, mechanical, safety and fire protection, electrical, lighting, and sustainability disciplines.

Major codes, laws, standards, and guidelines that are part of the NPS Design Standards include:

[1] Denver Service Center. "Design Standards." *Denver Service Center Workflows.* National Park Service, Department of the Interior. 2009. Accessed at http://www.nps.gov/dscw/dstandards.htm on March 6, 2012.

- *Architectural Barriers Act Accessibility Standard* (ABAAS) for Federal Facilities, 2004
- *International Building Code* (IBC), 2009
- *International Existing Building Code* (IEBC), 2009
- *National Fire Protection Association 101* (NFPA 101), Life Safety Code
- *National Historic Preservation Act of 1966* (NHPA), amended
- *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings* (36 CFR 68), 1995
- *The Secretary of the Interior's Standards for the Treatment of Historic Properties and the Guidelines for the Treatment of Cultural Landscapes*
- *The Secretary of the Interior's Standards and Guidelines for Archeological Documentation*
- *Uniform Code for Building Conservation*
- *Building Construction and Safety Code* (NFPA 5000)
- *National Fire Protection Association 70* (NFPA 70), National Electrical Code
- *Installation of Lightning Protection Systems* (NFPA 780)
- *Code for the Protection of Cultural Resource Properties* (NFPA 909)
- *Code for the Fire Protection of Historic Structures* (NFPA 914)
- *Safeguarding Construction, Alteration, and Demolition Operations* (NFPA 241)
- *Director's Order (DO) 5oB, Risk Management* (Manual 50B)
- *Director's Order (DO) 58, Structural Fire Management* (Manual 58)
- *5 U.S.C § 7902* (Safety Program)
- *15 U.S.C § 2225* (Fire Prevention and Control)
- *29 U.S.C § 668* (Occupational Safety and Health)
- *40 U.S.C § 619* (Construction, Alteration, and Acquisition of Public Buildings)

Summary of Conditions

Table 3. **Hatteras Light Station Principal Keeper's Quarters Summary of Conditions**						
UNIFORMAT II Outline Data					Condition Rating	Deficiency Rating
A	SUBSTRUCTURE					
	A10	FOUNDATIONS				
		A1010	Standard Foundations		POOR	CRITICAL
B	SHELL					
	B10	SUPERSTRUCTURE				
		B1010	Floor Construction			
			B101001	Structural Frame		
				B101001-1	First-Floor Structural Floor Frame	FAIR	SERIOUS
				B101001-2	South Porch Structural Floor Frame	FAIR	MINOR
				B101001-3	East Porch Structural Floor Frame	GOOD	MINOR
				B101003-4	Second-Floor Structural Floor Frame	GOOD	MINOR
				B101003-5	Attic Structural Floor Frame	GOOD	MINOR
			B101002	Structural Interior Walls		GOOD	MINOR
			B1020-1	1871 Main Block Structural Roof Frame		GOOD	MINOR
		B1020	Roof Construction				
			B1020-2	South & East Porch Structural Roof Frames		GOOD	MINOR
			B1020-3	1927 Addition Structural Roof Frame		GOOD	MINOR
	B20	EXTERIOR ENCLOSURE					
		B2010	Exterior Walls				
			B2010-1	Brick Exterior Walls		FAIR	SERIOUS
			B2010-2	Frame Exterior Walls		FAIR	SERIOUS
			B2010-3	Chimneys		FAIR	SERIOUS
			B2010-4	Porches		FAIR	SERIOUS
		B2020	Exterior Windows			FAIR	SERIOUS
		B2030	Exterior Doors			FAIR	MINOR
	B30	ROOFING					
		B3010	Roof Coverings				
			B301001	Roof Finishes			
				B301001-1	Main Roof Finishes	POOR	SERIOUS
				B301001-2	South Porch Roof Finishes	POOR	SERIOUS
				B301001-3	East Porch Roof Finishes	FAIR	MINOR
			B301004	Flashings & Trim			
				B301004-1	Valley Flashing	GOOD	MINOR
				B301004-2	Chimney Flashing	GOOD	MINOR
				B301004-3	Roof-Side Wall Flashing	GOOD	MINOR
				B301004-4	Roof Transition Flashing	GOOD	MINOR
				B301004-5	Skylight Flashing	GOOD	MINOR
			B301005	Gutters & Downspouts		FAIR	SERIOUS

(Table 3 continued)

C	INTERIORS				
	C10	INTERIOR CONSTRUCTION			
		C1020	Interior Doors	GOOD	MINOR
		C1030	Fittings		
			C103010 Closets		
			C103010-1 Historic Closets	GOOD	MINOR
			C103010-2 Modern Closets	GOOD	MINOR
			C103098 Other Casework		
			C103098-1 Trim	GOOD	MINOR
			C103098-2 Fireplaces	FAIR	SERIOUS
	C20	STAIRS			
		C2010	Stair Construction		
			C201001 Interior Stair Construction	FAIR	MINOR
	C30	INTERIOR FINISHES			
		C3010	Wall Finishes	FAIR	MINOR
		C3020	Floor Finishes	POOR	SERIOUS
		C3030	Ceiling Finishes	FAIR	MINOR
D	SERVICES				
	D20	PLUMBING		N/A	N/A
	D30	HVAC		FAIR	MINOR
	D40	FIRE PROTECTION SYSTEMS			
		D4010	Sprinklers	GOOD	MINOR
		D4030	Fire Protection Specialties		
			D403001 Fire Extinguishers	GOOD	MINOR
	D50	ELECTRICAL			
		D5010	Electrical Service & Distribution	GOOD	MINOR
		D5020	Lighting & Branch Wiring		
		D5030	Communications & Security Systems		
			D503001 Fire Alarm Systems	GOOD	MINOR
			D503008 Security Alarm Systems	GOOD	MINOR
		D5090	Other Electrical Systems		
			D509004 Lightning Protection System	POOR	CRITICAL
G	BUILDING SITEWORK				
	G20	SITE IMPROVEMENTS			
		G2030	Trail		
			G203003 Paved Surfaces	GOOD	MINOR
		G2040	Site Development		
			G204001 Fencing & Gates	N/A	N/A
			G204008 Storm Water Collection & Storage (Cistern)	POOR	MINOR
			G204099 Miscellaneous Structures	N/A	N/A
	G90	OTHER SITE WORK			
		G9087	Overall Building Site Drainage	POOR	CRITICAL
End of Table.					

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Principal Keeper's Quarters Condition Assessment

Note: Additional photographs of all building features are found in the physical description section.

A	SUBSTRUCTURE
A10	FOUNDATIONS
A1010	**Standard Foundations**

The modern and historic foundation walls are in overall good condition despite the lack of proper ventilation and the sunken crawlspace under the building. Only five small brick ventilators built into the historic portion (above-ground) of the brick foundation walls could be seen. These are not adequate to properly cross-ventilate the crawlspace. Lack of ventilation is causing issues with interior finish floors (see C3020 Finish Floors for more information).

Additionally, the floor of the crawlspace is approximately 2'-0" below the exterior grade (fig. 278). When water pools (which it does as evidenced by the existence of a sump pump in the crawlspace), the water cannot drain through the foundation vents, as originally designed. Furthermore, due to negative building drainage, water located on the exterior of the building can easily flow into the crawlspace through the open vents (fig. 279).

Condition Rating: POOR
Deficiency Rating: CRITICAL



Figure 278. The crawlspace floor is about 2'-0" below the exterior grade (green dashed line). The small vents are not adequate for proper ventilation. The typical water line is noted with a dotted red line. Photo: HPTC, 05/10/16.



Figure 279. The foundation vent on the south elevation of the kitchen wing is partially submerged below grade. It can allow water to freely enter the sunken crawlspace behind it. A problem evidenced through the addition of a wood well. Photo: HPTC, 05/10/16.

B	SHELL
B10	SUPERSTRUCTURE
B1010	Floor Construction
B101001	Structural Frame
B101001-1	**First-Floor Structural Floor Frame**

The first-floor structural floor frame, wholly replaced in 1985-87, is in overall good condition. However, several of the metal straps joining the joists to the support beams are corroded, which is to be expected in a coastal environment (fig. 280).

No insulation or vapor barrier are extant. This, combined with super-cooling of the interior spaces above, has caused damage to the interior finish floor surfaces.

Condition Rating: FAIR
Deficiency Rating: SERIOUS

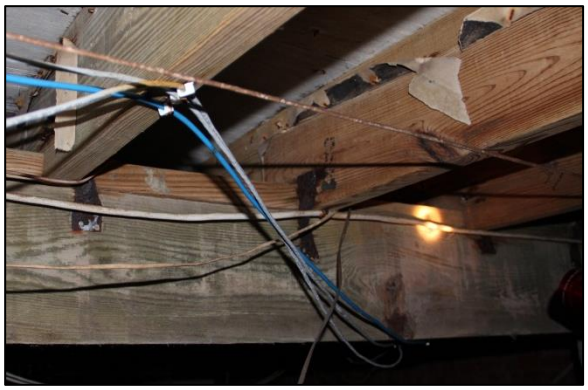


Figure 280. Several metal straps are corroded. Photo: HPTC, 05/10/16.

B101001-2	**South Porch Structural Floor Frame**

The south porch structural floor frame, wholly replaced in 1985-87, is inaccessible for direct inspection. However, based on conditions in adjacent areas, the structural floor frame is likely in fair condition, especially due to the abutment of the raised brick ramp sidewalk and added porch floor at the south elevation of the south porch (fig. 281). This could allow the accumulation of excess water that might affect the south porch framing members.

Condition Rating: FAIR
Deficiency Rating: MINOR



Figure 281. The brick ramp sidewalk abuts the added floor of the south porch. This could cause excess water to affect the structural floor frame. Photo: HPTC, 05/12/16.

B101001-3	**East Porch Structural Floor Frame**

The east porch structural floor frame, wholly replaced in 1985-87 is inaccessible for direct inspection. However, based on conditions in adjacent areas, the structural floor frame is likely in good condition.

Condition Rating: GOOD
Deficiency Rating: MINOR

B101001-4	Second-Floor Structural Floor Frame

The second-floor structural floor frame, likely original to 1871, is inaccessible for direct inspection. However, based on adjacent areas, the structural floor frame is likely in good condition.

Condition Rating: GOOD
Deficiency Rating: MINOR

B101001-5	Attic Structural Floor Frame

The attic structural floor frame, original to 1871 and 1927, is inaccessible for direct inspection. However, based on adjacent areas, the structural floor frame is likely in good condition.

The extant insulation (dating to 1983-85) has an approximate R-value of 25; this does not meet current energy code requirements (R-value of at least 30, 38 is preferred).

Condition Rating: GOOD
Deficiency Rating: MINOR

B101002	Structural Interior Walls

The structural interior walls, original to 1871 and 1927, appear to be in good condition.

Condition Rating: GOOD
Deficiency Rating: MINOR

B1020	Roof Construction
B1020-1	**1871 Main Block Structural Roof Frame**

The extant original structural roof frame of the 1871 main block would not meet current building specifications due to inadequate sizes of members, inadequate spacing between members, lack of rafter ties, etc. However, the roof frame is original and has resisted the environmental and weather forces until this time, which is evidence the roof framing is sufficient and in good condition.

Condition Rating: GOOD
Deficiency Rating: MINOR

B1020-2	South & East Porch Structural Roof Frame

The extant south and east porch structural roof frame, likely original, is inaccessible for direct inspection. However, based on adjacent areas, the structural floor frame is likely in good condition.

Condition Rating: GOOD
Deficiency Rating: MINOR

B1020-3	1927 Addition Structural Roof Frame

The extant original structural roof frame of the 1927 addition would not meet current building specifications due to inadequate sizes of members, inadequate spacing between members, lack of rafter ties, etc. However, the roof frame is original and has resisted the environmental and weather forces until this time, which is evidence the roof framing is sufficient and in good condition.

Condition Rating: GOOD
Deficiency Rating: MINOR

B20	EXTERIOR ENCLOSURE
B2010	Exterior Walls
B2010-1	**Brick Exterior Walls**

The brick exterior walls are in overall good condition with no mortar failure or spalled areas. It is likely that the exterior paint is latex based, which is not conducive to brick masonry exterior walls. The non-breathable paint could capture moisture behind it and cause damage to the underlying brick surfaces. Biological growth is prevalent on the north elevation (typical due to sun not hitting this elevation) (fig. 282).



Figure 282. Biological growth is present at the north elevation. Photo: HPTC, 05/12/16.

Condition Rating: FAIR
Deficiency Rating: SERIOUS

B2010-2	Frame Exterior Walls

The frame exterior walls are in good structural condition. The painted wood exterior siding exhibits some paint failure, exposed nails, and wood rot (especially at ends of siding adjacent to corner molding) (figs. 283-284).

The condition of any extant insulation, or even if it exists, is unknown. If extant, it likely does not meet modern energy code requirements of R-13 to R-15.

Condition Rating: FAIR
Deficiency Rating: SERIOUS



Figure 283. The ends of the siding have popped from their original location due to moisture and failing fasteners. Photo: HPTC, 05/12/16.



Figure 284. Deteriorated paint on the wood siding on the north elevation. Photo: HPTC, 05/12/16.

B2010-3	Chimneys

The chimneys are in overall good structural condition, however the west chimney lacks a permanent cap at the top of its flues to deter infiltration of rain water, insects, and rodents (fig. 285); it is unknown if the north chimney retains a permanent cap. Furthermore, the extant metal cap and concrete wash atop the east chimney could not be directly assessed, so its current condition is unknown.

Condition Rating: FAIR
Deficiency Rating: SERIOUS



Figure 285. The west (left) chimney does not have a cap over its flue. It is unknown if a cap is located atop the north (top) chimney. The east (right) chimney has a cap. Photo: HPTC, 05/12/16.

B2010-4	Porches

The painted wood south porch is in overall fair condition. It exhibits some paint failure, exposed nails, movement of extant Dutchman repairs, biological growth, and wood rot (fig. 286. Wood rot is most prevalent at the barge boards adjacent the sloping grade (fig. 287). The added porch floor atop of the original floor, along with the abutting grade, causes the retention of water in this area and has caused deterioration of wood components.

The painted wood east porch is also in overall fair condition. It also exhibits some paint failure, exposed nails, biological growth, and deterioration of post bases at porch floor (fig. 288). Furthermore, the porch floor appears to be level. Water does not drain easily away from building, causing rot in the siding at the base of the wall adjacent to the porch floor (fig. 289).

Condition Rating: FAIR
Deficiency Rating: SERIOUS





Figure 287, above. Peeling paint, exposed fasteners, moving Dutchman repairs, and rot present on the south porch. Note also the addition of the second floor atop the first to accommodate the brick ramp. Photo: HPTC, 05/12/16.

Figure 286, left. Biological growth is present on the ceiling boards on the south porch. Photo: HPTC, 05/12/16.



Figure 288. The bases of the posts are deteriorated at the wood floor. Note the deteriorating paint. Photo: HPTC, 05/12/16.



