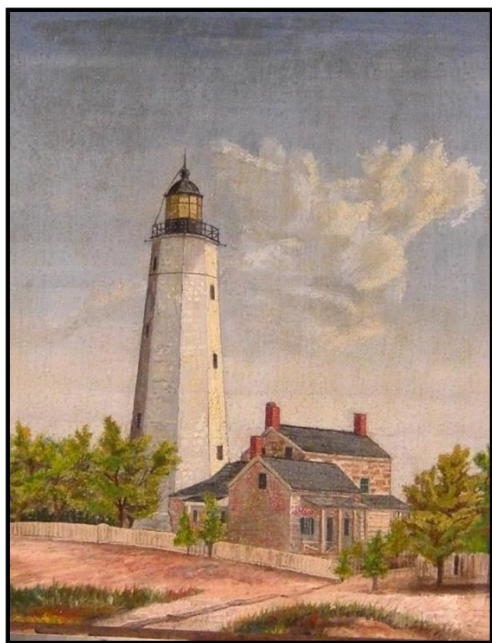


**SANDY HOOK LIGHTHOUSE
GATEWAY NATIONAL RECREATION AREA
MIDDLETOWN, MONMOUTH COUNTY, NJ
MONMOUTH UNIVERSITY
ARCHAEOLOGICAL FIELD SCHOOL
SUMMER 2016**



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Report Certification

The archeological report Sandy Hook Lighthouse, Gateway National Recreation Area, Middletown, Monmouth County, NJ, Monmouth University, Archeological Field School Summer 2016 by Richard F. Veit, Adam Heinrich, Sean McHugh, and Kristen Norbut, has been reviewed against the criteria contained in 43 CFR Part 7.18(a)(1) and upon recommendation of the Park Archeological Advisor has been classified as "Available (deletions)."



Superintendent

9/4/19

Date

Classification Key Words:

"Available" - Making the report available to the public meets the criteria of 43 CFR 7.18 (a)(1).

"Available (deletions)" - Making the report available with selected information on site locations and/or site characteristics deleted meets the criteria of 43 CFR 7.18(a) (1). A list of pages, maps, paragraphs, etc. that must be deleted from each report in this category is attached.

"Not Available" - Making the report available does not meet the criteria of 43 CFR 7.18 (a) (1).

Report Deletions

Gateway National Recreation Area would like to share this report with the general public and online databases. However, there are some text that contain sensitive archeological information that have been redacted for its publication. These redactions were agreed up after consultation with the primary author, Dr. Richard Veit, as well as with the Northeast Regional Archeology Program, the Northeast Regional ARPA Coordinator, New Jersey State Historic Preservation Office, Delaware Nation, and Delaware Tribe.

The following text, tables, and maps were redacted:

- Section: 3.1 Previously Identified Archaeological Sites, page 3-1 to 3-2.
- Section: 3.2 Previously Identified Cultural Resources, page 3-2.
- Table 3.1: List of Early Historic Sites on Sandy Hook, page 3-2 to 3-3.
- Section 3.3 Previous Cultural Resource Surveys, page 3-3 to 3-4, 3-13.
- Table 3.2 Cultural Resources Surveys conducted within one-mile of the study area, Page 3-5 to 3-13.
- Section 4.1 Regional Prehistory page, 4-2 to 4-3.
- Figure 5.4 Shovel test pit locations at the Sandy Hook Lighthouse, page 5-9.
- Figure 5.5 Shovel test pit locations at the Sandy Hook Lighthouse with shading representing artifact densities, page 5-10.
- Figure 5.6 The distribution of 18th-century artifacts by the Sandy Hook Lighthouse, page 5-11.
- Figure 5.7 Shovel tests containing 19th-century artifacts, page 5-12.
- Figure 5.12. Excavation unit locations, page 5-18.
- Figure 6.1 Archaeological map showing disturbed and intact deposits, page 6-4.
- Figure 6.3 Interpretive drawing showing the features excavated, page 6-8.
- Figure 6.4 Plan view showing the relationship to the 1826 map to the excavation units, page 6-9.

Minimal locational information was also redacted from the following sections:

- Section 5.4 Shovel Testing, page 5-6 to 5-9.
- Section 5 Excavation Unit 1, page 5-19.
- Section 5 Excavation Unit 2, page 5-30 to 5-31, 5-34.
- Section 5 Excavation Unit 3, page 5-40.
- Section 5 Excavation Unit 4, page 5-49.
- Section 5 Excavation Unit 5, page 5-55.
- Section 5 Excavation Unit 6, page 5-62.
- Section 6.1 Interpretations and Conclusions, page 6-2 to 6-21.

MANAGEMENT SUMMARY

The following report presents the results of an archaeological field school conducted at the Sandy Hook Lighthouse in Gateway National Recreation Area (Middletown Township, Monmouth County, New Jersey). This investigation was performed at the request of the United States Department of the Interior, National Park Service. It was conducted under agreement with the National Park Service (Cooperative Agreement# P16AC00022 and Scientific Research Permit: GATE-2016-SCI-0020). The project focused on an approximately three-acre site around the Sandy Hook Lighthouse. The Sandy Hook Lighthouse is a National Historic Landmark and is listed on the National and State Registers of Historic Places. Information collected during this study will help meet the Park's responsibility to inventory cultural resources under Section 110 of the National Historic Preservation Act and will aid in assessing impacts to identified resources under Section 106. The project was also designed to address public interests by involving students in a historic preservation program and motivating them to become involved in cultural resources protection and study in a real-world environment. Furthermore, the project served to increase public awareness, knowledge, and support for historic preservation and stewardship of the nation's cultural and historical heritage through public outreach programs using both digital and print media, and volunteer opportunities. Eleven graduate students, 10 undergraduate students, and 75 volunteers participated in the project.

Fifty-three shovel test pits and six excavation units, two three-foot squares, three five-foot squares, and one 2.5-foot by 10-foot trench were excavated. Twenty-one features were identified, and 4,516 artifacts were recovered. Testing revealed intact archaeological deposits relating to a lighthouse keeper's dwelling, a 19th-century outbuilding, two brick paths, and a rich 19th-century midden deposit reflecting the historic occupation of the site. Small quantities of earlier 18th-century material, and artifacts likely associated with the military occupation of the site during the American Revolution were also unearthed. These included gun parts, musket balls, and fragments of grape and canister shot. Although some areas of the knoll where the lighthouse stands have been impacted by recent utility work and site improvements, much of the site is intact and some stratified deposits are present. Efforts should be made to preserve this site for future study.

Based on the results of the 2016 field school and previous archaeological excavations at Sandy Hook Lighthouse it is evident that the site contains significant cultural features that provide new information

about the historic occupation of Sandy Hook, most notably the location of the 19th-century lighthouse keeper's houses, and the site's role during the American Revolution. Although testing was limited, the presence of intact cultural features associated with lighthouse keeper's dwellings indicates that the site is potentially significant under Criterion D of the National Register of Historic Places. Any future ground disturbance in this area should be preceded by additional archaeological research.

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CHAPTER 1: INTRODUCTION

1.1: Project Description

The following report presents the results of an archaeological field school conducted at the Sandy Hook Lighthouse in Gateway National Recreation Area (Middletown Township, Monmouth County, New Jersey) (Figure 1.1). It was performed at the request of the United States Department of the Interior, National Park Service. It was conducted under agreement with the National Park Service (Cooperative Agreement# P16AC00022 and Scientific Research Permit: GATE-2016-SCI-0020). The project focused on an approximately three-acre site around the Sandy Hook Lighthouse (Figures 1.1). Information collected will help meet Park responsibilities to inventory cultural resources under Section 110 of the National Historic Preservation Act and will aid in assessing impacts to identified resources under Section 106. The project was also designed to address public interests by involving students in historic preservation programs and motivating them to become involved in cultural resources protection in a real-world environment. Furthermore, the project also increased public awareness, knowledge, and support for historic preservation and stewardship of the nation's cultural and historical heritage through public outreach programs using both digital and print media, and volunteer opportunities.

The project was directed by Richard Veit, Ph.D., RPA, Adam Heinrich, Ph.D., RPA and Sean McHugh, M.A., RPA., with assistance from crew chiefs: Dorothy Both, Stephanie Codling, Nicky Kelly, Eric Lauenstein, Matthew LoBiondo, Andrew Martin, and Kristen Norbut. Twenty-one Monmouth University students (11 graduate and 10 undergraduate) and approximately 75 volunteers participated in the project. All fieldwork was supervised by archaeologists who fit appropriate Federal and State guidelines (36 CFR 61).

Fieldwork took place between May 28th and June 26th, 2016. A pro-bono ground-penetrating radar survey was conducted by Paul McLeod in May of 2016 (Appendix A). Six excavation units (EUs) and 53 shovel test pits (STPs) were excavated in order to identify archaeological deposits within the study area. Three EUs were five-foot square, two were three-foot square, and one was 2.5-foot-by-10-foot trench. Twenty-one (21) historic features were identified. Particular attention was focused on areas likely to contain artifacts dating from the Revolutionary War occupation of Sandy Hook



Figure 1.1: Project area location, topographic map, National Geographic Society, 2013.

1.2 Research Goals

The research goals for the project were as follows:

- To identify archaeological resources present in the area of the historic lighthouse, including, if possible deposits associated with the lighthouse keepers' dwellings that stood on the site, and the Revolutionary War era Refugee Town that was established in the vicinity of the lighthouse.
- To better characterize the age of the deposits present on the site from the prehistoric period through to the present.
- To better characterize the nature and extent of the historic deposits identified by previous studies on the property and identify features worthy of further study.
- To sample deposits associated with the Revolutionary War occupation of the site identified in previous utility work at the site.

Portions of the lighthouse tract have been the subject of previous studies (see Linck, Bianchi, and Pendery 2009). These studies have identified a range of historic deposits dating from the 18th through 20th centuries, as well as a small quantity of prehistoric material. These earlier studies were performed prior to various site improvement, with the most common being utility installations. No previous researcher attempted to look at the lighthouse property in a comprehensive manner. While some areas of the property have undergone considerable study, others remain essentially unstudied. This project aimed to correct and fill-in these gaps in our understanding of the site's history and archaeology.

The archaeological survey consisted of background research followed by subsurface testing throughout the approximately three-acre project area. Subsurface testing included the excavation of fifty-three (53) STPs. Thirty-five (35) STPs were excavated on a 50-foot interval grid throughout the project area. Within the 50-foot interval grid at the top of the hill around the lighthouse structure, 18 STPs were excavated on a tighter interval grid in order to more intensively investigate areas where features and dense artifacts deposits were identified in the 50-foot interval grid. Shovel test pit locations were mapped using Global Positioning System technology, measuring tapes, and relative distances to surveyed landmarks. Shovel test pits measured approximately 1.5 feet in diameter and reached an average depth of 3.85 feet below the ground surface. Archaeologists excavated STPs with round-nosed shovels. Individual soil horizons were hand excavated separately and screened through one-quarter-inch wire mesh to facilitate artifact recovery. A summary of the STPs is presented in

Appendix A. The placement of excavation units was based on the results of the shovel testing and data from previous studies of the property, as well as consultation with NPS archaeologists. Excavation units were located at STPs that were noted to contain features or notable artifact deposits, and one EU was located at the proposed location for an improved drainage feature adjacent to the lighthouse. The EUs were excavated by natural strata with flat-bladed shovels and trowels. All soil was screened through one-quarter-inch mesh fabric in order to facilitate the recovery of artifacts.

Field notes were taken on standard Monmouth University field forms. A feature list was compiled. Excavation units containing features were drawn in plan view. All units had stratigraphic profiles prepared and were photographed with scales and north arrows in place prior to backfilling. General field photographs were taken throughout the project. Artifacts were bagged in acid-free polyethylene bags. All historic and prehistoric artifacts noted were received, except brick fragments, mortar fragments, and broken stone fragments which were not retained. Bags were logged by context in the field. Recovered cultural material was processed and cataloged at an off-site laboratory. Historic artifacts are listed in the catalog presented in Appendix B.

The New Jersey Historic Preservation Office (HPO) reviewed the application for project review and authorization under the New Jersey Register of Historic Places Act and determined that the project did not constitute an encroachment pursuant to the New Jersey Register of Historic Places Act, Laws of 1970, Chapter 268, C. 13.1B-15.131. The National Park Service also issued a Scientific Research Permit GATE-2016-SCI-0020 permitting archaeological fieldwork in the park.

This survey was conducted in accordance with the *Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation*. The archaeological investigation was performed in accordance with the HPO's Guidelines for archaeological reporting (1994/2003) and surveys (2000). All field notes and photographs for this project are on file at the Monmouth University, Department of History and Anthropology, West Long Branch, New Jersey as well as on file with Gateway National Recreation Area.

1.3 National Register of Historic Places Criteria

The primary goal of this investigation was to identify archaeological resources at the lighthouse on Sandy Hook Lighthouse in Gateway National Recreation Area and assess whether such resources

were potentially significant in terms of the New Jersey Register of Historic Places' and the National Register of Historic Places' criteria for historic and/or archaeological significance. It should be noted that the Sandy Hook Lighthouse was designated a National Historic Landmark on January 29, 1964 (Greenwood 1964). It is also listed on both the National Register and the New Jersey State Register of Historic Places as site #66000468

<https://nationalregisterofhistoricplaces.com/NJ/monmouth/state2.html>).

It is the oldest operating lighthouse in the United States. At the time of the National Register nomination, the former lightkeeper's house was vacant; it had previously served as officers' quarters. It now functions as a visitor's center and gift shop. The lighthouse is situated within the larger Fort Hancock and the Sandy Hook Proving Ground Historic District (Butowsky 1984).

The New Jersey Register of Historic Places is the official list of the state's historic architectural and archaeological resources. Patterned after the National Register of Historic Places and established by the National Park Service, the New Jersey Register of Historic Places shares the same criteria for eligibility, nomination, and review process. Unlike the National Register, the New Jersey Register affords a degree of protection from state, county, or municipal undertakings to New Jersey Register-listed properties. Private owner objection does not prevent designation of properties, and only listed properties are afforded official protection.

Significant historic properties include districts, structures, objects, or sites that are at least 50 years old and that meet at least one National Register criterion. Criteria used in the evaluation process are specified in the Code of Federal Regulations, Title 36, Part 60, of the National Register of Historic Places (36 CFR 60.4) and reiterated in the Procedures Concerning the New Jersey Register of Historic Places (N.J.A.C. 7:4-2.3). To be eligible for inclusion on the New Jersey Register of Historic Places and/or the National Register of Historic Places, a historic property must possess at least one of the following criteria:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- a) That are associated with events that have made a significant contribution to the broad patterns of our history; or
- b) That are associated with the lives of persons significant in our past; or

- c) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- d) That have yielded, or may be likely to yield, information important in prehistory or history.

There are several criteria considerations. Under ordinary circumstances, cemeteries, birthplaces, or graves of historical figures, properties owned by religious institutions or used for religious purposes, structures that have been moved from their original location, reconstructed historic buildings, properties primarily commemorative in nature, and properties that have achieved significance within the past 50 years shall not be considered eligible for the New Jersey Register of Historic Places or the National Register of Historic Places. However, such properties will qualify if they are integral parts of districts that do meet the criteria or if they fall within the following categories:

- 1) A religious property deriving primary significance from architectural or artistic distinction or historical importance; or
- 2) A building or structure removed from its original location, but which is the surviving structure most importantly associated with a historic person or event; or
- 3) A birthplace or grave of a historical figure of outstanding importance if there is no appropriate site or building directly associated with his or her productive life; or
- 4) A cemetery which derives its primary significance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events; or
- 5) A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived; or
- 6) A property primarily commemorative in intent if design, age, tradition, or symbolic value has vested it with its own historical significance; or
- 7) A property achieving significance within the past 50 years if it is of exceptional importance (36 CRF 60.4).

This investigation at the Sandy Hook Lighthouse identified archaeological deposits associated with 18th-19th century lighthouse keepers' houses and the historic occupation of the site. Based on the

presence of these deposits, the site is eligible for the National Register under Criterion D, and any site improvements or ground disturbance on the property should be accompanied by archaeological monitoring.

CHAPTER 2: PHYSICAL SETTING AND NATURAL ENVIRONMENT

The Sandy Hook peninsula is located within New Jersey's Outer Coastal Plain physiographic province (Figure 2.1). The Outer and Inner Coastal Plain form an area known as the Coastal Plain. It is the largest physiographic province in the state, totaling 4,500 square miles, or about three-fifths of the state. The Outer Coastal Plain consists of more recent deposits relative to the Inner Coastal Plain. The sandy soils that form the peninsula are not particularly conducive for agriculture. The two provinces are geologically similar but differ in outcropping surface materials. The Outer Coastal Plain has much less clay at the surface and much of it is composed of porous sand. It is a relatively low-lying province, with elevations typically below 100 feet above sea level, although there are areas where elevations reach up to 400 feet (Wacker 1975:2).

New Jersey's Coastal Plain covers much of the southern portion of the state. It consists primarily of unconsolidated clays, marls, silts, and sands. Surficial deposits are mapped as beach deposits and are primarily Kirkwood and Cohansey Sands (Wolfe 1977:277-278). The Sandy Hook peninsula is located in Middletown Township in northeastern Monmouth County. It is bounded on the east by the Atlantic Ocean and on the west by Sandy Hook Bay or, more broadly, Raritan Bay. It extends north of the mainland approximately 5.2 miles or 8.4 km. As noted by Linck, Bianchi, and Pendery, "Sandy Hook is a complex recurve spit, which had accreted as a result of northward littoral drift of sediment derived from shore faces to the south" (Krupa 1981:1 in Linck, Bianchi, and Pendery 2009).

One soil type is represented within the study area: Udorthents sand, 0-8% slopes (UdaB and UdauB) (Figure 2.2; Table 2.1).

Table 2.1: Summary of soils mapped within the study area.

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
UdaB	Udorthents, 0 to 8 percent slopes	1.8	98.9%
UdauB	Udorthents-Urban land complex, 0 to 8 percent slopes	0.0	1.1%
Totals for Area of Interest		1.8	100.0%

UdaB - Udorthents, 0 to 8 percent slopes. Situated on low hills and is well drained.

Parent material: Fill and/or disturbed original soil material

Typical profile:

A - 0 to 12 inches: loam

C - 12 to 72 inches: loamy sand

UdauB - Udorthents-Urban land complex, 0 to 8 percent slopes.

Sandy Hook has an interesting geological history. According to Wolfe (1977:310, 321), at the height of the Wisconsinian glaciation, sea level was roughly 420 feet or 128 meters lower than today and “the submerged portion of the New Jersey Coastal Plain” was exposed for approximately 100 miles (Wolfe 1977:310, 321). This area was never glaciated, but instead appears to have been a treeless tundra, subjected to permafrost. Linck, Bianchi, and Pendery note that (2009:10), “pollen samples suggest some herbaceous vegetation between 17,000 and 13,000 B.P. These plants would have supported Pleistocene megafauna and likely the Paleo-Indians who co-existed with them.”

Rising sea levels between 14,000 and 7,000 years ago would have inundated much of this area, and by approximately 5,000 B.P. the modern coastline had been established. It is worth noting that the sea level is continuing to rise and has been for the last five hundred years (Merwin 2002).

An area just east of Sandy Hook was exposed during this period and is sometimes referred to as the “Old Hook.” This area extended well into Raritan and Sandy Hook bays and would have been visible at roughly 3,000 B.P., or the start of the Woodland Period (Linck, Bianchi, and Pendery 2009:11).

Sandy Hook itself has grown considerably over the past 500 years, with sand accreting at its northern end, contributing to the growth of the Hook. As noted by Linck, Bianchi, and Pendery (2009:13):

It is a unique, dynamic environment with a diversity of natural resources. The landform is also a fragile environment, as is witnessed by the rapid erosion of extensive beach tracts on both the ocean and bay sides, and the loss of vegetation due to lumbering and natural means, and most dramatically, the rapid opening and closing of inlets, which in recent times has severed the connection to the barrier beach during violent storms and, in earlier times, the mainland.

Today, the Sandy Hook peninsula is located in an area with a temperate coastal climate. Temperatures vary from an average of 34.5 F in the winter to a summer average of 74.6F. Precipitation averages 42.04 inches per year (Robichaud and Buell 1973:56-61). The Navesink and Shrewsbury Rivers drain into Sandy Hook Bay. Vegetation includes marsh grasses, while forest cover includes red maple, cedar, black gum, American holly, blueberry, huckleberry, laurel and azalea (Robichaud and Buell 1973:156-158). Historically, stands of cedar were an important resource on Sandy Hook as were beach plums, which were harvested by Native Americans as well as Euroamerican settlers.

Faunal resources include white-tailed deer, muskrat, skunk, possum, shellfish, clams, oysters and other species are present. Sandy Hook is located within the Atlantic Flyway and is visited by migratory ducks, geese, as well as other bird species.

The tremendous expansion of the Sandy Hook peninsula in the historic period may be due, at least in part, to erosion of soils from the nearby mainland due to forest clearing and farming (Linck, Bianchi, and Pendergast 2009:13).

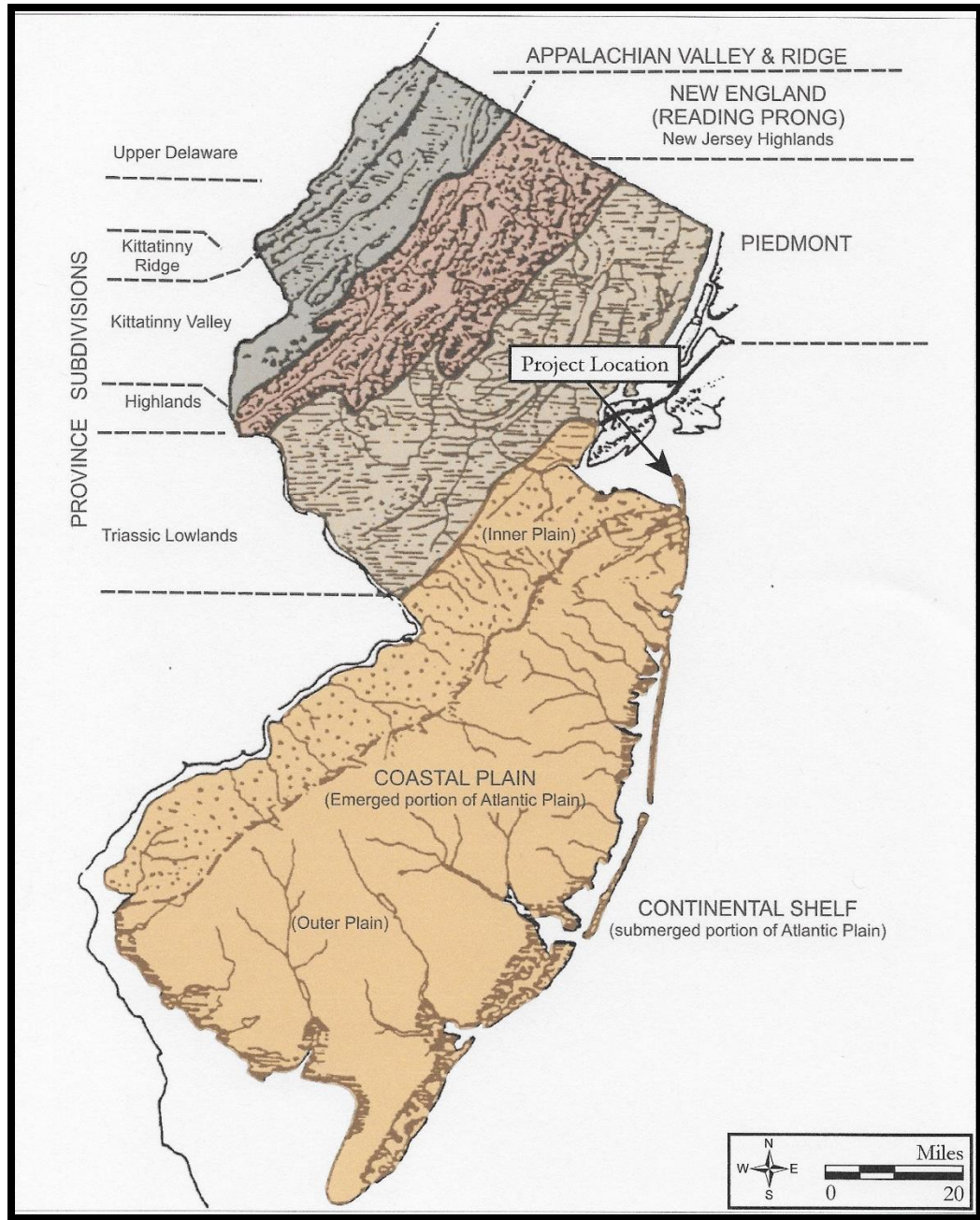


Figure 2.1: NJ Physiographic Provinces. Study area indicated with star (Source: Stansfield 1998: NP, Figure 3.1).

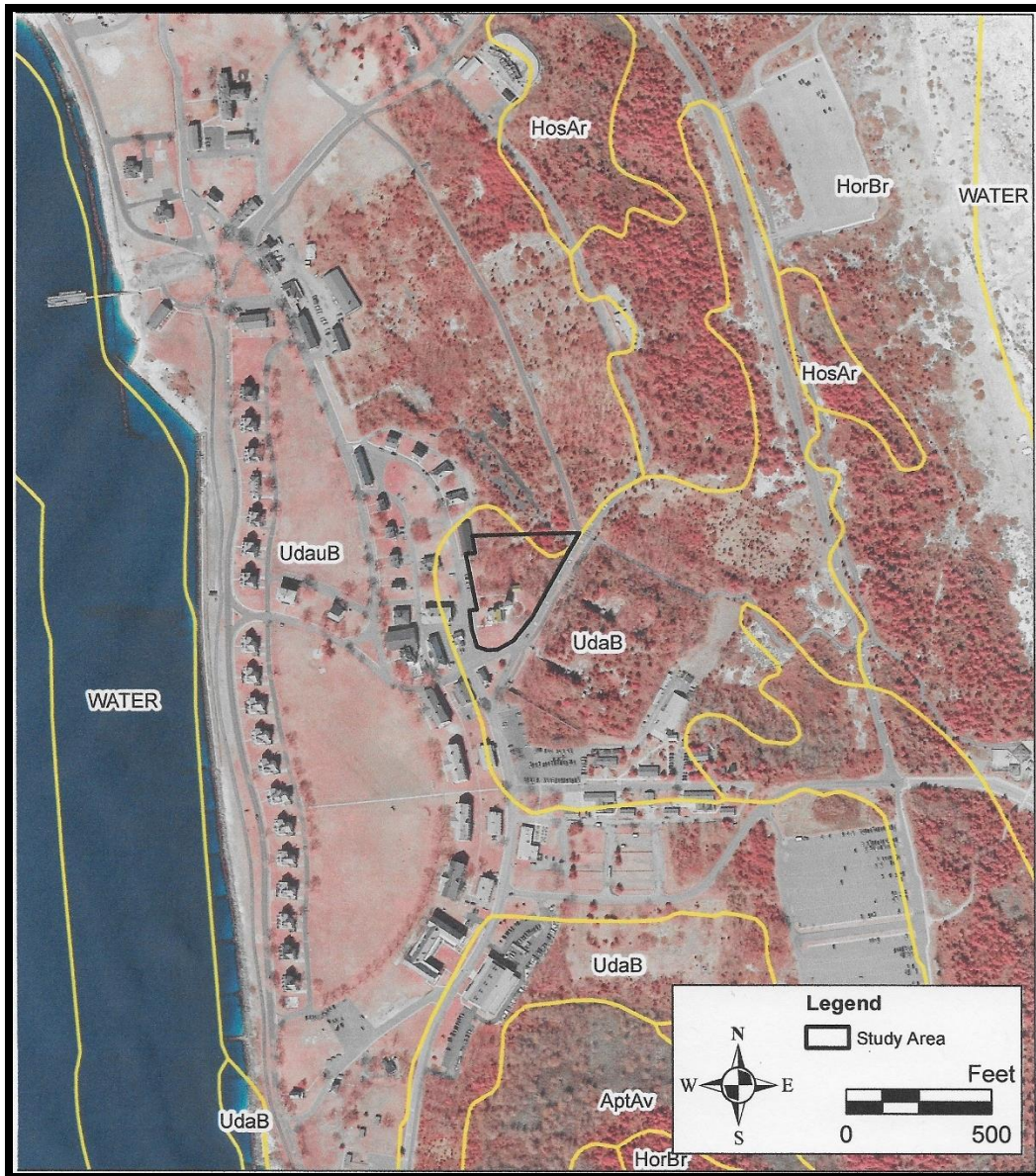


Figure 2.2: Soils Map (from 2016 Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture, Soil Survey Geographic [SSURGO]).

CHAPTER 3: RESEARCH METHODOLOGY

Research was conducted at NJSM, HPO, New Jersey State Library (NJSL), Gateway National Recreation Area, Monmouth County Historical Association, and Monmouth University Library. As per the request of the HPO, upon delivering digital report files, the following disclaimer applies to materials used in this report, but housed at the HPO: “This report was developed using New Jersey Historic Preservation Office digital data, but this secondary product has not been authorized by the HPO and is not state-authorized.”

Additional online research was conducted using the resources of American Memory of the Library of Congress (<http://memory.loc.gov/ammem/index.html>), United States Department of Agriculture, Natural Resources Conservation Service (<http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>) and the National Park Service, U.S. Department of the Interior, National Register of Historic Places (<http://www.nps.gov/nr/>).

Primary and secondary resources consulted prior to the publication of this report included the archaeological reports and collections curated by Gateway National Recreation Area.

3.1 Previously Identified Archaeological Sites

[illegible]

[REDACTED]

[REDACTED]

3.2 Previously Identified Cultural Resources

[REDACTED]

[REDACTED] [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

TABLE 3.1: List of Early Historic Sites on Sandy Hook from Milner (John Milner Associates 1978).

[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]
[REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED]
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[REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED]
[REDACTED]	[REDACTED]	[REDACTED] [REDACTED] [REDACTED]
[REDACTED]	[REDACTED] [REDACTED]	[REDACTED] [REDACTED]

[REDACTED]

[REDACTED]

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Table 3.2: Cultural Resource Surveys conducted within one-mile of the study area.

[REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]
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[illegible]

	[REDACTED] [REDACTED]		
[REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED]	[REDACTED] [REDACTED]
[REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED]
[REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED]

[REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]
[REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED]	[REDACTED] [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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CHAPTER 4: CULTURAL AND HISTORICAL BACKGROUND

4.1. Native American Settlement

Numerous sources regarding New Jersey's history and archaeology were consulted prior to writing this report. These sources include Skinner and Schrabisch's *Archaeological Survey of the State of New Jersey* (1913), Dorothy Cross's *Archaeology of New Jersey* (1941, 1956), Herbert Kraft's *The Lenape* (1986, 2001) and Alan Mounier's *Looking Beneath the Surface* (2003), as well as, the *Bulletin of the Archaeological Society of New Jersey* (Bello 1986, 1990) and (Grossman-Bailey 2001). From these sources this brief sketch of Native American cultural history is extracted (Table 4.1).

Table 4.1: Prehistoric Cultural History

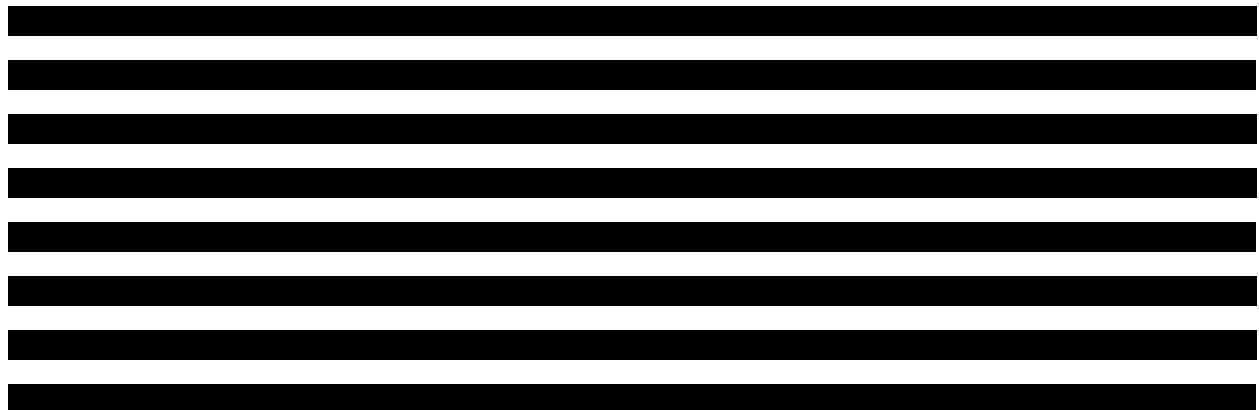
TIME PERIOD	CULTURAL NAME
18,000/12,000-8000 B.P.	Paleo-Indian
8,000-6,000 B.P.	Early Archaic
6,000-5,000 B.P.	Middle Archaic
5,000-3,000 B.P.	Late Archaic
3,000-2,000 B.P.	Early Woodland
2,000-1,100 B.P.	Middle Woodland
1,100-500 B.P.	Late Woodland
500 B.P.-Present	Historic (Contact Period 500 B.P.-250 B.P.)

The Paleo-Indian period (18,000/12,000-8,000 B.P.) is the earliest known period of human occupation in North America. The period is characterized by small, mobile bands of hunters whose material culture is represented by “fluted” projectile points, most notably the Clovis point. Paleo-Indians were living here at the same time as mammoth, mastodon, caribou, musk oxen, walrus, moose, elk, giant beaver, dire wolf and other megafauna and cold weather adapted animals. Though there have been no Clovis points found in relationship to mega-fauna in New Jersey, such associations have been found in the western United States, suggesting that Paleo-Indians in New Jersey may have occasionally hunted the large animals. Instead, these people would have hunted smaller game, such as caribou, moose, elk, deer and smaller animals, when they were available, while also primarily relying on foraging (Kraft 1986:31-35; Mounier 2003:18-20).

The Archaic period (8,000-3,000 B.P.) is typically subdivided into three periods: Early (8,000-6,000 B.P.), Middle (6,000-5,000 B.P.) and Late (5,000-3,000 B.P.) based on the subdivision of material cultures and “inferred social organization” (Mounier 2003:21). Generally, this period is thought to be the period of population expansion characterized by hunting and gathering by small nomadic groups. Early and Middle Archaic material cultures are characterized by the production of broad-bladed bifaces, bifurcated bases, and the appearance of the slender contracting-stemmed bifaces (which continued into the Woodland Periods). The Late Archaic toolkit consisted of specialized tools, made with exotic materials including bannerstones, axes, adzes, notched and perforated sinkers, celts, gouges, stone knives, choppers, scrapers, drills, atlatl weights, and other items. Near the end of the Archaic, a period known as the Terminal Archaic or Transitional Archaic, carved soapstone kettles, the antecedent of pottery, appear on the cultural landscape. Middle and Late Archaic sites include base camps, and longer-term occupations, located within floodplains and terraces (Kraft 1986:51-87; Mounier 2003:20-23).

The Woodland period is typically divided into three periods, Early (3,000-2,000), Middle (2,000-1,100 B.P.) and Late (1,100-500 B.P.). It is generally viewed as period of technological advances represented by stemmed and notched biface projectile points, ceramics and other specialized tools. Larger base camps and villages, perhaps occupied year-round, provide evidence for a more sedentary lifestyle. Material culture in a more sedentary lifestyle led to the development of identifiable regionalized culture complexes including, amongst some groups, stylized mortuary rituals (Kraft 1986; Mounier 2003:23-30). During the Contact period (500-250 B.P. or A.D. 1500-1750), the historically known Lenape occupied the region, including the Sandy Hook peninsula (Kraft 1986).

