



Battery Horace Hambright

Historic Structure Report

Cultural Resources, Partnerships and Science Division

Battery Horace Hambright

Fort Pulaski National Monument, Georgia

Historic Structure Report

February 2019

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About the front cover: View of Battery Horace Hambright from HABS GA-2158.

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Fort Pulaski National Monument, Georgia

Historic Structure Report

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Superintendent, Fort Pulaski National Monument

7/31/2018
Date

Recommended by: 
Chief, Cultural Resources, Partnerships and Science Division, Southeast Region

9/24/2018
Date

Recommended by: 
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9/26/2018
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9/26/18
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Contents

| | |
|-----------------------|-----|
| List of Figures | vii |
| Project Team | x |
| Foreword | xi |

Management Summary

| | |
|-------------------------------------|---|
| Historical Data | 1 |
| Treatment and Use | 4 |
| Administrative Data | 4 |
| Project Scope and Methodology | 5 |

Developmental History

| | |
|---|----|
| Early History of Cockspur Island | 9 |
| Planning of Fort Pulaski | 10 |
| Construction of Fort Pulaski | 12 |
| The Civil War, 1861–1865 | 13 |
| Fort Pulaski after the Civil War | 16 |
| Endicott Board, 1885–1886 | 17 |
| Endicott System Defensive Theory | 18 |
| Construction of Fort Screven, 1893–1902 | 19 |
| Construction of Battery Hambright, 1899–1902 | 22 |
| Early Preservation of Fort Pulaski, 1898–1924 | 24 |
| Fort Pulaski National Monument, 1924–1933 | 25 |
| Stewardship of the National Park Service | 26 |
| Battery Horace Hambright Chronology | 34 |

Physical Description and Condition Assessment

| | |
|-------------------------------------|----|
| Battery Hambright Landscape | 37 |
| Battery Hambright Description | 39 |
| Lower Level | 40 |
| Upper Level | 43 |
| Condition Assessment | 46 |

Significance and Integrity

| | |
|---|----|
| National Register of Historic Places | 53 |
| Significance Criteria | 53 |
| National Register Significance Evaluation | 54 |
| Period of Significance | 55 |
| Character-Defining Features | 56 |
| Assessment of Integrity | 56 |

Treatment and Use

| | |
|---|----|
| Requirements for Treatment and Use | 59 |
| Laws, Regulations, and Functional Requirements | 59 |
| Alternatives for Treatment and Use | 61 |
| Ultimate Treatment and Use | 62 |
| Recommendations | 64 |
| Recommendations for Further Research | 72 |
| Climate Change and Related Environmental Issues | 72 |

Bibliography 77

Appendices

Appendix A: Measured Drawings

List of Figures

Management Summary

- 1 Map of Georgia showing location of Fort Pulaski National Monument (red rectangle) on the coast near Savannah (not to scale) 7
- 2 Park map of Fort Pulaski National Monument 7

Developmental History

- 3 1831 plan of Fort Pulaski, showing the fort as it was constructed 12
- 4 A map showing the Union attack on Fort Pulaski in April 1862 15
- 5 The southeast corner of Fort Pulaski following the attack, 1862 15
- 6 Fort Pulaski, 1862, showing damaged casemate masonry at the southeast corner 15
- 7 Casemates and the parade ground, circa 1900 24
- 8 The parade ground and casemates, circa 1907 24
- 9 Aerial view of Fort Pulaski, before 1925. Note the overgrowth of trees and shrubs at the parade ground and demilune, low plants in the former moats, caretaker's house atop the terreplein, and small outbuilding on the parade ground 25
- 10 The 1940 New Deal program *Narrative Report* of Battery Hambright included this "Before Restoration" photograph 27
- 11 According the 1940 *Narrative Report*, "Battery Hambright was buried under jungle foliage. The battery itself was encased in a tangle of creepers and smilax. [This view] shows laborers clearing the site." It is interesting to note here that the site had to be cleared once again in the 1960s 28
- 12 Battery Hambright as it is "Nearing Completion" of the 1940 New Deal restoration 28
- 13 Battery Hambright as seen from the "North, or seaward face . . . from west to east;" note the exposed brick wall which looks like a series of steps, 1940 29
- 14 Battery Hambright as seen from the "North or seaward face... from east to west," 1940 29
- 15 "View northward from top of battery Hambright showing vista out through the river," 1940 29
- 16 View northeast of Battery Brumby at Fort Screven, 2016 32
- 17 View of Battery Garland, now the Tybee Island Museum, at Fort Screven, 2016 32