Figure 289. Water does not adequately drain from the porch floors causing deterioration of the bottom row of wood siding. Note the biological growth. Photo: HPTC, 05/12/16.

B2020	Exterior Windows

The presence of interior *and* exterior storm units on the exterior windows is unusual and excessive, however not unbeneficial. The wood exterior storm units protect the historic wood windows from weather and the wood interior storm units protect against the buildup of condensation. However it is important that each storm unit at each opening does retain means for ventilation.

The wood exterior storm units and exterior wood trim components exhibit the following issues: deteriorating paint, failing glazing putty (fig. 290), biological growth (fig. 291), rusting fasteners (fig. 292), wood rot, and missing components (fig. 293). Because of the existence of the exterior storm windows, the historic wood windows are in good condition with only minor paint and glazing putty deterioration.

Overall the interior storm windows are in good condition as well (fig. 294).

Wood shutters are no longer extant. They were last removed between 1995 and December 1998, likely to accommodate exterior storm windows (see figs. 290, 292).

The 1985-87 reconstructed skylight is in good condition. No evidence of water infiltration was noticed on interior finish materials around the skylight. Degraded paint was noticed on the interior, but this is likely due to intense sunlight due to its western exposure (fig. 295).

Windows K (Room 202), L (Room 205), and N (Room 204) are considered egress windows by the park, for use during a fire emergency. To be considered an egress opening, the window must satisfy the following code criteria:[1]

Code Requirements	Window K		Window L		Window N	
20″ minimum opening width	34″	✓	34″	✓	30″	✓
24″ minimum opening height	26″	✓	26″	✓	24″	✓
5.7 square foot net clear opening	6.1 SF	✓	6.1 SF	✓	5 SF	X
44 in. maximum sill height above floor	34″	✓	34″	✓	33″	✓

According to building codes, a single window and interior stair are sufficient for the building use, number of occupants (up to fifty occupants), square footage of the second floor, etc. In addition, the interior and exterior storms must be removable or have the ability to be held open during an emergency. An emergency ladder should also be made available.

Condition Rating: FAIR
Deficiency Rating: SERIOUS

[1] Underwood, Lynne. "Common Building-Code Violations: Emergency-Egress Windows Too Small." Fine Homebuilding website. Accessed at http://www.finehomebuilding.com/2002/08/01/common-building-code-violations-emergency-egress-windows-too-small on December 6, 2016.



Figure 290. Deteriorated and missing glazing putty on an exterior storm unit. Note the intact paint and glazing putty of the wood sash behind. Note the slot in the casing which was cut for an original shutter hinge (red arrow).Photo: HPTC, 05/12/16.



Figure 291. Biological growth present on an exterior storm. The wood sash behind is in good condition. Photo: HPTC, 05/12/16.



Figure 292. Rusting fasteners (hinges and nails) on a storm on the east elevation of the 1927 addition. Note the slots in the casing which were cut for the original shutter hinges (red arrows). Photo: HPTC, 05/12/16.



Figure 293. Rusting fasteners, wood rot, and missing trim component (at top of storm) on the south elevation paired second-floor window. The sash behind the storm shows some deterioration, likely due to its southern exposure. Photo: HPTC, 05/12/16.



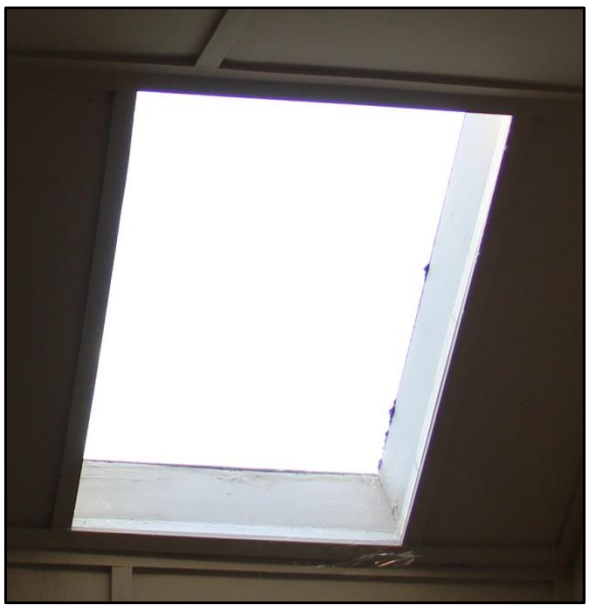


Figure 295, above. The interior of the skylight shows no leaking; degraded paint is from UV exposure. Photo: HPTC, 05/11/16.

Figure 294, left. The interior storm units are in good condition. Photo: HPTC, 05/11/16.

B2030	Exterior Doors

The 1985-87 replacement exterior doors show signs of everyday wear and tear, including scuff marks, degraded paint (fig. 296), missing paint where hardware was replaced (fig. 297), cracked glazing putty at the sidelights (see fig. 297), and missing or inadequate weatherstripping (fig. 298).

The 1985-87 screen doors also show signs of everyday wear and tear, including scuff marks, degraded paint, rusting fasteners (fig. 299).

Condition Rating: FAIR
Deficiency Rating: MINOR



Figure 296. Evidence of general wear and tear afflicts the exterior door openings. Photo: HPTC, 05/12/16.

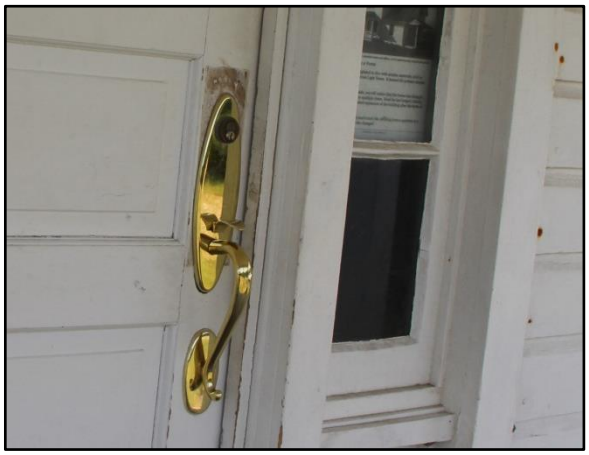


Figure 297. Door hardware was replaced and the door was never repainted. Glazing putty at sidelights is cracked. Photo: HPTC, 05/12/16.

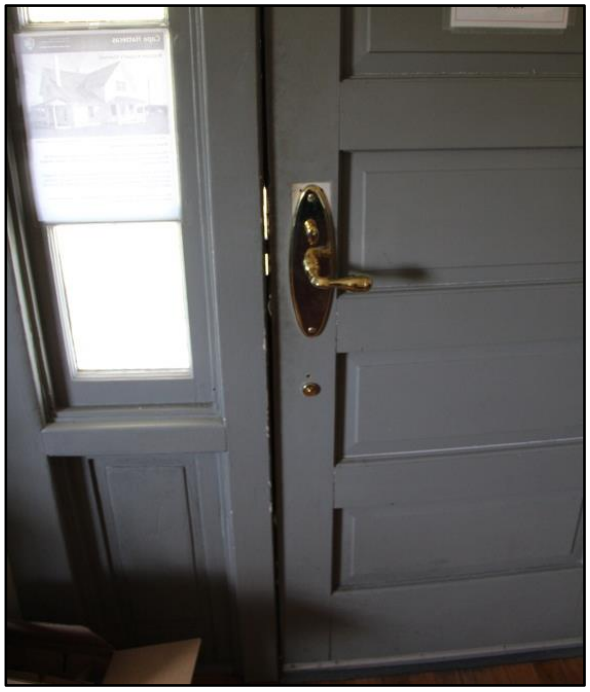


Figure 298. Missing weatherstripping at Door 2 allows daylight, and exterior air, into the interior of the building. Photo: HPTC, 05/11/16.



Figure 299. Nails rusting on the screen door at Door 1. Photo: HPTC, 05/12/16.

B30	ROOFING
B3010	Roof Coverings
B301001	Roof Finishes
B301001-1	**Main Roof Finishes**

The ca. 2011-installed cedar shingle main roof is in overall good visual condition, and should be due to its young age (approximately five years). However it was not installed according to Cedar Shake and Shingle Bureau (CSSB) specifications. Shingle roofs (typically of western red cedar, Alaskan yellow cedar, or redwood) which have been installed according to CSSB specifications carry a twenty to twenty-five year installation guarantee and typically last at least thirty years. The following assessment was made of the current main roof as compared to CSSB specifications:

	CSSB Specifications	Current Conditions
Product Grade	No. 1 Clear shingles preferred	Unknown.
Sheathing	Skip sheathing or sheathing boards (1x4 or 1x6 boards placed horizontally across rafters) spaced according to exposed surface of shingle, to allow proper ventilation. No solid plywood sheathing! No interlaid felt! No tar paper underlayment!	Historic skip sheathing and sheathing boards extant. Tar paper underlayment installed (fig. 300)!
Fasteners	Ring-shank stainless steel "Type 316" nail, probably 4d. Not underdriven or overdriven! Not hot-dipped or electro-galvanized!	Ring-shank nails, likely 4d (type unknown). Many overdriven between sheathing boards (see fig. 300)!
Zinc or Copper Strips	Helpful at ridge cap/vent and every 6'-0" down the slope to deter biological growth, but not required.	Not present.
Preservative Treatments	Preservative treatment (Certi-Last) is especially helpful in high-humidity areas to extend the service life, but not required.	Unknown.
Attic Ventilation	Movement of air will prevent or inhibit condensation of moisture on the underside of shingles or roof decks. Vents should be provided at soffits (eaves), gable ends (screened), and ridge lines.	Soffit vents extant, but air cannot move to attic due to presence of insulation (fig. 301)! Gable end vent present only in 1927 roof gable (no cross ventilation) (figs. 302-303)! No ridge vents extant (see fig. 300)!
Starter Course	Double or triple starter course preferred.	Double starter course.
Overhangs	Butts of first course of shingles should project 1-½" over fascia and approximately 1" over the gable or rake end.	Approximately correct.
Spacing	Spacing between adjacent shingles (joints), upon installation, should be between ¼" to $^{3}/_{8}$".	Unknown.

Because the cedar shingle roof was not installed in full accordance to CSSB specifications, the extant roof will have a dramatically shorter lifespan (ten to fifteen years should be assumed); therefore the roof is already a third to halfway through its lifespan. At this time, it still performs as a watertight roof.

Condition Rating: POOR
Deficiency Rating: SERIOUS

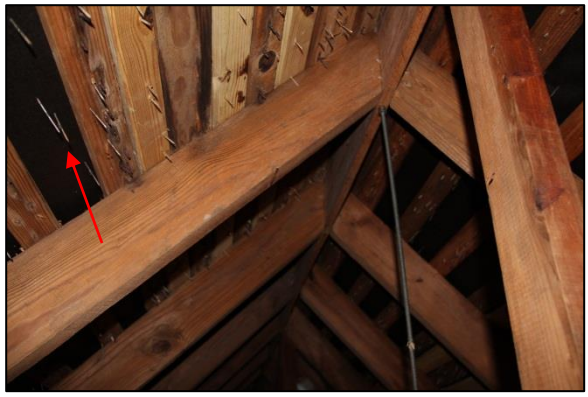


Figure 300. Historic sheathing boards have been supplemented with modern boards. Tar paper has been (inappropriately) laid under the shingles. Overdriven nails can be seen between sheathing boards (red arrow). Note the absence of a ridge vent. Photo: HPTC, 05/10/16.

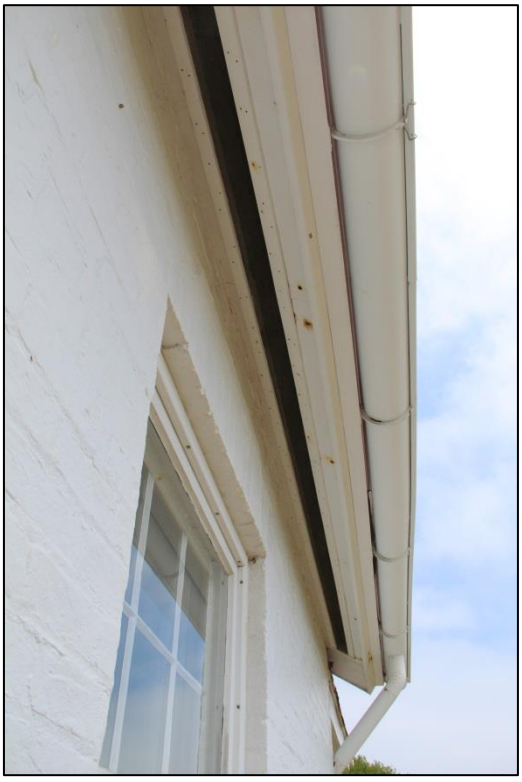


Figure 301, right. Soffit vents are extant around the perimeter of the building, but cannot adequately vent the attic due to the presence of insulation in the attic which blocks this air flow. Photo: HPTC, 05/12/16.



Figure 302. Gable-end vent located in the 1927 addition roof. Photo: HPTC, 05/10/16.



Figure 303. No gable-end vents are located in the main block roof. Photo: HPTC, 05/10/16.

B301001-2	South Porch Roof Finishes

The ca. 2011-installed cedar shingle south porch roof is in overall good visual condition, and should be due to its young age (approximately five years). However it was not installed according to CSSB specifications. Shingle roofs (typically of western red cedar, Alaskan yellow cedar, or redwood) which have been installed according to CSSB specifications carry a twenty to twenty-five year installation guarantee and typically last at least thirty years. Because the space between the porch ceiling and roof is inaccessible, its construction conditions are unknown. Therefore it is assumed that the south porch roof was installed in much the same way as the main roof. The assessment of the roof as compared to CSSB specifications is likely similar (see p. 173)

Because the cedar shingle roof was not installed in full accordance to CSSB specifications, the extant roof will have a dramatically shorter lifespan (ten to fifteen years should be assumed); therefore the roof is already a third to halfway through its lifespan. At this time, it still performs as a watertight roof.

Condition Rating: POOR
Deficiency Rating: SERIOUS

B301001-2	East Porch Roof Finishes

The 1985-87 standing-seam metal roof is in overall good condition, and should be according to its age (approximately thirty years). Standing-seam metal roofs which are installed according the traditional building details can be expected to last at least fifty years, and much longer if well maintained (historic metal roofs have been known to last 120 years); the current roof is thirty years old and maintained. The western edge of the roof has an unfinished look, which has been present since the 1985-87 work was completed. Otherwise, paint is degraded on portions of the roof.

Condition Rating: FAIR
Deficiency Rating: MINOR

B301004	Flashings & Trim
B301004-1	**Valley Flashing**

The valley flashing appears to be in good condition, as there are no known leaks and adjacent materials are also in good condition.

Condition Rating: GOOD
Deficiency Rating: MINOR

B301004-2	Chimney Flashing

The chimney flashing and crickets appear to be in good condition, as there are no known leaks and adjacent materials are also in good condition.

Condition Rating: GOOD
Deficiency Rating: MINOR

B301004-3	Roof-Side Wall Flashing

The various locations of roof-side wall flashing appear to be in good condition, as there are no known leaks and adjacent materials are also in good condition.