Regional Prehistory





4.2 Historic Background

The earliest historic descriptions of Sandy Hook date from the age of exploration. In 1524, Giovanni Verrazano sailed up the East Coast of the United States and provided one of the first descriptions of the region noting:

...we found a very pleasant situation among some steep hills, through which a very large river, deep at its mouth, forces its way to the sea...But as we were riding at good berth we would not venture up in our vessel without knowledge of its mouth; therefore, we took a boat, and entering the river we found the country on its banks well peopled, the inhabitants not differing much from the others, being dressed out with feathers of birds of various colors (Verrazano in Salter 1890:9).

Although historians agree that there were a number of other European explorers on the East Coast prior to 1609, Henry Hudson is the next well-documented visitor. In 1609, he and his men spent several days exploring the area around Sandy Hook and likely landed on the hook (Juet 1819). While in the area, they traded with the natives; however, one account mentions that they were attacked by natives while on a small boat off the coast. The incident resulted in the death of one John Coleman, who was likely buried on Sandy Hook (Moss 1964:12). Several maps from the 17th century show the gradual growth of the peninsula. Monmouth County fell within the territory claimed by New Netherland. However, Sandy Hook, then called “Sant punt,” did not appear to have been settled at the time.

Following the English conquest of New Netherland in 1664 portions of the Outer Coastal Plain were among the earliest regions of New Jersey to be settled (Wacker 1975). Groups of Rhode Island residents, English settlers from Long Island, and French Huguenots moved into the area prior to 1665 when the East Jersey Proprietors became actively involved in the settlement of New Jersey. These earliest settlements were mostly confined to the coastal margins (McMahon 1973; Pierce 1960).

Monmouth County was established in East Jersey, on March 7, 1683 and named for Monmouthshire, England (Snyder 1969). In 1693, the county was divided into Freehold, Middletown, and Shrewsbury townships (Snyder 1969:177). As noted by Joe Klett, “Middletown was founded in 1665 as one of the two original settlements in the Monmouth Patent region. It was within Middletown’s bounds that the first English to arrive in the Navesink area established themselves...the township included the northernmost portion of ‘old’ Monmouth, i.e., the area northwest of the Navesink River plus Sandy Hook” (Klett 2014:177). During the Colonial period, Monmouth County was characterized by dispersed farmsteads engaged in mixed crop farming and livestock production, and by the end of the 17th century, was described as the wealthiest county in the Province of East Jersey (Barber and Howe 1844:327). Sandy Hook, as a peninsula/barrier island, was largely forested, and was used for its timber resources by the locally prominent Hartshorne Family.

Richard Hartshorne, a Quaker, was apparently the first known European owner of Sandy Hook (Ellis 1885). He purchased Sandy Hook, which consisted of roughly 200 acres as well as additional large tracts of land, from the Lenape Native Americans in the 1670s (Moss 1964). Much of his property was in today’s Middletown Township and the highlands region. Hartshorne found himself in conflict with the Lenape over land ownership, and he had to purchase some tracts from the Lenape more than once (Moss 1964:14). In 1703, his property passed to his son William, and in 1748, it passed to William’s sons Robert and Esek. The Hartshorne’s retained ownership of Sandy Hook until 1762. Then a “four-acre plot, at the northern end of the hook (known as Flynn’s Knoll) was sold to a group of New York businessmen to build the Lighthouse” (Linck, Bianchi, and Pendery 2009:43).

During the Hartshornes’ tenure, a house was constructed on Sandy Hook. It appears on early maps of the peninsula and is labeled as the “Old” house (Figure 4.1). Despite this single dwelling, as late as 1889 it was described as “a primeval wilderness—within short sailing distance of New York—a dreary waste of sand, here heaped up in dunes, there heaped up in dunes, there scooped out into hollows, by the wind, with storm-twisted cedars and coarse salt grassed, bidding defiance to 3,000 miles of ocean” (Kobbé 1970:1).

An anonymous 1734 journal of a trip from Red Bank, New Jersey to New York City provides evidence for a Native American occupation of Sandy Hook. It reads:

We got into Permy City (Spermaceti) Cove where lay two vessels, one of them from Egg Harbor which was full of water. Ye people come on board of us to get some meat we having a small shoat let them have half of it and took part of the other and carried it on shore with some potatoes which we exchanged with the other people for musty Indian meal and made Doboys of it at an Indian wigwam (Moss 1964:14).

The famous Sandy Hook Light, which dates from 1764, is the oldest continually operating lighthouse in the United States and guards the entrance to New York Harbor. However, a lighthouse or beacon had been proposed for Sandy Hook as early as the 1680s. Indeed, New York's governor, Edmund Andros, suggested to New Jersey's governor, Philip Carteret, "the advisability of erecting beacons or 'sea marks for shipping' upon Sandy Hook—called by him 'Sandy Point' and advised the purchase of land from Richard Hartshorne for this purpose" (Houghton 1998). A few years later, in 1687, Thomas Dongan, suggested to the Lords of Trade in England that, "To make up a small Fort with twelve guns upon Sandy Hook, the channel there being so near the point that from on board one might toss a biscuit cake on shore..." (Stokes 1922:342). Similarly, in 1689, a petition was sent to England "That a platform be built on Sandy Hook on Sandy Bay in East Jersey at the entrance into Hudson's River from the sea which lies so conveniently situated by reason of the great sandbanks there that no ship can pass up into Hudson's river but within Musckett Shott, as will appear by the map, which said platform will require twelve guns and eighty men with arms and ammunition proportional" (Stokes 1922:357). Again, in 1693 it was recommended that "10 of the greatest guns to be mounted at Sandy Point" (Stokes 1922:381). However, it is unclear if these fortifications were ever erected. Plans were also made to erect a beacon near Sandy Hook in 1735. It is also unclear if this ever occurred (Linck, Bianchi, and Pendery 2009:45). However, an early 18th-century map from the Hartshorne family papers, in the collections of the Monmouth County Historical Association, shows a beacon on the Navesink Highlands (see Figure 4.1).

Pirate activity in the area around Sandy Hook was recorded in several early 18th-century newspapers. The 1708 *Boston News-Letter* reported that a privateer had chased a mail ship outside Sandy Hook (*Boston News-Letter*, Boston, MA, May 3, 1708, 211:2).

The mid-18th-century saw renewed interest in building a lighthouse on Sandy Hook. According to Stokes, "A letter to the *New York Post Boy*, proposed the 'erecting and maintaining of a residence for pilots at that station' (Stokes 1922:688). The need for a lighthouse and station for pilots was further reinforced by the enormous number of shipwrecks in the area.

It was not until “May 1761 that the New York Colonial Assembly passed an act to raise 3000 pounds by lottery to build a lighthouse on the hook” (Smith 1963:17). The land was then owned by Richard Hartshorne’s descendants, Iseek and Robert Hartshorne, who sold four acres for £750, or roughly \$135,959 dollars today (<https://futureboy.us/fsp/dollar.fsp?quantity=750¤cy=pounds&fromYear=1761>).

The committee of merchants who made this purchase for New York included misters Cruger, Livingston, Lispenard and Bayard (Houghton 1998:6). According to Houghton, the committee investigating the site noted that this was “unreasonable” but made the purchase nevertheless. However, the lottery failed to raise enough money, and only the land was purchased. A second lottery was held in 1762 and a tonnage tax on ships entering New York harbor was enacted in 1763 (New York Gazette 1763:1). The lighthouse was constructed in 1764. In 1828 a very thick piece of lead was discovered under the lantern during repairs to the lighthouse engraved with the names: Edward Nicoll, Susannah Nicoll, Sally Jauncye, and Polly King, 1 June 1765 (*The Spectator* 1828:5). This discovery may indicate that the light was installed in 1765, a year later than previously recorded.

Isaac Conro of New York was the builder of the lighthouse, and his work elicited considerable acclaim (Figure 4.2). According to Smith, the lighthouse was octagonal in form, the diameter at the base 29 feet, and at the top of the wall 15 feet. The whole light from bottom to top measured 103 feet or nine stories. Initially the light was lit by 48 oil blazes (Smith 1963:17). The tower stands 90 feet high and is visible for 15 ½ miles (Kobbé 1970:1). Kobbé also noted that the keeper’s house was a stone structure, which stood until 1883, when it was torn down. The building that was erected in its place still stands today (Kobbé 1970:1) (Figure 4.3).

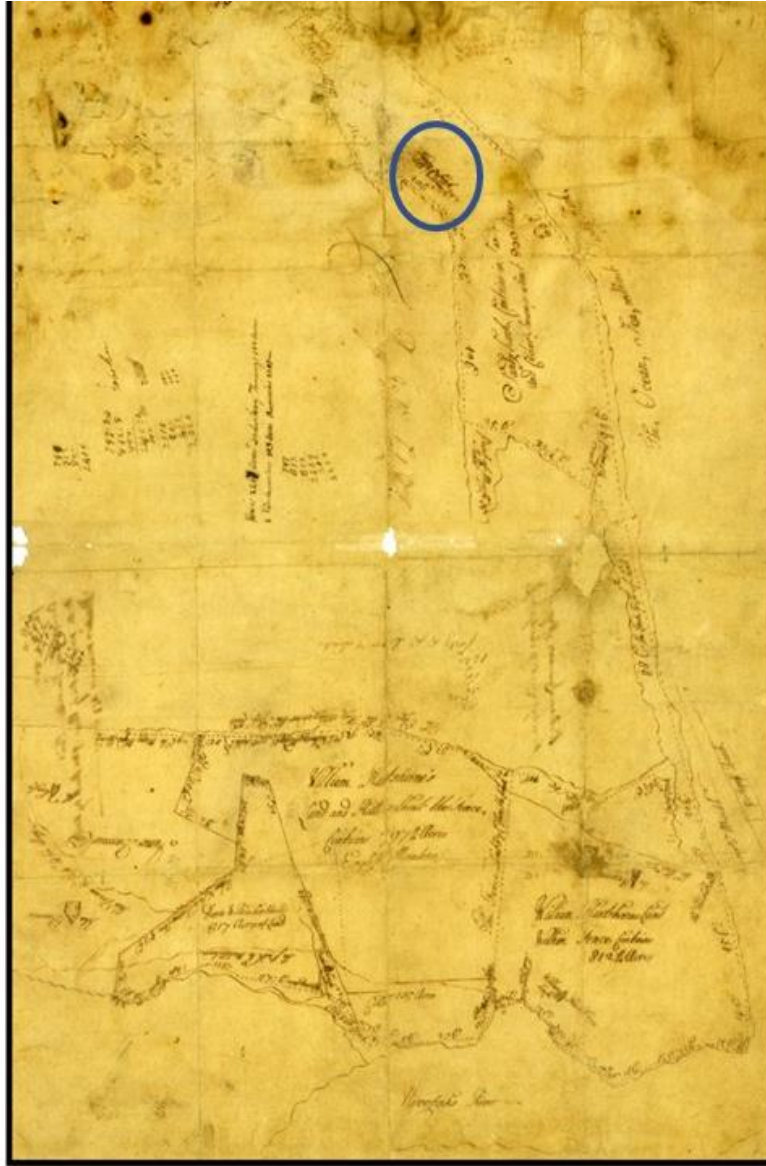


Figure 4.1: This early 18th-century map of the Hartshorne family's properties also shows Sandy Hook and the "Old House." The map is in the collections of the Monmouth County Historical Association and is believed to date from 1711.

On Monday Evening last, the NEW-YORK LIGHT-HOUSE, erected at Sandy-Hook, was lighted for the first Time. The House is of an Octagon Figure, having eight equal Sides; the Diameter at the Base, 29 Feet; and at the Top of the Wall, 15 Feet. The Lanthorn is 7 Feet high; the Circumference 33 Feet. The whole Construction of the Lanthorn is Iron; the Top covered with Copper. There are 48 Oil Blazes. The Building from the Surface is Nine Stories; the whole from Bottom to Top, 103 Feet. This Structure, was undertaken by Mr. Isaac Conro, of this City, and was carried on with all the Expedition that the Difficulty attending to and fro on the Occasion could possibly admit of; and is judged to be masterly finished.

Figure 4.2: Newspaper advertisement noting the completion of the Sandy Hook lighthouse, ca. 1764. From the collections of the National Park Service, Gateway National Recreation Area.

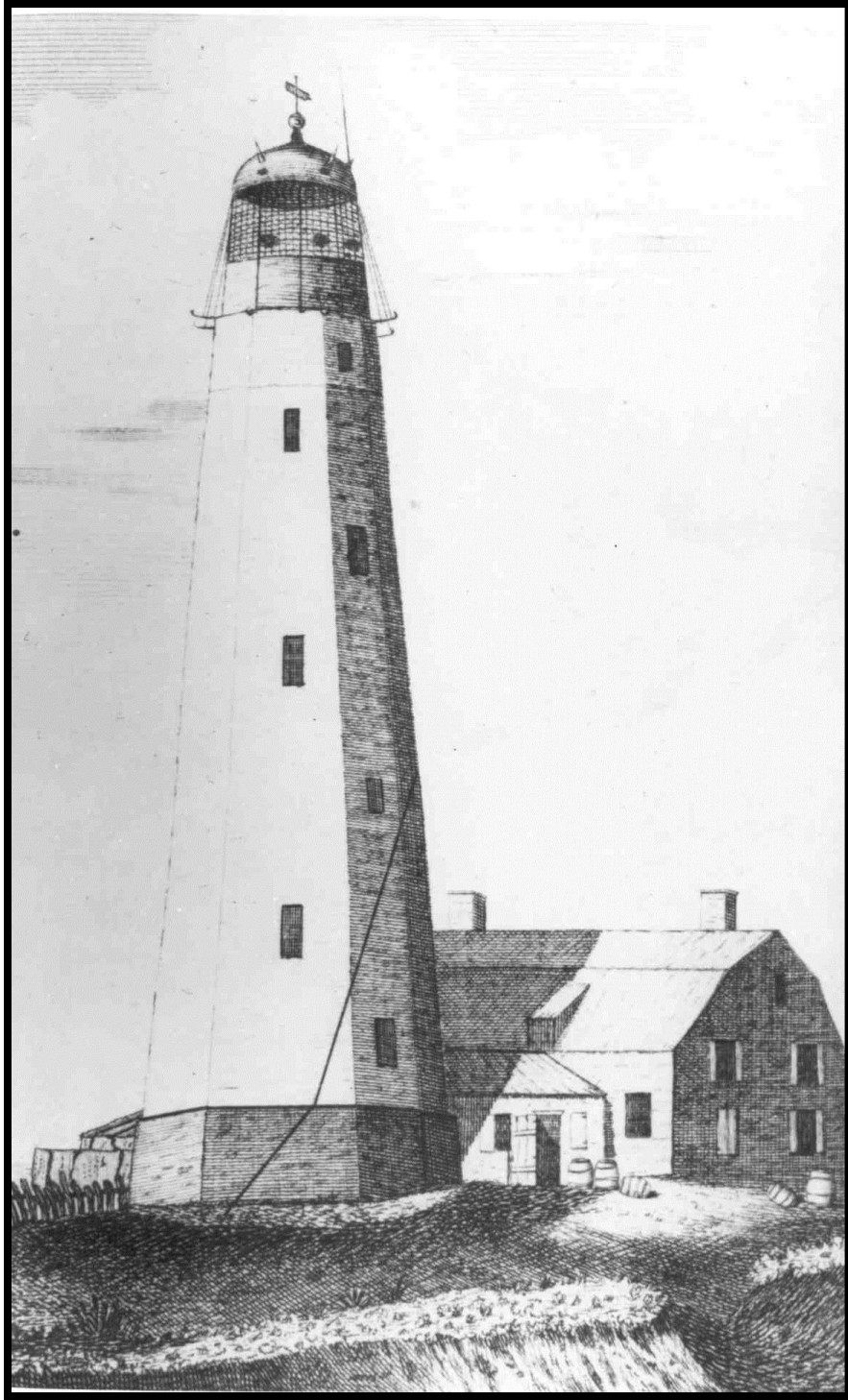


Figure 4.3: An August 1790 illustration of the Sandy Hook lighthouse, the keeper's house, which appears to be constructed of brick, a hyphen connecting the lighthouse and the keeper's house, and some roughly drawn outbuildings to the left. From the collections of the National Park Service, Gateway National Recreation Area.

In 1767, the lighthouse was struck by lightning. According to a contemporary source “twenty panes of the Glass Lanthorn broke to Pieces: the Chimney and Peach (presumably porch) belonging to the Kitchen was broke down and some People that were in the House received a little Hurt but are since recovered” (Moss 1964:19). It must have been repaired shortly thereafter.

Sandy Hook was of considerable strategic importance during the American Revolution, with both the Patriots and the Loyalists vying to hold the light. Sandy Hook Bay was frequently used as a rendezvous and anchorage by British warships, transports, and merchantmen. Eric Olsen, Park Ranger at Morristown National Historical Park, has transcribed a significant number of Revolutionary War references to Sandy Hook which are recounted here. As the war heated up in the New York/New Jersey theater, Sandy Hook was often in the news. The following citations are from a manuscript titled, *Sandy Hook in the American Revolution* compiled by Eric Olsen (2012).

On February 11, 1776, Alexander Hamilton led a nighttime attack on the lighthouse that failed because of a lack of munitions, and because of strong resistance from the British. As Hamilton wrote “I continued the attack for two hours with fieldpieces and small arms...being all the time between two smart fires from the shipping and the lighthouse, but could make no impression the walls” (Chernow 2004:75). On March 6, 1776 Major William Malcolm, a Continental officer, was instructed as follows:

Upon your arrival at Sandy Hook you will endeavor to take the glass out of the lantorn and save it if possible; but if you find this impracticable you will break all the glass. You will also endeavor to pump the oil out of the cisterns into casks and bring it off; but if you should be obstructed by the enemy or not be able to procure casks, you will pump it out onto the ground. In short you will use your best discretion to render the light-house entirely useless (Moss 1964:20).

The March 10, 1777, *New York Gazette and Weekly Mercury* reported the results of the attack, noting:

Saturday last about 250 of the Rebels made an Attack upon the Light-House at Sandy Hook. By the Bravery of the Men posted there, and by the Cannon of the *Syren* at Anchor near the Spot, they were beat off with some Loss. The Troops had not a Man either killed or wounded. Two are said to be missing. From the many Attempts of the Rebels upon this Light House it seems to be a favorite object” (Stryker 1901:310).

Malcolm was successful as militia Colonel George Taylor of Middletown wrote on March 12th, 1776, “Received from Wm. Malcom, eight copper lamps, two tackle falls and blocks and three casks, and a pair of a cask of oil being articles brought from the light-house on Sandy Hook”

On April 19th, 1776, Governor William Tryon (New York) wrote from the ship *Duchess of Gordon* to the Mayor of New York City, David Matthews.

Sir,

As the Commander of his Majesty’s ships of war on this station, found it expedient for his Majesty’s service, to burn down the Pilot-house at the Hook: I am to acquaint, all possible care has been taken of Mr. Adam Dobbs and his property, and if you will send down a sloop to the Hook, it will be suffered to bring up to New-York, Mr. Dobbs, his servants and effects. I am with regard, Sir, your most obedient servant.

William Tryon.

The unfortunate Mr. Dobbs was apparently the pilot. Though his house had been lost, a number of uninvited guests soon arrived. According to a report written on April 20th, “A large Number of the Regulars are at Sandy Hook & will soon be up to the City” (Bangs 1890:36). Eight days later, Henry Bedinger noted in his journal that “A few days since the *Asia* and *Phoenix* Moved Down some men and Landed at the Light House from the man of war in order to Get water. Some Jersey Men went and Took 16 men prisoners and filled the well full of Stones, & c...” (Dandridge 1910: 140).

As Hessian troops began arriving in the New York City region, several made note of the lighthouse. On August 12th, 1776. Lieutenant Jakob Piel of the Hesse-Cassel von Lossberg Regiment wrote, “At noon we passed the point of Sandy Hook. Here stands a lighthouse on which we saw the English flag waving. The water here is so shallow that in many places it was only three fathoms deep” (Burgoyne 2008:16). Another Hessian, Johann Conrad Dohla of the Ansbach-Bayreuth Regiment noted on June 3, 1777, “We arrived in the neighborhood of Sandy Hook where on the left a large lighthouse stands on the ocean shore to serve the ships approaching and sailing into the Harbor (Burgoyne 1990:22) (Figures 4.4 and 4.5).

Continental Troops again attempted to destroy the lighthouse in June of 1776. According to the Journal of Isaac Bangs a Lieutenant in the Continental Army (1890:45-46):

June 19th, On Monday last Major Brookes with 200 men and 2 Comps. of Artillery set off in the Afternoon on a private Expedition. We now find they were gone with an intention to

destroy the light House of which the Marines from on board the Ships had taken possession by building a Fort.

The expedition was evidently unsuccessful, as Henry Bediner reported on June 22nd (Dandridge 1910:144):

The Detachment Sent from New York to burn and destroy the Light House is Returned without Effecting anything as the shipping was able to keep our people at too large a Distance, so that our Field Pieces Could not Batter the walls Down. No person Kill'd nor wounded, tho' a Great Deal of Firing.

The diary of Solomon Nash, a Continental soldier from Connecticut describes the same incident (Nash 1861:20-21):

Got within 20 rods of the Light house and formed us at the Pitch of a hill—Commodore Tupper marched towards the Enemy and ordered them to surrender which they refused and fired on him—Commodore Tupper Retreated back to our Field Pieces and ordered them to fire which we did one and twenty rounds at the Light House they continued firing with muskets on Both Sides the Light House Being so strong that we could make no impression upon it—they fired upon us from the men of ware. But they did not hurt But Two ware slightly wounded after an Engagement $\frac{3}{4}$ of an hour we retreated to our Boats again and about 4 o'clock P.M. we set out for Amboy.

In June of 1776 Colonel Benjamin Tupper led a Continental assault on the lighthouse. He described his foray as follows:

I landed here the evening before last and by reason of several inconveniences, could not make an attack until this morning about four o'clock, when I advanced within one hundred and fifty yards of the Light-House in so secret a manner that manner that my party were not discovered. I advanced with an officer, and after a few words, he fired several shots at me, but as God would have it, missed me. I returned to my party and ordered the artillery to play which continued an hour, but found the walls so firm I could make no impression. I retired towards the shipping, not thinking, but as there were two men of war arrived yesterday that they would have been so complaisant as to send a part on shore to have attacked me, but could not provoke them. I occupied the ground about two hours and a half between two smart fires, viz from two men-of-war on one side, and the Lighthouse on the other: what is remarkable, I had not one man killed, nor one wounded so much as to apply to a surgeon” (Tupper in Moss 1964:20).



Figure 4.4: A view of the Highlands at Neversunk, northwest by west, four miles distant with the light house on Sandy Hook (DesBarres 1777).



Figure 4.5: The Miriam and Ira D. Wallach Division of Art, Prints and Photographs: Print Collection, The New York Public Library. "The high land of Never-sink, and Sandy Hook light House." New York Public Library Digital Collections. Accessed July 17, 2017. <http://digitalcollections.nypl.org/items/510d47db-176c-a3d9-e040-e00a18064a99>.

A similar anonymous patriot account of what appears to be the same incident was reprinted in the early 20th century by William Stryker, New Jersey's Adjutant General, who actively compiled information about the state's military history (1901:132):

Last Friday morning at three o'clock three hundred of our troops, under the Command of Colonel Tupper, with Major Brooks attacked the enemy at Sandy Hook, our party had two field pieces under the care of Captain Dewey of the Train. The enemy repaired to the light-house which was so strongly fortified, and cemented, that the shot from the field pieces made no impression, though not more than 150 yards distance; the Phoenix and the Liverpool, with springs on their cables poured in a heavy fire on our men.

Other sources may refer to the same assault or others in June of 1776. Continental Lieutenant Isaac Bangs wrote:

June 19th [1776] On Monday last Major Brookes with 200 Men and 2 Comps. Of Artillery set off in the Afternoon on a private Expedition. We now find they were gone with an intention to destroy the light House of which the Marines from on board the Ships had taken possession by building a Fort. Reports are various concerning the Success of the Party, a considerable firing hath been heard" (Bangs 1890:45).

Orders were issued for 80 Men, 2 Subs. & 1 Capt. to go on a private Expedition. These Officers & Men were drawn from the several Regts. in the Army. I was sent to be the Officer from Genl. Heaths Brigade. We paraded according to orders at Laboratory at 9 o'clock with Seven Days Provisions, Arms, Ammunition, &c. Leuts. Wheeler & Makepeace from the two other Brigades brought the Quota of Men belonging to each of them. This Party was raised to reinforce the Party at the Light house; but since the orders were issued News had been received that the Party were unable to effect anything for the want of heavier Metal, & were on their return. We were therefore ordered to return our Arms, & were sent to the Jersies to cut Cedar Wood Logs, &c. to build Fire Rafts..." (Bangs 1890:45).

Henry Bedinger, a Sergeant in Stephenson's Independent Company of Virginia Riflemen wrote about the incident in his journal (Bedinger in Dandridge 1910:144):

[June 1776] 22nd...The Detachment Sent from New York to burn & Destroy the Light House is Returned without Effecting anything as the shipping was able to keep our people at too large a Distance, So that our Field pieces Could not Batter the walls Down. No person Kill'd nor wounded, tho' a Great Deal of firing.

Occupied by the British Army during the Revolutionary War, Sandy Hook served as a convenient jumping off point for raids on the mainland. For instance, on June 3, 1778, the *New Jersey Gazette*, a pro-Patriot newspaper reported:

We are informed that on Wednesday morning last, a party of about seventy of the Greens from Sandy Hook, landed near Major Kearney's headed the mill-creek, Middletown-Point, and marched to Mr. John Burrow's, made him prisoner, burnt his mills and both his store-houses,

all valuable buildings, besides a great deal of his furniture—Also took Lieut. Col. John Smock, Capt. Christopher Little, Mr. Joseph Wall, Capt. Jacob Covenhoven and several other persons; killed—Pearce and –Van Brackle, and wounded another man mortally. Having completed these and several other barbarities, they precipitately returned the same morning to give an account of their abominable deeds to their bloody employers. A number of those gentry, we learn, were formerly inhabitants of that neighborhood (Lee 1903:237)

Following the Battle of Monmouth on June 28, 1778 the Crown forces retreated towards New York and crossed a pontoon bridge to Sandy Hook. A good description of Sandy Hook was provided by Hessian officer, Captain Johann Ewald:

The 5th at daybreak the army marched to its embarkation places. The corps under General Knyphausen was embarked about noon, several miles above Sandy Hook. The corps under Lord Cornwallis, which included the Jager Corps, marched through the impassable mountains and woods. About ten o'clock in the forenoon we crossed the channel which separates Sandy Hook from the mainland, where a pontoon bridge was built which was covered by two row galleys. The entire corps under Lord Cornwallis camped along the seashore on this sandy and deserted island. The deep white sand, out of which grew short fir bushes, served us as the softest bed. We slept here as peacefully as young children, because we were separated from the enemy on all sides by navigable water.

The lighthouse on this island, so famous in America, can guide the skippers who sail from Europe to America at a very great distance. It is built of the most beautiful squared stones, some thirty feet wide in the square, and is about two hundred feet high. Since the Americans constantly threaten to destroy it, the lighthouse has been fortified with a stone breastwork in which loopholes were constructed. In the tower itself portholes for cannon have been cut on all four sides, four of which are placed on the first floor for defense. The army furnished one captain, one officer, and fifty men for the guard, who were relieved each month but had to be on the alert, because the American privateers attempt a surprise attack nearly every month (Tustin 1979:137-138).

British officer, Lt. Col. John Graves Simcoe provided another interesting description of this move. He wrote:

The army remained in this vicinity till the 5th when it marched to Sandy Hook also: this peninsula has been made an island by the storms of the preceding winter; a bridge of boats was thrown across the channel, over which the army passed, the Queen's Rangers excepted, who, forming the rear guard, embarked in boats from the Jersey side, as soon as the bridge was broken up (Simcoe 1844:73).

The soldiers serving with the Crown Forces varied greatly in their descriptions of Sandy Hook. For instance, Hessian officer, Ewald lauded the deep white sand which “served as the softest beds” while his contemporary Lieutenant Jakob Piel characterized Sandy Hook as a “sandy Wasteland” (Burgoyne 1990).

In July of 1778, the French fleet anchored off Sandy Hook. This action caused considerable consternation among the British, who responded by further fortifying the hook. One source noted that a battery of two eight-inch howitzers and three thirty-two-pound howitzers were constructed (Andre 1904:82). Two regiments, which had a nominal strength of just over 700 men, were stationed on Sandy Hook, the 15th and 44th Regiments, “in the redoubts thrown up beside the lighthouse” (Uhlendorf 1957:190) (Figure 4.6).

Tories and New Jersey Volunteers regularly set out on raids from Sandy Hook. Two especially destructive raids were directed at Matawan in 1778 and Tinton Falls in 1779 (Adelberg 2012). Other raids occurred along the Bayshore and in Shrewsbury (Nelson 1914:353). The loyalists on Sandy Hook also carried out raids on American shipping as far away as Delaware Bay (Nelson 1914:251-252).

The winter of 1780 was incredibly cold, with numerous snowstorms, and the Hudson River frozen. This weather facilitated attacks across the ice (Cunningham 2007). On January 15, Americans attacked by sleigh, two schooners and sloop in the ice (Nelson 1914:154). On January 19th, a house on the hook was captured, seven prisoners taken, and \$45,000 counterfeit continental dollars seized (Nelson 1914:134). During the spring of 1780, Sandy Hook was garrisoned by the New Jersey Volunteers—Loyalists troops, with 35 privates, a captain, lieutenant, ensign, sergeant, and two corporals present (<http://www.royalprovincial.com/military/rhist/njv/state.htm>).

Additional efforts were made to improve the fortifications at the lighthouse in 1780, with light cannons placed in the lighthouse, and a fascine constructed around it (Klein and Howard 1984:99). Colonel Tye, the self-emancipated slave of Shrewsbury’s John Corlies (Hodges 1997), led many of these raids and earned a reputation as a fearless adversary. A contemporary source described him as follows, “The above-mentioned Ty is a negro, who bears the title of Colonel, and commands a motley crew at Sandy Hook” (Nelson 1914:80).

The Loyalists retained control of Sandy Hook, until the Peace of Paris, in September of 1783 (Smith 1963:18). On New Year’s Eve 1783, a group of Loyalists attempted to desert from the British Army. A detachment under Lt. Hamilton Douglass Halyburton was sent to find the runaways. They were unsuccessful and froze to death. Their grave, which stood to the south of the lighthouse, was later

marked by the mother of Lt. Halyburton (Moss 1964:24-37). Today, a historical marker indicates the site.

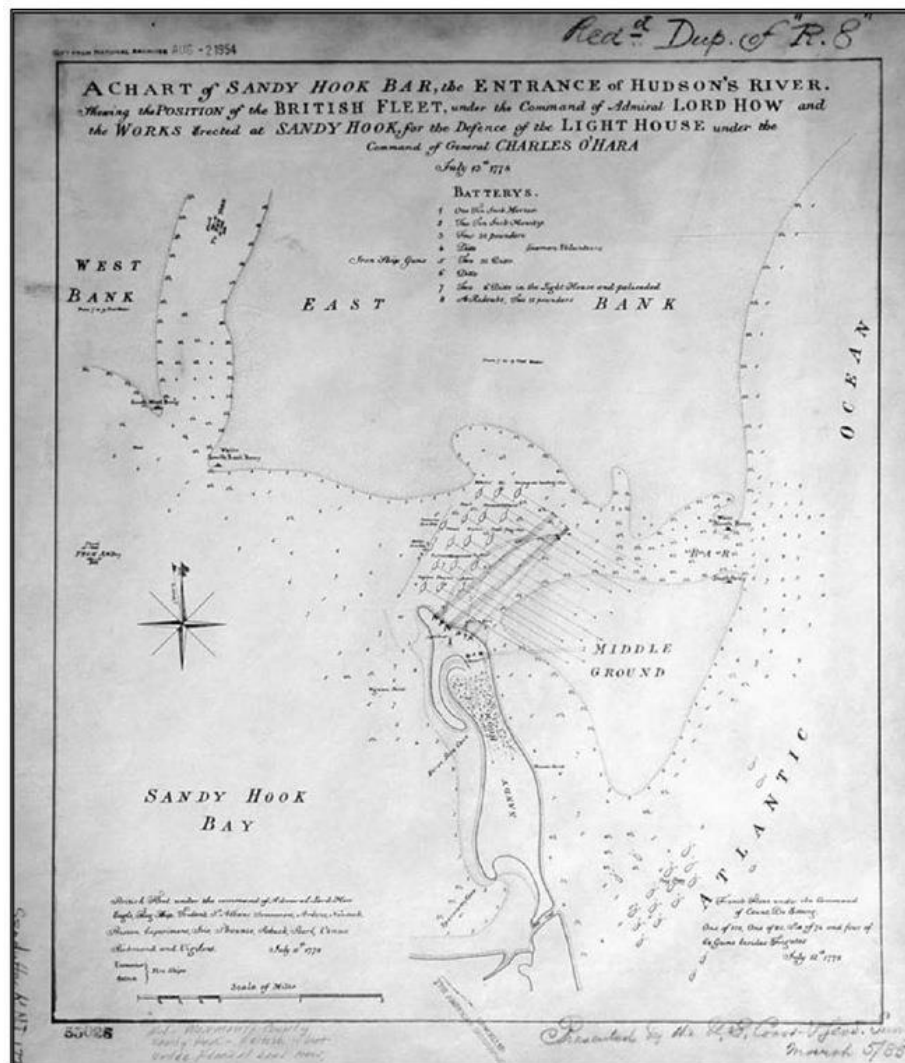


Figure 4.6: A chart of Sandy Hook Bar, the entrance of Hudson’s River, showing the position of the British fleet, under the command of Admiral Lord Howe, and the works erected at Sandy Hook for the defense of the light house under the command of General Charles O’Hara, July 13, 1778. (<http://what-when-how.com/new-jersey/salem-county-historical-society-to-sanitary-ware-industry-new-jersey/>).

Even after the war ended, traces of the conflict were visible by the lighthouse. According to travel writer Gustav Kobbé, author of *Jersey Coast and Pines* (1970:5) “The tower and the old house were known during the Revolution as the Lighthouse Fort, or Refugees’ Town.” Indeed, he further noted that “remnants of log fortifications are still to be seen near the large wooden screen, 300 yards east of

the West Beacon” (Kobbé 1970:5). A macabre story recounted by the travel writer Kobbé (1970:6) states that during repairs to the lighthouse in the 1870s, workmen discovered a cell beneath the stone floor of the cellar and in it a fire-place and human remains. “These latter are supposed to have been relics of the Revolutionary tragedies.”

In 1789, the new nation of the United States created “the Lighthouse Establishment as an administrative unit of the federal government, reflective of the importance of the Sandy Hook lighthouse (and other aids to navigation) to the young nation’s commerce” (Linck, Bianchi, and Pendery 2009:57). In 1790, the lighthouse was ceded to the Federal Government. One of the earliest depictions of the lighthouse dates from this period. It was published in August 1790 in the *New York Magazine*, and shows both the light and the keeper’s house (<https://digitalcollections.nypl.org/items/510d47da-2721-a3d9-e040-e00a18064a99>). The latter is depicted with a gambrel roof (see Figure 4.3). As described in Section 5 of this report, the foundations found during Monmouth University’s 2016 archaeological field school may relate to this structure, or one of its successors.

Bureaucratic oversight of lighthouses varied over time. Initially the lighthouses were under presidential control, then this responsibility was transferred to the Secretary of the Treasury. From 1792 until 1802, it was with the Commissioner of Revenue, before returning to the Secretary of the Treasury in 1802 (Linck, Bianchi, and Pendery 2009: 57).