Physical Description and Condition Assessment

- 18 The historic dike north of Battery Hambright. Note the North Pier Trail in the background to the right 37
- 19 Battery Hambright from the south showing the grassy area surrounding the structure 37
- 20 A map of the North Pier Trail showing the locations of Battery Hambright and the John Wesley Memorial ... 38
- 21 Visitors can access Battery Hambright from the North Pier Trail 38
- 22 The historic North Pier is located north of Battery Hambright 38
- 23 The North Pier Trail as it appears north of Battery Hambright 38
- 24 The John Wesley Memorial 38
- 25 A view from the north of the berm that covers Battery Hambright 39

| | | |
|----|---|----|
| 26 | The south elevation of Battery Hambright | 39 |
| 27 | The east retaining wall | 40 |
| 28 | The west retaining wall | 40 |
| 29 | The east passageway from the upper level | 40 |
| 30 | The west passageway. Note the wood-framed walkway at the top | 40 |
| 31 | View north toward the door opening at the east magazine | 41 |
| 32 | Remnant metal hinges remain at the door jambs | 41 |
| 33 | The magazine. Note the niche in the far wall and the embedded steel beams in the ceiling | 41 |
| 34 | A ventilation pipe in the top of the niche | 42 |
| 35 | The ventilation pipe extends up through the concrete walls and out past the wall | 42 |
| 36 | The east magazine. Note the niche to the right of the door opening | 42 |
| 37 | The entrance to the east magazine. Note the drain in the floor of the room | 42 |
| 38 | The west magazine. Note the niche to the right of the door opening | 43 |
| 39 | The west staircase that leads to the upper level | 43 |
| 40 | The wood-framed walkway that connects the center portion of the upper level to the observation station to the east | 43 |
| 41 | The underside of the wood-framed walkway that connects the center portion of the upper level to the observation station to the east | 43 |
| 42 | The observation station at the southeast corner of the battery | 44 |
| 43 | The center portion of the upper level of Battery Hambright. Note the wood-framed walkways in the foreground and background | 44 |
| 44 | Stairs lead up to the east gun platform | 44 |
| 45 | The east gun platform | 44 |
| 46 | The lowering niche at the west side of the east gun platform | 45 |
| 47 | An ammunition recess is in the east wall at the gun platform | 45 |
| 48 | The concrete roof over the east magazine. Note that the roof abuts the wall of the gun platform and the wall of the observation station | 45 |
| 49 | The concrete roof over the west magazine | 45 |
| 50 | The wood-framed walkway connecting the west and center portions of the upper level of the battery | 46 |
| 51 | The stairs leading to the west gun platform | 46 |
| 52 | The west gun platform | 46 |
| 53 | The lowering niche and ammunition recess at the east wall of the west gun platform | 46 |
| 54 | A lowering niche on the west wall of the west gun platform | 46 |
| 55 | Movement and displacement at a joint in the east retaining wall | 47 |
| 56 | Cracks were observed in the parge coating throughout the structure | 48 |
| 57 | The majority of the cracks observed in the parge coat were narrow | 48 |
| 58 | Delaminated parge coating was observed in several locations | 48 |

| | | |
|----|--|----|
| 59 | Cracking extended through the parge coating and the concrete structure | 48 |
| 60 | Cracking in the concrete structure extended beyond the parge coating. This crack, along the south wall, appears to have been routed, but not repaired | 48 |
| 61 | Sealant has been installed at routed-out cracks throughout the structure | 48 |
| 62 | An open crack at the south wall that was routed out but not repaired | 49 |
| 63 | Previous crack repairs and patches are cracked and debonded | 49 |
| 64 | Delaminated patch repairs at the floor of the observation station | 49 |
| 65 | Previous patch repairs are cracked and delaminated | 49 |
| 66 | Biological growth was observed at a joint between stairs and an adjacent wall | 50 |
| 67 | Biological growth observed at the top of a concrete wall | 50 |
| 68 | Leaching from the concrete was observed in several locations, particularly near cracks | 50 |
| 69 | Staining from organic growth and soil accumulation at the east retaining wall and observation station | 50 |
| 70 | Surface corrosion of the embedded steel beams was observed in all interior spaces. Note the run-down staining associated with the steel beams at the back wall | 51 |
| 71 | Joint preparation for crack repair testing implemented by the Park in May 2016 | 51 |
| 72 | Crack repair testing implemented by the Park in May 2016 | 51 |