Condition Rating: GOOD
Deficiency Rating: MINOR

B301004-4	Roof Transition Flashing

The roof transition flashing appears to be in good condition, as there are no known leaks and adjacent materials are also in good condition, however the flashing is not installed using traditional techniques.

Condition Rating: GOOD
Deficiency Rating: MINOR

B301004-5	Skylight Flashing

The skylight flashing appears to be in good condition, as there are no known leaks and adjacent materials are also in good condition, however the flashing is not installed using traditional techniques.

Condition Rating: GOOD
Deficiency Rating: MINOR

B301005	Gutters & Downspouts

A majority of the terne-coated stainless steel 0'-5"-halfround gutters and 0'-3"-round downspouts are undersized for the pitch of the roofs and the rainfall intensity for the area.

Additionally, all downspouts drain directly to grade directly adjacent the foundation. Considering the crawlspace is sunken below the exterior grade, and much of the perimeter has neutral or negative grading, it is likely all of this water drains directly into the crawlspace.

Condition Rating: FAIR
Deficiency Rating: SERIOUS

C	INTERIORS
C10	INTERIOR CONSTRUCTION
C1020	**Interior Doors**

The historic and modern interior doors of varying age are in overall good condition.

Condition Rating: GOOD
Deficiency Rating: MINOR

C1030	Fittings
C103010	Closets
C103010-1	**Historic Closets**

The historic closets are in overall good condition.

Condition Rating: GOOD
Deficiency Rating: MINOR

C103010-2	**Modern Closets**

The modern closets are in overall good condition. However their presence negatively impacts the interior spaces by adding features which were not present historically. With the eventual replacement of the extant HVAC system to a more sympathetic and efficient system (see D30 HVAC for more information), the closets will no longer be needed and could be removed from the building.

Condition Rating: GOOD
Deficiency Rating: MINOR

C103098	Other Casework
C103098-1	**Trim**

The interior trimwork, all dating to 1985-87, is in good overall condition.

Condition Rating: GOOD
Deficiency Rating: MINOR

C103098-2	**Fireplaces**

The interior fireplaces are in fair overall condition. The openings have been outfitted with fiberglass insulation and plywood at their flue openings. Because of the lack of caps over the flues on the exterior, dirt, insects, and rainwater can infiltrate to the inside of the building from the top of the flues.

Condition Rating: FAIR
Deficiency Rating: SERIOUS

C20	STAIRS
C2010	Stair Construction
C201001	**Interior Stair Construction**

The interior stair is in overall fair condition. The painted finishes and unpainted components show some wear (fig. 304).

Condition Rating: FAIR
Deficiency Rating: MINOR

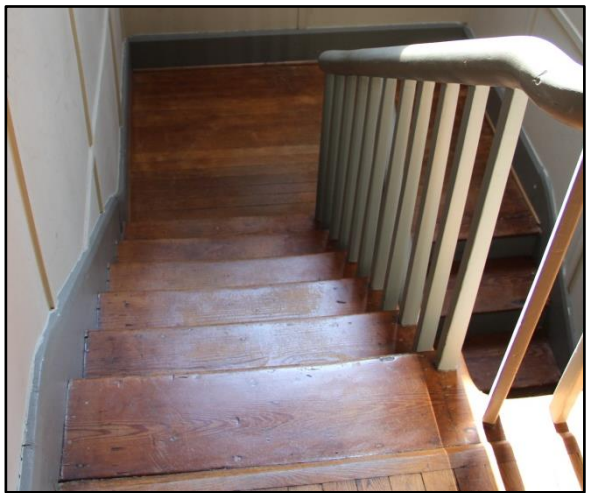


Figure 304, right. The interior stair shows general wear to its finishes. Photo: HPTC, 05/11/16.

C30	INTERIOR FINISHES
C3010	**Wall Finishes**

The interior wall finishes show some wear. Peeling and cracked paint and staining can be seen adjacent the HVAC supply vents. Although not the most historic interior finish, the extant drywall as finished (to look like beaverboard) is a historically appropriate finish to the 1927-1937 time period. Earlier than this would be lath and plaster, but would not be appropriate to the 1927 addition. Later CCC-installed (1937-39) V-joint cypress paneling would also not be appropriate.

Condition Rating: FAIR
Deficiency Rating: MINOR

C3020	**Floor Finishes**

The interior floor finishes show some wear to the finish, at both the first and second floors. Due to the unventilated crawlspace below, the floor in Room 102 has buckled several inches with increased moisture levels (fig. 305). This creates a walking hazard. Attempts to fix the problem occurred several years ago by park maintenance staff by screwing the finish floor to the subfloor (screws are hidden with small wood plugs). Since that time, the buckling has shifted northward, but is adjacent to the original buckled area.

A subsequent site visit in December 2016 showed the floor to be buckling even further, now to the north *and* south of the original and has extended into the adjacent Room 101 and Room 104 (figs. 307-308).

Furthermore, small mats have been laid over the wood floor (fig. 306). This obscures the wood floor and creates a haphazard appearance with many tripping hazards (edges).

Condition Rating: POOR
Deficiency Rating: SERIOUS

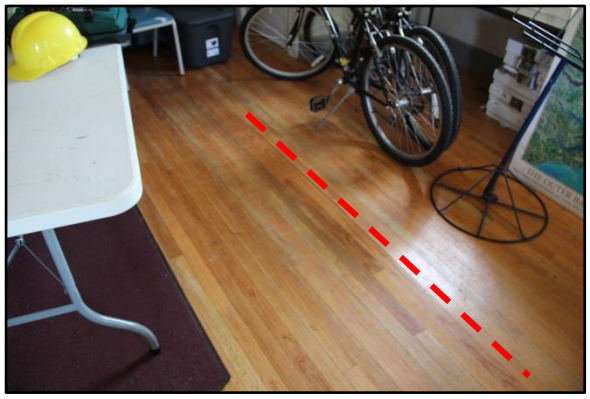


Figure 305. The finish floor is buckling in Room 102 due to the unventilated crawlspace below. Photo: HPTC, 05/11/16.



Figure 306. Modern floor mats obscure the wood floor and created tripping hazards. Photo: HPTC, 05/11/16.



Figure 307. The buckling finish floor in Room 102 has grown and a new area has appeared west of the original location. Photo: HPTC, 12/07/16.



Figure 308. The buckling finish floor fas expanded into adjacent Room 101 and Room 104 (seen in this photo). Photo: HPTC, 10/08/16.

C3030	Ceiling Finishes

The interior ceiling finishes show some wear. Peeling and cracked paint and staining can be seen adjacent the HVAC supply vents. Although not the most historic interior finish, the extant drywall as finished (to look like beaverboard) is a historically appropriate finish to the 1927-1937 time period. Earlier than this would be lath and plaster, but would not be appropriate to the 1927

addition. Later CCC-installed (1937-39) V-joint cypress paneling would also not be appropriate, as it postdates the period of significance (1871-1936).

Condition Rating: FAIR
Deficiency Rating: MINOR

D	SERVICES
D20	**PLUMBING**

No plumbing system is currently extant within the Principal Keeper's Quarters.

Condition Rating: N/A
Deficiency Rating: N/A

D30	**HVAC**

The 2015 HVAC system appears to be in good condition; however the system seems to be largely oversized for the building. Hidden (high-velocity) or more efficient (ductless minisplit) systems would be more appropriate and would not require the inappropriate addition of large closets to hide the equipment.

Condition Rating: FAIR
Deficiency Rating: MINOR

D40	FIRE PROTECTION SYSTEMS
D4010	**Sprinklers**

The wet-pipe sprinkler system was not assessed for working condition. It is assumed that the system is in good condition, as it is annually inspected. The pop-up sprinkler heads ensure the system is low profile.

However, it should be noted that no insulation or freeze-deterrent equipment are located on the system in the unconditioned attic.

Condition Rating: GOOD
Deficiency Rating: MINOR

D4030	Fire Protection Specialties
D403001	**Fire Extinguishers**

The fire extinguishers are regularly serviced and replaced as needed. Because of the wet-pipe sprinkler system, a single fire extinguisher on each floor is sufficient for the building.

Condition Rating: GOOD
Deficiency Rating: MINOR

D50	ELECTRICAL
D5010	**Electrical Service & Distribution**
D5020	**Lighting & Branch Wiring**

The 1985-87-installed electrical system, including panel, wiring, outlets, switches, and lighting appear to be in good condition.

Condition Rating: GOOD
Deficiency Rating: MINOR

D5030	Communications & Security Systems
D503001	**Fire Alarm Systems**

The ca. 2000 fire alarm system, including hardwired some detectors, pull stations, and strobes, appears to be in good condition.

Condition Rating: GOOD
Deficiency Rating: MINOR

D503008	**Security Alarm Systems**

The ca. 2000 security system appears to be in good condition.

Condition Rating: GOOD
Deficiency Rating: MINOR

D5090	Other Electrical Systems
D509004	**Lightning Protection System**

No lightning protection system is currently extant at the Principal Keeper's Quarters.

Condition Rating: POOR
Deficiency Rating: CRITICAL

G	BUILDING SITEWORK
G20	SITE IMPROVEMENTS
G2030	Trail
G203003	**Paved Surfaces**

The ca. 2000 brick-paved ramped walkway is in good condition, but is in causing damage to the south porch, negative drainage at the south elevation, and is visually incompatible to the historic setting.

Condition Rating: GOOD
Deficiency Rating: MINOR

G2040	Site Development
G204001	**Fencing & Gates**

No fences and gates are currently extant at the Principal Keeper's Quarters.

Condition Rating: N/A
Deficiency Rating: N/A

G204008	**Storm Water Collection & Storage (Cistern)**

The 1871 cistern is no longer used to collect rain water from the roof of the Principal Keeper's Quarters, as it did historically. The exterior of the brick and concrete cistern exhibits failing mortar, deteriorated paint, biological growth, and chipped edges due to lawn maintenance equipment (figs. 309-310). The interior of the cistern was not assessed. It is assumed that water is currently stored inside, but is not regularly cycled out and refreshed.

Additionally, the wood structure atop the cistern, which was extant throughout the period of significance, is no longer extant.

Condition Rating: POOR
Deficiency Rating: MINOR



Figure 309. Deteriorated mortar and paint, and biological growth on the historic cistern. Photo: HPTC, 05/12/16.



Figure 310, right. Chipped brick due to lawn maintenance equipment. Photo: HPTC, 05/12/16.

G204099	**Miscellaneous Structures**

No miscellaneous structures are currently extant at the Principal Keeper's Quarters.

Condition Rating: N/A
Deficiency Rating: N/A

G90	OTHER SITE WORK
G9087	**Overall Building Site Drainage**

The neutral and negative drainage around the building's foundation, along with downspouts which drain to grade at the foundation, and a sunken crawlspace, creates a critical situation. These conditions allow excess water to sit around and under the building, on a site with an already-high water table.

Condition Rating: POOR
Deficiency Rating: CRITICAL

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Part 2 | Treatment and Use

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Requirements for Treatment and Use

The treatment and use of the Hatteras Light Station Principal Keeper's Quarters must be considered within a framework of applicable laws, agreements, and policies. These mandates govern a wide range of management issues beyond the preservation, protection, and interpretation of the Cape Hatteras National Seashore's cultural resources. They extend to issues of visitor and staff use, agricultural lease, safety, and universal accessibility, among others. Additionally, the Cape Hatteras National Seashore Foundation Statement is discussed below.

Cape Hatteras National Seashore Foundation Statement

A foundation statement is "a formal statement of [a park's] core mission to provide basic guidance for all planning and management decisions: a foundation for planning and management." The document includes the definition of the park purpose, the park significance statements, primary interpretive themes, fundamental resources and values, and special mandates.[1]

Park Purpose:

> The purpose of Cape Hatteras National Seashore is to permanently preserve the wild and primitive character of the ever-changing barrier islands, protect the diverse plant and animal communities sustained by the coastal island process, and provide for recreational use and enjoyment that is compatible with preserving the distinctive natural and cultural resources of the nation's first national seashore.[2]

Park Significance: This section identifies seven reasons why the park's resources are significant enough to warrant national park designation. Two directly relate to the Hatteras Light Station buildings:

> Significance Statement 6: Its artifacts, historic sites, and geographic setting provide tangible links to understanding humankind's ability to adapt in a harsh and changing coastal environment in isolation from the mainland. These links, which are of deep symbolic significance to local villagers, include lighthouses, shipwrecks, Native American sites, and more.
>
> Significance Statement 7: Numerous historical events of national significance have occurred on or near its shores including four centuries of shipwrecks, the United States government's response to protect maritime commerce during the Civil War and World War II, and the experimental development and use of new technology.[3]

Primary Interpretive Themes: This section is based on the stated park purpose and significance. Two themes directly relate to the Hatteras Light Station buildings:

> Topic: History and Heritage – Within this dynamic and once isolated barrier island system, unique cultures have evolved which serve as a testament to humankind's relationship with the boundary of land and sea.

[1] National Park Service. "Foundation Statement: Cape Hatteras National Seashore, North Carolina." September 2011, pp. 6-7.
[2] Ibid, p. 9.
[3] Ibid, pp. 10-10-11.

> Topic: Stewardship and Preservation – Stewardship of the national seashore and preservation of its history provides future opportunities for people to access, experience, and learn about coastal dynamics/cultural change.[4]

Fundamental Resources and Values: This section identifies attributes "which warrant primary consideration during park planning and management because they are critical to achieving the park's purpose and maintaining its significance." The Principal Keeper's Quarters is identified as a fundamental resource under "Historic structures, archeological sites, and cultural landscapes."[5] Another identified important value is the story of "the movement and preservation of the Cape Hatteras Light Station."[6]

Outer Banks Group Climate Action Plan

On September 29, 2015 the *Climate Action Plan* for Cape Hatteras National Seashore and the other entities of the Outer Banks Group was finalized.[7] The plan acknowledges that climate change threatens the cultural and natural resources which the NPS strives to preserve. Directives and guidelines provide information on how to take action through adaptation and mitigation to climate changes. These directives and guidelines include the following, among others:

- Executive Order No. 13693: "Planning for Federal Sustainability in the Next Decade"
- Green Parks Plan (NPS)
- 2012-2014 Climate Change Action Plan (NPS)
- Climate Change Response Strategy (NPS)

The plan further defines strategies that CAHA enact to meet required mitigation and adaptation goals. These include:

1. Reduce Greenhouse Gas emissions resulting from activation by operations
2. Increase climate change education and outreach
3. Actions for adapting cultural and natural resources to a changing climate

Strategy 3 most directly affects the Hatteras Light Station. It further states:

> Climate change threatens the cultural and natural resources that the Outer Banks Group is known for and so the Outer Banks Group has considered actions to take to adapt to climate change. In the context of climate change, adaptation is an adjustment in natural or human systems that moderates harm or seeks out beneficial opportunities in response to change. Adaptation may include a variety of social, economic, or ecological responses such as adapting the location, structure, or function of Outer Banks Group facilities in anticipation of climate change. Given the potential impact from climate change, it is important to closely monitor

[4] Ibid, pp. 12-13.
[5] Ibid, pp. 14-15.
[6] Ibid, p. 16.
[7] National Park Service, U.S. Department of the Interior. "Cape Hatteras National Seashore, Wright Brothers National Memorial, & Fort Raleigh National Historic Site." *Climate Action Plan.* Signed September 29, 2015. Accessed at http://www.nps.gov/subjects/climatechange/upload/CAHA_Action-Plan-final-9-29-15.pdf on December 15, 2015.
Additional information on how the National Park Service is planning for and addressing climate change, can be found through the following sources:
Rockman, Marcy. "An NPS Framework for Addressing Climate Change with Cultural Resources." *The George Wright Forum, vol. 32, no. 31 (2015).* pp. 37-50. Accessed at http://www.georgewright.org/321rockman.pdf on December 15, 2015.
National Park Service, U.S. Department of the Interior. "Preserving Coastal Heritage." *Summary Report, April 3-4, 2014, Federal Hall National Monument, New York City.* Accessed at http://www.achp.gov/docs/preserve-coastal-heritage.pdf on December 15, 2015.

cultural and natural resources and identify those that are most at risk. From this identification, the Outer Banks Group can work towards reducing the risk or documenting the resources to try and keep a record of them. Presented below are the actions that are currently under way and which comprise the Outer Banks Group's progress to date, and those actions that the Outer banks Group will pursue.