As previously noted, the Peninsula of Sandy Hook has extended northward over time. In 1790, four acres of ground around it were ceded to the United States by the State of New York (Kobbé 1889:6). This followed an act of August 7, 1789, by which a dozen lighthouses erected by the Colonies were ceded to the Federal Government (Moss 1964:57). Sixteen years later, that portion of the hook north of the light-house was conveyed to the United States by Richard Hartshorne. A second sale conveyed the remaining portion on June 10, 1817 (Kobbé 1970:6) (Figures 4.7, 4.8, and 4.9).

Sandy Hook continued to play a strategic role during the War of 1812. Militia was stationed along the coast to guard against a feared invasion by the British. Camps were established on Sandy Hook, and the Navesink Highlands (Olsen 2012). There was great concern that British troops would occupy the hook as they had during the American Revolution, and Fort Gates was constructed on the hook’s

north point (Smith 1963:18). New York's Governor, Daniel Tompkins, noted that the lighthouse should be converted to a fortified tower because Fort Gates was so poorly constructed (Hastings 1902:45-46). A pair of blockhouses were constructed to the south of the fort (Linck, Bianchi, and Pendery 2009:61). Tent camps were established for the New Jersey Militia and the Sea Fencibles, "special volunteer naval artillery militia that served on both land and floating batteries to protect ports, harbors, and other vital coastal areas" (<https://narations.blogs.archives.gov/2010/09/17/family-tree-friday-who-were-the-sea-fencibles-in-the-war-of-1812/>). Numerous archaeological investigations have searched for the remains of this fortification, but very little physical evidence for the War of 1812 occupation of Sandy Hook has been identified. In 1817, President James Monroe visited Sandy Hook with Commodore Lewis, who was described as, "the defender of that post during the late war" (Moss 1964:39).

Only limited information is available about the organization of the lighthouse lot during this period. A map in the collections of the National Park Service at Gateway National Recreation Area, believed to have been traced by former NPS employee Dana Linck from a historic map, shows the lighthouse lot, ca. 1826 (Figure 4.10). It depicts two fenced yards, the lighthouse keeper's house, a kitchen, boat house, doctor's office, and several small outbuildings. Although fascinating, the image, which was not available during the field school, does not line up particularly well with the archaeological remains unearthed during this project. See Figure 6.4 for an overlay of the two maps.

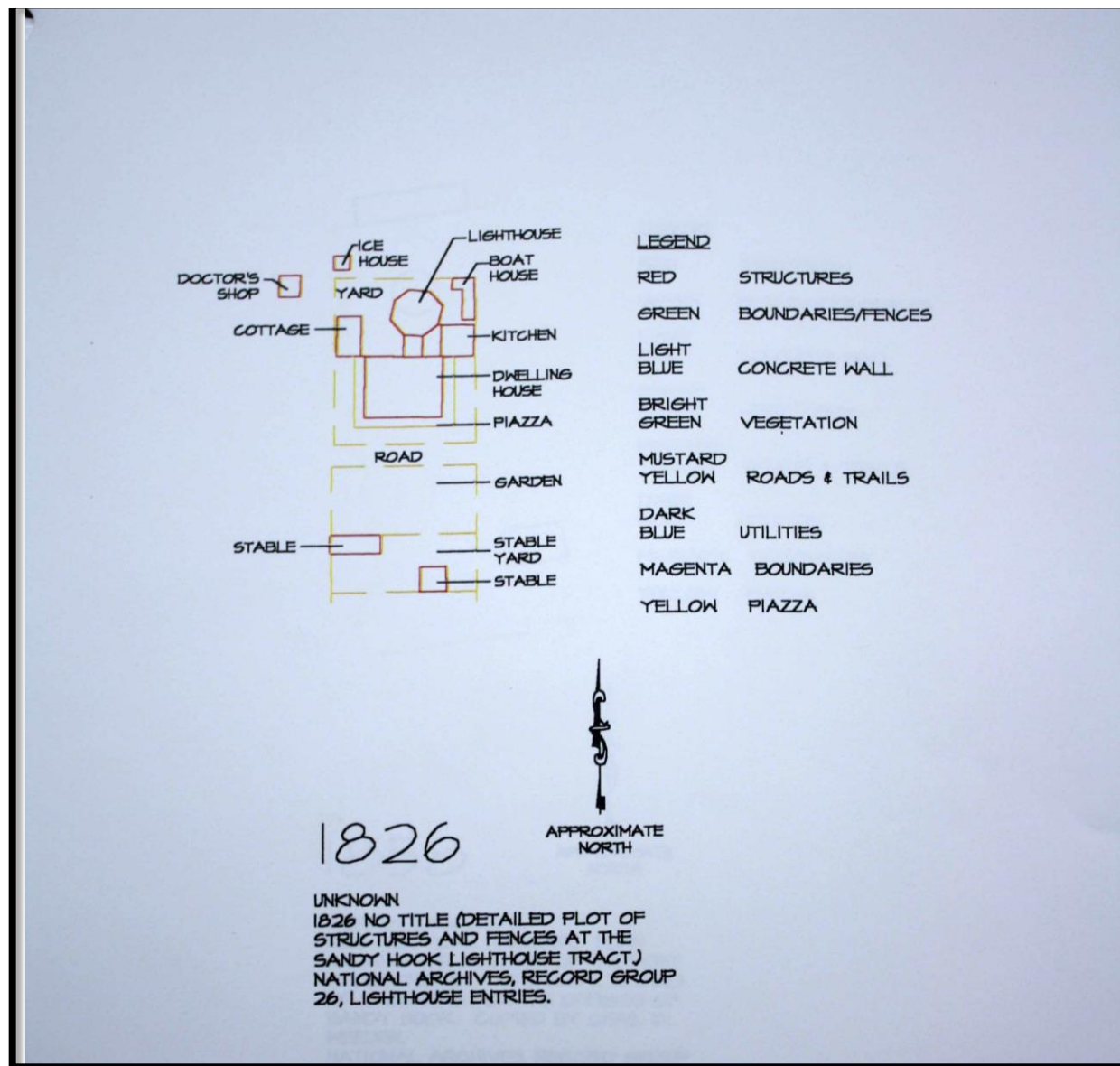


Figure 4.10: Tracing of an 1826 map by Dana Linck showing structures on the lighthouse tract.

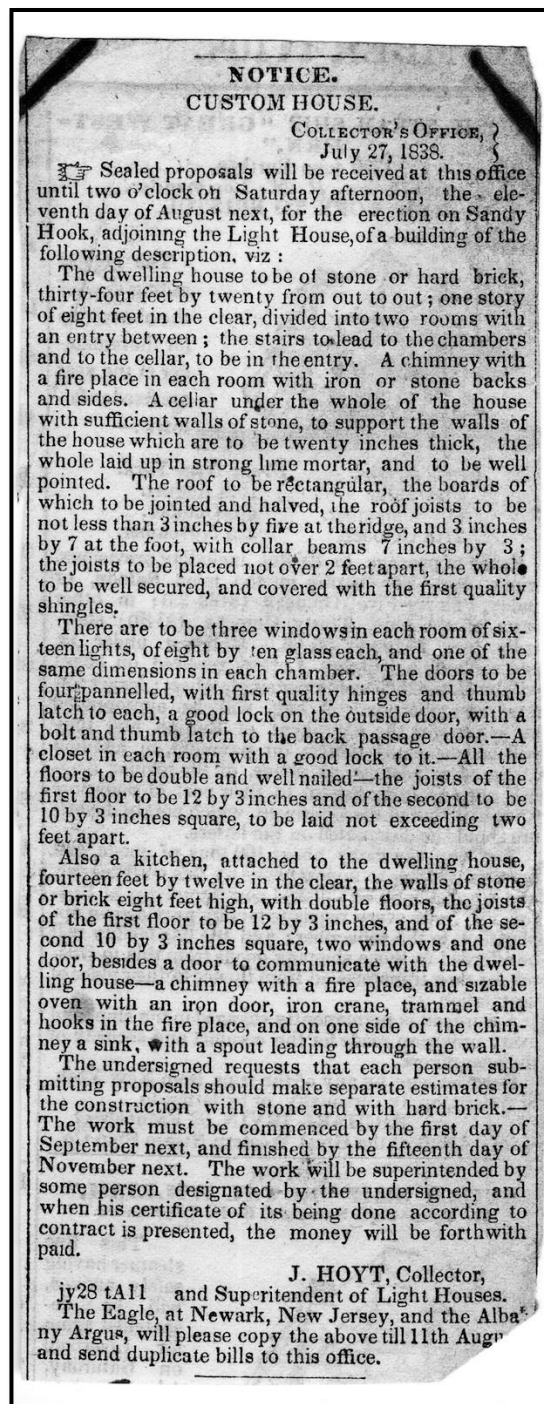


Figure 4.11: An 1838 advertisement for the construction of a new lighthouse keeper's dwelling and attached kitchen on Sandy Hook (<https://lighthousehistory.info/tag/sandy-hook-lighthouse/>).

In 1838 (Figure 4.11) the U.S. Customs Department published a very detailed request for proposals for the construction of a new lighthouse keeper's dwelling and attached kitchen. The main structure was to be of stone or hard brick and was to measure thirty-four feet by twenty feet. A cellar was to be constructed under the entire building, the walls of which were to be twenty-inches thick. An attached kitchen measuring 12 foot three inches by ten foot three inches was also called for. Construction was to begin in September 1839 (<https://lighthousehistory.info/tag/sandy-hook-lighthouse/>). The proposed structure strongly resembles the features identified during the 2016 field school.

Reports of the Light-House Board from the 19th-century provide considerable insight into the conditions of the Sandy Hook Lighthouse. The 1852 Light-House Board report was quite critical. It began by noting that:

The Sandy Hook main light, and the two beacons adjacent serve as the principal guide to pilots and navigators in passing over the bar, and through the channels leading from sea to New York bay. The tower of Sandy Hook main light was constructed in 1762, under royal charter, of rubble stone, and is now in a good state of preservation. Neither leaks nor cracks were observed in it. The mortar appeared to be good, and it was stated that the annual repairs upon this tower amount to a smaller sum than in the towers of any of the minor lights in the New York district. The dwelling attached to this tower had just undergone a thorough repair, and was painted in every visible interior part, where paint could be put on, ceilings, floors, walls, and the steps of the tower from the oil room on the ground floor to the lantern. The painting had the appearance of having been done in great haste and was undoubtedly put on in unnecessary places. The dwelling was not clean, notwithstanding the recent painting and repairs... (1852:30).

The critique continued noting:

The fact that there is only one keeper at Sandy Hook, while there are five at Navesink, cannot fail to be remarked upon. The lights are not lighted at sun-setting, and kept burning until sun-rising in compliance with instructions. The keeper uses his own discretion in this matter, generally lighting about dusk, and extinguishing at daybreak.

Supplies are furnished once during the year. The person charged with the distribution of supplies, leaves the articles in such quantities, and of such qualities, as he pleases. Bad articles are consumed, as a matter of necessity (1852:30).

The light was improved by the installation of a third-order Fresnel lens in 1856 (Gately 1998:29). At the same time, the lighthouse tower was relined with bricks. According to Linck, et al (2009:69),

although the lighthouse lot remained the same half acre parcel it was in the early 19th century, many of the buildings from the lighthouse lot were no longer, present. However, there were new stables depicted to the south of the lighthouse.

In 1872, another review of the site noted that the lighthouse was in a good state of preservation “Neither leaks nor cracks were observed in it. The mortar appears to be good” (U.S. Light-House Board 1872:607). However, the description of the lighthouse keeper’s house was not as charitable. It noted:

The dwelling attached to this tower has just undergone a thorough repair, and was painted in every visible interior part. The painting had the appearance of having been done in great haste... The dwelling was not clean, notwithstanding the recent painting and repairs... (U.S. Light-House Board 1872:607).

The keeper and management of the Sandy Hook Light were also harshly criticized. The report noted that the keeper was, “not instructed in the manner of adjusting the apparatus and had entered upon his duties without previous instruction” (U.S. Light-House Board 1872:608-609). The same report noted that “The oil is kept on the ground or lower floors of the light towers, subjected to the great citation of temperature of places near the ground.” A pair of auxiliary beacons, the East and West Beacons, had been constructed in 1842, necessitated by the growth of the hook (Ellis 1885:547). During the late 19th century, maps, paintings, photographs, and drawings provide a glimpse of the appearance of the lighthouse and surrounding grounds (Figures 4.12, 4.13, 4.14, 4.15, 4.16). Especially noteworthy are two paintings by the noted maritime artist Edward Moran (1829-1901), which depict the lighthouse and surrounding grounds. The first (Figure 4.15), an undated work, titled the “Inlet, Sandy Hook,” shows the lighthouse and the keeper’s house, which appears to be a two-story brick building with a gable roof. It looks west/southwest towards the lighthouse. The second is a close-up of the lighthouse, keeper’s house, and barn from the west (Figure 4.16). The house is depicted as a two-story brick or stone building, with a fading coat of whitewash. The barn appears to be a modest ramshackle building with an attached pigpen. The barn area is likely the same area where a rich midden deposit was uncovered during Monmouth University’s 2016 excavations.

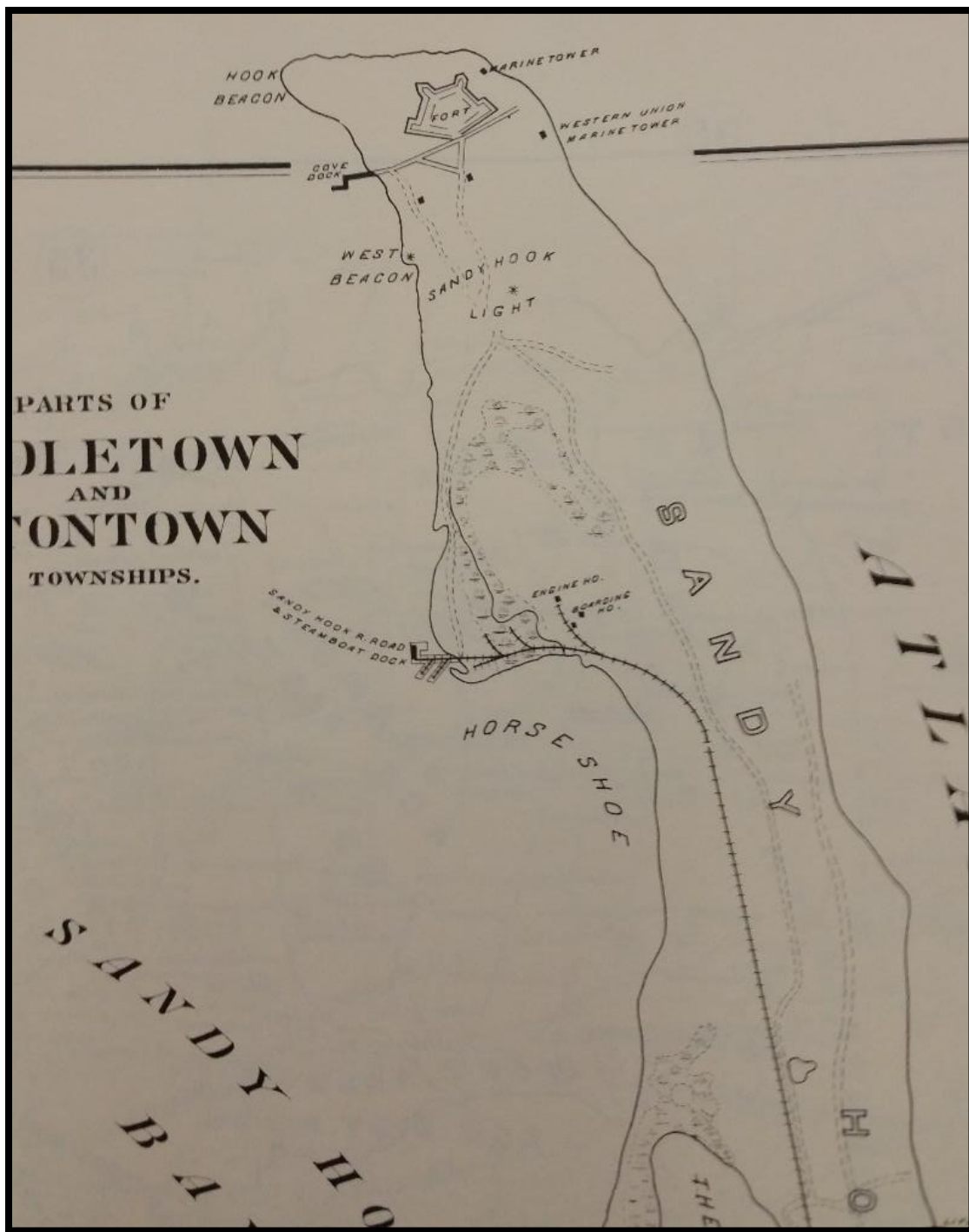


Figure 4.12: F. W. Beers *Atlas of Monmouth County* (1873), Portions of Middletown and Ocean Townships, showing Sandy Hook Light.

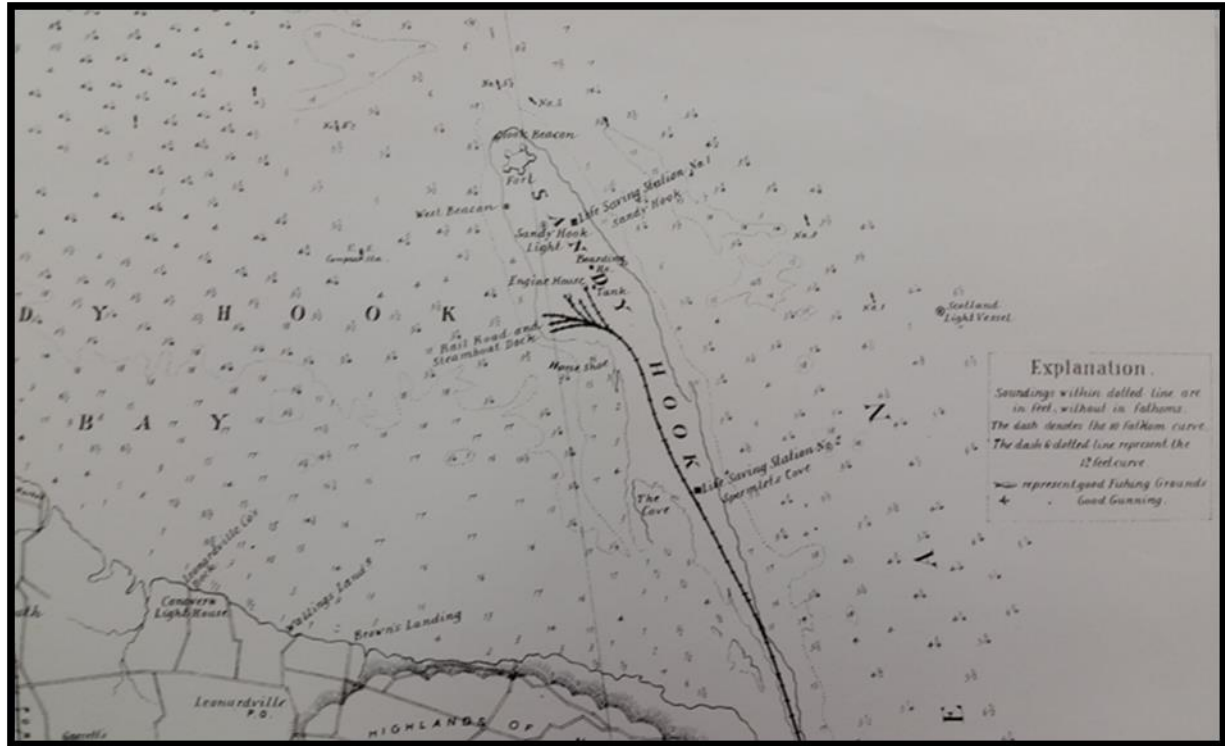


Figure 4.13: The Sandy Hook peninsula as depicted in Woolman and Rose's *Historical and Biographical Atlas of the Jersey Coast* (1878).

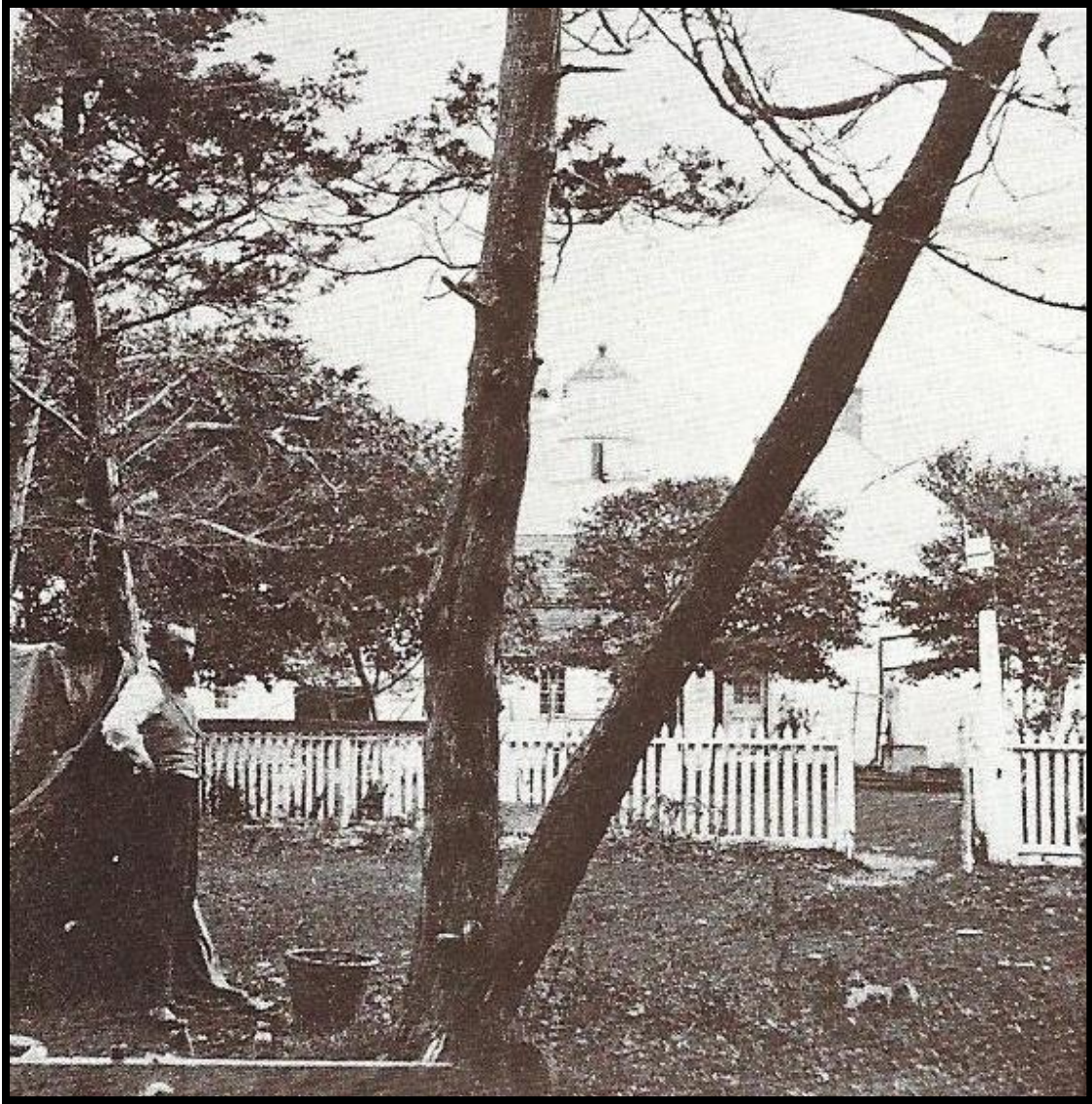


Figure 4.14: This photograph dates from 1859-1860 and is believed to be the earliest surviving photograph of the lighthouse and keeper's house. It was issued as part of a series of views titled, "American Scenery" by E. and H.T. Anthony of New York (Moss 1995:88).



Figure 4.15: Edward Moran, “The Inlet, Sandy Hook” (nd) (https://commons.wikimedia.org/wiki/File:Edward_Moran_-_The_Inlet,_Sandy_Hook,_New_Jersey.jpg). Curiously, the lighthouse is shown as circular rather than hexagonal.



Figure 4.16: Edward Moran, "Sandy Hook Lighthouse," 1876.
https://commons.wikimedia.org/wiki/File:Moran_Sandy_Hook_Lighthouse.jpg. Although the lighthouse keeper's dwelling appears correct, the lighthouse is shown as circular rather than hexagonal.

A pair of paintings by Frank Patterson, whose family manned the light at the end of the 19th century, survive. One is in the collections of the Monmouth County Historical Association [MCHA] (Figure 4.17) and the other is in the collections of the National Park Service (Figure 4.18). The MCHA's painting shows the lighthouse, the keeper's house or houses, picket fences, and a wooden boardwalk leading to the keeper's house. The main keeper's house is shown as a stone building, two stories tall with a gambrel roof. An apparent small addition, possibly the original keeper's house, is a story-and-a-half tall and appears to be brick. In form, it resembled a small Anglo-Dutch cottage. Both structures have south-facing porches. The NPS' painting depicts the house and lighthouse facing northwest. The eastern yard of the lighthouse is depicted full of pigs, chicken, and cattle. Several small outbuildings are also shown. A drawing dating to the same time (Figure 4.19) shows the same enclosed yard and structures, while a second drawing shows the keeper's hen coop, apparently constructed from fragments of shipwrecks (Figure 4.20).

In 1882, the Light-House Board reported, "The dwelling-house, which is old and unworthy of repair, should be replaced by a proper structure" (United States Light-House Board 1882:23). This recommendation was undertaken as the 1883 report stated that "The old and dilapidated stone dwelling was replaced by a substantial double frame-house, containing ample accommodations for the light-keepers" (United States Light-House Board 1882:33). According to Kobbé, "the keeper's dwelling was a stone house until 1883, when it was torn down and the present frame dwelling erected" (1970:5). The frame dwelling still stands. Although published maps fail to show much detail at the site (Figure 4.21), a traced historic map (ca. 1890) in the collections of the National Park Service at Gateway National Recreation Area, shows the lighthouse lot with fences and outbuildings, dwarfed by the enormous mortar battery to the east (Figure 4.22).

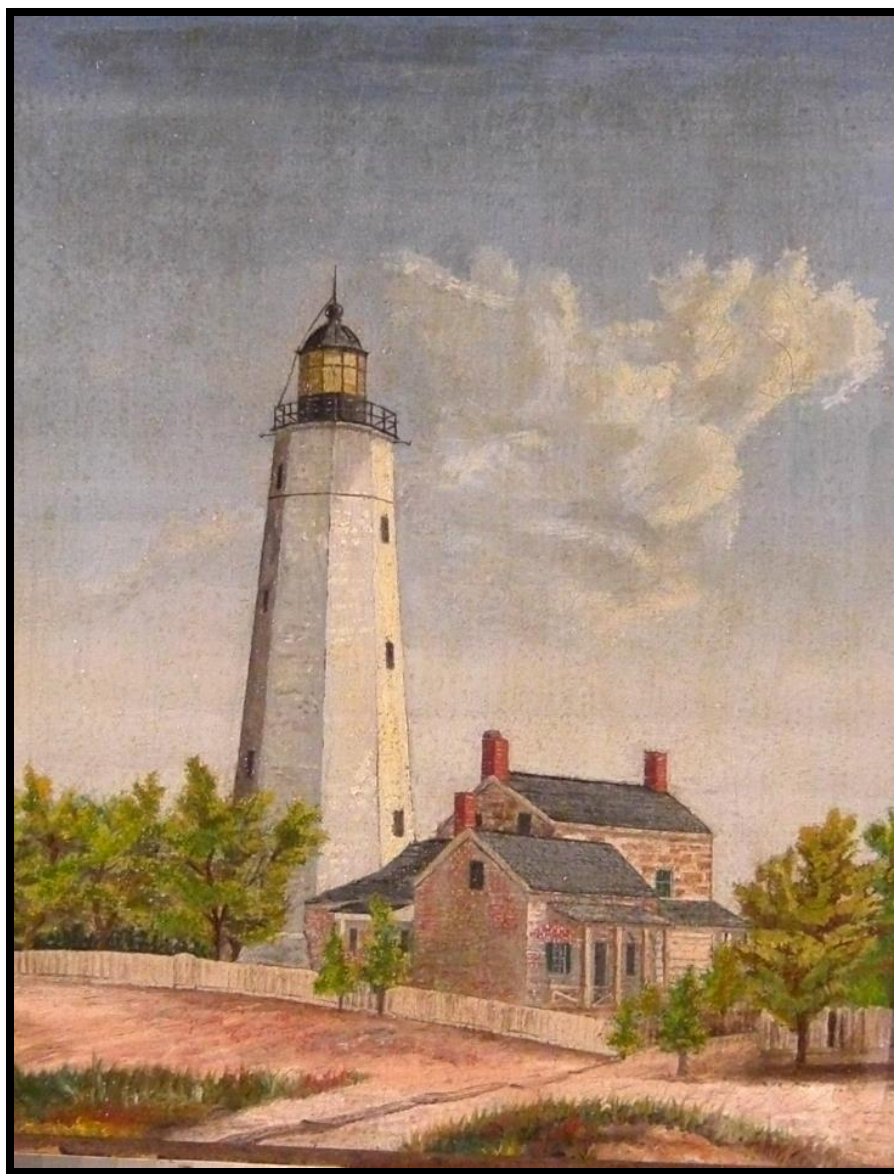


Figure 4.17: Painting titled “Main Lighthouse Sandy Hook: Southwest View” by Frank Patterson showing Sandy Hook Light, ca. 1870. Collections of the Monmouth County Historical Association.

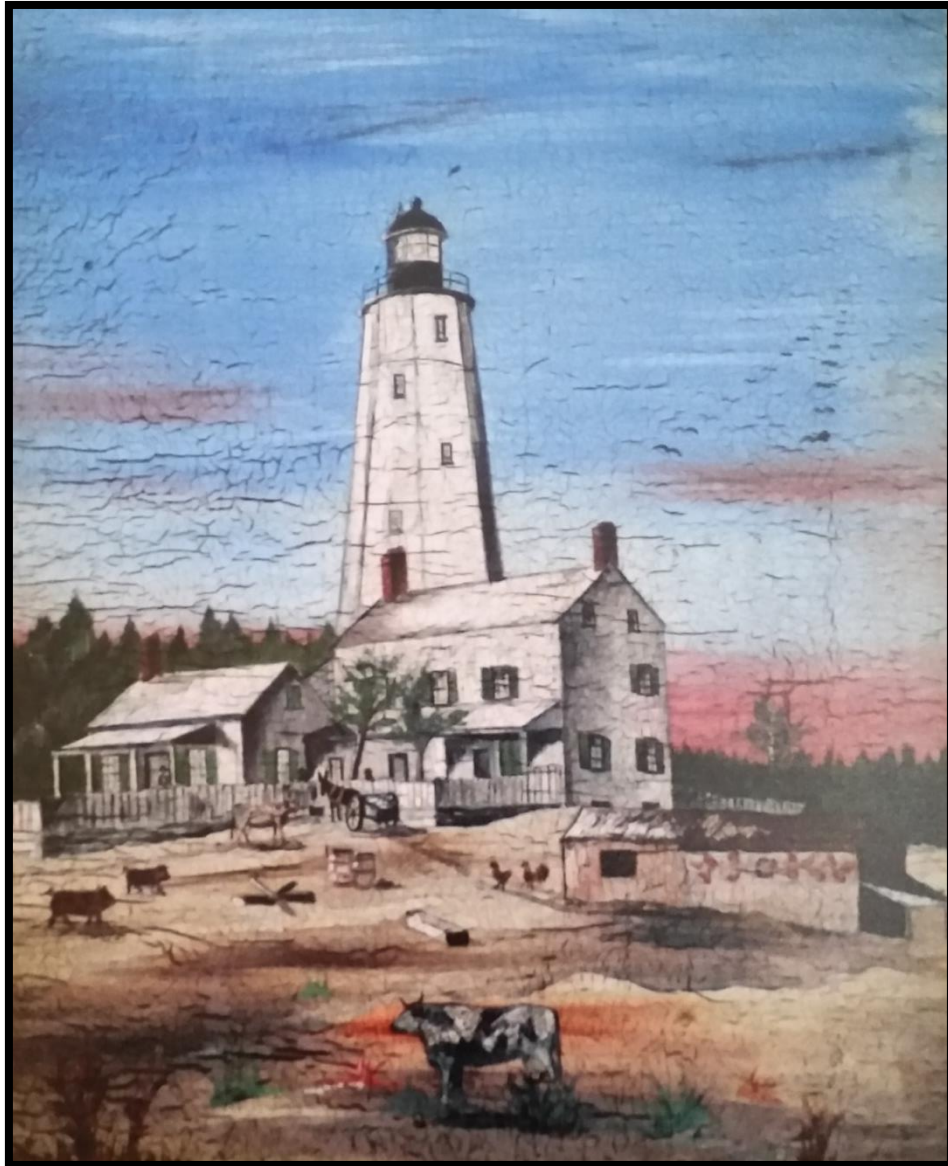


Figure 4.18: Untitled painting by Frank Patterson, showing the Sandy Hook lighthouse and keeper's houses, ca. 1870. Collections of the National Park Service, Sandy Hook Area, Gateway National Recreation Area.

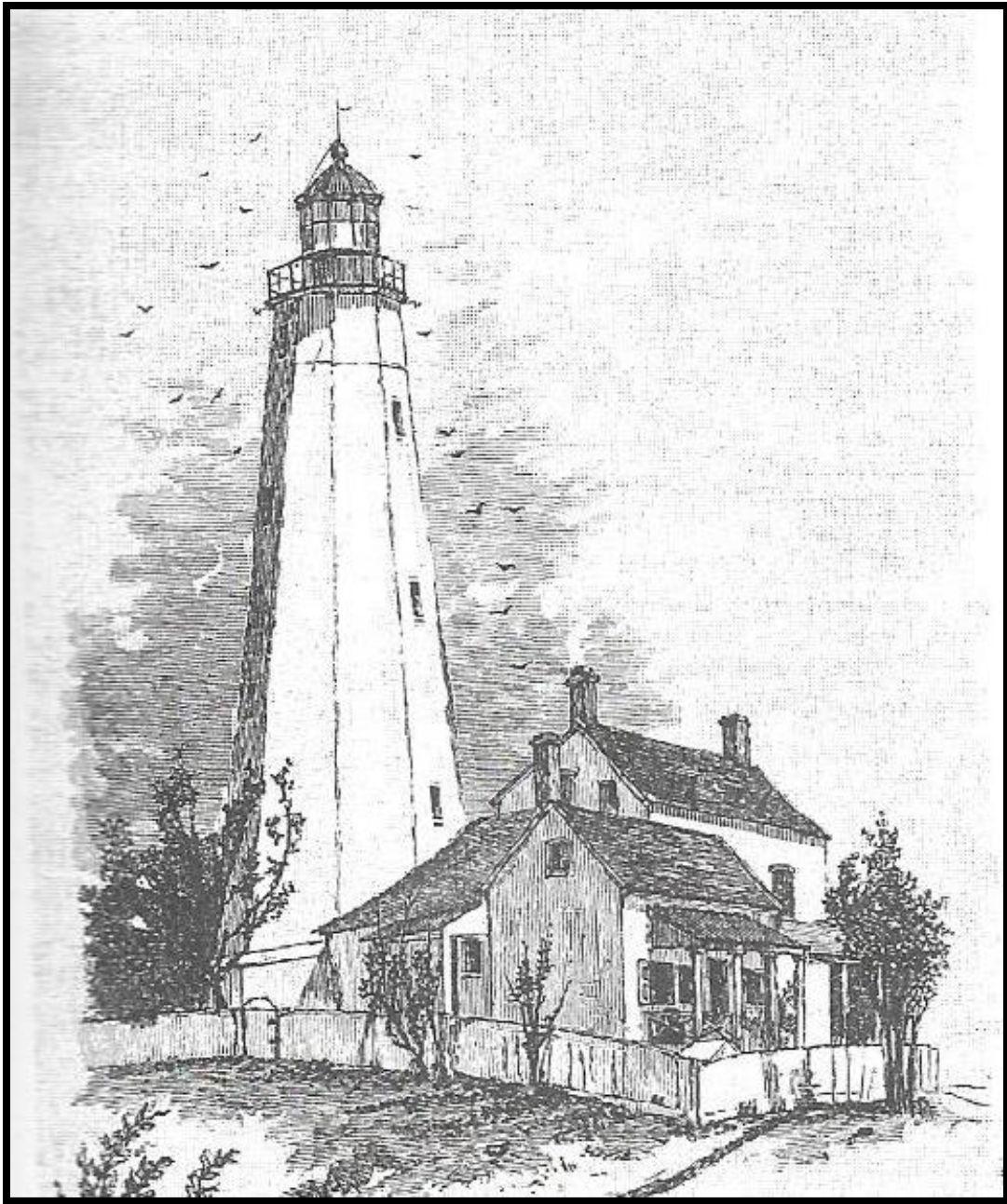


Figure 4.19: Main Light, Sandy Hook, published in 1879, showing the keeper's houses and lighthouse (Houghton 1998:3).