Treatment and Use

| | | |
|----|---|----|
| 73 | Aerial view of Fort Pulaski after Hurricane Irma, showing the dike system holding in floodwater | 73 |
| 74 | View of the dike south of the fort retaining floodwater after Hurricane Irma (channel is on right in photo) . | 73 |
| 75 | View from top of Battery Hambright after Hurricane Matthew, looking north | 74 |
| 76 | Rack line on Battery Hambright, several days after Hurricane Matthew after floodwaters had receded | 74 |
| 77 | Container ship traveling along the North Channel near Fort Pulaski | 75 |

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Foreword

We are pleased to make available this Historic Structure Report, part of ongoing effort to provide comprehensive documentation for the historic structures and cultural landscapes of Fort Pulaski National Monument. A number of individuals contributed to the successful completion of this work, but we would particularly like to thank the project team members who authored the report. The authors would like to thank the staff at Fort Pulaski National Monument who assisted with the project, especially Melissa Memory, Superintendent of Fort Pulaski National Monument, Joel Cadoff, Chief of Interpretation and Education at Fort Pulaski National Monument, Katherine Purcell Exhibit Specialist at Fort Pulaski National Monument, Laura Waller, Cultural Resource Specialist at Fort Pulaski National Monument, and Emily Harte, Chief of Facility and Resource Management, Fort Pulaski National Monument. In addition, the authors would like to thank Dr. Ali Miri and Laurie Chestnut of the Southeast Regional Office.

We hope that this study will prove valuable to park management and others in ongoing efforts to preserve Battery Hambright at Fort Pulaski National Monument and to everyone in understanding and interpreting its unique history and its contributions to our understanding of Endicott Era resources across the Nation.

Melissa Memory
Superintendent
Fort Pulaski National Monument
National Park Service

Management Summary

1 At the request of the National Park Service (NPS),
2 Panamerican Consultants, Inc. and its
3 subconsultant, Wiss, Janney, Elstner Associates,
4 Inc. (WJE), have developed this Historic Structure
5 Report (HSR) for Battery Horace Hambright at
6 Fort Pulaski National Monument on Cockspur
7 Island, near Savannah in Chatham County,
8 Georgia. Figure 1 illustrates the location of Fort
9 Pulaski National Monument within the state of
10 Georgia, while Figure 2 indicates the position of
11 Battery Hambright within the park.

12 Fort Pulaski is listed in the National Register of
13 Historic Places as the best preserved example of
14 the system of coastal fortifications designed during
15 the early nineteenth century by the French military
16 engineer Simon Bernard while in the employment
17 of the US Army Corps of Engineers. These
18 fortifications are known as the Third System of
19 coastal defenses. Due to the important strategic
20 location of Cockspur Island in protecting
21 Savannah Harbor, it was also identified as a key
22 location for positioning coastal defenses as part of
23 the Endicott System implemented during the late
24 nineteenth century. Battery Hambright was
25 completed in 1900 to cover a minefield placed in
26 the North Channel of the Savannah River as part
27 of the Endicott System during the Spanish
28 American War in 1898. It was engineered to
29 address deficiencies in the Third System coastal
30 defenses resulting from innovations in rifled
31 artillery and naval vessels. Fort Pulaski was also
32 retrofitted with an earthen demilune, new gun
33 emplacements, and electric mine controls as part
34 of the effort.

35 The National Register nomination for Fort Pulaski
36 indicates that the historic property is significant in
37 the areas of architecture, engineering, and military
38 history. The nomination also indicates that Fort

39 Pulaski is noteworthy for the fact that its
40 construction, designed to resist cannon fire,
41 rapidly failed when attacked by relatively new
42 rifled artillery—an event that signaled the need for
43 a new approach to fortification engineering.
44 Battery Hambright is indicated as a contributing
45 structure in the nomination.

46 Historical Data

47 Coastal defenses at Cockspur Island were first
48 developed during the French and Indian War of
49 the eighteenth century. Following the British
50 invasion of Washington, D.C., during the War of
51 1812, the US government planned fifty new forts
52 as part of a third system of national coastal
53 defenses, which included Fort Pulaski to defend
54 the approaches to Savannah. Plans were
55 completed in 1831 for a single-level brick masonry
56 fort topped by an open terreplein.