Progress to Date

- Relocated Cape Hatteras Lighthouse and other buildings away from eroding seashore.

Adaptation

1. Incorporate climate adaptation into all levels of NPS planning
   - Monitor resources for climate impacts
   - Develop management strategies to increase the adaptive capability of park resources and facilities
   - Identify species and resources most at risk
     - Conduct climate science within parks

Evaluate Progress and Identify Areas for Improvement

By taking the actions established in the goals above, the Outer Banks Group plans to reduce its emissions to the specified goals. Achieving these goals will require an ongoing commitment by the Outer banks Group, which may include subsequent emission inventories, additional mitigation and adaptation actions, and reevaluation of goals. Presented below are the actions that the Outer Banks Group will pursue.

Monitoring – Planned Actions

1. Monitor progress with respect to reducing emissions and use this to drive continual performance
   - Track progress on climate friendly actions through the environmental management system.

National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA) mandates that federal agencies, like the National Park Service, take into account the effects of their actions on properties listed or eligible for listing on the National Register of Historic Places and gives the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment.[8] The Principal Keeper's Quarters is listed as a contributing structure in the Cape Hatteras Light Station National Historic Landmark District and any undertakings (typically expenditure of federal funds) will be reviewed in accordance to NPS policy and federal historic preservation laws including the *Programmatic Agreement Among the National Park Service (U.S. Department of the Interior), the Advisory Council on Historic Preservation and the National Conference of State Historic Preservation Officers for Compliance with Section 106 of the National Historic Preservation Act* (2008).[9]

Section 110 of the NHPA clarifies the broad historic preservation responsibilities of Federal agencies with the intention of ensuring that historic preservation is fully integrated into the ongoing programs of all Federal agencies by identifying, protecting, and avoiding unnecessary damage to historic properties. Additionally, each agency is required to use historic properties available to it

[8] The NHPA of 1966 was last amended in 2006. A downloadable copy is located at (http://www.achp.gov/nhpa.html).
[9] A copy of this agreement can be found on the NPS's website at (http://www.nps.gov/policy/106agreement.pdf).

and when managing these properties, must consider preservation of their historic, archaeological, architectural, and cultural values.[10]

Executive Order No. 11593

Executive Order No. 11593: Protection and Enhancement of the Cultural Environment (1971) mandates that "the Federal Government shall provide leadership in preserving, restoring, and maintaining the historic and cultural environment of the Nation."[11] Responsibilities of federal agencies include:

- Nominating "...to the Secretary of the Interior all sites, buildings, districts, and objects under their jurisdiction of the control that appear to qualify for listing on the National Register of Historic Places."
- Exert caution "...during the interim period until inventories and evaluation...are completed to assure that any federally owned property that might qualify for nomination is not inadvertently transferred, sold, demolished, or substantially altered."
- "Initiate measures to assure that where as a result of Federal action or assistance a property listed on the National register of Historic Places is to be substantially altered or demolished, timely steps be taken to make or have made records, including measured drawings, photographs, and maps, of the property, and that copy of such records then be deposited in the Library of Congress as part of the Historic American Buildings Survey or Historic American Engineering Record for future use and reference."
- "Initiate measures and procedures to provide for the maintenance, through preservation, rehabilitation, or restoration, of federally owned and registered sites professional standards prescribed by the Secretary of the Interior."

Executive Order No. 13006

Executive Order No. 13006: Locating Federal Facilities on Historic Properties (1996) mandates that "the Federal Government shall utilize and maintain, wherever operationally appropriate and economically prudent, historic properties and districts...." Furthermore, "any rehabilitation or construction that is undertaken pursuant to this order must be architecturally compatible with the character of the surrounding historic district or properties."[12]

Secretary of the Interior's Standards

Treatment to the Hatteras Light Station Principal Keeper's Quarters is to be guided by *The Secretary of the Interior's Standards for Historic Preservation Projects.*[13] Descriptions of the four standards are as follows:

> Preservation: "the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property. Work, including preliminary measures to

[10] More information on Section 110 can be found on the NPS's website at (http://www.nps.gov/hps/fapa_110.htm).
[11] A copy of this E.O. can be found on the NPS's website at (http://www.nps.gov/history/history/online_books/anps/anps_7b.htm).
[12] A copy of this agreement is located on the ACHP's website at (http://www.achp.gov/EO13006.html).
[13] Weeks, Kay D. and Anne E. Grimmer. "The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings." United States Department of the Interior, National Park Service, Cultural Resource Stewardship and Partnerships, Heritage Preservation Services, Washington, DC, 1995.

> protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project."
>
> Rehabilitation: "the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values."
>
> Restoration: "the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period. The limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a restoration project."
>
> Reconstruction: "the act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location."

Because the Principal Keeper's Quarters stands intact, reconstruction is not a treatment consideration; however several outbuildings and other character-defining cultural landscape features are no longer extant and should be considered for reconstruction.

Director's Order 28

DO-28 Cultural Resource Management Guideline is intended to guide the National Park Service through successful cultural resource management through three steps[14]:

- Research: "identify, evaluate, document, register, and establish other basic information about cultural resources;"
- Planning: "ensure that this information is well integrated into management processes for making decisions and setting priorities;" and
- Stewardship: "planning decisions are carried out and resources are preserved, protected, and interpreted to the public."[15]

Through the development of this HSR, the research and planning (for treatment and use) of the Principal Keeper's Quarters is addressed. The general preservation philosophy integrated into this HSR is best represented by the following:

> Better to preserve than to repair, better repair than restore, better restore than [re]construct. It is ordinarily better to retain genuine old work of several periods, rather than arbitrarily to 'restore' the whole, by new work, to its aspect at a single period.[16]

[14] A copy of NPS-28 can be found at http://www.nps.gov/history/history/online_books/nps28/28contents.htm.
[15] NPS-28, p. 1.
[16] The Advisory Board on National Parks, Historic Sites, Buildings, and Monuments policy statement (1936). NPS-28, p. 2 .

Decisions for the future stewardship of the Hatteras Light Station Principal Keeper's Quarters are under the purview of Cape Hatteras National Seashore. As part of NPS-28 "stewardship focuses on five major activities:

- Control of treatment and use,
- Monitoring conditions of deterioration and structural failure,
- Protecting from human and environmental threats,
- Retaining or delegating responsibility for structures, and
- Developing the skills, knowledge, and attitudes needed to support the program."[17]

A Call to Action

In 2011, National Park Service Director Jon Jarvis put forth his vision for NPS employees and partners "to commit to actions that advance the service toward a shared vision for 2016 and our second century."[18]

Action Item #25, "What's Old is New," addresses preservation actions: "Modernize historic preservation methods and technologies, show how historic structures can be made sustainable, and support efforts to rebuild the economic vitality of rural and urban communities by updating the *Secretary of the Interior's Standards and Guidelines for the Treatment of Historic Properties* in consultation with historic preservation partners."

Additionally, creativity and flexibility are encouraged when applying these Actions and should not hinder the day-to-day operations of the NPS.

International Building Code

According to the 1988 Amendment to the Public Buildings Act, any building constructed or altered by a Federal agency must, "to the maximum extent feasible, be in compliance with one of the nationally recognized model building codes and with other applicable nationally recognized codes." The International Building Code (IBC) is one of the allowable recognized model building codes.[19]

Treatments of the building and its site are to be guided by the International Building Code (IBC).[20] Threats to public life, safety, and welfare are to be addressed; however, because the Hatteras Light Station Principal Keeper's Quarters is historic, alternatives to full legislative and code compliance are recommended where compliance would needlessly compromise the integrity of the historic building with the removal of character-defining features or infringement upon the National Historic Landmark characteristics of the site and/or structures.

[17] NPS-28, p. 127.
[18] More information on A Call to Action is located on the NPS website at (http://www.nps.gov/calltoaction/).
[19] The General Services Administration had more information on this amendment and other accepted building codes at (http://www.gsa.gov/portal/content/101288).
[20] IBC is overseen by the International Code Council. More information is located at http://www.iccsafe.org/CS/Pages/default.aspx.

Accessibility

With no construction activity to initiate changes, it is premature to recommend accessibility design modifications to the Hatteras Light Station Principal Keeper's Quarters. Additionally, an accessibility assessment was not included in the scope of work for this project and therefore recommended accessibility treatments will not be provided. However, it should be noted that modifications may be likely as property use evolves and rehabilitation work commences. The most appropriate response will take into account scoping and technical design requirements of the Architectural Barrier Act Accessibility Standards and skillful application of preservation principles to preserve the historic character and historical integrity of this property.[21] Refer to NPS Preservation Brief #32: "Making Historic Properties Accessible" for more information.[22]

[21] The Architectural Barrier Act Accessibility Standards are under the authorization of the United States Access Board. More information can be found through Access Board's website (http://www.access-board.gov/aba/).
[22] Jester, Thomas C. and Sharon C. Park. "Making Historic Properties Accessible." Preservation Brief 32. Washington, DC, September 1993. Accessible at (http://www.nps.gov/hps/tps/briefs/brief32.htm).

Preferred Ultimate Treatment and Use

The Hatteras Light Station Principal Keeper's Quarters was used as a dwelling from its construction in 1871 through 1932, when the last lighthouse keeper moved out (major alterations occurring in 1927). The building remained vacant until it was used by the CCC from 1935 through 1940 (major renovation occurring in 1935-37). After the CCC camp was disbanded, the dwelling was used as apartments through 1983. A major preservation project occurred between 1985 and 1987. Several plans were made for the reuse of the building, but it would sit empty until after its move in 1999, when the building began a new life as offices.

Because there are no funded and/or active projects occurring at the Principal Keeper's Quarters presently, the ultimate treatment and use recommendations provided are meant to guide the ultimate treatment and do not provide a construction or architectural program. The identification of resource impacts should be fully assessed once a construction or architectural program is finalized.

Considering the applicable laws, agreements, and policies discussed above, the Preferred Ultimate Treatment for the Hatteras Light Station Principal Keeper's Quarters is as follows:

- *Exterior Restoration* with the removal of non-sympathetic modern accretions and retention, preservation, and restoration of character-defining features and associated buildings important to the historic design and construction of the dwelling by the United States government in 1871, and alterations which occurred to the dwelling and associated buildings through 1936.
- *Interior Rehabilitation* and preservation of character-defining features with removal of non-sympathetic modern accretions to reflect its original function. This treatment will preserve character-defining features and allow for the reversal of non-sympathetic treatments, materials, and finishes.

Also, considering the applicable laws, agreements, and policies discussed above, the Preferred Ultimate Use of the Hatteras Island Principal Keeper's Quarters is to continue its use as offices for park employees.

Alternatives for Treatment and Use[23]

The biggest emerging threat to the Principal and Double Keeper's Quarters is flood water that may be associated with accumulation of rainfall, sea water that washes over the dune system, and, possibly, sound-side water that may flood these areas as a result of storm surge. Flood waters can damage the building substructure, flooring, wallboard, insulation, and electrical systems. The acute and chronic impacts of flooding seriously threaten the ability for the Seashore to preserve these structures in a sustainable manner. Additionally, flooded conditions around this historic property are likely to become a more frequent and intense occurrence over the next several decades. Based on tidal gauge records from Cape Hatteras during the period 1978-2002, sea level rose 3.46 mm per year, indicating a mean sea level trend of 13.6 mm per century.[24] A recent panel of expert scientists predicted an additional sea level rise of between 0.4 and 1.4 meters over the next ninety years.[25] Other studies suggest that sea level rise in this area could be as high as 2 meters over the next century.[26]

As a result, the structures in this area are likely to be faced with an unprecedented level of flooding stress associated with future storms. Park managers must consider implementing significant adaptation actions if these structures are to be preserved in the face of these changes and in a manner that will be cost effective and sustainable.

It appears that three options may be available to preserve these structures in the face of increasing risk of flooding-related damages. They include:

1. Relocating the structures to higher elevation areas;
2. Elevating the structures to ensure that they are above reasonably foreseeable floodwaters; or
3. Implementing a large scale water management system to prevent flooding from reaching the structures.

Park managers believe that raising these structures presents the most reasonable and cost-effective solution to preserving them over the next fifty years. Elevating historic structures is a commonly-used and often advisable management measure that has been practiced by historic architects in coastal areas. This alternative is supported in the National Park Service Cultural Resources Climate Change Strategy (CRCC Strategy), which states that elevating a building above projected flood levels is an adaptation option to improve resilience/resistance of a resource exposed to environmental forces.[27] It is recommended that the park reference guides, produced by the states of Louisiana and Mississippi, to elevate structures in flood-prone areas at Cape Hatteras. These

[23] This section was completed by Cape Hatteras National Seashore park managers in December 2017.
[24] Zervas, Chris. "North Carolina Bathymetry/Topography Sea Level Rise Project: Determination of Sea Level Trends." *NOAA Technical Report NOS CO-OPS 041*. May 2004. Accessed at https://tidesandcurrents.noaa.gov/publications/techrpt41.pdf on 12/12/2017.
[25] Rahmstorf, Stefan. "A Semi-Empirical Approach to Projecting Future Sea-Level Rise. *Science*, 315: 368-370. 01/19/07. Accessed at http://science.sciencemag.org/content/315/5810/368 on 12/12/2017.
[26] Pfeffer, W.T., Harper, J.T., and O'Neal, S. "Kinematic Constraints on Glacier Contributions to 21st-Century Sea-Level Rise." *Science*, 321: 1340-1343. 09/05/2008. Accessed at https://www.ncbi.nlm.nih.gov/pubmed/18772435 on 12/12/2017.
[27] N.C. Coastal Resources Commission Science Panel on Coastal Hazards. "North Carolina Sea-level Rise Assessment Report." March 2010. Accessed at http://www.sealevel.info/NC_Sea-Level_Rise_Assessment_Report_2010--CRC_Science_Panel.pdf on 12/12/2017.

documents provide guidelines that will assist the Seashore in developing plans for elevating structures that minimize adverse effects to the historic character of these buildings.[28]

[28] Louisiana Office of Cultural Development, and URS. "Elevation Design Guidelines for Historic Buildings in the Louisiana GO Zone." 2014. Accessed at http://www.crt.state.la.us/Assets/OCD/hp/uniquely-louisiana-education/Disaster-Recovery/Final%20Elevation%20Design%20Booklet%2012-07-15%20v2.pdf on 12/12/2017.