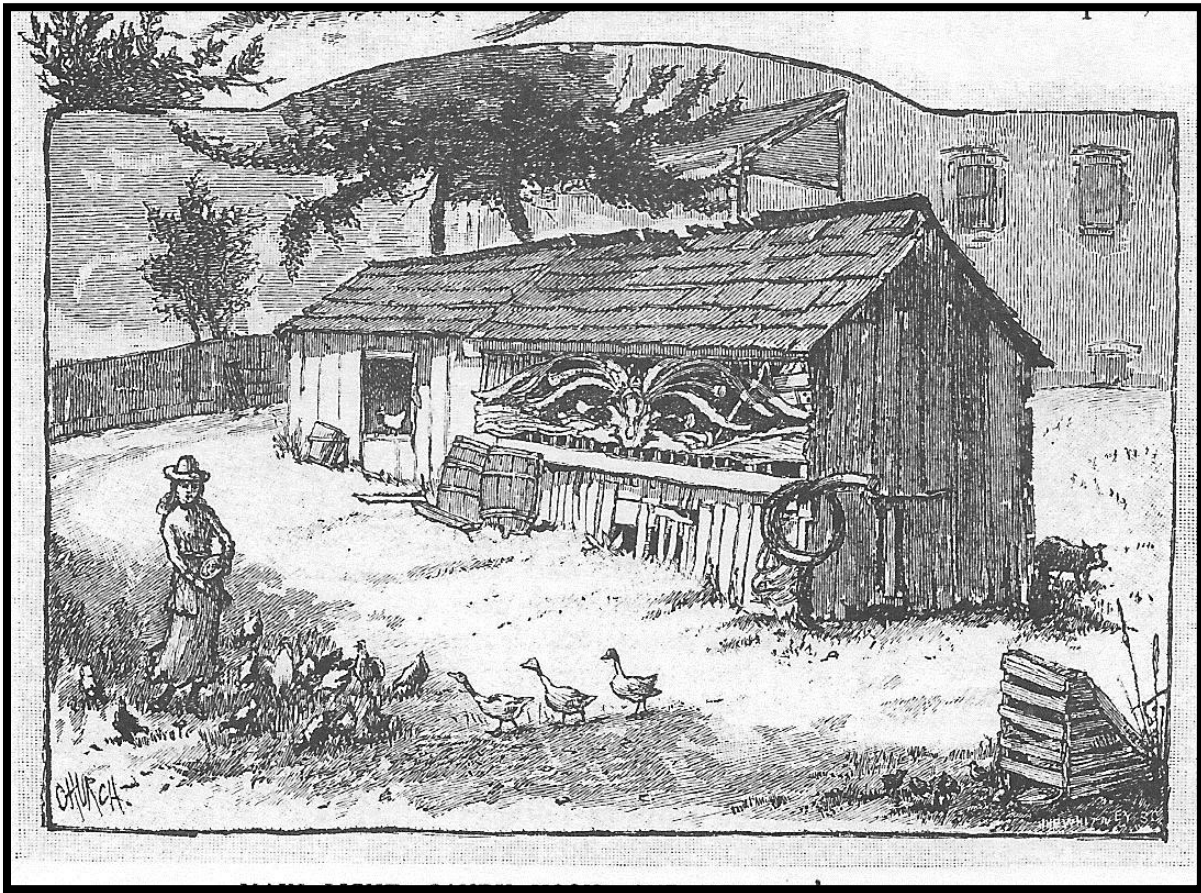


Figure 4.20: “Main Light, Sandy Hook and Keeper’s Hen-Coop,” published in 1879, showing the keeper’s houses and lighthouse (Houghton 1998:3).

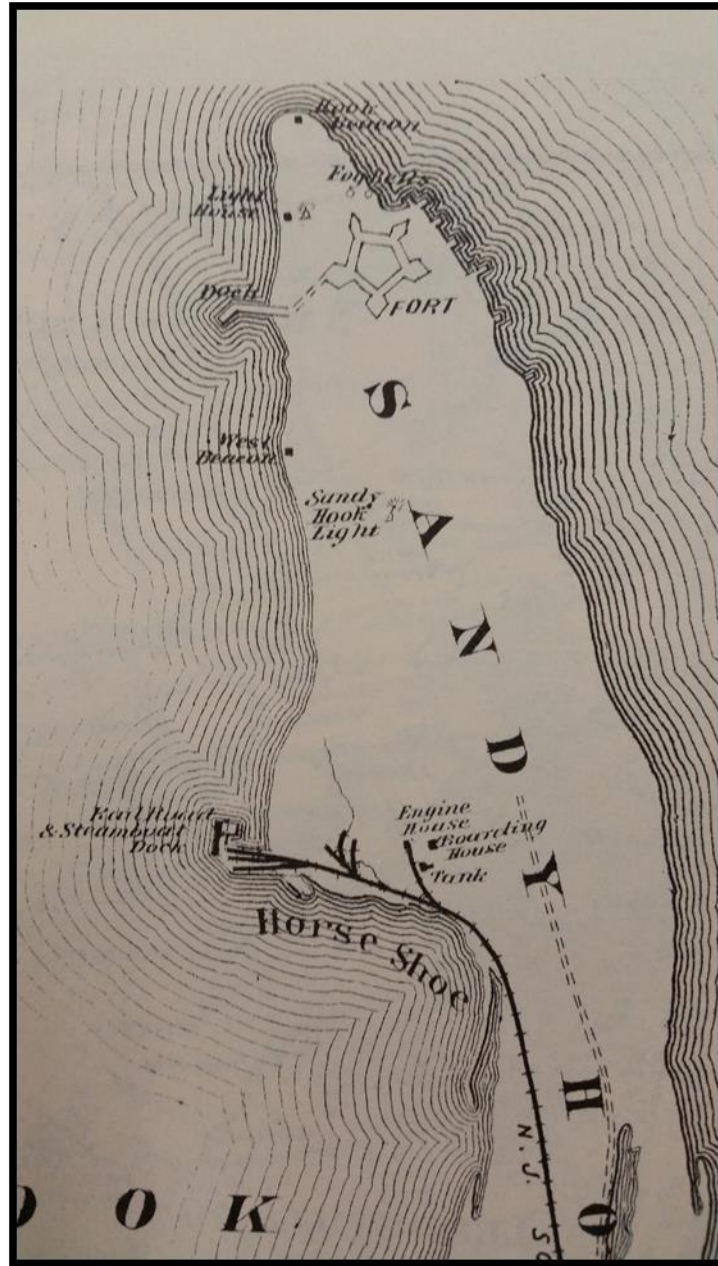


Figure 4.21: Wolverton and Breou, *Atlas of Monmouth County, New Jersey*, 1889.

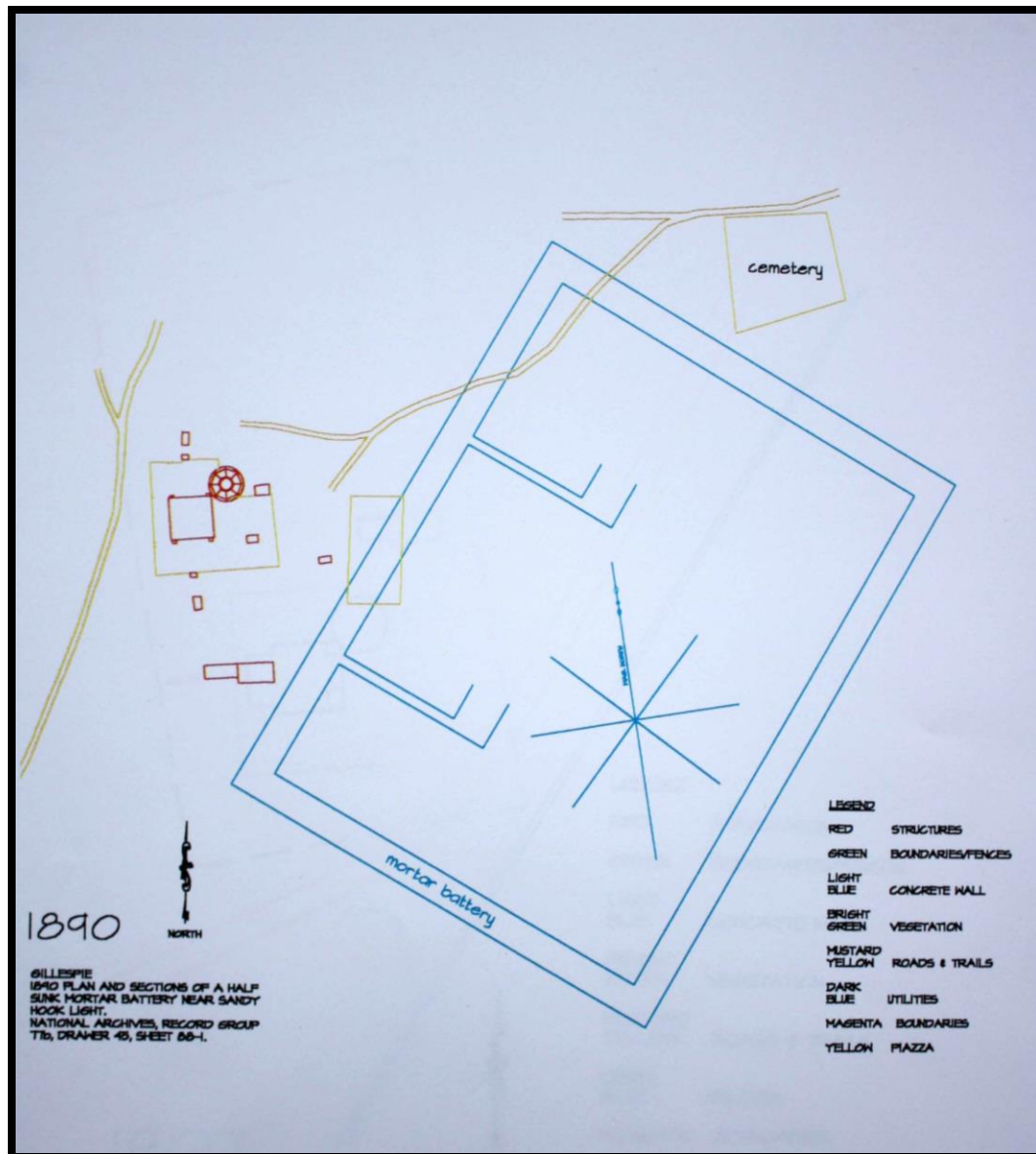


Figure 4.22: Tracing of historic 1890 map by Dana Linck showing the lighthouse tract, ca. 1890. Note the relationship to the mortar battery.

Although a lightship had marked the channel since 1823 (Holland 1972:55), the lighthouse remained important. In 1889, it became the first in the United States to be lit by electric incandescent lamps.

Bureaucratic changes affected the Sandy Hook Lighthouse in the 20th century. The Department of Commerce and Labor, created by Congress in 1905 took over the Lighthouse Board from the Treasury Department (Weiss 1926:18). In 1910, the Bureau of Lighthouses was created and in 1939, administration of lighthouses was transferred to the Coast Guard which fell under the Treasury Department (Holland 1972:38). Numerous early 20th-century photographs of the site survive. The earliest photographs show an oil storage structure to the east of the lighthouse (Figure 4.23), and several sheds (Figure 4.24). One of the most interesting images depicts the lighthouse painted in camouflage during World War II (Figure 4.25).

After 1941, the lighthouse keeper's quarters were used as quarters for Fort Hancock officers. A State Park was created on the southernmost part of the peninsula in 1962 (Moss 1964:61) and in 1964, the Sandy Hook Lighthouse was designated as a National Historic Landmark. It was added to the National Register of Historic Places in 1966 as a pre-existing National Historic Landmark when the Register was established under the National Historic Preservation Act. When Gateway National Recreation Area was created in 1972, the Sandy Hook Lighthouse, the fifth lighthouse built in this county and the oldest operating example in the county, was transferred to the Sandy Hook Unit of Gateway National Recreation Area. In 1996, the ownership of the lighthouse was transferred from the Coast Guard to the National Park Service. The lighthouse and surrounding Fort Hancock district are today part of Gateway National Recreation Area. The lighthouse is still in active operation and is equipped with a 3rd order Fresnel lens illuminated by a 1000-watt bulb and emitting 45,000 candle-power. It is visible 19 miles at sea (NPS Interpretive Panel).

In the 19th century, the lighthouse was only one of a large variety of structures on Sandy Hook. These included fortifications, military laboratories, telegraph, and life-saving stations. In 1847, plans were put forward for a new masonry fortification guarding the approaches to New York. In 1857, site work began. Although it was manned during the Civil War, the fort was never completed (Bearss 1976:2). The invention of new rifled artillery and long-range guns rendered masonry forts vulnerable, which rendered the incomplete fort obsolete.

During the 19th century there was conflict over use of the resources on Sandy Hook, with repeated requests to the War Department to allow the cutting of timber, and construction of various structures. Almost all of these requests were denied (Moss 1964:40-41). Particularly problematic was Peter Johnson, associated with a Boiler Testing Commission who operated an experimental station to the south of the lighthouse where boilers were put through tests to determine their safety (Moss 1964:41). He established his station without permission. In 1853, the New York and Sandy Hook Telegraph Company was granted permission to construct a telegraph station (Moss 1964:46). Other telegraph stations were also erected on the hook.

The Federal Government proposed to build a quarantine station on Sandy Hook in the 1850s, but local opposition, led by the Hartshorne family, defeated this plan.

The U.S. Life-Saving Service was also active on Sandy Hook. In 1849, the first lifesaving station in the United States was constructed at Spermaceti Cove (Butowski 1984:3). The original station still survives, but has been moved to Twin Lights State Park in Highlands, New Jersey. The current Visitor's Center at Spermaceti Cove was the final station built for the Life-Saving Service on Sandy Hook, erected in 1915 (Butowski 1984:3).

Sandy Hook also became home to the Ordnance Proving Grounds, an artillery testing facility. Construction began in 1874 and continued for nearly fifty years (Linck, Bianchi, and Pendery 2009:71). Historian Edward Bearss wrote:

All of the big guns and mortars and their carriages, mounted in the Nation's Endicott and Taft-period coastal fortifications from the early 1890s through WWI were developed at Sandy Hook and many of them proved there. The heavy and field artillery used by the U.S. Army in the Spanish-American [War] and W.W.I were tested at Sandy Hook as were various types of Gatling Guns, and mitrailleuses. The Life-Saving Service's Lyle gun was tested at the Proving Grounds. Powders, both explosive and propellant, and fuses were tested. The Sandy Hook Proving Grounds...had a key role in the development of the weapons employed by the U.S. Coast Artillery and U.S. Field Artillery during the vital years that the Nation emerged as a world power (Bearss 1976a:1-2).

However, after WWI, the new artillery was too powerful to be safely tested on Sandy Hook and the proving ground was transferred to Aberdeen, Maryland.

The late 19th century saw the construction of a new series of fortifications on Sandy Hook, part of a defensive network guarding New York Bay. Fort Hancock was completed on October 30, 1895. The fortifications included gun and mortar batteries and numerous support structures. Construction of other batteries continued through the early 20th century. Fort Hancock was active from the Spanish American War through both World Wars. It served as a training location for artillerists and served as a command center for the Harbor Defenses of New York. During World War II, it was also a staging area for troops preparing for service overseas (Linck, Bianchi, and Pendery 2009:75). Deactivated in 1950, it reopened during the Korean War, and in 1956, a Nike missile base was constructed on the hook. It was upgraded to handle Nike-Hercules missiles in 1960 and was deactivated in 1967. The army transferred Fort Hancock to the National Park Service in 1974, though a portion of the northwestern area of the hook was transferred to the Coast Guard (Linck, Bianchi, and Pendery 2009).



Figure 4.23: Sandy Hook lighthouse in an early-20th-century photograph, note the oil storage building to the east of the lighthouse. Courtesy of the National Park Service, Gateway National Recreation Area.

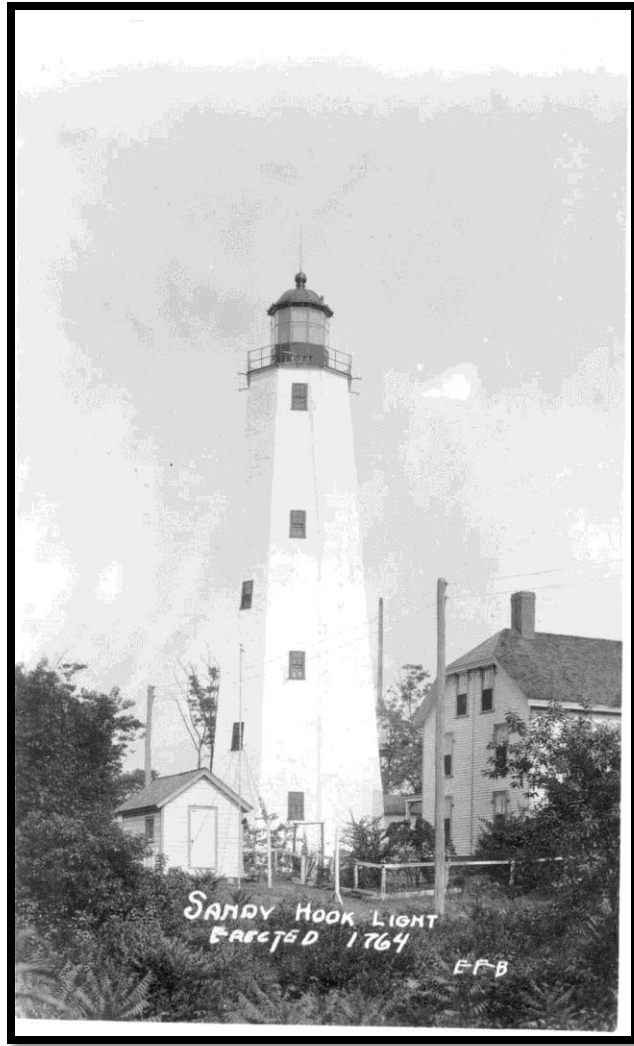


Figure 4.24: Sandy Hook lighthouse in an early-20th-century photograph, note the shed, and fences. This photo is looking east/southeast. Courtesy of the National Park Service, Gateway National Recreation Area.



Figure 4.25: Sandy Hook lighthouse in wartime service, painted in camouflage during World War II. This photo is looking north/northeast. Note the oil storage building is no longer present. Courtesy of the National Park Service, Gateway National Recreation Area.

CHAPTER 5: FIELDWORK METHODS

Section 5.1 Introduction

Fieldwork at the Sandy Hook Lighthouse in Gateway National Recreation Area was carried out on the last weekend in May and all four weekends in June of 2016 by students enrolled in Monmouth University's undergraduate (AN/HS 315) and graduate (AN/HS 520) field schools. The field school was directed by Richard Veit and Adam Heinrich with assistance from Sean McHugh. The fieldwork was conducted for the NPS in preparation for improvements to the park. Ten undergraduate students and 11 graduate students participated. This project was conceived as a public archaeology project and over 75 local volunteers also participated in the fieldwork. The project was funded by the NPS under National Park Service (Cooperative Agreement #P16AC00022 and Scientific Research Permit: GATE-2016-SCI-0020).

Testing focused on a 1.5-acre parcel immediately surrounding the lighthouse. Fifty-three shovel test pits and six excavation units were excavated. Twenty-one features were identified, and 4,516 artifacts were recovered. Testing revealed intact archaeological deposits relating to a lighthouse keeper's dwelling, a 19th-century outbuilding, two brick paths, and a rich 19th-century midden deposit reflecting the historic occupation of the site. Small quantities of earlier 18th-century material, and artifacts likely associated with the military occupation of the site during the American Revolution were also unearthed. These included gun parts, musket balls, and fragments of grape and canister shot. Although some areas of the knoll where the lighthouse stands were impacted by recent utility work and site improvements, much of the site is intact with some stratified deposits. Efforts should be made to preserve these deposits for future study.

Based on the results of the 2016 field school and previous archaeological excavations at Sandy Hook Lighthouse, it is the authors' conclusion that the site contains significant cultural features, most notably the remains of a 19th-century lighthouse keeper's house and attached kitchen, as well as rich 19th-century midden deposits that provide new information about the site's historic occupation. Although intact 18th-century deposits were not encountered the presence of military artifacts likely associated with the lighthouse's Revolutionary War occupation is also noteworthy. Although testing was limited, it is our professional opinion that the site is significant under Criterion D of the National Register of

Historic Places. Any further ground disturbance in these locations should be preceded by additional archaeological research.

5.2 Field Methods

The archaeological survey consisted of background research, remote sensing, and subsurface testing throughout the 1.5-acre project area. Subsurface testing included the excavation of 53 STPs and six EUs. It was preceded by a remote sensing survey carried out *pro bono* by Paul McLeod and followed by lab work consisting of artifact cleaning, cataloging, and labelling at the Monmouth University archaeology lab.

5.3 Remote Sensing

Prior to the field school, Paul McLeod, President of Environmental Probing Investigations, Inc., performed a *pro bono* geophysical survey of the lighthouse property utilizing ground penetrating radar (GPR) and magnetometry (electromagnetic induction/EM) (Appendix A). A GSSI SIR-3000 Radar System with a 400 MHz antenna and a GSSI EM Profiler were employed. Anomalies were mapped using a Trimble GEO 7X GPS (McLeod 2016).

While the GPR survey covered the entire area around the lighthouse, the magnetometry survey focused on the area south of the lighthouse (Figures 5.1 and 5.2). The GPR survey was performed as a series of transects running perpendicularly across the site with a spacing of approximately four feet between lines. Thirteen features were identified. These included from north to south, modern communications lines (2), modern electrical lines (2), unidentified pipes (3), unidentified trends (5), and a well (1). Although all the utilities were modern, the “unidentified trends” were subsequently shown to correspond with historic features, generally the walls of buried structures (Figure 5.3).

The EM survey focused on the area to the south of the lighthouse. The areas to the west and north of the lighthouse were avoided because of modern utilities, benches, and sidewalks incorporating metal reinforcements, all of which would throw off the EM Induction survey. Survey lines were run in a north to south direction at a three-foot line spacing with data points collected at a rate of two samples per second. These points are individually georeferenced. McLeod collected electromagnetic data at three different frequencies: 15,000 Hz, 8,000 Hz, and 2,000 Hz, providing three different

depth slices of the subsurface. McLeod (2016:2) notes, “Specifically, the 15KHz frequency corresponds to a depth of around 0-2’, the 8KHz frequency corresponds to a depth of around 2-4’, and the 2KHz frequency corresponds to a depth of around 4-6.” Each of the three frequencies data are collected for the “In Phase” component and the “Conductivity” component. These components relate to two different ways that the transmitted signal is received.” The EM data (Appendix A) were considerably more complicated than the radar data. Widespread anomalies appear across the site, especially around the lighthouse (Figure 5.3). Unfortunately, the density of electromagnetic signals was so great that no specific features could be identified.



Figure 5.1: Paul McLeod carrying out the ground penetrating radar survey at the Sandy Hook lighthouse. The photo is looking northeast towards the lighthouse.



Figure 5.2: Paul McLeod carrying out the EM survey at the Sandy Hook lighthouse. The photo is looking southwest away from the lighthouse.

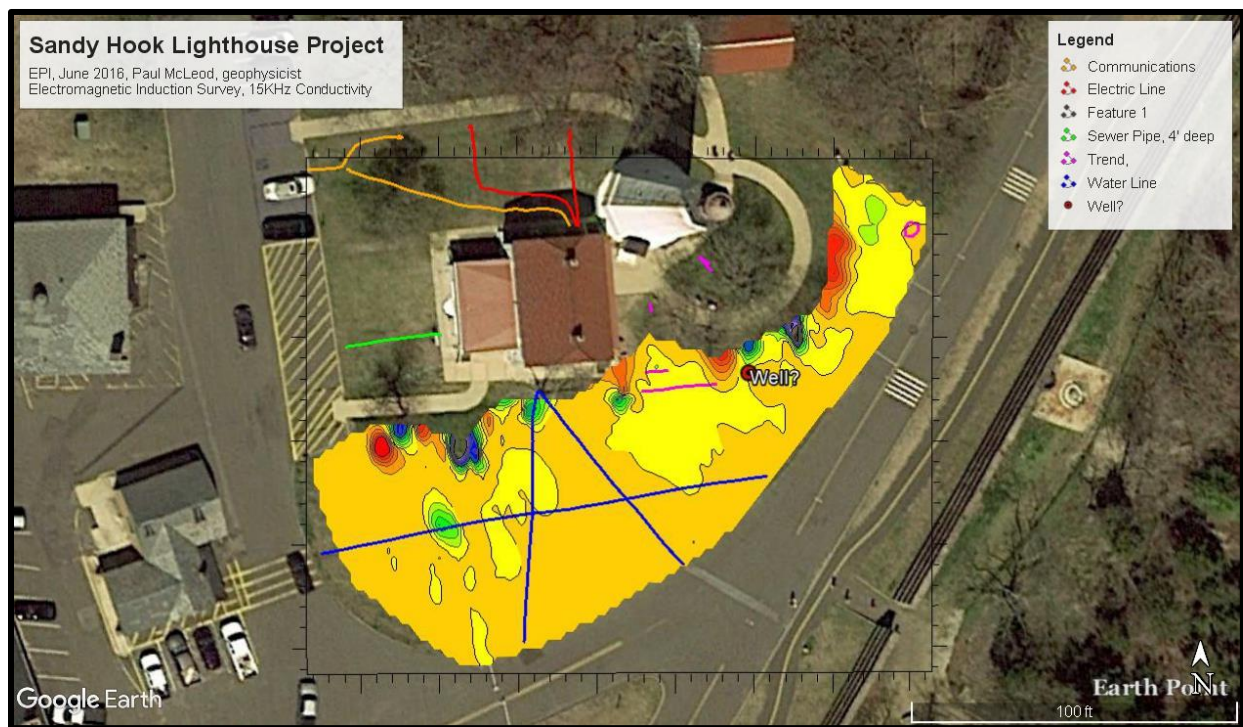


Figure 5.3: Results of the Radar and EM Surveys at the lighthouse. EM data is shown as colored shading. Radar anomalies are shown as colored lines. Image courtesy of Paul McLeod.

5.4 Shovel Testing

Fifty-three STPs were excavated during the survey (Figure 5.4). Thirty-four were excavated on a 50-foot interval grid throughout the project area. An additional 19 STPs were excavated on a tighter interval grid in order to further investigate areas where features and dense artifact deposits were identified in the 50-foot interval grid. Shovel test pits designated with alphabetic suffixes, e.g., 18a, were judgmentally placed to investigate suspected features or artifact deposits. Shovel test pit locations were mapped using Global Positioning System technology, measuring tapes, and relative distances to surveyed landmarks. Shovel test pits measured approximately 1.5 feet in diameter and reached an average depth of 3.85 feet below the ground surface.

Students excavated STPs with round-nosed shovels. All excavated soils were screened through one-quarter-inch hardware-cloth mesh to facilitate artifact recovery. Individual soil horizons were hand excavated separately and screened through one-quarter-inch wire mesh to facilitate artifact recovery.

Recovered material was separated by stratum and placed in 4-mil resealable polyethylene bags with a tag containing the appropriate provenience information. Recovered cultural material was processed and cataloged at Monmouth University's archaeology laboratory. Historic artifacts are listed in the catalog presented in Appendix B.

A summary of the STPs is presented in Appendix B. Nineteen hundred eighteen artifacts were recovered from the shovel tests. On average, 47 artifacts were recovered from each of the STPs. Particularly rich concentrations of artifacts were noted in STPs 37 (89), 38 (240), 39 (196), 41 (217), and 48 (135) (Figure 5.5). Eighteenth-century artifacts were found primarily to the south and east of the lighthouse (Figure 5.6). Nineteenth-century artifacts were located on all sides of the lighthouse, reflecting a period of more extensive use of this area (Figure 5.7).

An artifact density map was prepared using ArcGIS 10.5 (see Figure 5.5). This map revealed artifact concentrations  of the lighthouse dating to the mid-19th century, with smaller concentrations of 20th-century materials on the  peripheries of the study area.

Ten features were identified during the shovel testing, several of which (seen in Table 5.1) were further investigated with larger excavation units. These features included foundation walls in STPs

20, 42, 43, 46, and 49. Brick and stones, not clearly associated with foundations, were found in STPs 10, 18, 19, 20. Midden deposits were also noted in the STPs.

STP 10 was located approximately [REDACTED] of the current lighthouse keeper's house and revealed Feature 3. This feature contained brick that may be from a walkway or alternatively was displaced from a structure on the site. No other artifacts were noted in association with this feature.

STP 18 was located approximately [REDACTED] of the current lighthouse keeper's house. It revealed Feature 5, a stone wall from the former lighthouse keeper's quarters, 0.7-2.1 feet below datum.

STP 19 revealed Feature 2, a single sandstone block that was 1 foot wide and extended from 1.41-1.85 feet below ground surface. It was located approximately [REDACTED] of the current lighthouse keeper's house. The STP also contained a heavily corroded iron spike, brick fragments, the femur from a pig, and small bits of charcoal. It is not clear whether this is simply a displaced stone or a stone that was part of a larger feature. No further excavation was undertaken in this location due to time constraints.

STP 20 also contained a single stone block, designated Feature 4. It was located approximately .4 feet below datum on the north side of the shovel test pit. It was located approximately [REDACTED] of the current lighthouse keeper's dwelling. No other artifacts were associated with this feature. Its exact dimensions were not recorded as it was largely outside of the shovel test pit.

STP 24 uncovered a rich 19th-century midden deposit, located roughly [REDACTED] of the lighthouse. This is a stratified deposit that extended from just below the ground surface to 4.4 feet below ground surface.

STP 31 revealed a horizontal brick in the sidewall between 1.7 and 2.2 feet below ground surface. It was designated Feature 8 and was located roughly [REDACTED] of the lighthouse and [REDACTED] of the lighthouse.

STP 38 revealed an extensive deposit of fieldstone rubble 0-1.2 feet below ground surface. It was designated Feature 7 and was located approximately [REDACTED] of the lighthouse keeper's dwelling.

STP 42 was located immediately [REDACTED] to the current lighthouse keeper's dwelling. At 0.6 feet below ground surface, Feature 6, a solid foundation consisting of mortared sandstone, was encountered. Found on the feature were fragments of charcoal, shell, cut nails, plaster, and bone. This is interpreted as a portion of the earlier lighthouse keeper's dwelling (Figure 5.8).

STP 43 was located approximately [REDACTED] of the current lighthouse keeper's dwelling (see Figure 5.4). At 0.5 feet below the ground surface a solid stone foundation consisting of mortared sandstone was encountered. This is interpreted as a portion of Feature 6, the wall of the earlier lighthouse keeper's dwelling revealed by STP 42 (Figure 5.9).

STP 46 was located about [REDACTED] of the current lighthouse keeper's dwelling (see Figure 5.4). This STP revealed Feature 11, a section of stone wall running north to south between .7-2.0 feet below ground surface. It is believed to be part of an earlier lighthouse keeper's dwelling.

STP 47 was located approximately [REDACTED] of the current lighthouse keeper's dwelling (see Figure 5.4). Feature 10, a section of stone wall, was noted running east to west in the unit. This was interpreted as a portion of the wall of the earlier lighthouse keeper's dwelling (Figure 5.10).

STP 49 was located approximately [REDACTED] of the lighthouse (see Figure 5.4). Feature 12, broken stone from a mortared sandstone foundation, was encountered at 0.2 feet below ground surface. The foundation appears to run east to west and may have been part of the wall from the earlier lighthouse keeper's dwelling (Figure 5.11).

Even at a 50-foot shovel test interval, numerous historic cultural features were identified in the area around the lighthouse, particularly to the [REDACTED] of the current lighthouse keeper's house. They revealed the presence of extensive intact structural remains of one or more former lighthouse

keeper's houses, as well as rich midden deposits associated with the historic occupation of the lighthouse [REDACTED] In almost all cases, these were further explored with excavation units or trenches.

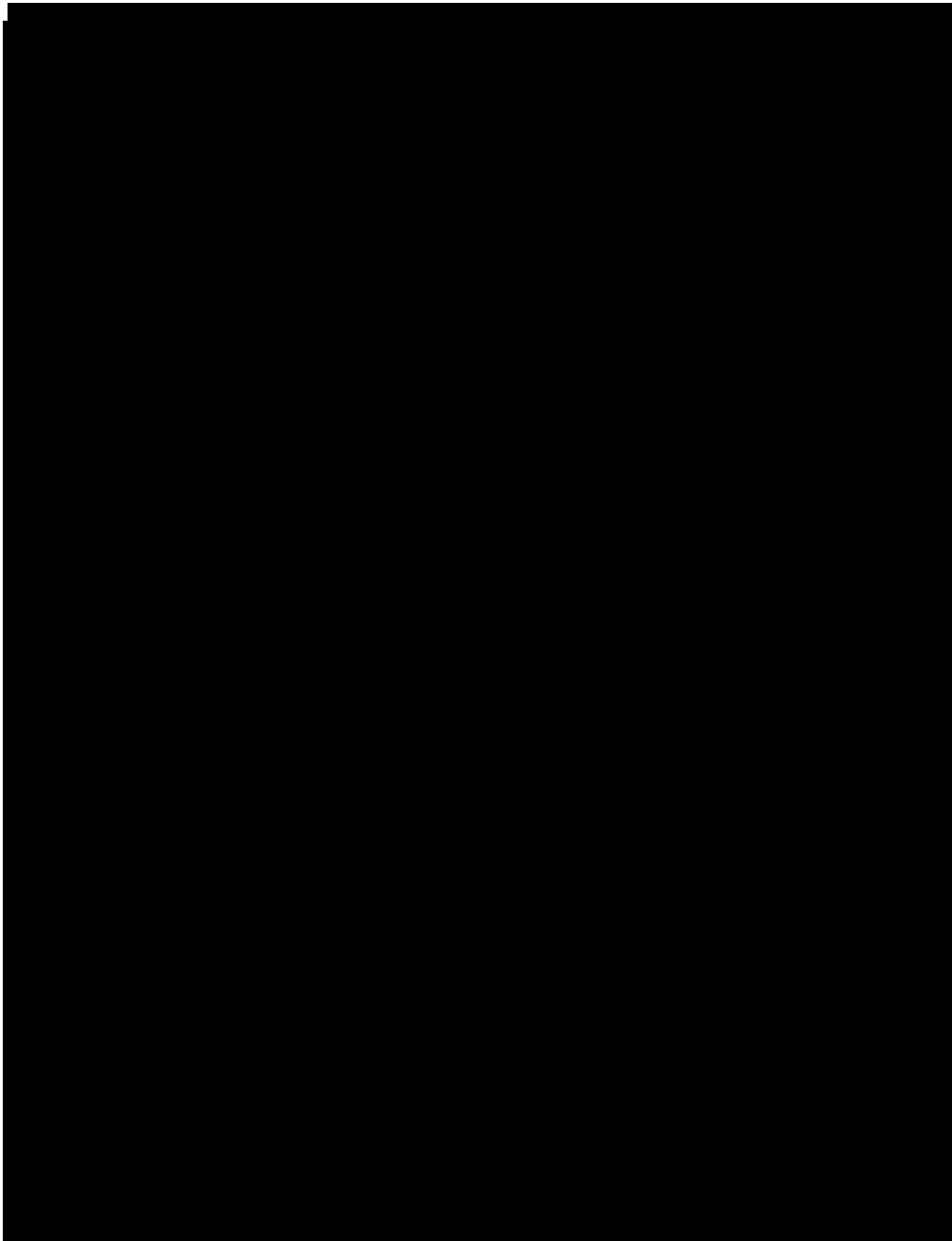


Figure 5.4: Shovel test pit locations at the Sandy Hook Lighthouse. Tests were dug on a 50-foot interval supplemented by judgmental tests to investigate features identified in testing or by remote sensing.