Recommended Treatments by Feature

Treatment Timeframes

As part of the planning process required by NPS-28, the recommended treatments for each feature have been divided into different timeframes. The "Emergency" timeframe is for features that must be addressed as soon as possible within the next year, and are the items which are in the most dire condition (poor and critical). The "Immediate" timeframe is for features that must be repaired or replaced in the next one to three years, and are often the items which are in the worst condition (poor and critical). The "Short-Term" timeframe is for features which should be addressed in the next three to five years and are likely the items which are in moderate condition (fair and serious). Features found to be in good condition with a maintenance deficiency of minor have been categorized in the "Long-Term" timeframe. Typically these features currently require routine maintenance to maintain their current condition employing preventative maintenance methodologies but there is a reduced life expectancy within the five- to ten-year period and beyond.

Recommended treatments for items with an emergency need (Timeframe: *Emergency (within 1year*), an urgent need (Timeframe: *Immediate (1-3 years*), a less urgent need (Timeframe: *Short-Term (3-5 years*), and a minor need (Timeframe: *Long-Term (beyond 5 years)*, as described above, are included under the Uniformat II layout by condition and deficiency rating in the Recommended Treatments for the Hatteras Light Station Principal Keeper's Quarters section below.

Table 4. **Hatteras Light Station Principal Keeper's Quarters Prioritized Treatment List**

Major Group Element	Group Element	Individual Element	Specific Element	Sub-Element	Condition Rating	Deficiency Rating
POOR						
D SERVICES	D50 ELECTRICAL	D5090 Other Electrical Systems	D509004 Lightning Protection System		POOR	CRITICAL
A SUBSTRUCTURE	A10 FOUNDATIONS	A1010 Standard Foundations			POOR	CRITICAL
G BUILDING SITEWORK	G90 OTHER SITEWORK	G9087 Overall Building Site Drainage			POOR	CRITICAL
C INTERIORS	C30 INTERIOR FINISHES	C3010 Floor Finishes			POOR	SERIOUS
B SHELL	B30 ROOFING	B3010 Roof Coverings	B301001 Roof Finishes	B301001-1 Main Roof Finishes	POOR	SERIOUS
B SHELL	B30 ROOFING	B3010 Roof Coverings	B301001 Roof Finishes	B301001-2 South Porch Roof Finishes	POOR	SERIOUS
G BUILDING SITEWORK	G20 SITE IMPROVEMENTS	G2040 Site Development	G204008 Storm Water Collection & Storage (Cistern)		POOR	MINOR
FAIR						
B SHELL	B10 SUPERSTRUCTURE	B101 Floor Construction	B101001 Structural Floor Frame	B101001-1 First-Floor Structural Floor Frame	FAIR	SERIOUS
B SHELL	B20 EXTERIOR ENCLOSURE	B2010 Exterior Walls	B2010-1 Brick Exterior Walls		FAIR	SERIOUS
B SHELL	B20 EXTERIOR ENCLOSURE	B2010 Exterior Walls	B2010-2 Frame Exterior Walls		FAIR	SERIOUS
B SHELL	B20 EXTERIOR ENCLOSURE	B2010 Exterior Walls	B2010-3 Chimneys		FAIR	SERIOUS
B SHELL	B20 EXTERIOR ENCLOSURE	B2010 Exterior Walls	B2010-4 Porches		FAIR	SERIOUS
B SHELL	B20 EXTERIOR ENCLOSURE	B2020 Exterior Windows			FAIR	SERIOUS
B SHELL	B30 ROOFING	B3010 Roof Coverings	B301005 Gutters & Downspouts		FAIR	SERIOUS
B SHELL	B10 SUPERSTRUCTURE	B1010 Floor Construction	B101001 Structural Frame	B101001-2 South Porch Structural Floor Frame	FAIR	MINOR

(Table 4 continued)

B SHELL	B20 EXTERIOR ENCLOSURE	B2020 Exterior Doors			FAIR	MINOR
B SHELL	B30 ROOFING	B3010 Roof Coverings	B301001 Roof Finishes	B301001-3 East Porch Roof Finishes	FAIR	MINOR
C INTERIORS	C20 STAIRS	C2010 Stair Construction	C201001 Interior Stair Construction		FAIR	MINOR
C INTERIORS	C30 INTERIOR FINISHES	C3010 Wall Finishes			FAIR	MINOR
C INTERIORS	C30 INTERIOR FINISHES	C3030 Ceiling Finishes			FAIR	MINOR
D SERVICES	D30 HVAC				FAIR	MINOR
GOOD						
B SHELL	B10 SUPERSTRUCTURE	B1010 Floor Construction	B101001 Structural Frame	B101001-3 East Porch Structural Floor Frame	GOOD	MINOR
B SHELL	B10 SUPERSTRUCTURE	B1010 Floor Construction	B101001 Structural Frame	B101001-4 Second-Floor Structural Floor Frame	GOOD	MINOR
B SHELL	B10 SUPERSTRUCTURE	B1010 Floor Construction	B101001 Structural Frame	B101001-5 Attic Structural Floor Frame	GOOD	MINOR
B SHELL	B10 SUPERSTRUCTURE	B1010 Floor Construction	B101002 Structural Interior Walls		GOOD	MINOR
B SHELL	B10 SUPERSTRUCTURE	B1020 Roof Construction	B1020-1 1871 Main Block Structural Roof Frame		GOOD	MINOR
B SHELL	B10 SUPERSTRUCTURE	B1020 Roof Construction	B1020-2 South & East Porch Structural Roof Frames		GOOD	MINOR
B SHELL	B10 SUPERSTRUCTURE	B1020 Roof Construction	B1020-3 1927 Addition Structural Roof Frame		GOOD	MINOR
B SHELL	B30 ROOFING	B3010 Roof Coverings	B301004 Flashing & Trim	B301004-1 Valley Flashing	GOOD	MINOR
B SHELL	B30 ROOFING	B3010 Roof Coverings	B301004 Flashing & Trim	B301004-2 Chimney Flashing	GOOD	MINOR
B SHELL	B30 ROOFING	B3010 Roof Coverings	B301004 Flashing & Trim	B301004-3 Roof-Side Wall Flashing	GOOD	MINOR

(Table 4 continued)

B SHELL	B30 ROOFING	B3010 Roof Coverings	B301004 Flashing & Trim	B301004-4 Roof Transition Flashing	GOOD	MINOR
B SHELL	B30 ROOFING	B3010 Roof Coverings	B301004 Flashing & Trim	B301004-5 Skylight Flashing	GOOD	MINOR
C INTERIORS	C10 INTERIOR CONSTRUCTION	C1020 Interior Doors			GOOD	MINOR
C INTERIORS	C10 INTERIOR CONSTRUCTION	C1030 Fittings	C103010 Closets	C103010-1 Historic Closets	GOOD	MINOR
C INTERIORS	C10 INTERIOR CONSTRUCTION	C1030 Fittings	C103010 Closets	C103010-2 Modern Closets	GOOD	MINOR
C INTERIORS	C10 INTERIOR CONSTRUCTION	C1030 Fittings	C103098 Other Casework	C103098-1 Trim	GOOD	MINOR
D SERVICES	D4010 Sprinklers				GOOD	MINOR
D SERVICES	D4030 Fire Protection	D403001 Fire Extinguishers			GOOD	MINOR
D SERVICES	D50 ELECTRICAL	D5010 Electrical Service & Distribution			GOOD	MINOR
		D5020 Lighting & Branch Wiring			GOOD	MINOR
D SERVICES	D50 ELECTRICAL	D5030 Communications & Security Systems	D503001 Fire Alarm Systems		GOOD	MINOR
D SERVICES	D50 ELECTRICAL	D5030 Communications & Security Systems	D503008 Security Alarm Systems		GOOD	MINOR
G BUILDING SITEWORK	G20 SITE IMPROVEMENTS	G2030 Trail	G203003 Paved Surfaces		GOOD	MINOR
NOT RATED, NOT APPLIACABLE, or UNKNOWN						
D SERVICES	D20 PLUMBING				N/A	N/A
G BUILDING SITEWORK	G20 SITE IMPROVEMENTS	G2040 Site Development	G204001 Fencing & Gates		N/A	N/A
G BUILDING SITEWORK	G20 SITE IMPROVEMENTS	G2040 Site Development	G204099 Miscellaneous Structures		N/A	N/A

End of table.

Principal Keeper's Quarters Recommended Treatments

D509004 Lightning Protection System	POOR	CRITICAL

Timeframe: *Emergency (within 1 year)*

A permanent, UL-rated lightning protection system should be installed. It should be designed to be demountable in the event of future roof replacements. Design features should include exposed downlead cables and the use of minimally-sized aerial terminals (government points). Attention should be paid to the selection of fasteners for the downlead cables into masonry walls. Penetrations through the roof should not be allowed. Require submittals from installers including layout of installation. Chimneys need a minimum of one point per chimney.

A lightning risk assessment is part of the project evaluation checklist found in Denver Service Center's Fire Protection Standards for properties undergoing rehabilitation work. Installing lightning protection is consistent with Director's Order #58: "Structural Fire Management," requiring NPS construction to have safeguards assuring life-safety design and minimizing the chances of catastrophic loss of property.[1]

A1010 Standard Foundations	POOR	CRITICAL

Timeframe: *Emergency (within 1 year)*

The enclosed crawlspace lacks ventilation. According to the Federal Emergency Management Agency (FEMA), ventilation openings must not be less than one square foot (SF) for each 150 SF of enclosed crawlspace area. In addition, a ventilation opening must be within 3'-0" of each corner of the building. Refer to fig. 311 to while reading the following recommendations.[2]

In the area below the original main block, four ventilation openings are extant. Based on the approximate 480 SF enclosed in this area, the approximate cumulative vent opening area of 3.2 SF is exactly accurate. It is suggested that two additional vents of similar size be added to the south wall of the area under the main block (adjacent the south porch) for additional ventilation which would not be seen from the

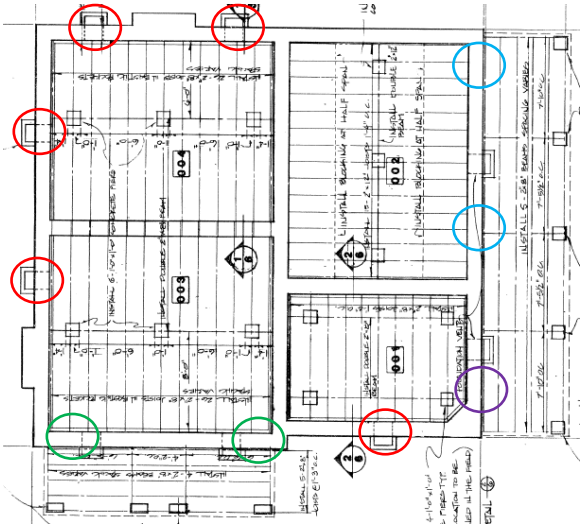


Figure 311. Red circles denote extant ventilation openings in crawlspace. New main block vents (green) and kitchen vent (purple) should be within 3'-0" from corners. Of the new addition vents, one should be within 3'0" of the northeast corner. Drawing: NPS DSC eTIC No. CAHA 603 80016, Sheet 3. Cropped by author.

[1] Refer to Structural Fire Reference Manual 58 at https://www.nps.gov/fire/structural-fire/resources/documents/reference-manual-58.pdf for more information.
[2] FEMA. "Crawlspace Construction for Buildings Located in Special Flood Hazard Areas, National Flood Insurance Program Interim Guidance." *Technical Bulletin.* November 2001. FEMA TB-11. Accessed at https://www.fema.gov/media-library/assets/documents/3527 on September 8, 2016.

exterior of the building. These additional vents should be located within 3'-0" of the each corner of the building (southwest and southeast).

In the area below the original kitchen wing, one ventilation opening is extant. Based on the approximate 130 SF enclosed in this area, the approximate cumulative vent opening of 0.8 SF is not adequate. One additional vent of similar size should be added to the east wall of the area under the kitchen wing (adjacent the east porch) for additional ventilation which would not be seen from the exterior of the building. This vent should be located within 3'-0" of the southeast corner of the kitchen wing.

In the area below the addition, there are no ventilation openings extant. Based on the approximate 240 SF enclosed in this area, two vents of similar size to those extant should be added to the east wall (adjacent the east porch). These vents would provide additional ventilation which would not be seen from the exterior of the building. The northern vent should be located within 3'-0" of the northeast corner of the addition.

Changes to the crawlspace ventilation should be completed concurrently with the site building drainage, crawlspace fill, and insulation in the first-floor structural floor frame (see G9087 Overall Building Site Drainage and B101001-1 First-Floor Structural Floor Frame for more information), prior to attempting repairs to the flooring at the first floor (see C3020 Floor Finishes for more information).

G9087 Overall Building Site Drainage	POOR	CRITICAL

Timeframe: *Emergency (within 1 year)*

Negative drainage toward the building and neutral drainage should be corrected immediately. Minor regrading of soil to create positive surface drainage near (within 12'-0") the building should be completed on all elevations; this includes at the south porch where abutting grade has caused rot to wood components. Every effort should be made to ensure water is running away from the building. The addition of small swales to direct water away from building could rectify large changes in grade elevation at the building.

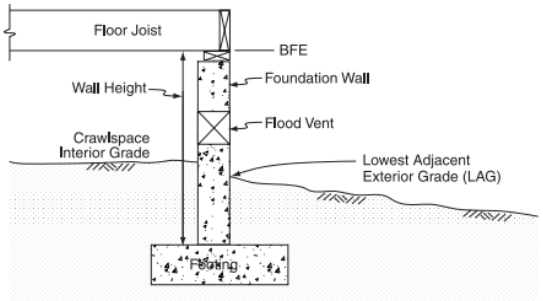


Figure 312. FEMA's preferred crawlspace construction with the interior grade at or above the exterior grade. Drawing: http://www.fema.gov/media-library-data/20130726-1511-20490-0716/tb_11_rev.pdf.

According to FEMA, crawlspaces should have their floors at or above the lowest grade adjacent to the building. A below-grade foundation, extant at the PKQ, must meet additional FEMA requirements and are not the recommended construction method, "because of the increased likelihood of problems with water accumulation, moisture damage, and drainage. The use of crawlspace construction with the interior grade at or above the [lowest adjacent exterior grade] minimizes the occurrence of these problems."