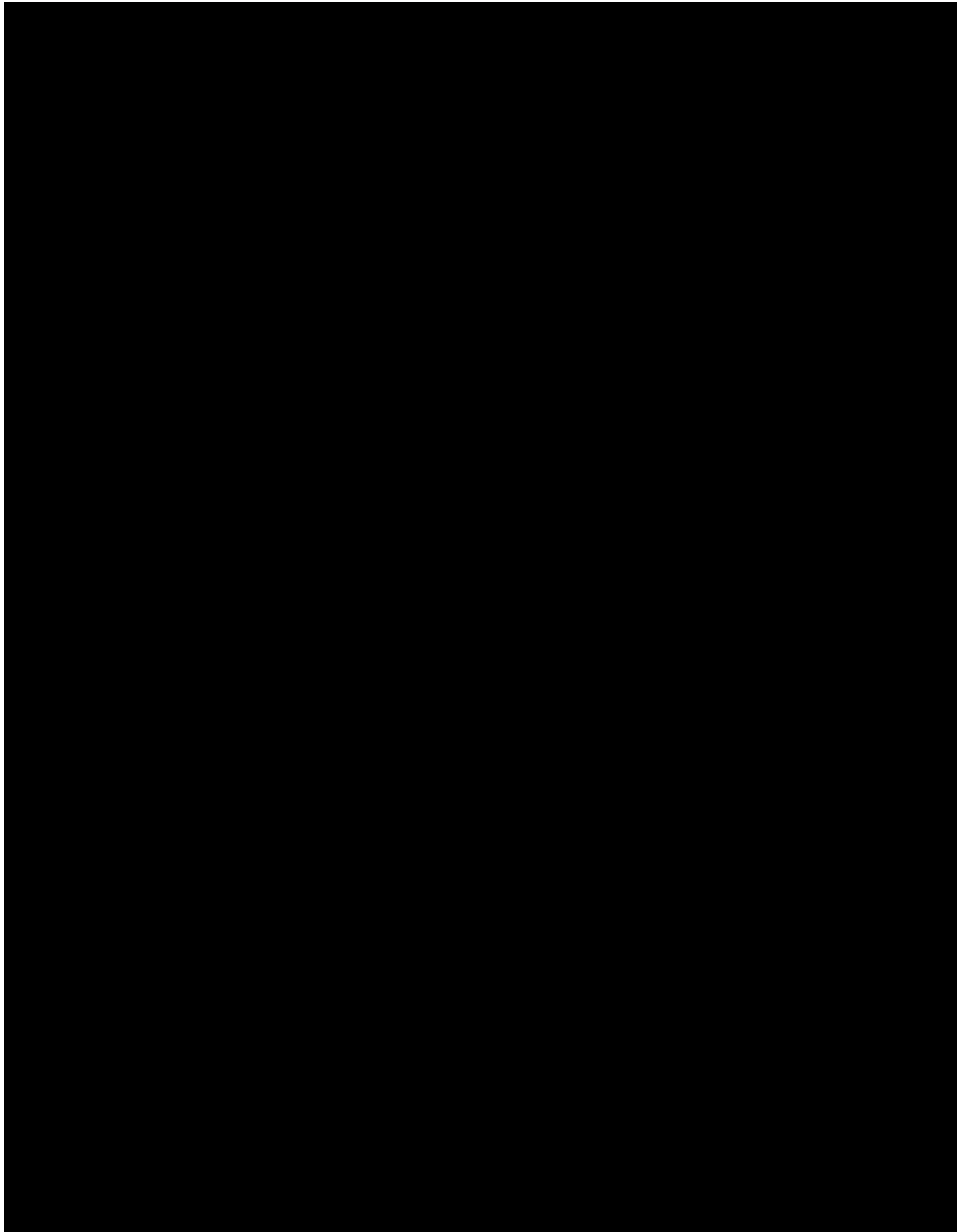


Figure 5.5: Shovel test pit locations at the Sandy Hook Lighthouse with shading representing artifact densities.

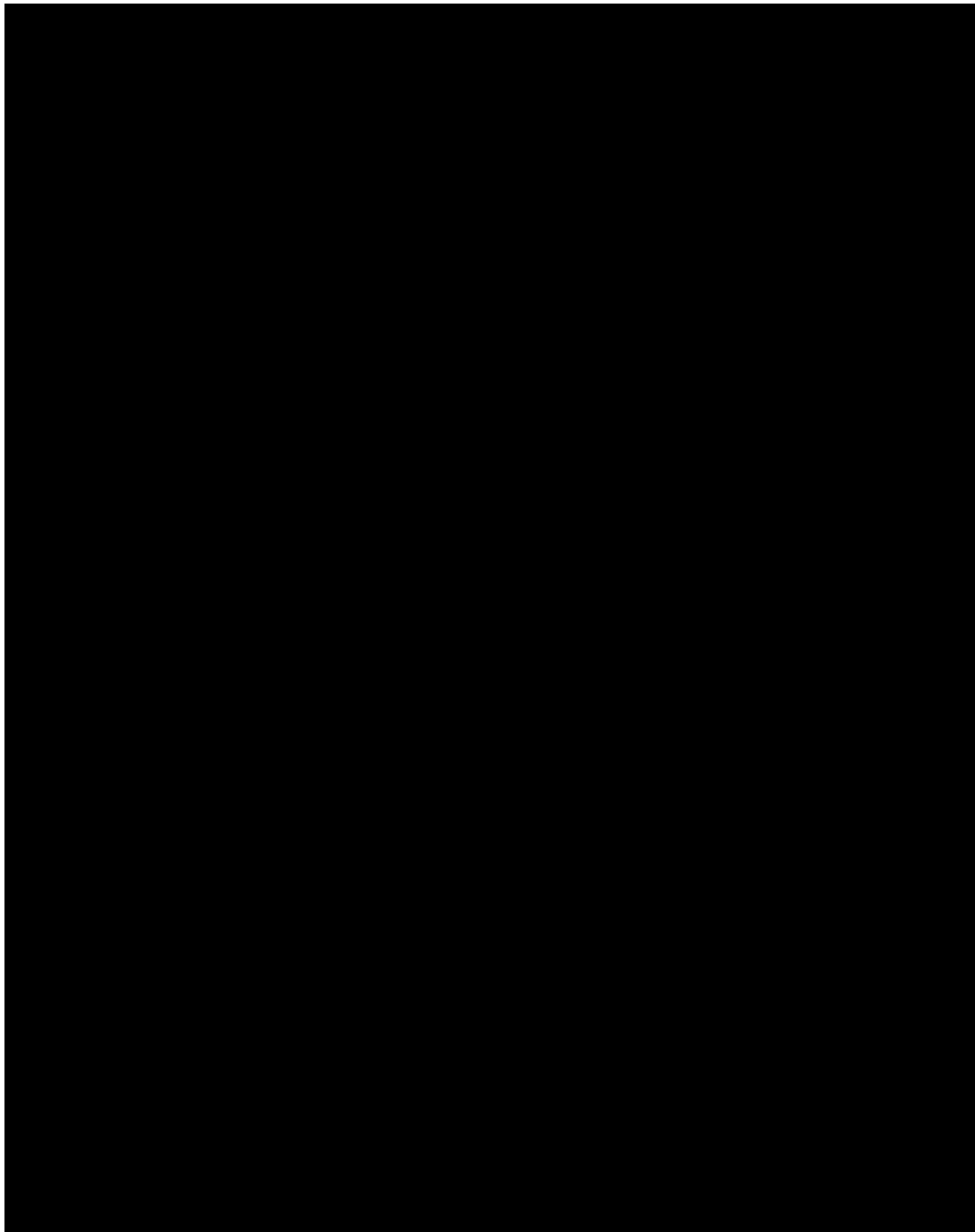


Figure 5.6: The distribution of 18th-century artifacts by the Sandy Hook Lighthouse. Note STP 11 was not located within the keeper's house but was offset [REDACTED] and was adjacent to the structure. Eighteenth-century artifacts were generally concentrated to the [REDACTED] of the lighthouse.

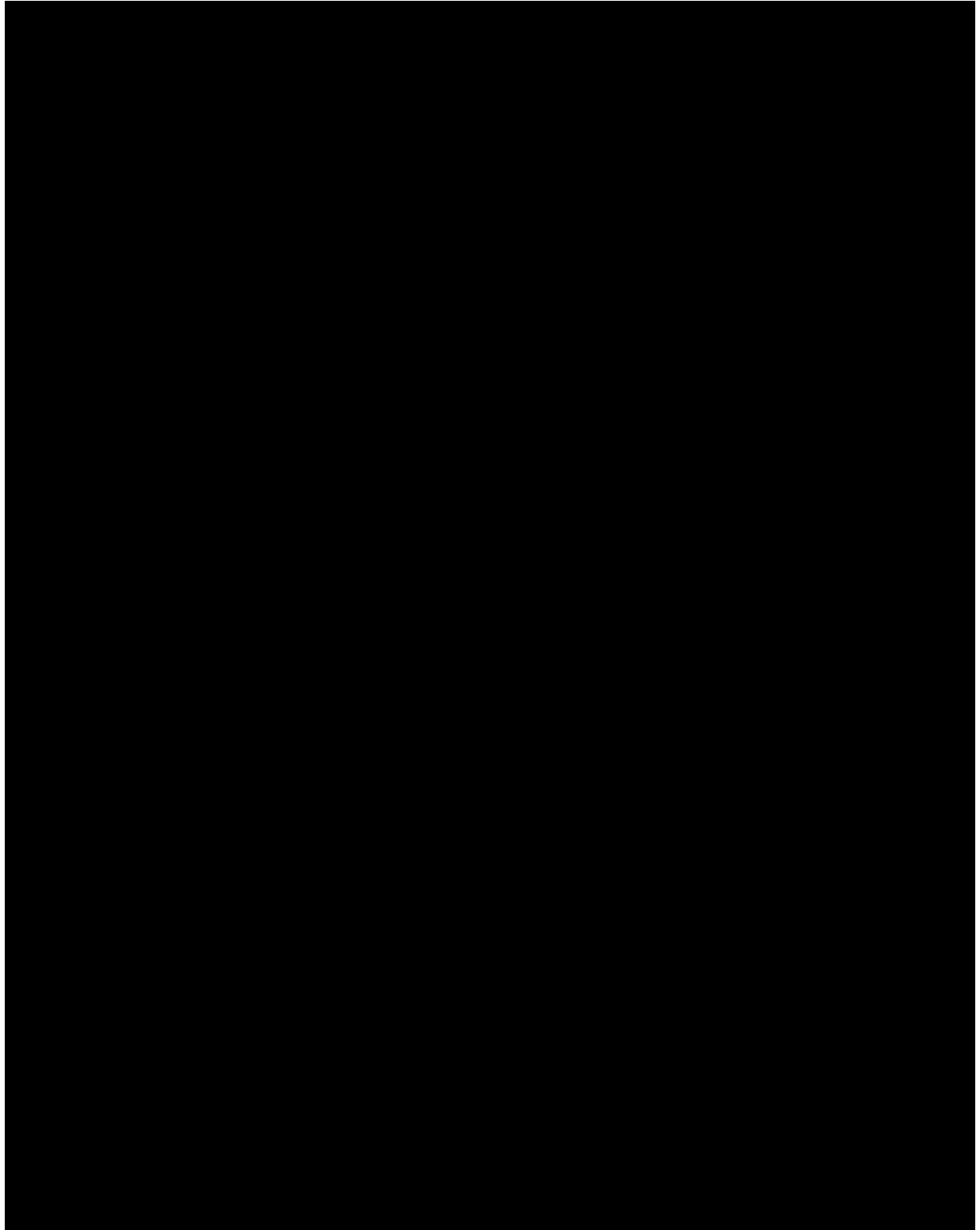


Figure 5.7: Shovel tests containing 19th-century artifacts by the Sandy Hook Lighthouse, note that artifacts are found across almost all of the study area. Note STP 11 was not located within the keeper's house but was offset [REDACTED] was adjacent to the structure.

Table 5.1: Feature List

Feature #	Description	Location	Depth	Interpretation
1	Deep midden deposit	STP 24	0.5-2.3' below ground surface	19th-century midden deposit
2	Stone Block	STP 19	1.4-1.85' below ground surface	Possible displaced wall fragment
3	Brick pad, two-foot square, one brick thick, no other artifacts	STP 10	0.9-1.2' below ground surface	Brick pad
4	Stone Block	STP 20	0.4'-unknown feet below ground surface	Possible displaced wall fragment
5	Brick Rubble	STP 18	0.9' feet below ground surface	Brick rubble
6	Mortared fieldstone foundation	STP 42 and 43	0.6-5.7' feet below ground surface	Foundation of lighthouse keeper's house.
7	Fieldstone rubble	STP 38	1.2-3.8' below ground surface	Midden deposit
8	Brick in sidewall	STP 31	1.7-2.2' below ground surface	Possibly structural
9	Stone curb	EU 2	1.5-2.0' below ground surface	Former roadway from Hudson Drive to former carriage house.
10	Fieldstone foundation	STP 47	0.1-0.65' feet below ground surface	Possible wall of lighthouse keeper's house or associated outbuilding.

11	Stone wall running north to south	STP 46, EU 4	0.7-2.0' below ground surface	Likely part of a wall from a lighthouse keeper's house
12	Mortared stone wall running east to west	STP 49, EU 5	0.8'+ below ground surface	Likely northern wall of lighthouse keeper's house
13	Brick pathway	EU 1	0.87-1.3' below datum	Walkway associated with former lighthouse keeper's dwelling
14	Flagstone curb	EU 2	0.8-2.2' below ground surface	Curb to road leading to former carriage house
15	Brick pathway	EU 1	1.0-1.9' below datum	Walkway associated with former lighthouse keeper's dwelling
16	Rectangular posthole like feature NW corner of EU	EU 2	2.3-2.8' below datum	Possible postmold
17	Rectangular posthole like feature NW corner of EU	EU 2	2.3-2.8' below datum	Possible Postmold
18	Brown sand fill layer, possible builder's trench on exterior of Feature 6	EU 3	0.4-2.0' below ground level	Possible builder's trench

19	Gravel drive	EU 2	0.5-.8' below ground surface	Gravel path leading to former carriage house
20	Pit feature	EU 6	1.6-2.4' below datum	Pit feature in northern portion of EU, possibly associated with repairs to the lighthouse.
21	Stone and brick porch footing	EU 3	Runs perpendicular to the south side of Feature 6.	Porch footing from lighthouse keeper's house



Figure 5.8: Shovel test pit 42 showing Feature 6, the wall of the lighthouse keeper's dwelling.



Figure 5.9: Shovel test pit 43 showing Feature 6, the wall of the lighthouse keeper's dwelling.



Figure 5.10: Shovel test 47, showing Feature 10, the foundation of the lighthouse keeper's house.



Figure 5.11: Shovel test 49, showing Feature 12, the foundation of the lighthouse keeper's house.

5.5 Excavation Units:

Six EUs were excavated. Three were five-foot-square excavation units, two were three-foot square units, and one was a 2.5-foot wide by 10-foot long trench (Figure 5.12). All were excavated by hand with soils screened through one-quarter inch hardware cloth mesh. Artifacts, including faunal remains, were retained for cataloging and analysis. Plans and profile views were drawn for all of the EUs and record photographs were taken.

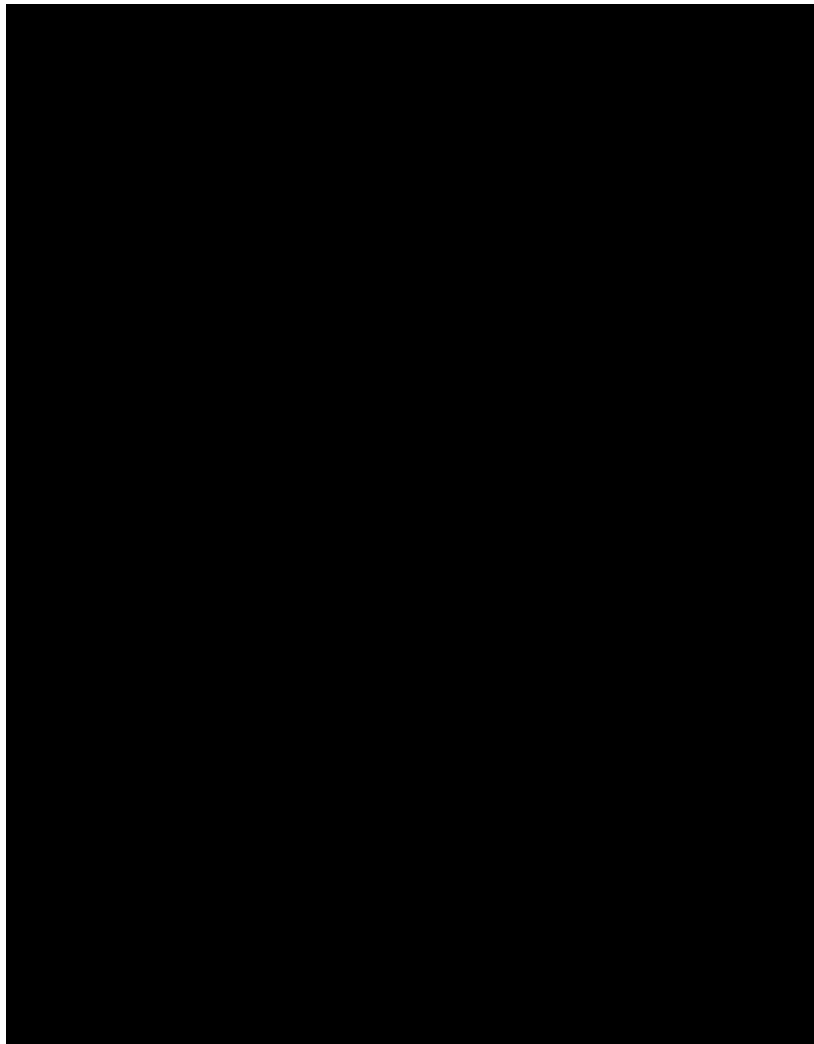


Figure 5.12: Excavation unit locations. Excavation Units 1, 3, 4, and possibly 5 revealed sections of the earlier lighthouse keeper's dwelling. EU 2 was located on a rich midden deposit, overlain by a historic gravel road with associated curb. Excavation Unit 6, showed a small pit feature, designated Feature 20, possibly associated with the lighthouse's construction.

Excavation Unit 1

Excavation Unit 1 was a five-foot square located at STP 43 due to the identification of a foundation, designated Feature 6 in that STP. The datum for this excavation was located at 0.2 feet above the ground surface in the northeast corner of the excavation unit. Feature 6 was the corner of a mortared stone foundation likely associated with a lighthouse keeper's dwelling. EU 1 was placed to expose more of the foundation and to investigate any cultural deposits within and outside the foundation. The unit was also located [REDACTED] of the current lighthouse keeper's dwelling [REDACTED]. Excavation of EU 1 revealed three features: Feature 6, a corner of the lighthouse keeper's dwelling; Feature 13, a brick walkway; and Feature 15, which was either a brick walkway or the edging for a planting bed (Figures 5.13, 5.14, 5.15, 5.16, 5.17).

The first soil layer removed from EU 1, Stratum I was a 0.19-foot thick dark brown (7.5YR 3/2) sand that was likely a modern yard deposit resulting from gardening or upcast from the adjacent sidewalk's construction. Only four artifacts were recovered from the first stratum: two bottle glass and two window glass fragments. The deposit is recent, as the bottle glass dates to the 20th century.

Stratum II consisted of a .21-foot thick dark brown (7.5YR 3/3) sand mottled with dark brown (7.5YR 3/4) sand and a brown (7.5YR 4/4) sand fill layer that extended across the whole EU. This deposit may have been used to level the ground surface after the demolition of the structure represented by Feature 6. This deposit has a moderate number of artifacts (24). These included one hand wrought, two machine cut, and one wire nail, four .22 caliber rim fire bullet casings marked "US", fragments of creamware (2), pearlware (2), and whiteware (1); glass fragments from colorless, cobalt, and brown bottle glass (6), a fragment of lamp chimney glass, bone fragments (3), and one modern plastic button. This appears to be a modern fill deposit. The removal of Stratum II uncovered Feature 6 along with Strata III, IV, and V.

Feature 6, a roughly L-shaped foundation, was composed of roughly-shaped sandstone blocks held together with lime mortar. It began at 0.6 feet below datum and extended 4.6 feet south into the unit and three feet from west to east into the unit. The foundation was associated with an in-filled cellar, which was not assigned a separate feature number. The foundation walls aligned with other sections of wall uncovered in STP 42 and STP 46.

Soils inside and outside the feature were excavated separately. Those inside Feature 6 consisted of fill strata representing demolition debris from the removal of the building. Those outside the feature represented historic occupation surfaces and fill deposits and are discussed separately below.

Stratum III was the first demolition level within the in-filled cellar hole. It consisted of dense brick and sandstone rubble with little soil matrix (a brown 7.5 YR 4/4 sand). Excavated as a cultural stratum, the rubble fill was about five feet deep from the top of the foundation (.6 feet below ground surface to 5.7 feet below the current ground surface). A brick floor was identified at 5.7 feet below ground surface. Due to its depth and the confined space between the foundation and the EU wall, the excavation inside the fill was converted to a shovel test, which allowed the floor to be identified, but did not allow for detailed observation of the construction techniques or pattern to the brick floor.

A total of 46 artifacts were recovered from Stratum III. These included a ferrous metal buckle, a button, a shutter dog, a ferrous metal ring, a lead fragment, two creamware fragments, a pearlware fragment, three bottle glass fragments, and 27 window glass fragments. Again, the deposit appears to be a 19th-century fill deposit, pushed into the cellar when the building was taken down. Many of the finds relate to the architecture of the building, including the window glass and the shutter dog.

Excavation outside of Feature 6 revealed stratified deposits outside of the structure. Stratum IV and Stratum V were recognized as exterior deposits. Stratum IV consisted of a black (10YR 2/1) silty sand fill deposit along the southern exterior of the feature. Due to the tight exposure between Feature 6 and the southern EU wall, Stratum IV was not fully excavated. Excavation ended at 0.6 feet below datum. Artifacts recovered included a crown cap seal from a bottle (ca. 1892+), a buckle, a button, two machine cut nail fragments, a staple, a wire nail, a fragment of pearlware, a fragment of porcelain, three bottle glass fragments, a lamp glass fragment, and eight animal bone fragments.

Stratum V was identified along the exterior of the eastern foundation wall as a 0.5-foot thick dark grayish brown (10YR 4/2) silty sand with mortar fill deposit. Stratum V contained 16 artifacts, including four wire nails, two fragments of window glass, three lamp glass fragments, and five bone fragments.

The removal of Stratum V revealed Feature 13 at the northeast corner and Feature 15 at the southeast corner of the EU. Feature 13 was identified at 0.87-foot datum as a series of unmortared one-course deep bricks laid as a brick pad or pathway with the bricks aligned along their stretcher ends. The removal of Feature 13 determined that the bricks were only one course deep. Feature 15 was a line of bricks mortared together as a short wall or support. The line of bricks was aligned along their stretcher sides and the feature was three courses deep. Feature 15 (1.0-1.9' below datum) was not clearly associated with Feature 6 or Feature 13, and it may have been a structure related to a porch or garden at the front of the lighthouse keeper's dwelling. To the south of Feature 15, Stratum VI was identified as a fill deposit consisting of dark brown (7.5YR 3/2) sand. This feature was left intact, which did not allow for the excavation of Stratum VI in the tight southeast corner of the EU. Only three artifacts were recovered from Stratum VI: a fragment of window glass and two small bone fragments.

The removal of Stratum V and Feature 13 revealed Stratum VII and Stratum IX. Stratum IX was a 0.7-foot thick dark yellowish brown (10YR 3/4) sand with mortar and shell fill layer that was only identified in the north and east EU corners of the unit. Stratum VII extended across the eastern half of the EU outside Feature 6. Stratum VII was a 1.0-foot thick light olive brown (2.5Y 5/4) mottled with an olive brown (2.5Y 4/4) sand fill layer. This proved to be a rich midden context, partially sealed by the later brick path (Feature 13). It was artifact rich, containing 95 artifacts. These included an iron buckle, an iron spike, two .22 caliber brass shell casings, three musket balls, fragments of creamware, pearlware, redware, and stoneware, three clay pipe stems, two fragments of olive-green bottle glass, 29 window glass fragments, and fragments of mammal, fish, and bird bone. The shell casings, ca. 1880 or later, may indicate some degree of disturbance of what otherwise appears to be a 19th-century midden deposit associated with the occupation of one of the lighthouse keeper's dwellings.

Beneath Stratum VII, Stratum VIII was identified as yellow (2.5Y 7/6) sand mottled with an olive yellow (2.5Y 6/6) sand B-horizon. The B-horizon was augured to 5.75 feet below the ground surface, and no cultural material was recovered.

Artifacts recovered (n=236) from EU 1 support the interpretation that the seven cultural strata were layers of fill (Figures 5.18, 5.19, 5.20). Artifacts dating to the 18th through 20th centuries were often

mixed together with relatively recent artifacts. Recovered domestic artifacts include creamware, pearlware, porcelain, redware, whiteware, stoneware, vessel glass, and faunal remains. Architectural material includes wrought, machine cut, and wire nails, a wrought iron window shutter dog, and window glass. Personal artifacts include buckles and tobacco pipe stems. Relatively recent artifacts recovered from lower fill layers include a porcelain electrical insulator in Stratum V (ca. 1880-1930) and a .22-caliber brass shell casing in Stratum VII (ca. mid-19th to 20th centuries) (Myers 2010; Winant 1970). The fill within the cellar is likely associated with the demolition of the early 19th-century lighthouse keeper's dwelling in 1883. Most of the fill was composed of broken brickbats, stone, and mortar from the demolished building, though a modest quantity of artifacts was also present. Features, 6, 13, and 15 are noteworthy as they provide new information about the exact location of the lighthouse keeper's dwelling and associated landscape improvements, e.g. paths. The fill is a mixed deposit with limited interpretive potential.

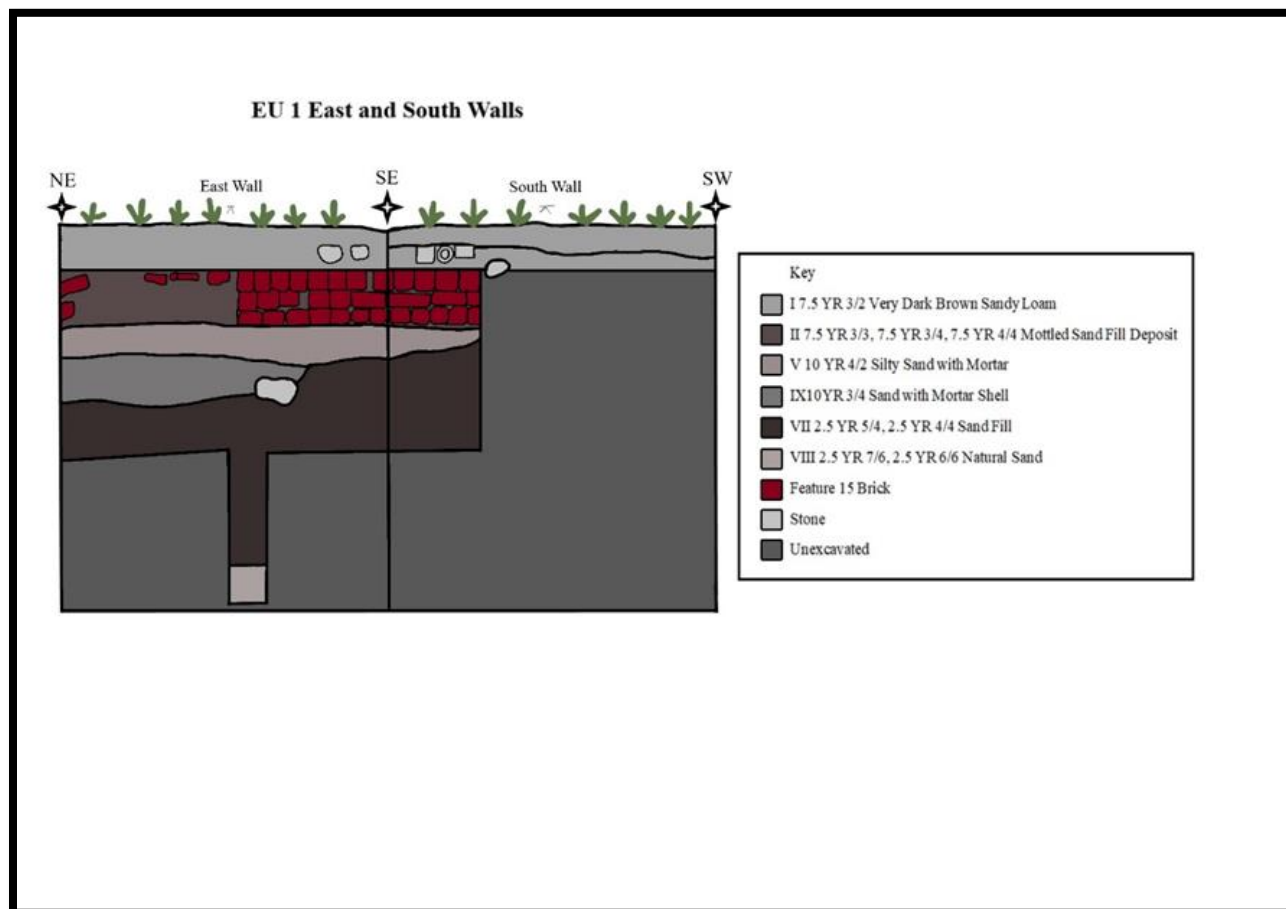


Figure 5.13: EU 1, east and south profiles.

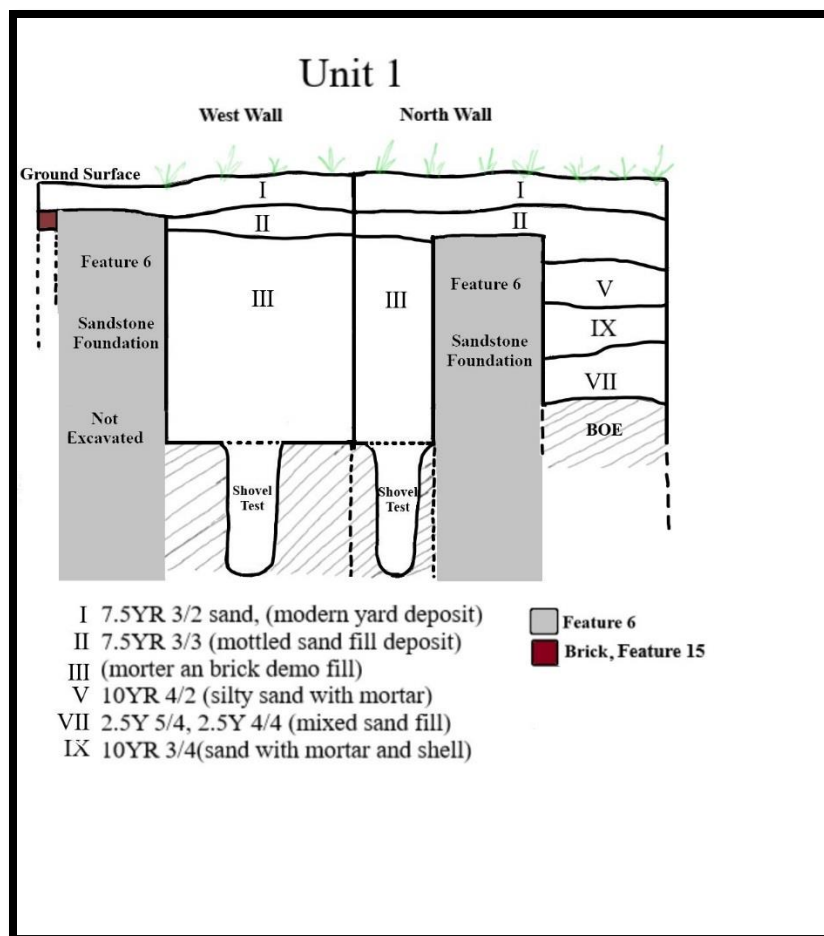


Figure 5.14: EU 1, west and north profiles, showing Feature 6.



Figure 5.15: EU 1, view south. The stone foundation is Feature 6. The interior of the in-filled cellar hole can be seen in the bottom right or northwest corner of the photograph. Feature 13 is the line of loosely laid bricks running along the eastern (left) edge of the photograph. Feature 15 is the line of bricks running at a 45-degree angle to the foundation, and likely unassociated with the building.



Figure 5.16: EU 1, view north, close of excavation.

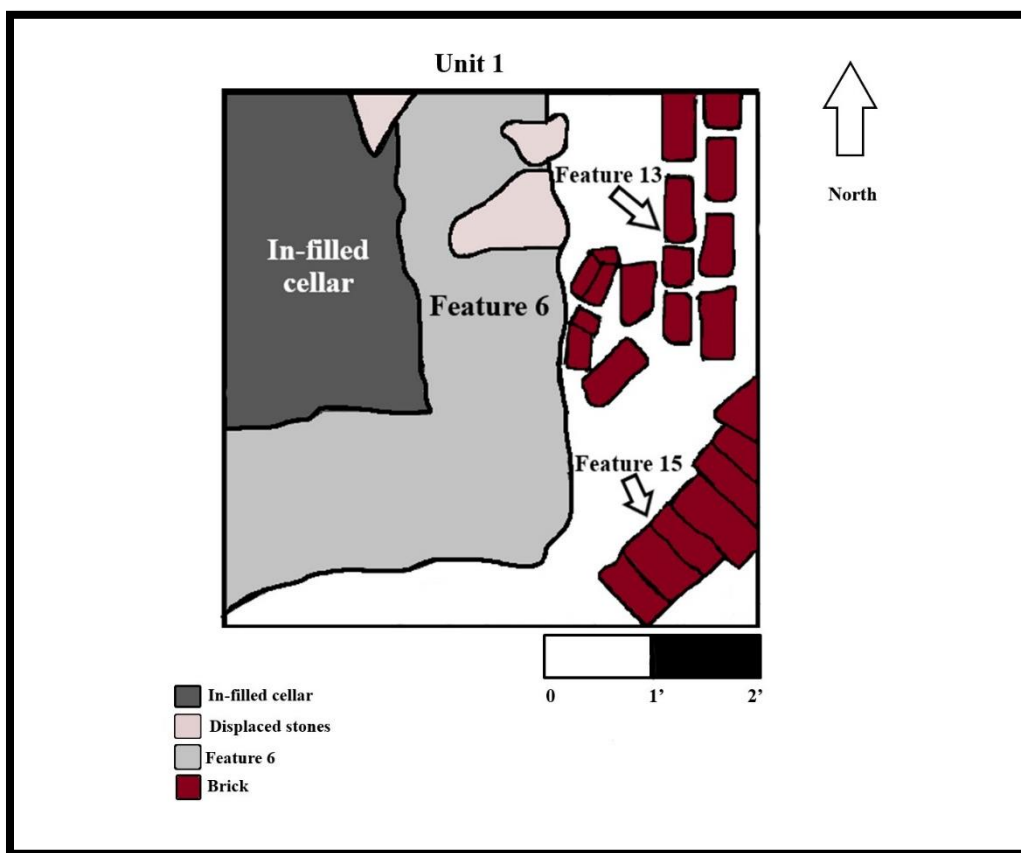


Figure 5.17: EU 1, Plan view showing Features 6, 13, and 15.



Figure 5.18: EU 1 select artifacts, from left to right and top to bottom. Lead shot, copper nails,.22 caliber bullet casings, a fragment of case shot, an unidentified lead fragment possible a shim or wrap for a gun flint, cut nails, a buckle, button, crown cap (ca. 1893+), buckles, machine cut nails, an unidentified bone fragment, iron stable, roofing nail, a fragmentary piece of architectural ironwork and a large spike.



Figure 5.19: Select artifacts from EU 1, from left to right and top to bottom: pipe stems, glass fragments, ceramic fragments, bone fragments, 20th-century bottle glass, whiteware, redware, porcelain, window glass, redware, stoneware fragments, a 20th-century porcelain insulator and an early-20th-century bottle finish fragment.



Figure 5.20: Select artifacts from interior of Feature 6, including an iron buckle frame, copper nail, bottle glass, and lead fragment.

Excavation Unit 2

Excavation Unit 2 was a five-foot square, centered on STP 30, which contained 18th- and early 19th-century artifacts including the Brown Bess musket part. The location of EU 2 was also near an

Twelve strata of soil, overlying natural subsoil were revealed (Figure 5.21). These strata appear to represent trash tossed off the lighthouse knoll, and layers of soil deposited by erosion. Several features were also noted, including Feature 9, a gravel road surface, Feature 14, a flagstone curb, and Features 16 and 17, possible postmolds (Figure 5.22). Overall, 1,905 artifacts were recovered, making this the richest excavation unit dug during this project. The stratigraphy, as viewed during excavation, differed somewhat from what was noted when profile views were drawn, likely due to and undulating nature of the deposits. In order to better understand the stratigraphic history represented in this excavation unit, *terminus post quem* (TPQ) dates and mean ceramic dates were calculated for each stratum. The deposits, discussed below, date from the 19th century, with whiteware (TPQ 1820) present in even the deepest deposits (Figures 5.23, 5.24, Table 5.2). Similarly, mean ceramic dates show that the deposits are rich in early 19th-century material, but must have been deposited after the common use of whiteware in the 1820s. Generally speaking, deeper deposits produced earlier material.

Stratum	TPQ	MCD
I	1762	1791
II	1820	1815
III	1830	1804
IV	1830	1817
V	1830	1821
VB	1830	1873
VI	1820	1796
VII	1820	1809
VIII	1800	1800
IX	1830	1801
X	1820	1796
XI	1790	1789
XII	1820	1802

Table 5.2: *Terminus post quem* and mean ceramic dates for the stratigraphic contexts in Excavation Unit 2.

Historic images of the lighthouse  show an informal outbuilding incorporating fragments of shipwrecks near this location, surrounded by ducks, pigs, and other animals (see Figure 4.18). These deposits may relate, in part, to that structure.

The first layer excavated in EU 2, Stratum I was a 0.2-foot thick brown (10YR 5/3) silty loam fill layer that contained erosion control material such as plastic netting and plastic cup-like hardware to hold grass seed. Stratum I was a young topsoil level that contained 27 artifacts. These included a wire nail, creamware sherds, fragments of modern bottle glass, window glass, and coal.

The removal of Stratum I revealed Stratum II and Feature 9 that cut into Stratum II in the northeast corner of the EU. Feature 9 was a 0.3-foot-thick linear concentration of basalt gravel fill with dark gray (10YR 3/1) sand that likely represents a remnant of the driveway. Stratum II was a 0.32-foot thick dark brown (10YR 3/3) clayey loam fill. It too contained a modest quantity of artifacts (29). These included a wire nail, four fragments of pearlware, a fragment of whiteware, a fragment of stoneware, bottle glass, lamp glass, and window glass fragments. Based on the presence of the wire nail, this stratum almost certainly dates from the 20th century.

The removal of Stratum II revealed a sloping Stratum III. Stratum III was a 0.8-foot-thick dark grayish brown (10YR 4/2) silty loam fill layer. Stratum III yielded 250 artifacts, including machine-cut nails, barbed wire, a possible gun part, a copper nail—possibly from ship's sheathing, fragments of creamware, pearlware, yellowware, porcelain, redware, and stoneware, as well as a pipestem fragment, numerous fragments of bottle glass, including embossed 19th-century beer bottles, lighting glass, and animal bone fragments.

During the excavation of Stratum III, long blue stone curbing was revealed running from the northwest corner to the south wall of the EU. The stone curbing, Feature 14, likely dates to the late nineteenth or twentieth century as it is made of the same stone material and aligns with the curbing on Hudson Road. The sealing of the flagstone curb by Stratum III suggests that Stratum III may be a fill emplaced to cover the curbing after it was no longer used, or Stratum III may also have derived from erosion down the adjacent hill. Excavators pedestaled the feature in order to avoid dislodging the long stones that continued beyond the EU's walls.

After the removal of Stratum III, Stratum IV was a 0.3-foot thick very dark brown (10YR 2/2) sand fill layer. Stratum IV contained only 29 artifacts, including a machine cut nail, a staple, fragments of creamware, pearlware, redware, yellowware, stoneware, tobacco pipe stems, and fragments of window, bottle, and lighting glass.

Stratum V (A) was a 10 YR 2/1 black silty loam with large quantities of pebbles and gravel. The layer contained 219 artifacts. They included thin fragments of copper sheet, fragments of creamware, pearlware, whiteware, yellowware, stoneware, porcelain, embossed 19th-century beer bottles, pressed glass, olive glass, lighting glass, and small quantities of animal bone. The large quantity of pebbles and gravel likely indicate that this was a historic road surface or path.

Stratum V (B) was a 10 YR 3/2 greyish brown coarse sand. It contained 77 artifacts, including several indeterminate metal objects, a single hand-wrought nail, two buttons, a lead musket ball (chewed), an earthenware marble tobacco pipe stem fragment, whiteware, porcelain, yellowware, stoneware, and redware fragments, bottle glass, and animal bone fragments.

Stratum VI was a thin stratum that contained only 18 artifacts. The soil matrix was a 10 YR 3/4 dark yellow brown coarse sand. It included small quantities of creamware and pearlware, whiteware, two pipe stem fragments, freeblown olive glass bottle fragments and a machine made-colorless bottle glass fragment, and several animal bone fragments.

Stratum VII was a 10 YR 2/2 brown sand. It was a thin stratum with only a small quantity of artifacts. The 21 artifacts included fragments of creamware, blue transfer-printed pearlware, redware, a fragment of tin-glazed earthenware, two fragments of whiteware, a tobacco pipe stem, a stoneware fragment, bottle glass fragments, and a bone button (two-way sew through).

Stratum VIII was a 10 YR 5/3 sand that yielded 75 artifacts. These included a fragment of creamware, a fragment of annular pearlware, two fragments of blue transfer-printed pearlware, a neck fragment from a free-blown bottle, and several animal bone fragments.

Stratum IX was a 10 YR 4/3 very dark grayish brown sandy loam that contained copious amounts of artifacts. One button, a copper nail, a .22-caliber brass shell casing, 58 creamware fragments, over

60 fragments of pearlware, half with blue transfer print decoration, over 25 fragments of redware, eight fragments of stoneware, small quantities of bottle glass, 38 window glass fragments, and 27 lamp glass fragments, as well as numerous fragments of bird, fish, and mammal bone were uncovered.

Stratum X, a 10 YR 4/2 light yellowish brown sand, also had a high concentration of artifacts totaling 662. Particularly interesting was an embossed brass strip inscribed Friedrich Schroder that may be a fragmentary case band from a personalized pocket watch. German emigre Friederich Schroeder, was Mayor of Brooklyn, a New York State Senator, and a successful cigar manufacturer in the mid-19th-century (https://en.wikipedia.org/wiki/Frederick_A._Schroeder). He arrived in the United States in 1849 and died in 1899. Given the slightly different spellings of the surname Schroder versus Schroeder, it is not clear whether the Schroder represented by the watch band is the same individual who served as Brooklyn's Republican mayor. Substantial quantities of creamware, as well as smaller quantities of pearlware, redware, and stoneware were also recovered. Only one fragment of whiteware was noted (Figure 5.25). Sixty-three fragments of olive-green bottle glass were present. Animal bone fragments and shell, especially oyster and clam, were present.

Generally speaking, the deposits appear to get older as they get deeper but based on the presence of whiteware (ca. 1820+), the deposits date from the 19th century.

Stratum XI was a 10 YR 6/3 very pale brown sand that contained notably fewer artifacts compared to the previous stratum. Only 27 artifacts were found, including small quantities of historic ceramics such as creamware, pearlware, and stoneware, along with olive bottle glass fragments, and mammal bones (Figure 5.26).

Stratum XII was a 10 YR 8/1 very pale brown sand that also yielded few artifacts. Fifty-two items were recovered, again, including small quantities of historic ceramics: pearlware, stoneware, and redware. Fragments of olive bottle glass, and small faunal fragments were also uncovered (Figure 5.27).

Feature 17 had seven artifacts, including two fragments of creamware, window glass, and lamp chimney glass.

Overall, EU 2, with 1,905 artifacts, was the single most productive excavation unit excavated. The stratigraphic profile is largely intact, and consists of multiple layers of artifact rich soil, with smaller layers that may be erosional deposits between them. The earliest materials date from the late 18th century, but even these deposits show some mixing with later material. The deposits indicate that the area [REDACTED] from the lighthouse and keeper's house was a rich disposal area.

Stratum II contained early 20th-century Peter Breidt beer bottle glass while Stratum XII contained brown bottle glass characteristic of the mid-19th through 20th centuries (Lindsey 2017). Domestic artifacts recovered from EU 2 include redware, creamware, pearlware, whiteware, ironstone, yellowware, buff-bodied slipware, tin-glazed earthenware, white salt glazed stoneware, gray-bodied stoneware, vessel glass, and faunal remains. Architectural artifacts include machine cut nails and window glass. Military artifacts include musket parts and ammunition. Personal objects recovered include buttons, jewelry, pins, and tobacco pipe fragments. While the artifacts indicate an intermittent sequential deposition, the strata contained a proportion of 18th-century artifacts such as tin-glazed earthenwares, embossed-edged creamwares, Staffordshire-type slipwares, mouth blown glass wine bottles, and military artifacts such as Brown Bess gun parts and musketballs that may have been redeposited from other locations. Historic images of the lighthouse grounds (see Figure 4.18) show a rustic barn near this location. This deep artifact-rich deposit may be a midden associated with this structure that was intermittently used from the 18th through late 19th centuries.

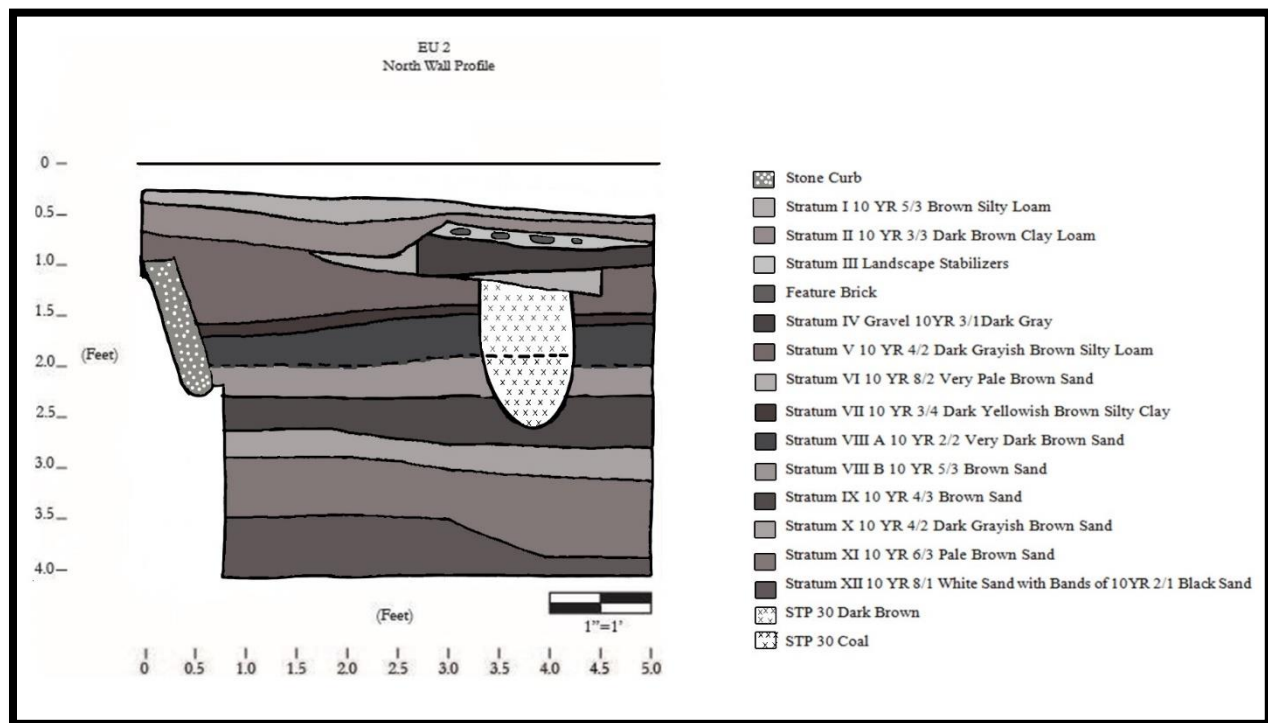


Figure 5.21: EU 2 north wall profile



Figure 5.22: EU 2 photo looking west. Note Feature 14, a large grey stone curb, associated with road gravel. Displaced stones and brick are also present. The feature was pedestaled and excavations continued on the eastern side of the curb.



Figure 5.23: Select ceramics from EU 2, from left to right and top to bottom. Redware, pearlware, porcelain, banded pearlware, porcelain redware, pearlware, brown British stoneware, pearlware, Brown British stoneware, whiteware, yellowware, pearlware, green shell edged pearlware, brown British stoneware, porcelain, creamware, yellowware, gray salt glazed stoneware, a ginger beer bottle fragment, and a Rhenish stoneware chamber pot body/handle fragment.



Figure 5.24: Select glass fragments from EU 2, from left to right, top to bottom, including a faux glass jewel, bottle glass fragments, including neck and finish fragments, pressed glass, and in the last row a dark green or “black” glass English bottle, a large 18th-century dark green glass bottle, and window glass.



Figure 5.25: EU 2, Stratum 10, select artifacts, including from left to right and top to bottom, a ginger beer bottle fragment, a late 18th-century glass bottle with wire closure, locally-produced stoneware hollowware vessel, two pontiled colorless glasses, and two pearlware fragments.



Figure 5.26: EU 2, Stratum 11, select artifacts, including from left to right and top to bottom, buff-bodied English earthenware, white salt-glazed stoneware plate, two pearlware fragments—one mocha/banded, and a glass bottle base fragment.



Figure 5.27: EU 2, Stratum 12, select artifacts, including from left to right and top to bottom, three redware fragments, three transfer-printed whiteware fragments, a bottle base, and two pipestems.

Excavation Unit 3

Excavation Unit 3 was a five-foot square unit located at STP 42. It was [REDACTED] of the current lighthouse keeper's house. The area was chosen in order to further investigate a corner of Feature 6, a foundation wall previously identified in EU 1 (Figures 5.28, 5.29, 5.30, 5.31). A porch footing, (Feature 21), was also uncovered in this unit.

Stratum I was a 1.0-foot-thick gray (10YR 5/1) compact loamy sand fill layer that contained nodules and small lenses of dark yellowish brown (10YR 4/6), very dark grayish brown (10YR 3/2), and dark grayish brown (10YR 4/2) compact sand.

In this fill 50 artifacts were recovered including fragments of a knife or tool, a spike, a Revolutionary War era bayonet clip, nearly two dozen .22-caliber rim fire cartridge cases, a single grape shot, fragments of pearlware and whiteware, a bottle seal from a "Chateau Lafitte" wine bottle, a fragment of milk glass and an undiagnostic medium mammal bone. The artifacts range from the 18th to late 19th centuries. The military artifacts are noteworthy as this structure may have been standing during the Revolution. The Chateau Lafitte bottle fragment is also noteworthy, as this was and is one of the finest French wines in production since the 17th century (<http://www.lafite.com/en/chateau-lafite-rothschild/history/>).

The removal of Stratum I revealed Feature 6, Feature 21, and Strata II through V. As Stratum I covered Feature 6 and Strata II-V, Stratum I likely represented fill used to cover the remains of the demolished caretaker's house and to level the ground surface.

A portion of the Feature 6 foundation located within EU 3 was constructed of roughly shaped sandstone that was mortared together like that found in EU 1. At the corner of Feature 6, it was noted that [REDACTED] and current lighthouse keeper's building and the perpendicular wall ran west-east in line with the foundation uncovered in EU 1 with Stratum IV as an interior fill. Stratum IV was a dark yellowish brown (10YR 3/6) sandy loam with dense brick rubble. Stratum IV was only excavated a foot deep to better view the interior of Feature 6. It contained 31 artifacts, including several spikes, a .22 caliber brass shell

casing, a graphite pencil, a lead fragment, a yellow Dutch brick, several fragments of whiteware, fragments of free-blown bottles, and mammal bone fragments.

Feature 21 was a dry-laid collection of iron-rich sandstone and brick fragments extending from the southern face of Feature 6. Feature 21 may represent a support for a porch for the building represented by Feature 6. Feature 21 separated two fill layers, Stratum II and Stratum III.

Stratum II was a 0.4-foot -thick very dark grayish brown (10YR 3/2) sand fill layer located in the southeast corner of EU 3. It was bounded by Feature 6 and Feature 21 and contained 22 artifacts dating to the mid-to-late 19th century. These included a hand-wrought nail, two straight pins, a copper nail, a redware sherd, whiteware sherds, hand-blown bottle glass fragments, three tobacco pipe fragments, several fragments of window glass and a black glass bead. It appears to date from the mid-late 19th century.

Stratum III was limited to the southwest corner of the unit. Stratum III consisted of a 0.51-foot-thick 10 YR 3/3 dark brown sand fill layer that was cut by Feature 18, a narrow 0.5-foot wide trench parallel to the south side of Feature 6. The fill from Feature 18 was an 0.8-foot -deep very dark grayish brown (10YR 3/2) sand with large quantities of brick and stone rubble. Because Feature 18 did not reach the full depth of Feature 6, it may have been a repair trench instead of a builder's trench.

Stratum III contained very few (5) artifacts including three fragments of whiteware, a hand-wrought nail, and a bone fragment. The removal of Feature 18 and Stratum III revealed Stratum V in the southwest corner of EU 3. Stratum V was a 0.6-foot thick brown (10YR 5/3) sandy loam fill layer that contained no artifacts.

The removal of Stratum V revealed Stratum VI, which was recognized to extend across the southern half of the EU south of Feature 6 and beneath Feature 21. Stratum VI was a white (10YR 8/1) mottled with brown (10YR 4/3) sand fill layer. While the stratum was not completely excavated, a 1.35-foot thick level was removed. It contained only eight artifacts, including a

hook- and-eye from clothing, a fragment of tin-glazed earthenware, a fragment of redware, two lamp chimney fragments, and a fragment of animal bone.

During the excavation of Stratum VI, Stratum VII was limited to the southwest corner of the EU and consisted of a 0.8-foot thick brown (10YR 5/3) mottled with very pale brown (10YR 7/3) sand fill layer. Minimal amounts of artifacts were found including two fragments of whiteware and several indeterminate bottle glass fragments. While Strata VI and VII continued, excavation was stopped at 2.3 feet below the ground surface along the south side of the EU. An auger test was completed in order to attempt to find the B-horizon. Through the auger test it was determined that Stratum VI was 5.3-feet thick, and the B-horizon was identified at 6.2 feet below the ground surface as a pale yellow (2.5Y 7/3) coarse sand.

One hundred thirty three artifacts were recovered from EU 3. Domestic artifacts include tin-glazed earthenware, redware, pearlware, whiteware, ironstone, gray-bodied stoneware, bottle glass, and bone. Personal artifacts include a button, a black bead, a pencil, and tobacco pipe fragments. Recovered architectural artifacts include wrought nails, window glass, and two yellow bricks that may be Dutch in origin. Weaponry include a .22-caliber brass shell, a percussion cap, a grape shot, and a musket's bayonet clip. The deposits date from the 18th and 19th centuries and show a mixing of artifacts common on the site, likely due to the sandy soil.

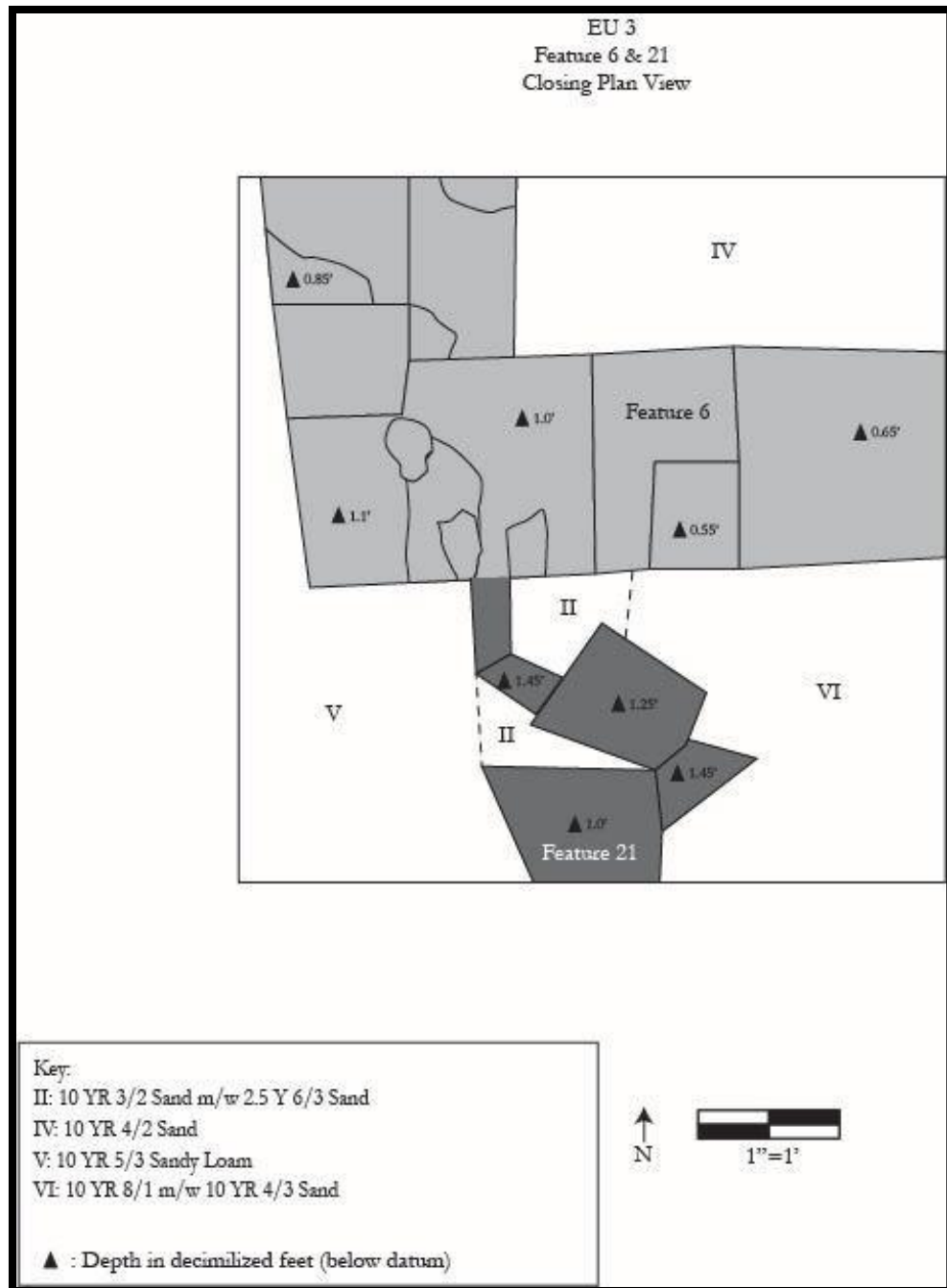


Figure 5.28: EU 3 plan view showing features 6 and 21.

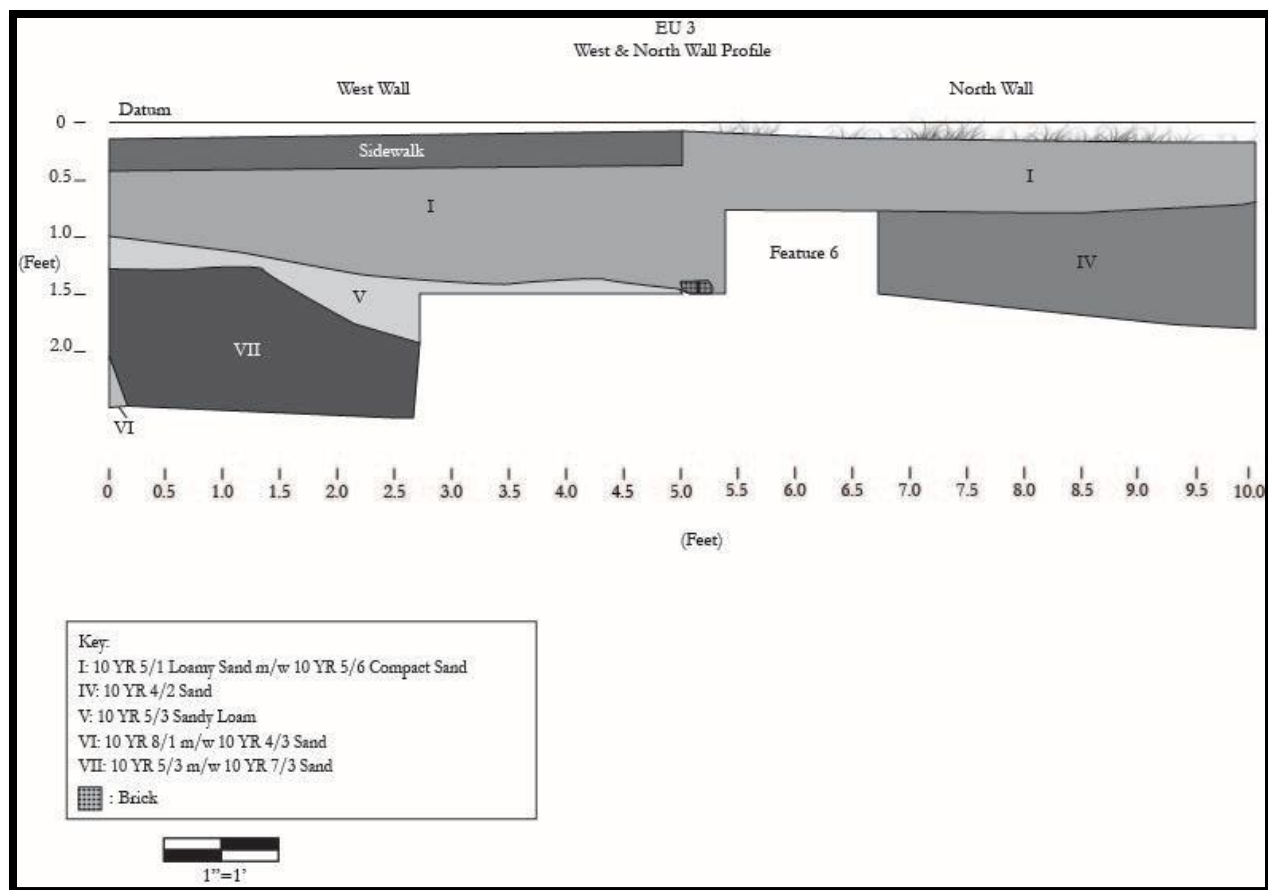


Figure 5.29: EU 3 west and north wall profiles.



Figure 5.30: EU 3, plan view photograph, showing foundation of former lighthouse keeper's house and porch footing.



Figure 5.31: EU 3, plan view photograph showing foundation and porch footing.



Figure 5.32: EU 3, select artifacts including bottle glass, nails, melted metal fragments, and spikes.



Figure 5.33: Chateau Lafitte wine bottle seal. This was a high-quality French wine. The vineyard, which is still in operation, opened in the 17th century.

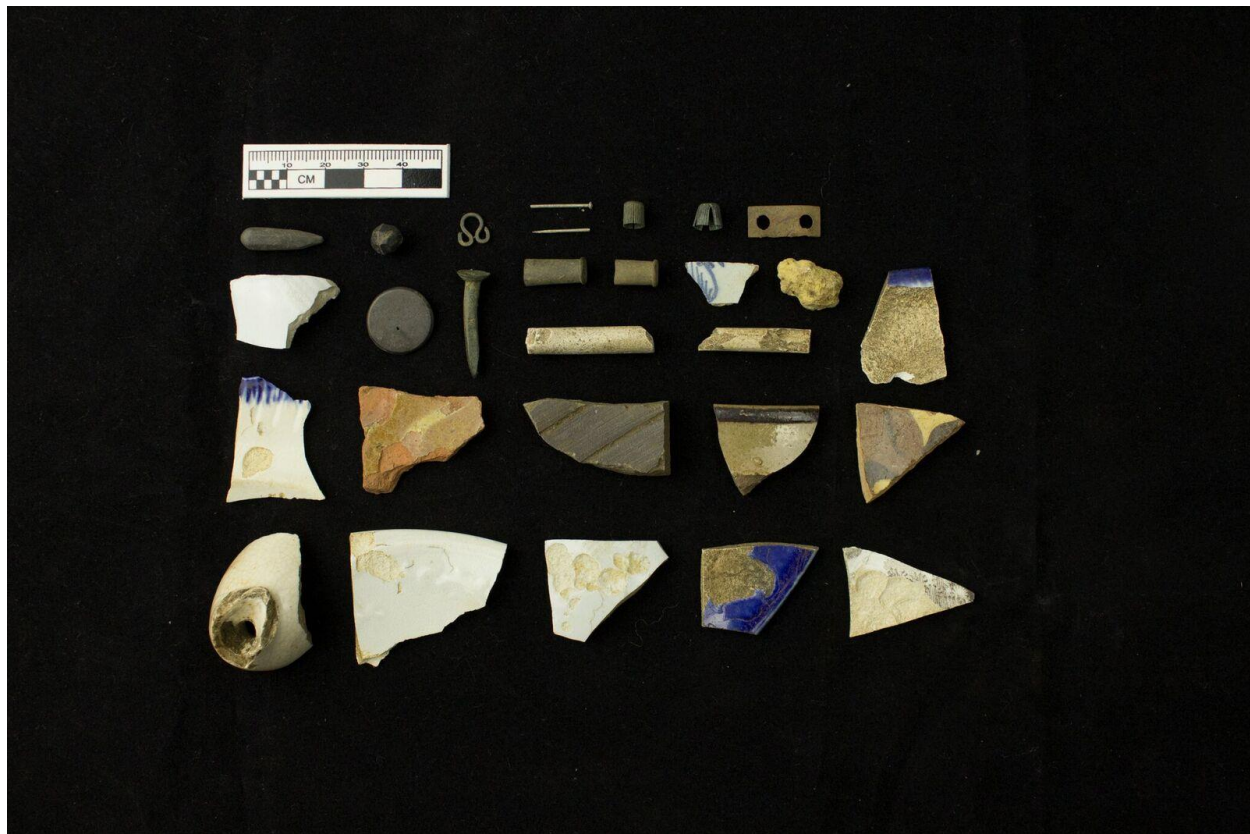


Figure 5.34: Select artifacts from EU 3, including from left to right top to bottom, a lead pencil, clothing fastener, pins, percussion caps, an unknown object, whiteware fragment, button, copper nail, pipe stems, pearlware, redware, buff bodied slipware, a tobacco pipe bowl, and more refined ceramics.

Excavation Unit 4

Excavation Unit 4 was located at STP 46 due to the identification of Feature 11. The feature was a mortared stone foundation oriented north-south that lined up with the north-south foundation of Feature 6 exposed in EU 1. Excavation Unit 4 was a three-foot square aimed to expose the foundation and locate a [REDACTED] foundation of a lighthouse keeper's house (Figures 5.35, 5.36, 5.37, 5.38).

The first layer in EU 4 was Stratum I, a 0.1-foot thick very dark grayish brown (10YR 3/2) loamy sand Ao horizon that mainly consisted of the sod cap. Stratum I overlaid Stratum II, a 0.2-foot thick dark yellowish brown (10YR 4/4) sandy loam fill layer, and Stratum III, a 0.25-foot thick very dark gray (10YR 3/1) sandy loam fill layer. The removal of Stratum III revealed Feature 11 along the west side of the EU and Stratum IV within the rocks of Feature 11 and making up the building's interior fill. Stratum IV was a 2.3-foot thick dark gray (10YR 4/1) sand with large quantities of stone and brick rubble. The brick and stone rubble contained numerous voids including some iron sheets. The fill's looseness limited excavation to 3.0 feet below the ground surface so the base of the fill or building interior was not observed. Stratum IV is interpreted as destruction debris from the demolition of the lighthouse keeper's house. A small quantity of artifacts (28) was recovered from Stratum IV and includes creamware, pearlware, ironstone, window and vessel glass, a brass .22-caliber shell, bone, and various pieces of iron hardware.