Fill should be added to the interior of the crawlspace to a height equal to or slightly above the lowest adjacent exterior grade (fig. 312) keeping in mind that the exterior grade may also change due to re-grading negative and neutral drainage. In addition, the re-grading of the interior and exterior should not be done that the vents are covered in any way.

An engineer specializing in coastal environments and grading and drainage design should be hired to complete a final drainage plan for the building.

Changes to the site building drainage and crawlspace fill should be completed concurrently with the installation of insulation in the first-floor structural floor frame and crawlspace ventilation (see B101001-1 First-Floor Structural Floor Frame and A1010 Standard Foundations for more information), prior to attempting repairs to the flooring at the first floor (see C3020 Floor Finishes for more information).

C3010 Floor Finishes	POOR	SERIOUS

Timeframe: *Emergency (within 1 year)*

As an emergency measure, the buckling finish flooring should be carefully removed in the areas of buckling (in order to be reused at a later time when other measures have been completed). The plywood subfloor should be in good condition and sufficient for use as a temporary floor. The removed areas of flooring should be stored within the Principal Keeper's Quarters to ensure the wood stays in the environment (humidity, temperature, etc.) in which it will eventually be reinstalled.

After emergency work is completed to the site building drainage, crawlspace fill and ventilation, and insulation in the first-floor structural floor frame (see B101001-1 First-Floor Structural Floor Frame, A1010 Standard Foundations, and G9087 Overall Site Building Drainage for more information), the finish floor can be reinstalled in the same manner they were originally installed.

Timeframe: *Immediate (1-3 years)*

Small floor mats scattered throughout the building create a haphazard appearance and should be removed. If floor coverings are preferred, large area rugs should be used.

B301001-1 Main Roof Finishes	POOR	SERIOUS

Timeframe: *Immediate (1-3 years)*

Movement of air in the attic will prevent or greatly inhibit condensation of moisture on the underside of the cedar shingles. To encourage circulation and improve ventilation of air in the attic of the Principal Keeper's Quarters, extant vents should be improved and others should be added. A general rule of thumb for ventilation is for every 150 SF of attic area, there should be 1 SF of vent area. The attic space is approximately 975 SF; therefore a cumulative total of 6.5 SF of vent area is needed to minimally vent the attic and provide minimal air circulation to the shingles. A

combination of venting, at the soffits, gable ends, and ridges, is important for air circulation (fig. 313).

The extant soffit vents, added in the 1980s, are recommended; however fiberglass insulation covers the vents and prohibits air exchange. The extant fiberglass insulation should be temporarily removed. Attic rafter vents, also referred to as baffles, should be installed on the lower portion of and between every rafter. The insulation can then be replaced to abut the baffles (fig. 314). Allowing the extant soffit vents to breath properly will add approximately 7.6 SF of vent area to the attic.

The small gable end vent at the peak of the east addition gable should not be altered in any way. This vent provides approximately 2.25 SF of attic ventilation.

Timeframe: *Short-Term (3-5 years)*

Because the extant cedar-shingle roof finishes of the main roof were not installed in full accordance with Cedar Shake and Shingle Bureau (CSSB) specifications, the shingles will need to be replaced in approximately five years.

The replacement roof covering should be completed with CSSB-certified No. 1 Blue Label clear cedar shingles. The length of the shingles should be determined from the spacing of the extant roof sheathing boards; an experienced and competent roof contractor will be able to determine the length and exposure of the shingles. Preservative-treated shingles (Certi-Last) are an option and should be considered for the coastal location. The shingles should be applied over spaced sheathing (extant in attic as sheathing boards) with no underlayment (extant underlayment should be removed and not replaced).

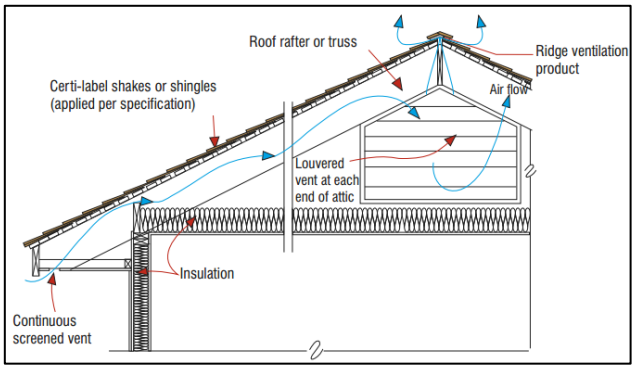


Figure 313. Several means of attic ventilation are important to adequately supply fresh air to the attic and underside of the cedar shingles. Photo: CSSB "New Roof Construction Manual, p. 13.

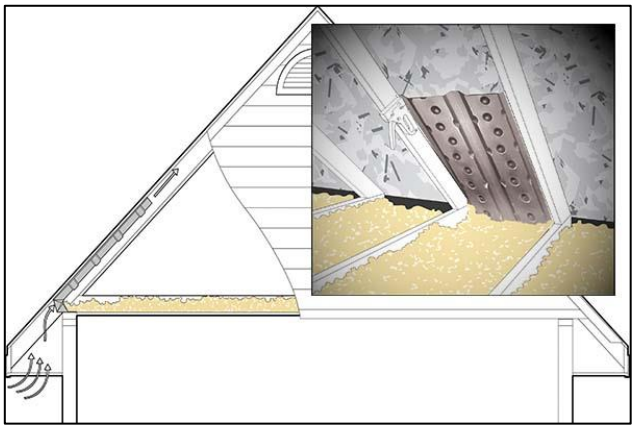


Figure 314. Insulation baffles between every rafter ensure attic insulation does not cover soffit vents and inhibit air flow. Photo: http://www.trustgreenguard.com/attic_rafter_vents/.

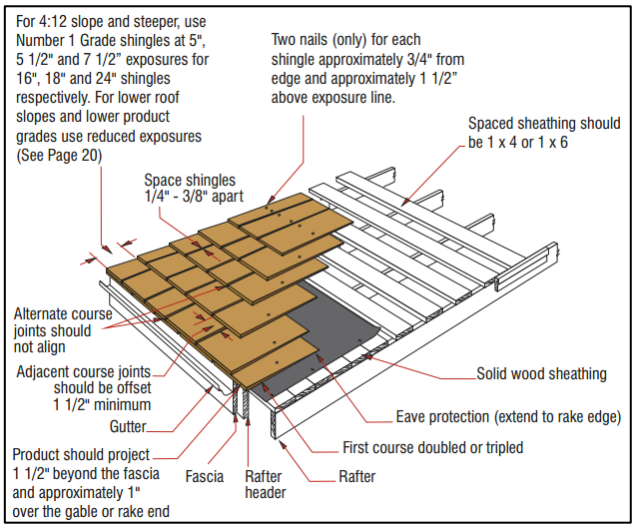


Figure 315. The application of cedar shingles has been standardized by the Cedar Shake and Shingle Bureau. Photo: CSSB "New Roof Construction Manual, p. 5.

According to the CSSB, the following shingle application should be followed (fig. 315):

1. Shingles must be double or tripled at all eaves.
2. Butts of first course shingles should project 1½" beyond the fascia and approximately 1" over the gable or rake end.
3. Spacing between adjacent shingles (joints) should be a minimum of ¼" and a maximum of $^{3}/_{8}$".
4. Certi-label shingles shall be laid with a side lap not less than 1½" between joints in adjacent courses, and not more than 10% shall be in direct alignment in alternate courses. Check with your local building official in your area.
5. In lesser grade shingles containing both flat and vertical grain, joints should not be aligned with centerline of heart.
6. Flat grain shingles wider than 8" should be split in two before nailing. Knots and similar defects should be treated as the edge of the shingle and the joint in the course above placed 1½" from the edge of the defect.[3]

Furthermore, ring-shank stainless steel "Type 316" nails, probably 4d, should be used. They should not be overdriven or underdriven and should not be hot-dipped or electro-galvanized.

Zinc or copper strips are helpful at the ridge cap/vent and approximately every 6'-0" down the slope to deter biological growth.

Concurrent with the roof replacement, a continuous ridge vent should be added to the ridge of the main block roof and the ridge of the addition roof (fig. 316). The addition of ridge vents will add approximately 10 SF of vent area to the attic.

Refer to the CSSB's website and technical publications for more information on the best practices for installing and maintaining cedar shingle roofs.

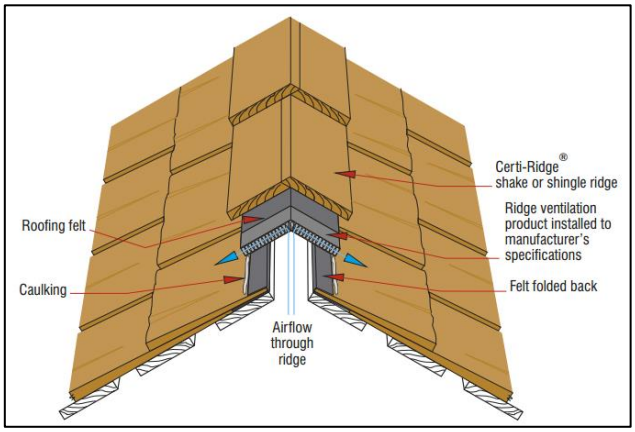


Figure 316. A ridge vent allows airflor through the ridge and is hidden by cedar shingles. Photo: CSSB "New Roof Construction Manual, p. 14.

For further information, consult NPS Preservation Brief #19 *The Repair and Replacement of Historic Wooden Shingle Roofs.*

B301001-2 South Porch Roof Finishes	POOR	SERIOUS

Timeframe: *Short-Term (3-5 years)*

Because the extant cedar-shingle roof finishes of the south porch were not installed in full accordance with Cedar Shake and Shingle Bureau (CSSB) specifications, the shingles will need to be replaced in approximately five years.

[3] Cedar Shake & Shingle Bureau. "New Roof Construction Manual." March 2015 edition. Accessed at http://www.cedarbureau.org/manuals/imperial/2015/RFI/RoofManual-0407-i.pdf on September 13, 2016.

The replacement roof covering should be completed with CSSB-certified No. 1 Blue Label clear cedar shingles. The length of the shingles should be determined from the spacing of the extant roof sheathing boards; an experienced and competent roof contractor will be able to determine the length and exposure of the shingles. Preservative-treated shingles (Certi-Last) are an option and should be considered for the coastal location. The shingles should be applied over spaced sheathing (extant in attic as sheathing boards) with no underlayment (extant underlayment should be removed and not replaced).

According to the CSSB, the following shingle application should be followed (see fig. 315):

1. Shingles must be double or tripled at all eaves.
2. Butts of first course shingles should project 1½" beyond the fascia and approximately 1" over the gable or rake end.
3. Spacing between adjacent shingles (joints) should be a minimum of ¼" and a maximum of $^{3}/_{8}$".
4. Certi-label shingles shall be laid with a side lap not less than 1½" between joints in adjacent courses, and not more than 10% shall be in direct alignment in alternate courses. Check with your local building official in your area.
5. In lesser grade shingles containing both flat and vertical grain, joints should not be aligned with centerline of heart.
6. Flat grain shingles wider than 8" should be split in two before nailing. Knots and similar defects should be treated as the edge of the shingle and the joint in the course above placed 1½" from the edge of the defect.[4]

Furthermore, ring-shank stainless steel "Type 316" nails, probably 4d, should be used. They should not be overdriven or underdriven and should not be hot-dipped or electro-galvanized.

Zinc or copper strips are helpful at the ridge cap/vent and approximately every 6'-0" down the slope to deter biological growth.

Refer to the CSSB's website and technical publications for more information on the best practices for installing and maintaining cedar shingle roofs.

For further information, consult NPS Preservation Brief #19 *The Repair and Replacement of Historic Wooden Shingle Roofs.*

G204008 Storm Water Collection & Storage (Cistern)	**POOR**	**MINOR**

Timeframe: *Immediate (1-3 years)*

The historic cistern should be returned to use as a reservoir collecting rain water from the roof of the Principal Keeper's Quarters, as it did historically. An overflow valve will likely need to be installed (on the north side) to allow water to cycle through the cistern and not become stagnant inside.

Exterior biological growth should be removed from the painted brick using a non-abrasive cleaner, such as D/2 Biological Solution (http://www.d2bio.com), a non-toxic cleaning solution.

[4] Cedar Shake & Shingle Bureau. "New Roof Construction Manual." March 2015 edition. Accessed at http://www.cedarbureau.org/manuals/imperial/2015/RFI/RoofManual-0407-i.pdf on September 13, 2016.

Any repointing repairs needed should be undertaken prior to repainting of the brick. The following information regarding treatment recommendations to repointing masonry is located in the *Historic Lighthouse Preservation Handbook* (1997):

- Remove deteriorated mortar by carefully hand raking the joints to avoid damaging the masonry.
- Duplicate the historic mortar in strength, composition, color, and texture. A mortar analysis can be performed by preservation professionals.
- Duplicate old mortar joints in width and in joint profile.
- Do not remove non-deteriorated mortar from sound joints for purely cosmetic reasons.
- Do not use electric saws and hammers rather than hand tools to remove deteriorated mortar from joints prior to repointing.
- Do not repoint with mortar of high Portland-cement content (unless it is the same content of the historic mortar). This can often create a bond that is stronger than the historic material and cause damage resulting from the different coefficient of expansion and the differing porosity of the material and the mortar.
- Do not repoint with a synthetic caulking compound.[5]

For further information, consult NPS Preservation Brief 2 *Repointing Mortar Joints in Historic Masonry Buildings.*

After repointing the exterior should be recoated using a breathable, exterior masonry paint to match the extant historic colors. Keim Mineral Coatings of America, Inc. (http://www.keim.com) offers several options for vapor-permeable paints and coatings for historic masonry structure preservation projects. The paint has an extended life. A product representative will be able to provide technical assistance on appropriate treatments and products.

Timeframe: *Long-Term (beyond 5 years)*

In order to accurately interpret the building site to its period of significance, the wood superstructure which sat atop the cistern from 1871 through at least 1949 (removed by 1957), should be reconstructed using historic photographs (fig. 317).



Figure 317. This photograph from June 1937 shows the wood superstructure over the cistern as it should be reconstructed. Photo: Cape Hatteras National Seashore Archives.

B101001-1 First-Floor Structural Floor Frame	FAIR	SERIOUS

Timeframe: *Immediate (1-3 years)*

Rusting and corroded hurricane straps should be replaced in kind with galvanized units which resist corrosion in coastal environments.

[5] National Park Service, United States Lighthouse Society. *Historic Lighthouse Preservation Handbook*. 1997. Accessed at http://www.nps.gov/martitime/nhlpa/handbook.htm. Part IV. A, p. 19.

Insulation should be installed between each of the first-floor structural floor frame joists to meet R-25 insulative requirements. Recommended insulation includes waterproof closed-cell spray polyurethane foam (SPF); R-25 would require approximately 0'-3" of SPF in each joist bay. With the use of closed-cell SPF, no separate vapor barrier is required, as the foam acts as a vapor barrier as well.