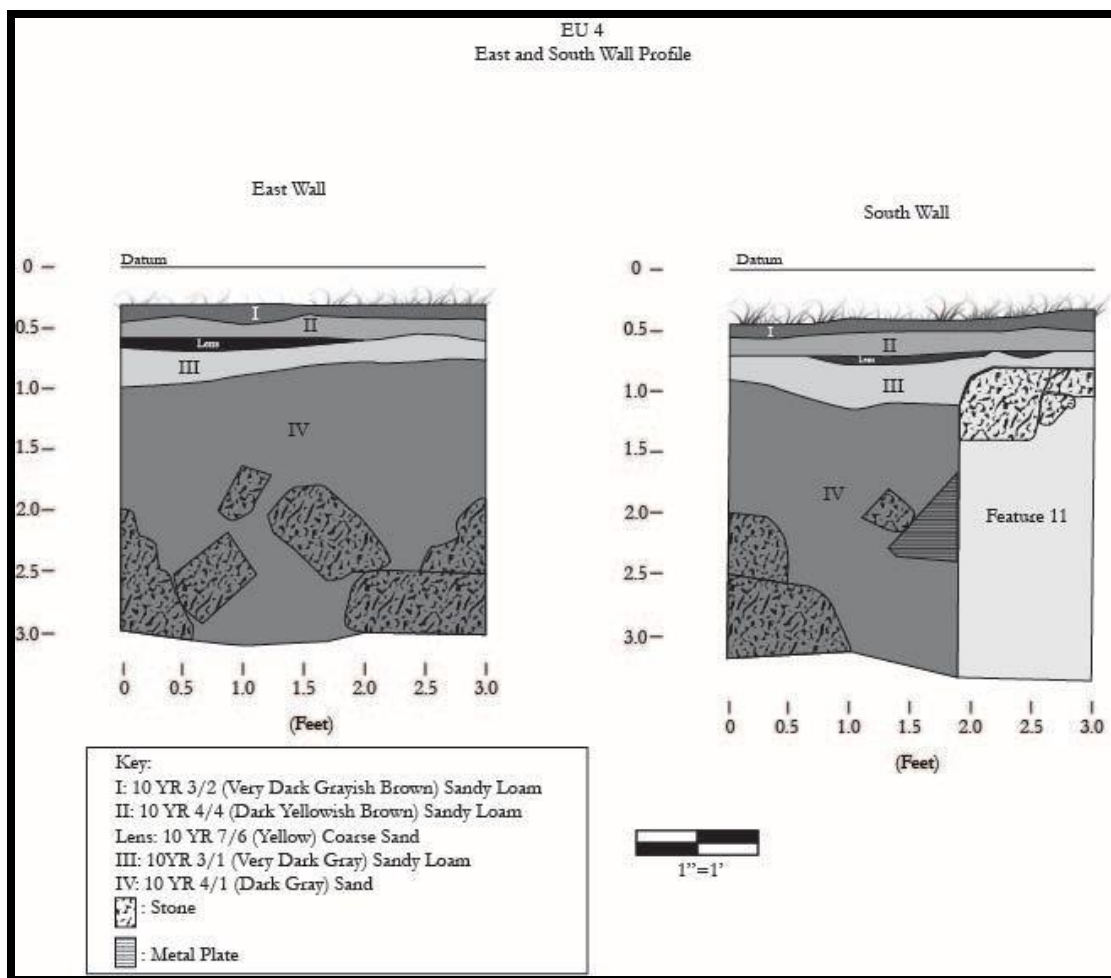


Figure 5.35: EU 4 profile drawing showing the east and south walls.

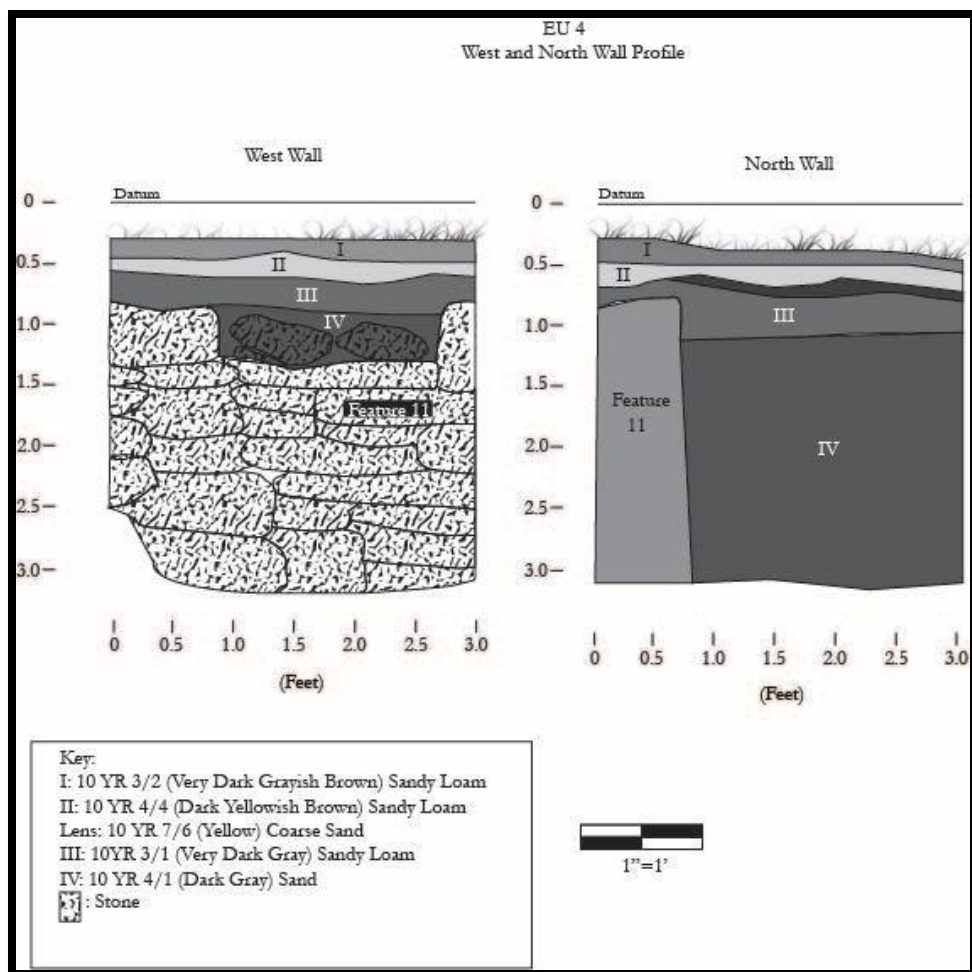


Figure 5.36: EU 4 profile drawing showing the west and north walls.

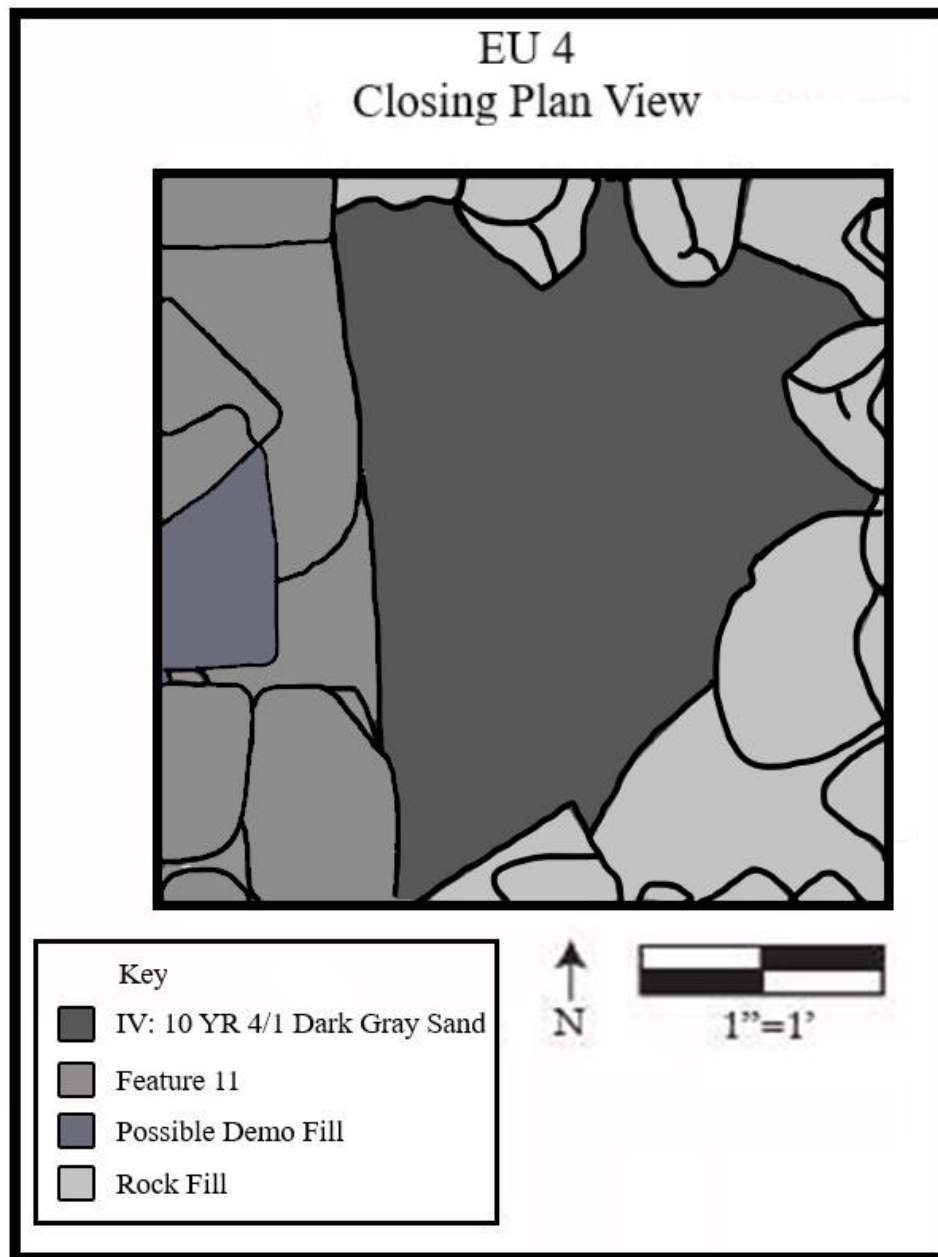


Figure 5.37: EU 4 Plan view showing stone wall (Feature 11).



Figure 5.38: EU 4, Feature 11, west profile



Figure 5.39: EU 4, select artifacts, metal fragments, screw, key, .22-caliber shell, ceramic, and glass fragments, metal plate, cast iron fragments.

Excavation Unit 5

Excavation Unit 5 was located at STP 49 due to the identification of Feature 12, the [REDACTED] of the lighthouse keeper's building. Excavation Unit 5 was configured as a 10-foot long and 2.5-foot wide trench in order to expose as much of Feature 12 as possible and attempt to locate a corner of the lighthouse keeper's building to help determine its dimensions (Figure 5.40, 5.41, 5.42, 5.43).

The first layer in EU 5, Stratum I, was a 0.36-foot thick dark grayish brown (10YR 4/2) sandy loam Ao horizon that primarily consisted of the sod cap. It yielded no artifacts. It was removed to expose Stratum II, a 0.6-foot thick dark yellowish brown (10YR 4/4) sandy loam fill layer that extended across EU 5. Stratum II contained only four artifacts, a 1984 U.S. dime, a copper alloy button and two fragments of a modern lightbulb base.

The removal of Stratum II revealed portions of Feature 12 within the western half of the EU and three new layers, Strata III, IV, and V. Stratum III was identified between and concealing additional stones of Feature 12 and was a 0.21-foot thick very dark grayish brown (10YR 3/2) sandy loam fill. Stratum III yielded seven artifacts including a brick marked "FROST," a fragment of engine-turned stoneware-likely from a teapot, an olive glass bottle fragment, a machine-molded bottle fragment, a file, and two animal bones. The FROST brick was likely manufactured by the Eugene Frost Brick Company of Montrose and Croton, New York between 1905 and 1910 (<http://brickcollecting.com/collection.htm>). The removal of Stratum III showed that Stratum IV was also present between and concealing stones of Feature 12 in addition to making up interior fill of the lighthouse keeper's house foundation. Stratum IV was up to 2.79-feet thick and a dark grayish brown (10YR 4/2) sandy loam fill layer with its deeper extents identified within the interior stone and brick rubble fill. It yielded 17 artifacts. These included a file, a staple, copper electrical wire, a lead fragment, a fragment of pipe, single fragments of creamware and pearlware, a fragment of lighting glass, a window glass fragment, and an unidentified animal bone fragment.

The removal of Stratum IV revealed the northeastern corner of the lighthouse keeper's house at the eastern end of EU 5. It was limited to the internal fill of the lighthouse keeper's house.

Stratum V was a very dark grayish brown (10YR 3/2) mottled with light yellowish brown (10YR 6/4) loose sand with brick and stone rubble fill. It was only excavated to 3.55 feet below the ground surface due to the impassable rubble fill. It too yielded 17 artifacts, including a machine cut nail, a machine-made spike, a copper nail, two pipe bowl fragments, a stoneware jug, and fragments of both free blown and mold blown glass bottles.

Forty-seven artifacts were recovered from EU 5 (Figure 5.44). Recovered artifacts include engine-turned redware, whiteware, Nottingham stoneware, window and vessel glass, brick, machine cut nails, bone, a lightbulb, a utensil handle, a button, tobacco pipe fragments, and a 10-cent coin. The coin dated 1984 was recovered from Stratum II the fill layer that seals Feature 12 and its associated rubble.

Feature 12 is a large, well-constructed stone wall. It is located in approximately the same area as an oil storage building seen in some historic photographs of the lighthouse (see Figure 4.20). The wall has a clear turn to the south at its western end (see Figures 5.34 and 5.35). However, it does not have a clear turn at its eastern end, so the structure was at least ten feet long and had a cellar at least 3.55 feet deep. Although no evidence reflecting the structure's use as an oil house was uncovered, this seems the most likely interpretation. Alternatively, the wall may relate to the earlier lighthouse keeper's dwellings on the site; however, its alignment relative to the other walls noted in EUs 1, 3, and 4 is somewhat off, which argues against this interpretation.

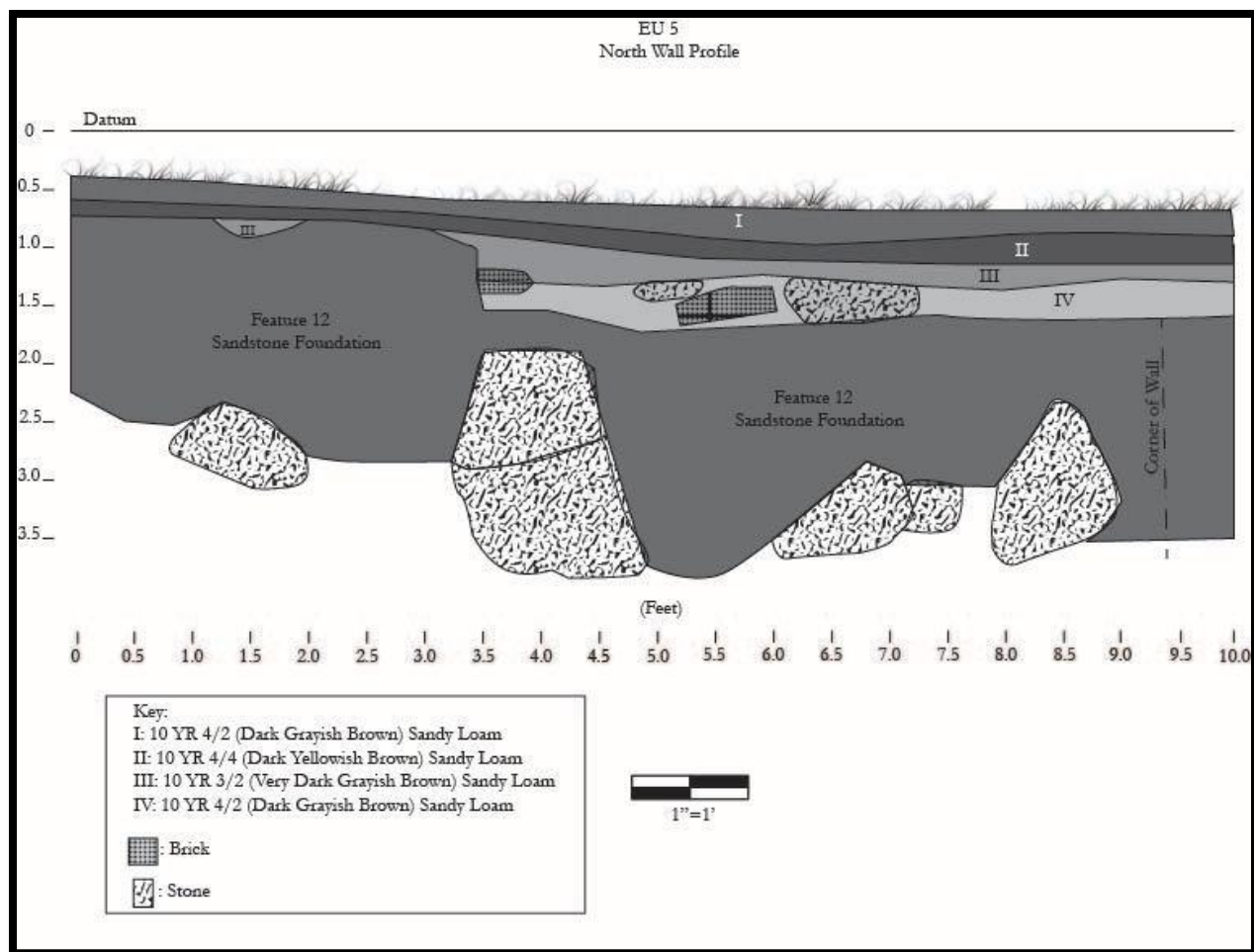


Figure 5.40: EU 5 north wall profile.



Figure 5.41: EU 5 south wall photo showing rubble fill inside stone foundation.



Figure 5.42: EU 5 view east showing stone foundation and area cleared of rubble fill.

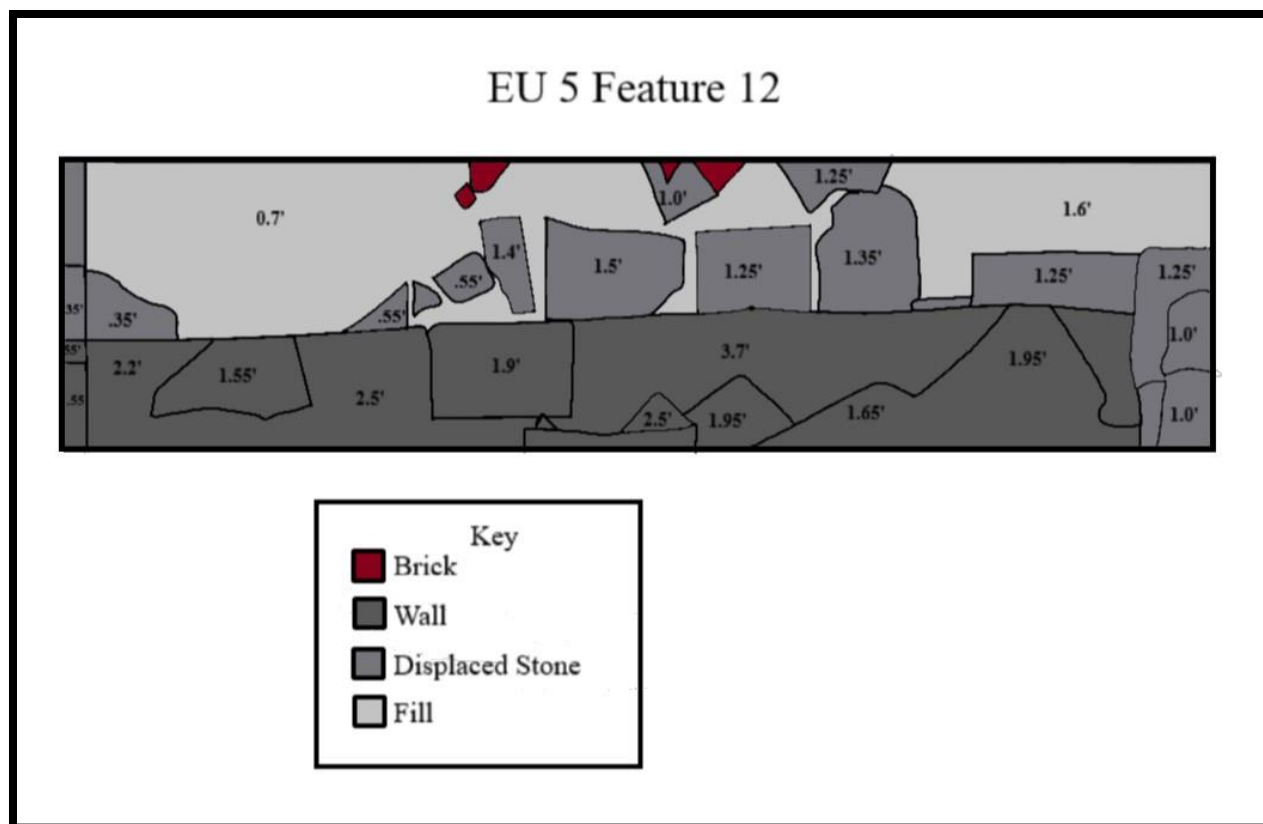


Figure 5.43: EU 5 plan view (south at top of image) showing Feature 12.



Figure 5.44: EU 5 select artifacts, including, metal fragments, fragmentary piece of jewelry, Roosevelt dime, button, pipe stem, engine turned redware, lead collar, clothes pin spring, copper sheathing, whiteware, screw, copper nail, iron staple, glass fragments, machine cut nails, staple, glass fragment, light bulb base, bone handle for cutler, stoneware fragments, one decorated with cobalt blue, and a triangular file.

Excavation Unit 6

Excavation Unit 6 was a three-foot square located at the [REDACTED] of the lighthouse near STP 17. Discrete fill layers were identified in STP 17 that may have been related to construction and maintenance of the lighthouse including whitewashing the exterior. STP 17 also contained a musket ball suggesting that Revolutionary War-related deposits may be present there. Excavation Unit 6 was located at the proposed location of improved drainage infrastructure and was excavated in order to determine if any significant archaeological deposits risk being disturbed by the construction. The unit revealed a stratigraphy consisting of historic fill deposits overlying natural wind-blow sands. A historic pit feature, designated Feature 20, was also noted. It may relate to the construction of the lighthouse or improvements to the structure (Figures 5.45, 5.46, 5.47).

Excavation Unit 6 contained a 0.4-foot-thick very dark grayish brown (10YR 3/2) compacted sand fill layer called Stratum I. It contained only 14 artifacts including an indeterminate metal object, copper nails, a redware fragment, a stoneware fragment, a fragment of milk glass, a lamp glass fragment, two fragments of window glass, and a rubber bottle stopper fragment. Stratum I overlay a 0.9-foot thick highly compacted fill layer designated Stratum II, consisting of brick and stone debris intermingled with a 7.5YR 3/3 Dark Brown silty loam. Stratum II contained 123 artifacts. These included a bolt, a door hinge, a copper alloy object, fragments of creamware, pearlware, whiteware, and porcelain, as well as numerous window glass fragments (36), and mammal and bird bone fragments. The removal of Stratum II revealed Feature 20 cutting into Stratum III at the northwestern corner of the EU. Feature 20 had a roughly circular plan shape with vertical walls and a flat base 0.8-foot deep. Feature 20 contained two layers of fill: Fill 1 was a light gray (10YR 7/2) sand and Fill 2 was a dark greenish gray (Gley 1 3/1) sand. Only 13 artifacts were recovered from Feature 20, including an olive-green glass fragment, a redware fragment, and fragments of window glass. Stratum III was a pale brown (10YR 3/2) sand excavated by shovel to 2.8 feet and then augured to 8.9 feet below the ground surface. One hundred and seven artifacts were recovered from Stratum III, including a door hinge, hand wrought nail, copper button, copper nail, lead musket ball, creamware fragments, white clay tobacco pipe stems, whiteware fragments, olive bottle glass, lamp chimney glass, window glass,

and bone and shell fragments. No builder's trench or deep fill related to the construction of the lighthouse was identified.

Two hundred forty-nine artifacts were recovered from EU 6, which include redware, creamware, pearlware, whiteware, porcelain, stoneware, wrought and machine cut nails, window and vessel glass, bones, mollusk shell, and tobacco pipe fragments. Feature 20 and Stratum III, into which the feature cuts both, contained lamp chimney glass which indicates that they date from the 1860s or later (See Figures 5.48 and 5.49).

Unit 6, Feature 20 Profile

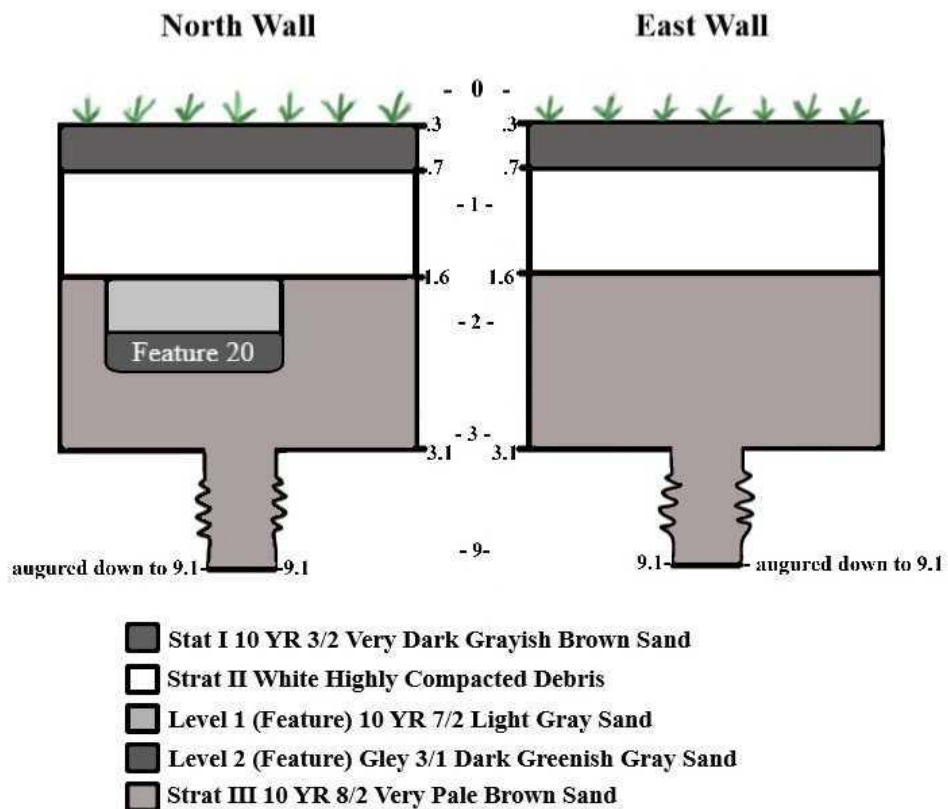


Figure 5.45: EU 6 profile view. All depths are in feet and tenths.



Figure 5.46: Photo showing EU 6, in plan view with east profile partially visible. Feature 20, a large soil discoloration in the NW corner of the excavation.



Figure 5.47: EU 6, select artifacts, from left to right and top to bottom (not all artifacts are noted). Lead shot, copper rivets, chalk, and an iron buckle. Metal fasteners (possible electrical) pearlware, redware, bone, a copper nail, a hand-wrought iron nail, and additional copper nails, bottle and window glass, whiteware, and a glass handle. The last artifact is a plug possible with a military function.

SECTION 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 Interpretations and Conclusions

Monmouth University's archaeological survey/2016 field school at the Sandy Hook Lighthouse in Gateway National Recreation Area (Middletown Township, Monmouth County, New Jersey) was performed at the request of the United States Department of the Interior, National Park Service. It was conducted pursuant to an agreement with the NPS (Cooperative Agreement #P16AC00022 and Scientific Research Permit: GATE-2016-SCI-0020). The project focused on an approximately three-acre site around the Sandy Hook Lighthouse. Information collected during this study will help the Park meet its responsibility to inventory cultural resources under Section 110 of the National Historic Preservation Act and will aid in assessing impacts to identified resources under Section 106. The project was also designed to address public interests by involving students in historic preservation programs and motivating them to become involved in cultural resources protection and study in a real-world environment. Eleven graduate students, 10 undergraduate students, and 75 volunteers participated in the project. This project was unusual in that it was not driven solely by cultural resource management considerations. Instead, it was research focused, with a secondary goal of providing local residents with the opportunity to participate in archaeological fieldwork under professional supervision. In addition to extensive volunteer participation in the fieldwork, the results of the archaeological investigation were shared with diverse audiences. Richard Veit made presentations on the results of this project to the Monmouth County Historical Association (125 attendees), the National Park Service (35 attendees), and at several archaeological conferences, including the 2017 Middle Atlantic Archaeological Conference, and the January 2017 meeting of the Archaeological Society of New Jersey. Presentations are also planned for the Monmouth County Sierra Club and the Society for American Archaeology conference. Several of the volunteers who participated in the project were inspired to continue volunteering in archaeology through the Archaeological Society of New Jersey and have participated in subsequent Monmouth University field schools. An article sharing the results of the fieldwork is also planned for a local or regional archaeological journal.

Fieldwork consisted of remote sensing and archaeological testing of the lighthouse tract. Paul McLeod, President of Environmental Probing Investigations, Inc. conducted ground penetrating radar (GPR) and magnetometry (electromagnetic induction/EM) surveys of the lighthouse tract. A GSSI SIR-3000

Radar System with a 400 MHz antenna and a GSSI EM Profiler were used. Subsurface anomalies were mapped using a Trimble GEO 7X GPS (McLeod 2016). The radar survey covered the entire lawn area around the lighthouse, while the magnetometry survey focused on the area to the south of the lighthouse. The GPR survey identified a total of 13 unnumbered features. These included modern communications lines (2), modern electrical lines (2), unidentified pipes (3), unidentified trends (5), and a well (1). Although all the utilities were modern, the “unidentified trends” were subsequently shown to correspond well with historic features, generally the walls of buried structures (see Figure 5.1).

The EM survey focused on the area to the south of the lighthouse. The areas to the west and north of the lighthouse were avoided because of modern utilities, benches, and sidewalks incorporating metal reinforcements, all of which would throw off the EM Induction survey. The EM data was considerably more complex than the radar data. It showed widespread anomalies across the site, especially around the lighthouse (see Figure 5.2). Unfortunately, the density of electromagnetic signals was so great that no specific features could be identified.

Excavation consisted of a total of 53 shovel test pits and six excavation units—two three-foot squares, three five-foot squares, and one 2.5-foot by 10-foot trench. Twenty-one features were identified and 4,516 artifacts were recovered. Thirty-four (34) STPs were excavated on a 50-foot interval grid. An additional 19 STPs were excavated on a tighter interval grid and as judgmental tests following features, in order to better delineate the cultural deposits at the site. An average of 47 artifacts were recovered per STP. Shovel testing showed that the area to the north and west of the lighthouse were disturbed by 20th-century activities, likely associated with the coal storage facility located to the north of the lighthouse. No intact archaeological deposits were noted in this area (see Figure 6.1). The area to the [REDACTED] of the lighthouse contained intact and stratified archaeological deposits. Particularly rich concentrations of artifacts were noted in STPs 37, 38, 39, 41, and 48 (Figure 5.5). The artifacts are primarily concentrated to the [REDACTED] of the lighthouse, with smaller concentrations, of 20th century materials on the [REDACTED] peripheries of the study area. These artifacts are from deposits associated with the lighthouse keeper’s dwelling to the east of the lighthouse and date from the mid-19th century.

Four research questions drove the project. They were:

1. To identify archaeological resources present in the area of the historic lighthouse, including, if possible, deposits associated with the lighthouse keepers' dwellings that stood on the site, and the Revolutionary War era Refugee Town that was established in the vicinity of the lighthouse.
2. To better characterize the age of the deposits present on the site from the prehistoric period through to the present.
3. To better characterize the nature and extent of the historic deposits identified by previous studies on the property and identify features worthy of further study.
5. To sample deposits associated with the Revolutionary War occupation of the site identified in previous utility work at the site.

The project's research design, combining remote sensing with close-interval shovel testing, resulted in the identification of numerous archaeological resources in the area of the historic lighthouse and allows questions 1, 2, and 3 to be addressed. Twenty-one archaeological features were identified. These included the remains of two lighthouse keeper's dwellings and rich midden deposits dating from the late 18th through 19th centuries. The relocation of the keeper's dwellings clearly shows the relationship of these structures to the lighthouse and the current lighthouse keeper's dwelling. Although Revolutionary War artifacts were recovered, including musket balls, a bayonet hanger, and a fragmentary sideplate from a British Long Land Pattern musket, features relating to the Revolutionary War era Refugee Town were not identified.

These excavation units and trench focused on deposits associated with the lighthouse keeper's dwellings and associated outbuildings to the [REDACTED] of the lighthouse. Historic paintings and drawings show that this area was the location of several dwellings associated with the lighthouse, as well as related outbuildings. The exact evolution of the lighthouse keeper's dwelling or dwellings is not clear. The earliest known illustration is a published etching from the 1790s showing the Sandy Hook lighthouse, the keeper's house, which appears to be a two-story brick building with a gambrel roof (see Figure 4.3). A hyphen connects the lighthouse and the keeper's house, and some roughly drawn outbuildings to the left. In terms of location, this structure is close to the foundations uncovered during the 2016 excavations. Later illustrations show a two-block structure, arranged on a linear plan, running roughly east to west (see Figures 4.15, 4.16, and 4.17).

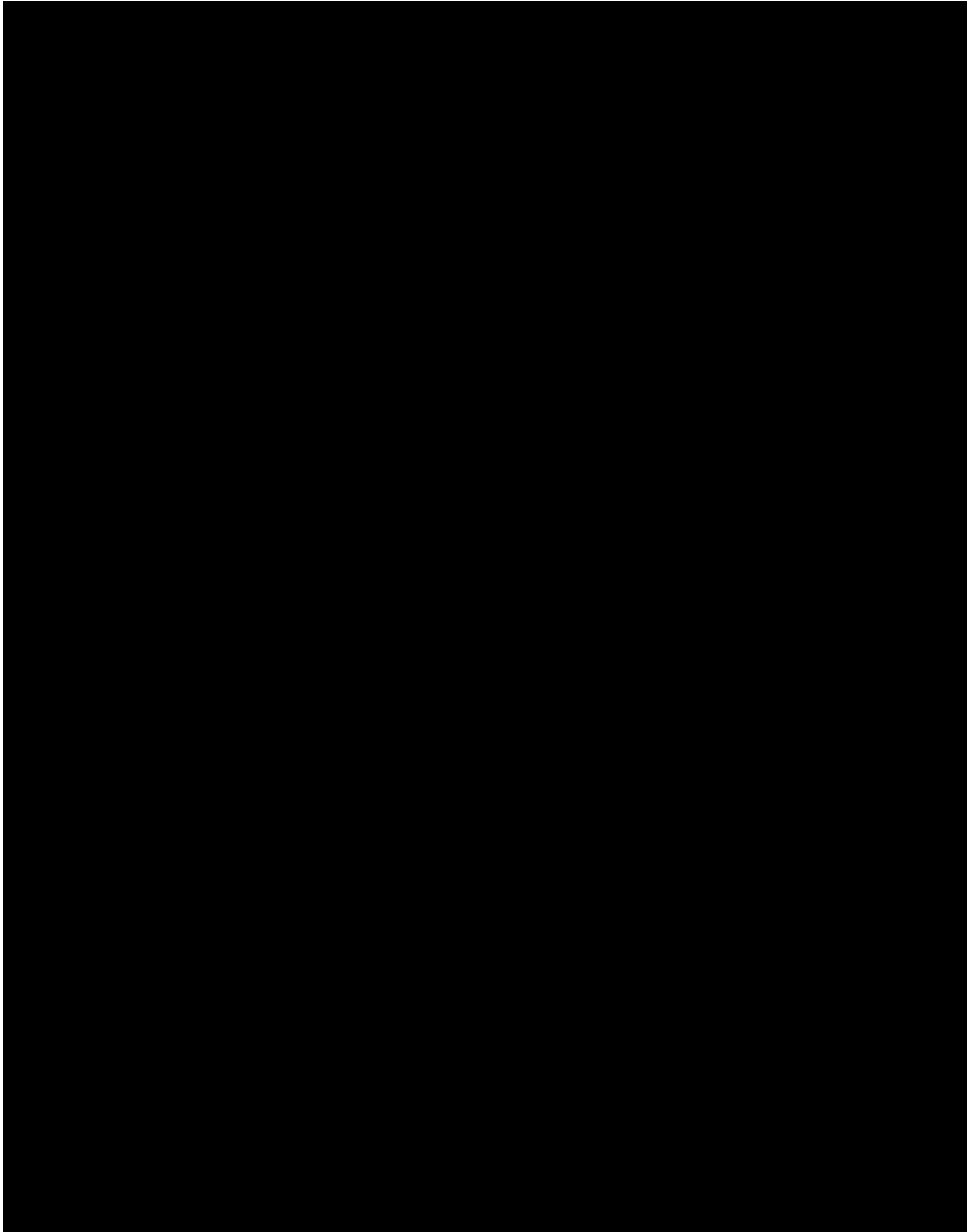


Figure 6.1: Archaeological map showing area of disturbed soils, circled in yellow, and area with intact archaeological deposits, circled in green. These boundaries are approximate.