The addition of closed-cell SPF should be completed concurrently with the site building drainage, crawlspace fill, and crawlspace ventilation (see G9087 Overall Building Site Drainage and A1010 Standard Foundations for more information), prior to attempting repairs to the flooring at the first floor (see C3020 Floor Finishes for more information).

B2010-1 Brick Exterior Walls	FAIR	SERIOUS

Timeframe: *Short-Term (3-5 years)*

After the paint on the brick exterior walls has reached the end of its useful life, all paint should be removed the exterior brick surfaces in order to remove the incompatible latex paint. A paint window should be retained if ever the need arises for a paint study.

The brick should then be recoated using a breathable, exterior masonry paint to match the extant historic colors. Keim Mineral Coatings of America, Inc. (http://www.keim.com) offers several options for vapor-permeable paints and coatings for historic masonry structure preservation projects. The paint has an extended life. A product representative will be able to provide technical assistance on appropriate treatments and products.

B2010-2 Frame Exterior Walls	FAIR	SERIOUS

Timeframe: *Immediate (1-3 years)*

Small sections of the exterior siding have deteriorated and must be repaired. Any rotted locations should be repaired or replaced using consolidation and/or Dutchman repairs using the same species of wood, with the same grain orientation and similar moisture content. All deteriorated paint should be scraped, sanded, primed with oil-based primer, and painted with two coats of *premium-quality* latex paint. The paint color should match existing. The extant paint should be tested to determine if it lead-based before commencing any work.

B2010-3 Chimneys	FAIR	SERIOUS

Timeframe: *Immediate (1-3 years)*

A custom-fitted, vented, and screened non-corrosive sheet metal chimney cap (stainless steel or copper; galvanized is second preference) should be installed to the west chimney and at the north chimney if one is not present. This will prevent water from entering the chimney flue and prevents unwanted birds and rodents from nesting in chimneys. See B&B Sheet Metal

(http://www.bbsheetmetal.com/product/chimney-caps/) for similar-type products or contact a local sheet-metal fabricator to have a custom cap made.

B2010-4 Porches	FAIR	SERIOUS

Timeframe: *Immediate (1-3 years)*

Small sections of the south and east porches have deteriorated and must be repaired. Any rotted locations should be repaired or replaced using consolidation and/or Dutchman repairs using the same species of wood, with the same grain orientation and similar moisture content. All deteriorated paint should be scraped, sanded, primed with oil-based primer, and painted with two coats of *premium-quality* latex paint. The paint color should match existing. The extant paint should be tested to determine if it lead-based before commencing any work.

For further Information, consult NPS Preservation Brief #45 *Preserving Historic Wood Porches.*

B2020 Exterior Windows	FAIR	SERIOUS

Timeframe: *Immediate (1-3 years)*

All of the exterior storm windows should be individually assessed for treatment needs and then treated off-site. Treatments will generally include removal of the units; refinishing rusting hardware; scraping and sanding of the paint; performing necessary carpentry repairs; and having the sash re-glazed, primed, and painted.

Before reinstalling the exterior storm windows in their respective window openings, all deteriorated paint should be removed from the window jambs and windows, all necessary carpentry repairs completed to the jambs, the windows spot glazed in place, and the jambs and windows primed and painted. The skylight should be treated similarly.

For further information, consult NPS Preservation Brief # 9 *The Repair of Historic Wooden Windows.*

At this time, the interior storms do not need any treatment.

The south opening of double Window K in Room 202 should be designated an emergency egress window and be labelled as such. An emergency escape ladder should be installed close by. The exterior storm window, double-hung window sash, and interior storm window should receive periodic maintenance to ensure they are each operable and removable in the event of an emergency. The exterior storm window at this opening already retains hinges at the top; a mechanism, or stick, should be provided that would allow the window to be held open in the case of an emergency. Alternatively, the hinges could be installed on the side (casement) and latched on the interior; the storm windows are not historic or character-defining features and could easily be altered to accommodate such an important life-safety issue. Note: According to current code, Window N in Room 204 does not meet code for egress, is not needed for egress, and should not be

considered for alterations to meet opening requirements, as it is a historic window opening (to building's original construction in 1871).

Timeframe: *Long-Term (beyond 5 years)*

In order to accurately interpret the building to its period of significance, wood shutters, present from 1871 through at least 1932, should be installed on all exterior window openings. The louvered shutters should be composed of moisture-resistant wood, like cedar or mahogany, and should follow a pattern similar to those seen in historic photographs.

B301005 Gutters & Downspouts	FAIR	SERIOUS

Timeframe: *Immediate (1-3 years)*

Most of the extant 0'-5"-halfround gutters and 0'-3"-round downspouts are undersized for the pitch of the roofs and the rainfall intensity for the area. The components should be replaced with painted terne-coated stainless steel components which are the proper size, as follows:

Location	Current Gutter	Proposed Gutter	Current Downspout	Proposed Downspout
West Slope of Main Block	0'-5"	No change	2 @ 0'-3" to grade	2 @ 0'-4" (S to grade, N to cistern)
East Slope of Main Block north of Addition & North Slope of Addition	0'-5"	0'-6"	1 @ 0'-3" to grade	2 @ 0'-5" (E to grade, W to cistern)
East Slope of Main Block south of Addition	0'-5"	No change	1 @ 0'-3" to lower roof	No change
South Slope of Addition & Kitchen Wing	0'-5"	0'-8"	1 @ 0'-3" to grade	1 @ 0'-6" to grade
East Porch	0'-5"	No change	1 @ 0'-3" to grade	2 @ 0'-4" to grade
South Porch	N/A	0'-5"	N/A	1 @ 0'-4" to grade

Every effort should be made to utilize the cistern with downspouts located on the north side of the building.

C103098-2 Fireplaces	FAIR	SERIOUS

Timeframe: *Immediate (1-3 years)*

After chimney caps are installed, the extant fiberglass and plywood coverings at the fireplaces can be removed. To deter air from infiltrating the interior of the building rigid XPS foam can be inserted at the base of the flue. The foam should be scribed and cut to fit snugly without the need for plywood or unsightly studs holding the plywood in place.

B101001-2 South Porch Structural Floor Frame	FAIR	MINOR

Timeframe: *Immediate (1-3 years)*

Small sections of the south porch have deteriorated and must be repaired. Any rotted locations should be repaired or replaced using consolidation and/or Dutchman repairs using the same

species of wood, with the same grain orientation and similar moisture content. All deteriorated paint should be scraped, sanded, primed with oil-based primer, and painted with two coats of *premium-quality* latex paint. The paint color should match existing. The extant paint should be tested to determine if it lead-based before commencing any work.

B2020 Exterior Doors	FAIR	MINOR

Timeframe: *Immediate (1-3 years)*

All three exterior storm doors should be individually assessed for treatment needs. Treatments will generally include removal of the units; scraping and sanding of the paint; performing necessary carpentry repairs; and priming and painting. Before reinstalling the exterior doors in their respective openings, all deteriorated paint should be removed from the door jambs and sidelights, all necessary carpentry repairs completed to the jambs, the sidelights spot glazed in place, and the jambs and sidelights primed and painted.

A determination should be made whether the extant screen doors are needed. Because the building is cooled during the summer months and heated during the winter months, the screen doors may no longer be needed and should be removed in order to return the building to an historic appearance. If deemed important, the screen doors should also receive maintenance similar to what is described in the previous paragraph.

B301001-3 East Porch Roof Finishes	FAIR	MINOR

Timeframe: *Ongoing*

The service life of the standing-seam metal east porch roof can be extended several decades, or longer, if properly maintained and repaired, as needed.

Traditional field repair techniques, though not needed at this time, are thoroughly detailed by the Sheet Metal and Air Conditioning Manufacturers Association's (SMACNA) "Standard Practice in Sheet Metal Work" (http://www.smacna.org/store/product/?Product_code=1175) and illustrated in NPS Preservation Brief 4: Roofing of Historic Buildings. Future minor imperfections can be corrected via spot-brazing and patching techniques. The paint system should be renewed every 3-5 years, depending on exposure and weathering.

Good roof practice for maintenance must be observed including cleaning of gutters and downspouts, cleaning of roof surface, and maintenance of roof surface. When working on roof, all person should be restricted to rubber-soled boots or sneakers.

C201001 Interior Stair Construction	FAIR	MINOR

Timeframe: *Short-Term (3-5 years)*

The stair treads are beginning to show wear. The treads should be refinished in a compatible manner as completed in 1985-87. Records indicate the stair treads were finished with Tung oil at that time. Waterlox, a resin-modified Tung oil is compatible with the extant finish. Waterlox recommends the following steps for refinishing Tung-oil-finished surfaces:

1. Determine if the surface is oil-based by applying a drop of ammonia in an inconspicuous area. Covering the ammonia with a small cup will ensure it does not evaporate. If an oil product is extant, the ammonia will eventually wrinkle the film and turn yellow.
2. Clean the surface with TSP and water, followed with a clear-water rinse. Allow to dry for 24 hours.
3. Once surface is dry, lightly buff the surface with a maroon pad, or similar.
4. Re-coat the prepared surface with Waterlox Original Tung oil finishing system.

More information on Waterlox can be found at https://www.waterlox.com/project-help.

C3010 Wall Finishes	FAIR	MINOR

Timeframe: *Short-Term (3-5 years)*

The interior walls should be primed and repainted using a low-VOC paint.

C3030 Ceiling Finishes	FAIR	MINOR

Timeframe: *Short-Term (3-5 years)*

The interior ceilings should be primed and repainted using a low-VOC paint.

D30 HVAC	FAIR	MINOR

Timeframe: *Long-Term (beyond 5 years)*

At the end of the extant HVAC system's service life, the inefficient system should be replaced with an efficient slim-duct, high-velocity or mini-split system. Large, unsympathetic closets would not be required with these systems. Use of ground-sourced heating and cooling systems to replace fossil-fuel-based systems should be considered when extant systems need to be replaced.

For more information, refer to NPS Preservation Brief #24 *Heating, Ventilation, and Cooling Historic Buildings: Problems and Recommended Approaches.*

B101001-3 East Porch Structural Floor Frame	GOOD	MINOR

Timeframe: *Immediate (1-3 years)*

Small sections of the south porch have deteriorated and must be repaired. Any rotted locations should be repaired or replaced using consolidation and/or Dutchman repairs using the same species of wood, with the same grain orientation and similar moisture content. All deteriorated paint should be scraped, sanded, primed with oil-based primer, and painted with two coats of *premium-quality* latex paint. The paint color should match existing. The extant paint should be tested to determine if it lead-based before commencing any work.

B101001-4 Second-Floor Structural Floor Frame	GOOD	MINOR

Timeframe: *Ongoing*

The second-floor structural floor frame has no noted deficiencies. If deflection is noted at any time, further investigation into this system will be required.

B101001-5 Attic Structural Floor Frame	GOOD	MINOR

Timeframe: *Immediate (1-3 years)*

An additional layer of insulation should be added atop the extant fiberglass insulation to meet current R-value requirements. The additional fiberglass insulation should be laid perpendicular to the extant insulation and be rated approximately R-13.

Timeframe: *Ongoing*

The second-floor structural floor frame has no noted deficiencies. If deflection is noted at any time, further investigation into this system will be required.

B101002 Structural Interior Walls	GOOD	MINOR

Timeframe: *Ongoing*

The structural interior walls have no noted deficiencies. If deflection is noted at any time, further investigation into this system will be required.

B1020-1 1871 Main Block Structural Roof Frame	GOOD	MINOR
B1020-2 South & East Porch Structural Roof Frames	GOOD	MINOR
B1020-3 1927 Addition Structural Roof Frame	GOOD	MINOR

Timeframe: *Ongoing*

The structural roof frames of the 1871 main block, south and east porches, and 1927 addition have no noted deficiencies. If deflection is noted at any time, further investigation into these systems will be required.

B301004-1 Valley Flashing	GOOD	MINOR

Timeframe: *Short-Term (3-5 years)*

The valley flashing appears to have been installed adequately. When the roof coverings are replaced, the valley flashing should be assessed to ensure it was installed adequately.

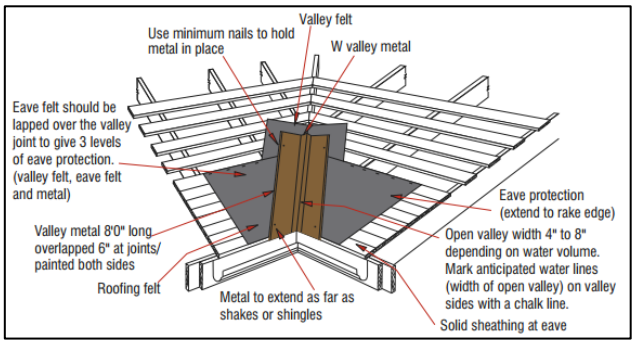


Figure 318. Roof valley flashing details as specified by CSSB. Photo: CSSB "New Roof Construction Manual, p. 9.

The following recommendations, from the CSSB, should be utilized at all valleys (at roofs with slopes of about 12:12) (fig. 318):

> Valley flashing should extend not less than 8" on each side of the valley centerline. . . . Valley flashing should be underplayed with No. 30 ASTM D226 Type II or No. 30 ASTM D4869 Type IV roofing felt.
>
> Different flashing metals are available in different areas depending on climatic variations. It is good practice to use metals that have proven their reliability under the specific conditions to be encountered. It is important that metal flashing have the same longevity as Western Red Cedar.[6]

Refer to details in CSSB's New Roof Construction Manual for more details.

B301004-2 Chimney Flashing	GOOD	MINOR

Timeframe: *Short-Term (3-5 years)*

The chimney flashing appears to have been installed adequately. When the roof coverings are replaced, the chimney flashing should be assessed to ensure it was installed adequately.

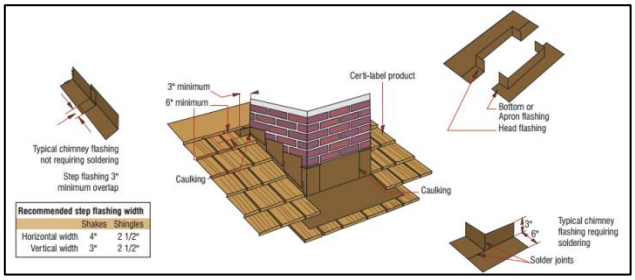


Figure 319. Typical chimney flashing details, as specified by CSSB. Details for roof-side wall flashing should be similar. Photo: CSSB "New Roof Construction Manual, p. 11.

The following recommendations, from CSSB, should be utilized at all chimneys (fig. 319):

> Step flashing should extend under the [certified shingles], up the vertical surface, (one flashing installed on each course concealed under the covering course) and should be covered by a second layer of flashing (counter-flashing)."
>
> Different flashing metals are available in different areas depending on climatic variations. It is good practice to use metals that have proven their reliability under the specific conditions to be encountered. It is important that metal flashing have the same longevity as Western Red Cedar.[7]

Refer to details in CSSB's New Roof Construction Manual for more details.