A pair of paintings from the 1870s by Frank Patterson provide the most detailed views of the structure. The first titled, “Main Lighthouse Sandy Hook: Southwest View” was recently restored and is in the Collections of the Monmouth County Historical Association. It shows a brick hyphen connecting the lighthouse to the keeper’s dwelling. The dwelling consists of a two-and-a-half-story main block constructed of what appears to be cut stone, with a whitewash finish, and a one-and-a-half-story brick structure, to the west. A similar painting, showing the structures from the southeast, clearly shows that the two sections of the keeper’s dwelling were arranged with the smaller structure situated slightly further south than the main block. The entire structure appears to be have been whitewashed (see Figure 4.16). A drawing of the dwellings, published in 1879 (see Figure 4.17), closely resembles Patterson’s painting “Main Lighthouse Sandy Hook: Southwest View.” In 1883, the lighthouse keeper’s dwelling, described as old and in poor repair was replaced with the current dwelling, now used as an interpretive center.

The structural features unearthed during the 2016 field school largely align with the historic images. Feature 6, the walls of the [REDACTED] lighthouse keeper’s dwelling, was noted in Excavation Units 1 and 3. The building had stone walls (Feature 6), which are present at roughly .4-.5 feet below ground surface and measuring roughly 1.25-1.5 feet thick. Within the building a brick-paved cellar is present at 5.7 feet below the current ground surface. The southeastern and southwestern corners of the building were exposed in Excavation Units 1 and 3 respectively and indicate that the building was roughly 30-feet-wide. It is likely that it was 30-feet or less deep. Stone pads, likely relating to a porch footing (Feature 23), a brick walkway (Feature 13) and what may be a garden edging or a second brick walkway (Feature 15) were also noted. Deposits inside the structure show that it was demolished and the cellar hole filled in the late 19th century. The fill deposits contain artifacts dating from the 18th through early 20th centuries. The latest artifacts may relate to efforts to deal with soil subsidence. Large quantities of broken brickbats were noted in the cellar fill, and likely relate to the building’s demolition. Excavation outside the cellar hole revealed deposits with 18th and 19th century materials, which showed some mixing. This may be due to cultural bioturbation, as improvements occurred around the lighthouse. Especially noteworthy, were some artifacts that hint at the site’s 18th-century and Revolutionary War occupations. These included fragments of yellow brick (Veit 2000; Sopko 1982) (Figure 6.2). These thin, yellow bricks, called *dreilingen* bricks, were manufactured in the Netherlands, and are found on early colonial sites in the eastern United States and Caribbean. They may hint at an earlier occupation of the lighthouse knoll, though in this case, they appear to have been

employed as convenient elements of porch supports on the brick wing of the lighthouse keeper's dwelling. A small quantity of Revolutionary War era artifacts was also noted. This included nine lead musket balls, two fragments of iron grape shot, and one canister holding several lead canister shot. All were located outside of the [REDACTED] and may relate to the intermittent skirmishing that occurred on Sandy Hook during the Revolution, or the site occupation by British and Royal Provincial troops (see Olsen 2012). Most of the artifacts recovered both in the filled cellars and outside the structures, relate to the 19th-century occupation of the site, and consist of architectural and domestic artifacts from mixed contexts.

Feature 11 was another stone wall made of cut, mortared stone. It runs north to south and is perpendicular to the wall, Feature 6, noted in EUs 1 and 3. Feature 11 ran along the western side of the unit while the eastern side was an in-filled cellar hole. The cellar hole was filled with large blocks of cut and broken stone. A large iron plate, possibly from a stove or fireplace was lodged against the stone wall. The fill inside the structure was not temporally diagnostic. Feature 11 runs perpendicular to the wall noted in EUs 1 and 3. It may relate to the eastern block of the lighthouse keeper's dwelling. The depth of the cellar associated with the wall (Feature 11), could not be determined from our excavation as the stone rubble within the unit was too dense to fully penetrate. The stone rubble would also support the idea that this wall is associated with the larger, stone wing of the lighthouse keeper's dwelling.

Feature 12 was noted along the northern side of Excavation Unit 5, a ten-foot-long trench, running east to west across the site. Excavation exposed a long stretch of cut stone foundation (Feature 12). Again, the interior of the structure was filled with broken stone, presumably from the demolition of the building. The eastern corner of the structure was also noted. Although this wall is located close to the site of a historic oil or kerosene house, the foundation seems much too sizable and robust for such a structure. One possibility is that Feature 11, noted in EU 4, and Feature 12 in EU 5 are two sections of wall from the second lighthouse keeper's house, constructed in the 1830s, a stone structure seen in paintings by Frank Paterson, while Feature 6 noted in EUs 1 and 3 is the brick lighthouse keeper's house (Figure 6.3). An attempt to overlay the 1826 map of the lighthouse keeper's dwelling on the 2016 field map, shows notable disparities with the features identified in the field (Figure 6.4). The lighthouse keeper's dwelling is depicted as larger than indicated by the foundation. Clear evidence for the boat house, doctor's house, and ice house was not identified. However, we did not have access to

the 1826 map when the project began and were basing the locations of our tests on a 50-foot grid and anomalies noted through the results of the ground penetrating radar survey. However, the structure proposed in the 1838 request for the construction of a new lighthouse keeper's house aligns well with the feature (<https://lighthousehistory.info/tag/sandy-hook-lighthouse/>).



Figure 6.2: A *drelingen* brick or Dutch yellow brick with lime mortar adhering, excavated from EU 3.

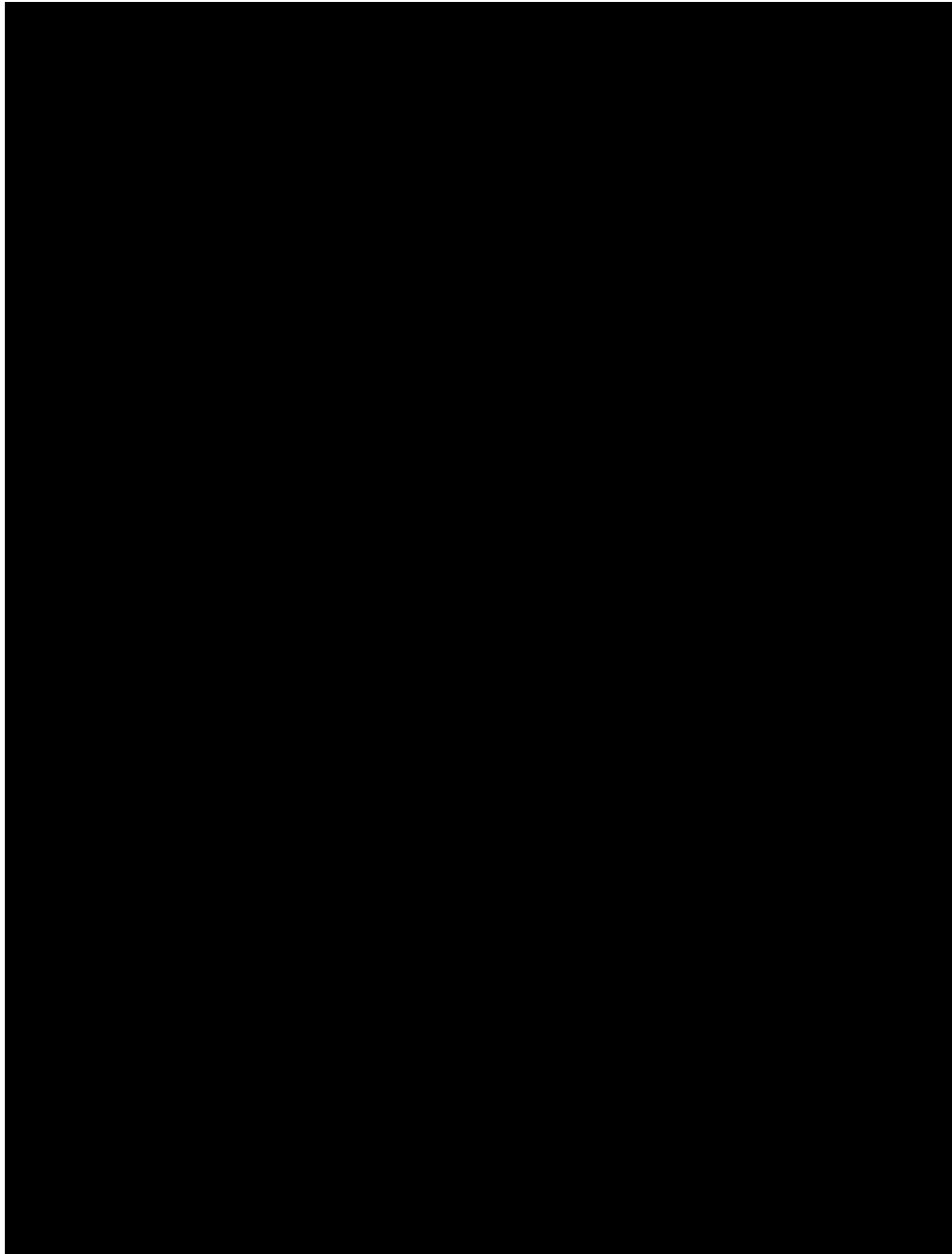


Figure 6.3: Interpretive drawing showing the features excavated at Sandy Hook and their relationship to the historically known structures [REDACTED]. The brown boxes show the approximate locations of foundations that may represent the lighthouse keepers' dwellings.

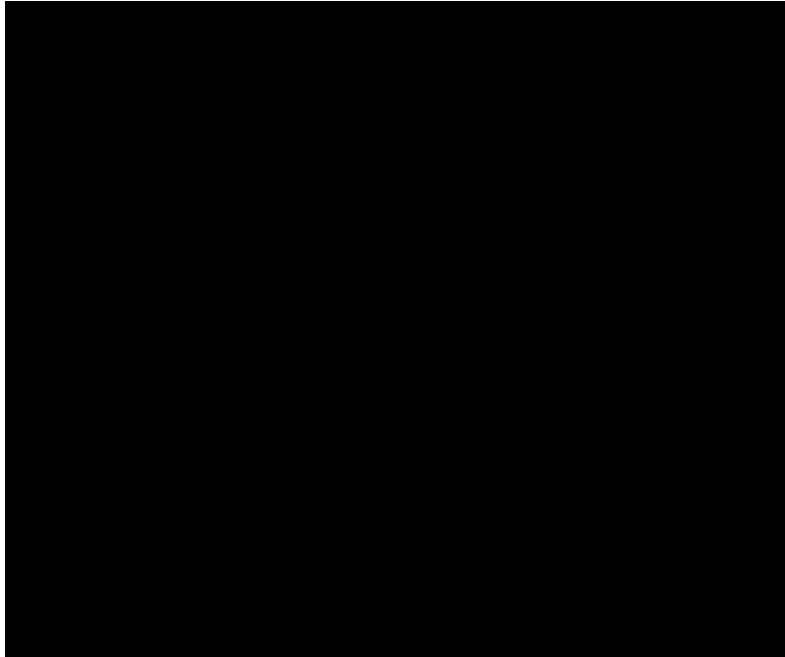


Figure 6.4: Plan view showing the relationship of the 1826 map to the excavation units dug during the 2016 field school. The 1826 map appears to exaggerate the size of the dwelling house.

The richest artifact deposit unearthed during this study was noted in Excavation Unit 2. It contained a total of 1,905 artifacts. It was placed to investigate deposits first noted in STP 30 at the base of the [REDACTED] of the lighthouse. Remote sensing had revealed a strong anomaly in this area. A shovel test had revealed stratified deposits that appeared to date back to the 18th century, with the deepest deposit, yielding one of the most interesting finds, the fragmentary side plate of a British Long Land Pattern Musket. An excavation unit opened in this area showed that the anomaly was in fact a large grey slate curb, roughly 1.0-2.3 feet below ground surface. The deposit was stratified, but dated from the early 19th century, through to the 20th century. Soil accumulation in this area was significant, and likely due to erosion. This seems to have been a midden employed by the lighthouse keeper's and may be the messy yard region shown in historic images such as Moran and Patterson's paintings (see Figures 4.15, 4.16, 4.17, 4.18).

At the request of the NPS Personnel, a final three-foot square excavation unit was dug on the [REDACTED] of the lighthouse. This was excavated in order to determine the condition of deposits adjacent to the lighthouse. Here the soil deposits appear to be stratified. One of the most interesting finds was an impacted musket ball that appears to have hit the lighthouse and retains an impression from a corner

of the lighthouse. A historic pit feature, Feature 20, was identified in this EU. It is likely related to the construction or repair of the lighthouse.

One of the research priorities for this study was characterizing the age of the deposits present on the site from the prehistoric period through to the present. The archaeological deposits unearthed during Monmouth University's 2016 excavations at the Sandy Hook Lighthouse reflect nearly all periods in the site's history, with the 19th century being particularly well represented.

No clearly prehistoric material was recovered during the project. There are also no clearly 17th-century deposits, though the yellow Dutch bricks found on the site are consistent with 17th and 18th-century deposits at other sites in New Jersey, New York, and Delaware (Veit 2000).

No intact 18th-century deposits were noted. However, 18th-century material was present in many of the shovel tests, and in Excavation Units 1 2, 3, and 6. Many of the 18th-century artifacts are associated with the military occupation of the lighthouse during the American Revolution. These included nine lead musket balls, two fragments of iron grape shot, one canister holding several lead canister shot, a large grey flint gunflint, the side plate to a Brown Bess or British Long Land Pattern musket, and a bayonet hanger. These were found in shovel tests 11, 12, 17, 25, and EUs 1, 2, 3, and 6 (see Figures 6.5, 6.6, 6.7). Most were found to the [REDACTED] of the lighthouse.

Musket balls have been shown to be especially useful artifacts for the interpretation of military sites (see Sivilich 2016). The musket balls vary in size (Figure 6.5, Table 6.1). Seven of the nine musket balls measure over .66 caliber in diameter, and as such represent ammunition for Brown Bess muskets (see Sivilich 2016:31). The canister shot measure .62 caliber (Figure 6.6). The gunflint, or more properly a gun spall, is not diagnostic. It is a light grey chert that doesn't resemble either the English grey flints or the French honey colored flints (Noël Hume 1980:209; McGuire 2013:108) (see Figure 6.6). In fact, it resembles Onondaga chert and may have been used for a strike-a-light. The key plate or side plate is from a British Long Land Pattern musket (Figure 6.8 and 6.9). It is from a first pattern musket, initially produced in 1720 and is often called the Brown Bess. It is snapped, possibly broken during a repair. The reverse of the piece displays a crude letter "W."



Figure 6.5: Select musket balls and a fragment of iron grapeshot from the excavations at the Sandy Hook Lighthouse. From left to right, the first and fourth musket balls are impacted.



Figure 6.6: A very large spall of grey flint or chert from EU 2. It may have been used as a gunflint or as a strike-a-light.



Figure 6.7: A fragmentary case-shot can with two .62 caliber musket balls. It was excavated from EU 2.

Correspondence with Erik Goldstein, Curator of Mechanical Arts and Numismatics at the Colonial Williamsburg Foundation, revealed that “the sideplate is from a “Long Land Pattern” Brown Bess (46” barrel, made ca.1730-1768). I believe the little “W” has to do with the manufacturer of the sideplate, and the filed-in numeral is an assembly mark and would have mated similar markings on the other components of the musket, lock, barrel, stock, etc.” (Personal communication, Erik Goldstein 2016).

Similar examples are illustrated in R. R. Gale’s *“Soldier-Like Way” The Material Culture of the British Infantry, 1751-1768* (2007:12) (Figure 6.10). Also recovered was a bayonet hanger, used to carry a bayonet on a belt (Figures 6.11 and 6.12). It was found in EU 3. It too is similar to examples illustrated in Gale (2007:12). (Figure 6.13).

Within Site	Description	Measurements: Dimensions
STP 11, STRATUM I, 0.0-0.45 FT	MUSKETBALL IMPACTED BALL, MUSKET	19.31mm/.76 caliber
STP 12, STRATUM I, 0.0-0.6 FT	GRAPE SHOT GRAPE SHOT	28.61mm/1.12 caliber
STP 17, STRATUM IV, 0.7-1.2 FT	MUSKETBALL BALL, MUSKET	17.63mm/.69 caliber
STP 17, STRATUM VI, 1.30-5.30 FT	MUSKETBALL BALL, MUSKET	20.62mm/.81 caliber
STP 25, STRATUM I, 0.0-1.8 FT	MUSKETBALL IMPACTED BALL, MUSKET	22.03mm/.86 caliber
EU 1, STRATUM VII, 2.9-3.9 FT	MUSKETBALLS IN FERROUS METAL BALL, CANISTER	15.89mm, 15.7mm/.62 caliber
EU 1, STRATUM VII, 2.9-3.9 FT	MUSKETBALL BALL, MUSKET	17.68mm/.69 caliber
EU 1, MISCELLANEOUS	SHOT, SPRUE SCAR BALL, SHOT	8.45mm/.33 caliber
EU 2, STRATUM V-B, 2.1 FT	MUSKET BALL PIG CHEWED BALL, BULLET	18.10mm/.70 caliber
EU 3, STRATUM I, 0.2-1.2 FT	MUSKETBALL OR GRAPE SHOT BALL, MUSKET	26.20mm/1.03 caliber
EU 6, STRAT III, 1.6-3.1 FT	MUSKETBALL BALL, MUSKET	22.03mm/.87 caliber

Table 6.1: Munitions recovered from the Sandy Hook Lighthouse excavations.



Figure 6.8: Key plate of a British Long Land Pattern Musket, obverse view.



Figure 6.9: Key plate of a British Long Land Pattern Musket, reverse view.

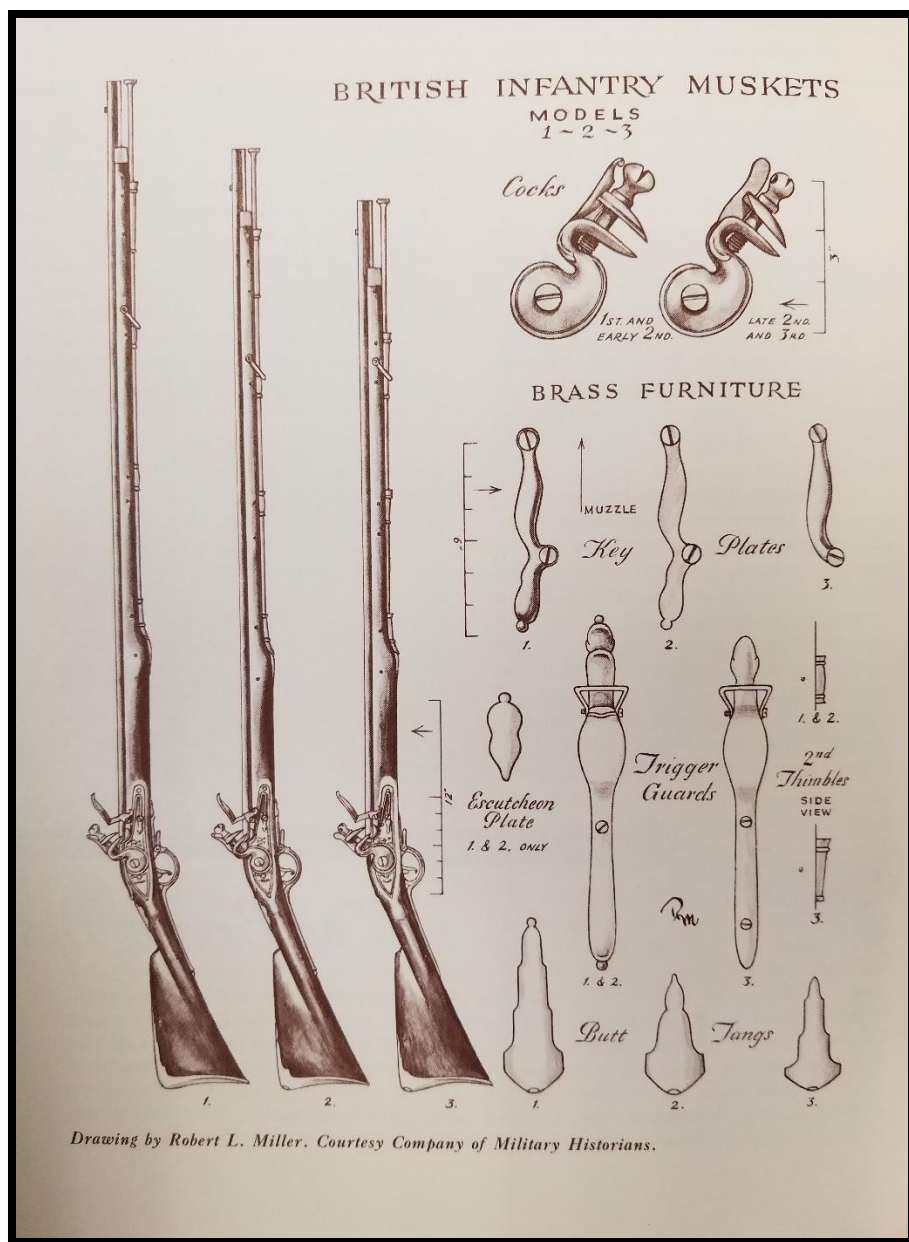


Figure 6.10: Select Brown Bess musket parts, from *The Book of the Continental Soldier* (Peterson 1968:28). Note the Key Plate #1, which matches the example found in STP 30.



Figure 6.11: Bayonet clip part, obverse view.



Figure 6.12: Bayonet clip part, side view.

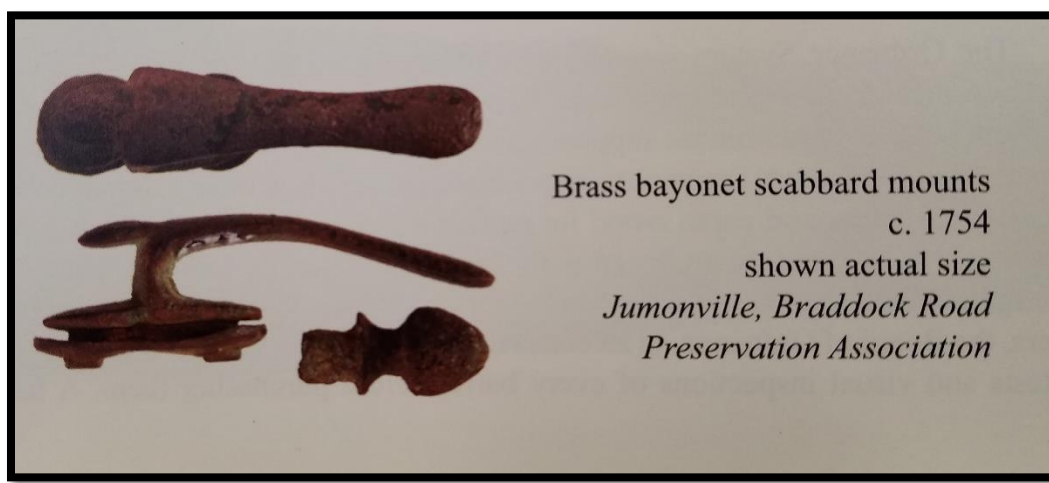


Figure 6.13: Bayonet scabbard mounts that closely match the example found in EU 2, Stratum II, at Sandy Hook. Reproduced from “*A Soldier-Like Way*” *The Material Culture of the British Infantry, 1751-1768* (Gale 2007:12).

Several fragments of iron grapeshot were found. These are iron balls, slightly larger than a musket ball, which would have been placed in a tightly-tied muslin sack and fired from a cannon in an anti-personnel capacity (See Peterson 1968:127; Neuman and Kravik 1975:10) (Figure 6.14). A tin box containing lead canister shot was found in EU 2 (Peterson 1968:127; Neuman and Kravik 1975:10). Canister shot is similar to grapeshot but employs tightly packed lead balls in a tin canister rather than iron balls in a muslin sack (Figure 6.15). All of these artifacts are consistent with the fighting that occurred on Sandy Hook during the American Revolution.

Other 18th-century artifacts were largely domestic, and included olive-green bottle glass, creamware, pearlware, white salt glazed stoneware, locally-produced stoneware, and tin-glazed earthenware, all from mixed deposits. These artifacts were present in modest quantities. The bottle glass is likely from England or Continental Europe. Pontil mark forms can help reveal where bottles were produced, but no intact bases with pontil marks were recovered at Sandy Hook. The ceramics were primarily mass-produced in Great Britain. White salt-glazed stoneware was present in small quantities. Creamware and pearlware are among the most common 18th-century ceramics. The examples recovered from Excavation Unit 2 are simple blue shell edge and banded pieces.



Figure 6.14: Grapeshot from the Revolutionary War on display at the Museum of the American Revolution, Philadelphia, Pennsylvania. Photography by Steve Santucci.



Figure 6.15: Canister shot from the Revolutionary War (<http://www.militaryheritage.com/caseshot.htm>).

Some other refined English earthenwares, especially transfer printed wares were recovered from the shovel test grid, as were institutional ceramics from the 19th century, primarily ironstones.

Nineteenth century deposits were rich and extensive, though often mixed with earlier, and later materials. Ceramics, including creamware, pearlware—transfer printed, banded, edged, and plain, whiteware, yellowware, gray salt-glazed stoneware, and molded and embossed bottles were recovered, as were tablewares, buttons, watch parts, numerous machine-cut nails, and screws. Small rimfire ammunition may date from the late 19th or early 20th centuries. Especially intriguing is an inscribed watch band (Figure 6.16). Particularly noteworthy were the stratified deposits in EU 2, which is stratified. Similar deposits were noted in other shovel tests east of the lighthouse keeper's dwellings.

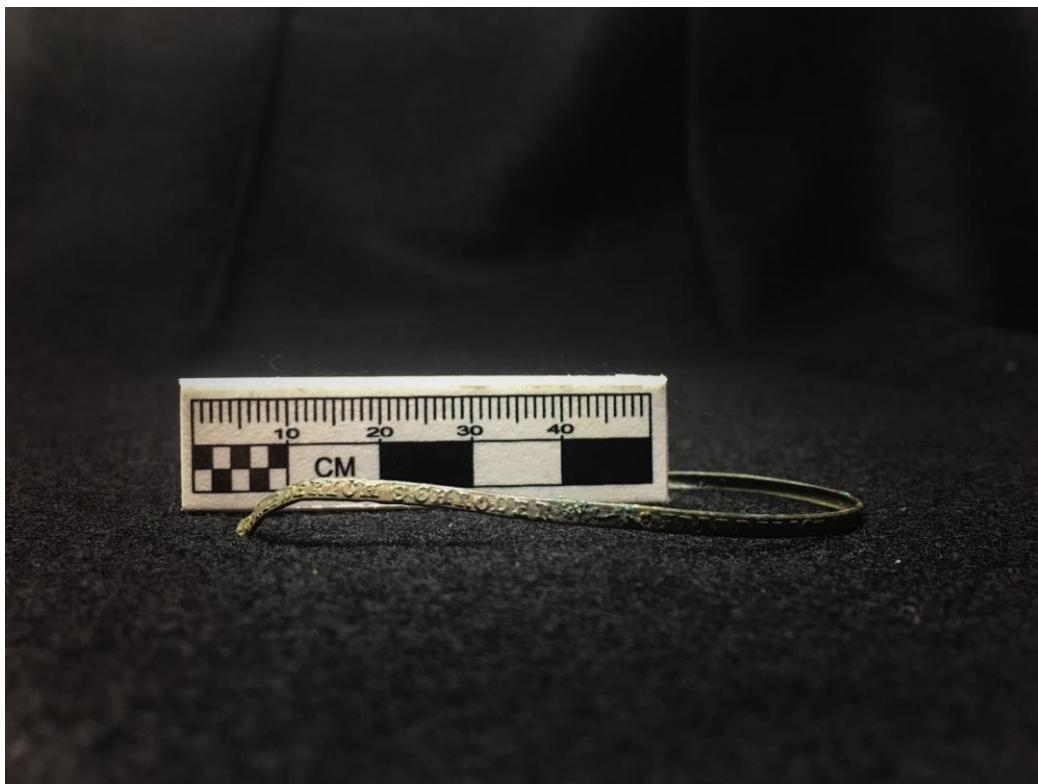


Figure 6.16: An inscribed brass watch band from Excavation Unit 2.

Twentieth-century material was mixed in with many of the deposits and included whiteware, modern bottle glass, buttons, electrical insulators, modern nails and other hardware. It was widely distributed across the site. ***

A moderate quantity, 296 fragments, of faunal remains was recovered during the field school. One-hundred-fifty-two bone fragments were recovered from the STPs and 144 were recovered from the EUs. Faunal remains were most frequently recovered from the [REDACTED] of the identified keeper's house. Shovel Test Pits 24A, 37-41, 48, 50, 51 contained 72 (47.4 percent) of the bone fragments recovered from STPs. Excavation Unit 2 contained 72 (50.0 percent) of the bone fragments recovered from all of the EUs. The high proportion of faunal remains recovered on these slopes may indicate a favored disposal area for kitchen refuse and/or an animal processing area.

Animals represented in the faunal assemblage include a mix of domestic and wild animals. Domestic animals include cattle, pig, sheep, and chicken. It is possible that these animals were raised at the site as suggested by historic images showing chickens, ducks, pigs, and cattle (see Figures 4.14, 4.16, and 4.18). The presence of various body parts including cranial and post-cranial portions also suggests a local source for the animals or the acquisition of complete animals from a market. Wild animals are represented by rodents, birds, fish, white-tailed deer, clam, whelk, and oyster. One bird is represented by a raptor talon and may have derived from an osprey. The raptor may be a natural inclusion and not a food source. Due to the limited sample size, quantifications and butchery analysis was not possible. The [REDACTED] of the keeper's house could provide a suitable sample size to understand animal management and consumption at Sandy Hook with additional archaeological survey.

In summary, testing revealed intact archaeological deposits relating to two structures, which align closely with the lighthouse keeper's dwelling and attached kitchen constructed in the 1830s, two brick paths, and a rich 19th-century midden deposits reflecting the historic occupation of the site. Small quantities of earlier 18th-century material, and artifacts likely associated with the military occupation of the site during the American Revolution were also unearthed. These included gun parts, musket balls, and fragments of grape and canister shot. Overall, the 18th century ceramics reflect a modest expenditure on ceramics, while those from the 19th century are fashionable transfer prints. Later, undecorated ironstone and whiteware are common. Ceramics finds are associated reflect an attempt to set a fashionable table even at the rather isolated lighthouse. More intensive investigation of the

deposits unearthed in Excavation Unit 2 could provide additional information about foodways at the site.

The project successfully identified the structural remains of two buildings, likely the 1838 lighthouse keeper's house and attached kitchen [REDACTED] of the current lighthouse. Deposits dating from the 18th and 19th centuries were identified, and a rich 19th-century midden deposit to the [REDACTED] of the lighthouse was sampled. The information derived from Monmouth University's excavations have clarified the organization of the lighthouse tract, and better located some of the historic structures once present [REDACTED]. The rich deposits noted in Excavation Unit 2 may relate to the 18th-century deposits noted by Dana Linck near the lighthouse keeper's barn. A noteworthy collection of Revolutionary-War era artifacts was recovered and analyzed.

Although some areas of the knoll where the lighthouse stands have been impacted by recent utility work and site improvements, much of the site is intact and some stratified deposits are present. Efforts should be made to preserve these deposits for future study. Based on the results of the 2016 field school and previous archaeological excavations at Sandy Hook Lighthouse, it is clear that the site contains significant cultural features with the potential to provide new information about the historic occupation of the site. These features include what are almost certainly the remains of the 1838/9-1883 lighthouse keeper's house and attached outkitchen. Also present are rich midden deposits dating from the early 19th through late 19th centuries. The presence of the previously-discussed Revolutionary War era artifacts is also noteworthy. Although testing was limited, it is evident that the site is significant under Criterion D of the National Register of Historic Places. Any further ground disturbance in these locations should be preceded by additional archaeological research. Overall, this project has added considerably to our knowledge of the lighthouse site's occupation. We have a much better understanding of the site, the features present, the organization of these features, and the types of artifacts present.

6.2: Recommendations

Testing at Sandy Hook lighthouse revealed intact historic features relating to historic lighthouse keeper's dwellings (EUs 1, 3, 4, and 5), rich domestic deposits, dating from the 19th-century and reflective of life on the Hook (EU 2), and features related to either the construction or maintenance

of the lighthouse (EU 6). These deposits are significant historic resources which provide new information about the history of the lighthouse, the lives of its keeper's and their families, and the organization of space around the lighthouse.

Scattered evidence for the Revolutionary War activities by the lighthouse were represented in the archaeological deposits in the form of musket balls, a fragment of a side plate from a Brown Bess, or British Long Land Pattern Musket, grapeshot, and a bayonet hanger. However, these artifacts came from mixed deposits. Nevertheless, the fact that even shovel tests were unearthing musket balls speaks to the site's rich potential to provide new information about the Revolutionary War history of the site.

Additional research to better delineate the location and arrangement of the lighthouse keeper's dwellings and associated outbuildings is recommended. Historical information indicates that at least three incarnations of the lighthouse keeper's dwelling has existed on the site. The first was contemporaneous with the construction of the lighthouse and appears to be a large, two-story, gambrel-roofed structure, likely with associated outbuildings. In 1838 the U.S. Customs Service advertised for the construction of a new two-story keeper's house and an attached outkitchen. The dimensions of those structures are very similar to the features noted in Excavation Units 1, 3, 4, and 5. The structures also resemble Frank Paterson's paintings (see Figures 4.17 and 4.18). The third and final lighthouse keeper's house was constructed in 1883 and still stands. Further investigation of the foundations associated with the keeper's houses is warranted. Other structural remains are present on the site; however, their extent and integrity are unknown. Shovel tests 19 and 38 contained features that were not fully explored. These features warrant further investigation.

Rich midden deposits were noted northeast of the lighthouse, most notably in Excavation Unit 2. These deposits have the potential to provide new information about both the lives of the lighthouse keeper's and in particular their access to consumer goods. Lighthouse keepers often complained about their isolation. The deposits unearthed during Monmouth's 2016 field school contained substantial quantities of faunal remains, though often from disturbed deposits. Further excavation of these midden deposits accompanied by careful analysis of the faunal remains could shed new light on the diet of the lighthouse keepers. Finally, Revolutionary War artifacts are present across the site. Previous fieldwork by Dana Linck and colleagues by the lighthouse keeper's barn found what may be stratified

deposits containing Revolutionary War era materials. Further investigation of this area is strongly suggested.

Any ground disturbing activities on the site should be preceded by additional archaeological fieldwork. The site is a unique resource with exceptional potential to provide information about an important topic and eras in New Jersey's history.

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