[6] Cedar Shake & Shingle Bureau. "New Roof Construction Manual."
[7] Cedar Shake & Shingle Bureau. "New Roof Construction Manual."

B301004-3 Roof-Side Wall Flashing	GOOD	MINOR

Timeframe: *Short-Term (3-5 years)*

The roof-side wall flashing appears to have been installed adequately. When the roof coverings are replaced, the roof-side wall flashing should be assessed to ensure it was installed adequately.

The following recommendations, from CSSB, should be utilized at all roof-side wall junctions at the Principal Keeper's Quarters roofs:

> Step flashing should extend under the [certified shingles], up the vertical surface, (one flashing installed on each course concealed under the covering course) and should be covered by a second layer of flashing (counter-flashing)."
>
> Different flashing metals are available in different areas depending on climatic variations. It is good practice to use metals that have proven their reliability under the specific conditions to be encountered. It is important that metal flashing have the same longevity as Western Red Cedar.[8]

Refer to details in CSSB's New Roof Construction Manual for more details.

B301004-4 Roof Transition Flashing	GOOD	MINOR

Timeframe: *Short-Term (3-5 years)*

The roof transition flashing between the upper, steep slope and lower, shallow slope of the addition appears to have been installed adequately. When the roof coverings are replaced, the valley flashing should be assessed to ensure it was installed adequately.

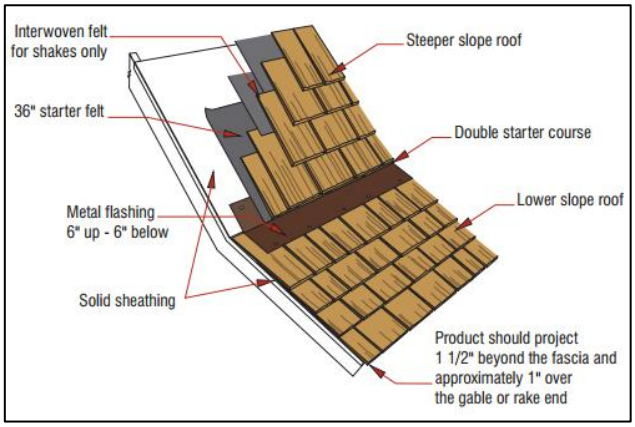


Figure 320. Roof transition flashing details as specified by CSSB. Photo: CSSB "New Roof Construction Manual, p. 8.

The following recommendations, from CSSB, should be utilized at the roof transition at the Principal Keeper's Quarters (fig. 320):

> Roof transitions require appropriate flashing, felt, and product application. . . . Solid sheathing is required above and below the change in slope, metal flashing is required across the change in slope, and a 36" strip of starter felt is required on the upper slope, installed in the same fashion as at the eaves.[9]

Refer to details in CSSB's New Roof Construction Manual for more details.

[8] Cedar Shake & Shingle Bureau. "New Roof Construction Manual."
[9] Cedar Shake & Shingle Bureau. "New Roof Construction Manual."

B301004-5 Skylight Flashing	GOOD	MINOR

Timeframe: *Short-Term (3-5 years)*

The skylight flashing appears to have been installed adequately. When the roof coverings are replaced, the chimney flashing should be assessed to ensure it was installed adequately.

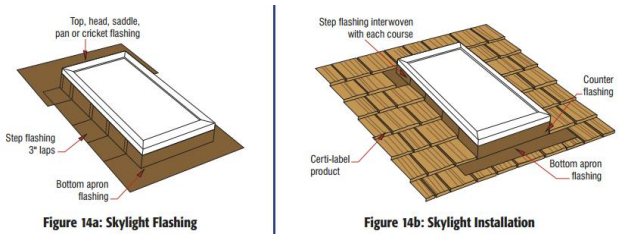


Figure 321. Typical skylight flashing and installation of abutting shingles, as specified by CSSB. Photo: CSSB "New Roof Construction Manual, p. 11.

The following recommendations, from CSSB, should be utilized at the Principal Keeper's Quarters skylight (fig. 321):

> Step flashing should extend under the [certified shingles], up the vertical surface, (one flashing installed on each course concealed under the covering course) and should be covered by a second layer of flashing (counter-flashing)."
>
> Different flashing metals are available in different areas depending on climatic variations. It is good practice to use metals that have proven their reliability under the specific conditions to be encountered. It is important that metal flashing have the same longevity as Western Red Cedar.[10]

Refer to details in CSSB's New Roof Construction Manual for more details.

C1020 Interior Doors	GOOD	MINOR

No work is required at this time.

C103010-1 Historic Closets	GOOD	MINOR

No work is required at this time.

C103010-2 Modern Closets	GOOD	MINOR

Timeframe: *Long-Term (beyond 5 years)*

When the extant HVAC system is replaced with a more sympathetic and efficient system (see D30 HVAC for more information), the modern closets will no longer be needed and should be removed from the building.

C103098-1 Trim	GOOD	MINOR

No work is required at this time.

[10] Cedar Shake & Shingle Bureau. "New Roof Construction Manual."

D4010 Sprinklers	GOOD	MINOR

Timeframe: *Immediate (1-3 years)*

Precautions should be taken to eliminate the possibility of sprinkler system freezing in the attic of the Principal Keeper's Quarters. This issue is particularly important in climates not normally associated with cold weather. The park should be alert to unusual climatic changes that may cause freezing and should be prepared to take protective measures as if in a cold climate. The following should be considered in advance of the cold season:

- During severe weather conditions, the piping may need to be drained to eliminate the possibility of ice plugs obstructing the piping or damaging the fittings and sprinkler heads.
- Provide adequate heating capacity to prevent freezing.
- Pay attention to locations like attics to ensure adequate heat and air flow are reaching these areas.
- Search for isolated drafts or cold air leaks into little frequented areas or spaces where there are sprinkler pipes.
- Maintain extra heat during periods of extreme cold.
- Install pipe insulation on sprinkler piping in unheated areas taking care not to block the sprinkler heads.[11]

Otherwise, the sprinkler system should continue to receive annual inspections.

D403001 Fire Extinguishers	GOOD	MINOR

Timeframe: *Ongoing*

The fire extinguishers should continue to receive annual inspections.

D5010 Electrical Service & Distribution D5020 Lighting & Branch Wiring	GOOD	MINOR

No work is required at this time.

D503001 Fire Alarm Systems	GOOD	MINOR

Timeframe: *Ongoing*

The fire alarm system should continue to receive periodic inspections.

[11] CNA. "Polar Prep: The sprinkler system freeze-up prevention guide." Accessed at https://www.cna.com/web/wcm/connect/d139531d-97f9-4598-8025-220dc7b3dfc9/RC_Property_Bul_PreventingSprinklerSystemFreezeUps_CNA.pdf?MOD=AJPERES on December 13, 2016.

D503008 Security Alarm Systems	GOOD	MINOR

Timeframe: *Ongoing*

The security alarm system should continue to receive periodic inspections.

G203003 Paved Surfaces	GOOD	MINOR

Timeframe: *Immediate (1-3 years)*

The brick-paved ramped walkway should be reassessed for compatibility with the historic structure. While an ABAAS-compliant walkway is necessary for the building, the ramp is creating negative drainage at the south elevation and creating moisture-related issues at the south porch.

D20 Plumbing	N/A	N/A

No work is required at this time.

G204001 Fencing & Gates	N/A	N/A

Timeframe: *Long-Term (beyond 5 years)*

A fence surrounding the Principal Keeper's Quarters site should be reconstructed to match that which was seen in the 1932 photographs of the Light Station. The *Cultural Landscape Report* states: "Restore the historic concrete post and wire fence that surrounded the principal and double keepers' quarters at the end of the historic period. This is consistent with the period of significance in that a rectangular fence surrounded the quarters from 1888 to ca. 1950." A site plan and fence detail are provided in the CLR (fig. 322).

As a note, HPTC believes the posts could also have been composed of painted wood.

Refer to NPS Preservation Brief #36 *Protecting Cultural Landscapes: Planning, Treatment and Management of Historic Landscapes* on the importance of these features for interpretation of the site.

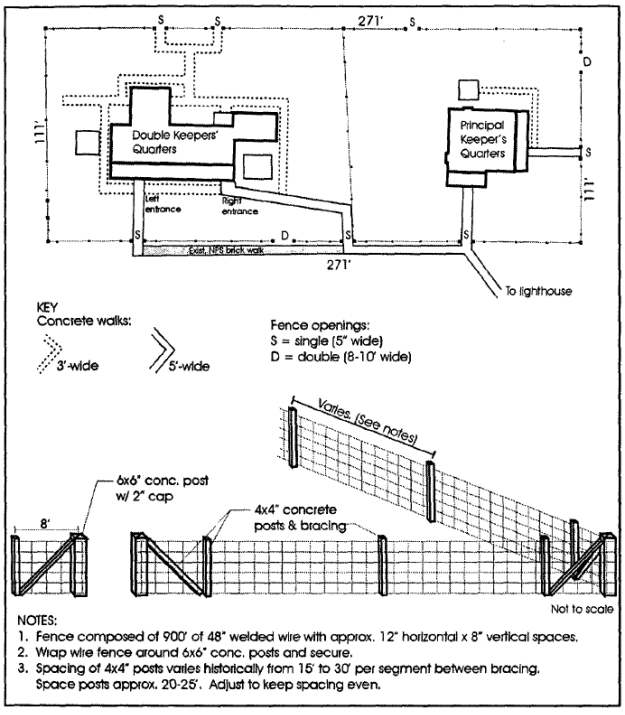


Figure 322. Details for the fence around both keepers' quarters. Drawing: Cultural Landscape Report, p. 46.

G204099 Miscellaneous Structures	N/A	N/A

Timeframe: *Long-Term (beyond 5 years)*

The miscellaneous accessory structures (two outbuildings and a privy) which were extant at the Principal Keeper's Quarters in the 1932 photograph should be reconstructed for interpretive purposes (fig. 323). Consultation of additional photographs will easily provide details to accurately reconstruct these buildings.

Refer to NPS Preservation Brief #36 *Protecting Cultural Landscapes: Planning, Treatment and Management of Historic Landscapes* on the importance of these features for interpretation of the site.



Figure 323. Historic outbuildings can be seen in this 1932 photograph. A privy also stood on site, but is obscured by the other buildings. Photo: Cape Hatteras National Seashore Archives. Cropped by author.

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Effects of Recommended Treatments

The potential effects of the recommended treatments for preservation are outlined in Table 5. The table is ordered by prescribed timeframe: emergency first, immediate second, short-term third, and long-term fourth. Effects to historic fabric, recommended mitigating measures, and beneficial outcomes are examined. Treatment recommendations which include periodic housekeeping and maintenance, reassessment, or are in good and minor conditions, are not discussed.

Table 5. **Hatteras Light Station Principal Keeper's Quarters Recommended Treatment Effects**

Recommended Treatment	Potential Effect on Historic Fabric	Mitigating Measures	Beneficial Effects
Emergency (within 1 year)			
Install lightning protection system.	No adverse effect.	N/A	Protect building from lightning strikes.
Install five new vents in foundation walls.	Adverse effect: Removal of small portion of historic brick foundation wall.	Ventilation will create a healthier environment within the crawlspace; vents will be installed under porches so they are not seen from the exterior of the building.	Rectify humidity issues within the building.
Correct negative drainage by regrading around exterior perimeter.	Adverse effect: Regrading could cause grade to slightly alter from historic level.	Removal of detrimental drainage issue around/under building.	Allow water to flow away from building, not to and under it.
Temporarily remove finish floor boards on first floor where buckling.	No effect. Floor boards are not historic.	N/A	Temporary safety measure. Will be reinstalled after above measures are taken.
Insulate sprinkler pipes in attic.	No effect.	N/A	Eliminate threat of freezing water within pipes and damage to historic fabric.
Immediate (1-3 years)			
Install fill on the interior of crawlspace.	No adverse effect.	Removal of detrimental drainage issue around/under building.	Allow water to flow away from building, not to and under it.
Remove insulation covering extant soffit vents; install interior rafter baffles; reinstall insulation.	No adverse effect.	N/A	Lengthen lifespan of roof shingles.
Return cistern to operational as water-collecting reservoir.	No adverse effect.	N/A	Reinstate the use of a historic cultural landscape feature.
Clean, repoint, and repaint cistern.	No adverse effect.	N/A	Preservation maintenance.
Replacement of corroded hurricane straps	No adverse effect.	N/A	Preservation maintenance.

(Table 5 continued)

Install insulation and vapor barrier between first-floor structural floor frame.	No adverse effect.	N/A	Rectify humidity issues within building. Meet current energy code.
Repairs to and repainting of wood siding and trim of addition.	No adverse effect.	N/A	Preservation maintenance.
Install chimney caps.	Adverse effect: installation of non-historic feature.	Minimal caps will only be seen from the lighthouse.	Lengthen lifespan of chimneys. Deterrent from nesting insects, birds, and rodents, and intruding rain water.
Repairs and repainting of south and east porches.	No adverse effect.	N/A	Preservation maintenance.
Repairs and repainting of exterior storm windows, jambs, and window sash, including skylight.	No adverse effect.	N/A	Preservation maintenance.
Install properly sized gutters and downspouts of same material.	No adverse effect.	N/A	Rectify site drainage issues.
Repairs and repainting of exterior doors, jambs, and sidelights.	No adverse effect.	N/A	Preservation maintenance.
Install additional insulation layer in attic.	No adverse effect.	N/A	Meet current energy code.
Short-Term (3-5 years)			
Replace extant cedar shingles in-kind (main roof and south porch), using traditional techniques. Correct deficient flashing details.	No adverse effect.	N/A	Lengthen lifespan of roof shingles. Rectify deficient conditions.
Install ridge vent at all roof ridges.	Adverse effect: removal of small portion of historic skip sheathing boards along ridge.	Ventilation will create healthier environment within the attic. Undetectable from exterior.	Lengthen lifespan of roof shingles.
Repaint exterior brick walls with masonry mineral paint.	No adverse effect.	N/A	Allow masonry to breath without changing the look of the building's exterior.
Refinish interior stair treads with Waterlox.	No adverse effect.	N/A	Preservation maintenance.
Repaint interior walls and ceilings.	No adverse effect.	N/A	Preservation maintenance.
Long-Term (beyond 5 years)			
Reconstruct wood superstructure atop cistern.	No adverse effect.	N/A	Reconstruction of a missing cultural landscape feature.
Install reproduction wood shutters at all window openings.	No adverse effect.	N/A	Reinstallation of missing character-defining features.

(Table 5 continued)

Replace HVAC system with energy-efficient, sympathetic system. Remove modern HVAC closets.	No adverse effect.	N/A	Rectify unsympathetic changes. Remove unsympathetic features.
Reconstruct historic fencing and gates.	No adverse effect.	N/A	Reinstallation of missing cultural landscape features.
Reconstruct two historic outbuildings and historic privy.	No adverse effect.	N/A	Reinstallation of missing cultural landscape features.
End of Table 5.			

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As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. Administration.

NPS Document # 603 133106 2016


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