57 Construction began in 1833 but progressed slowly
58 due to frequent storms and limited funding. The
59 overall structure was not completed until 1839,
60 and the demilune and interior were not fully
61 completed until early in 1847. As completed, the
62 five-sided masonry fort included a central parade
63 ground surrounded by casemates. A gorge along
64 the west elevation included officers' quarters,
65 while casemates were present on the remaining
66 four sides of the fort. Above the interior casemates
67 and gorge rooms was a terreplein. The fort was
68 designed to hold 146 guns, but by 1860 only
69 twenty guns had been installed, and the fort was
70 manned only by a peacetime caretaker and an
71 ordnance sergeant.

72 After the election of Abraham Lincoln, southern
73 states began to consider secession from the Union.
74 South Carolina seceded on December 20, 1860,

1 and less than a week later, a small US Army
2 garrison occupied Fort Sumter in Charleston
3 Harbor. Local leaders in Savannah were
4 concerned that federal forces would soon occupy
5 all military fortifications throughout the South,
6 including nearby Fort Pulaski. Georgia Governor
7 Joseph E. Brown therefore ordered the Georgia
8 militia to seize Fort Pulaski on January 2, 1861.
9 The militia encountered no resistance at the
10 almost unmanned fort.

11 Georgia troops, supported by enslaved labor from
12 nearby rice plantations, quickly began to prepare
13 the fort for possible attack. War officially began
14 with the Confederate assault on Fort Sumter in
15 April 1861. In the fall of 1861, Union forces moved
16 south by sea to begin a planned naval blockade of
17 the South. Union forces quickly captured forts at
18 Hilton Head and Bay Point Islands in South
19 Carolina. The Confederates responded by
20 strengthening the defenses of Fort Pulaski,
21 including moving an artillery battery from Tybee
22 Island to the fort. The abandonment of Tybee
23 Island by the Confederates allowed Union troops
24 to move south to Tybee Island and prepare for a
25 blockade of Fort Pulaski.

26 By early 1862, Union forces had established gun
27 positions along the Savannah River and blockaded
28 Fort Pulaski. The fort had a six-month supply of
29 food in January 1862, making its surrender
30 inevitable if the blockade could not be broken.
31 Despite this advantage, Union Brigadier General
32 Thomas Sherman still sought a quick capture of
33 the fort and the City of Savannah rather than
34 waiting for the Confederates to surrender due to a
35 lack of food.¹

36 The main Union position was on Tybee Island,
37 1 to 2-1/2 miles away from Fort Pulaski, which was
38 too far for conventional smoothbore guns and
39 mortars to be effective against a heavy masonry
40 wall. Federal Captain Quincy Adams Gillmore was
41 familiar with a new weapon, the rifled gun, with
42 which the US Army began experimenting in 1859.
43 In late 1861, convinced that the rifled gun could

44 breach the walls of Fort Pulaski from Tybee Island,
45 Gillmore persuaded Sherman to implement his
46 plan to attack the fort from that location. Union
47 troops erected eleven batteries of guns and
48 mortars on the northwest shore of Tybee Island,
49 facing Fort Pulaski. By April 9, preparations were
50 ready for the attack.

51 On the morning of April 10, the Union assault
52 began. By the end of the day, the Confederate
53 defenders were aware that Fort Pulaski was in
54 significantly damaged condition, as the 7-1/2-foot-
55 thick wall at the southeast corner now had an
56 intact thickness of only 3 feet. The bombardment
57 of Fort Pulaski continued at dawn the next
58 morning. Shortly after noon, the southeast angle of
59 the fort was in ruins, with two sizeable holes
60 present, making the inside of the fort visible from
61 Tybee Island. At approximately 2:30 pm on
62 April 11, the Confederate flag was lowered, a gun
63 was fired from the casemate, and a white sheet was
64 raised. Fort Pulaski was surrendered to Union
65 control.

66 The 48th New York Infantry arrived at Fort
67 Pulaski in June 1862 and was charged with making
68 repairs to the damaged fort, which included
69 rebuilding the fort's southeast corner. In addition,
70 the batteries on Tybee Island were dismantled,
71 with some of the guns relocated to Fort Pulaski. By
72 June 1863, the fort's garrison was largely reduced
73 to a holding force as fighting continued elsewhere.

74 In October 1864, a group of 520 Confederate
75 prisoners was transferred from Morris Island, near
76 Charleston, to Fort Pulaski. At the end of the war,
77 several Confederate leaders were brought to Fort
78 Pulaski, where many remained imprisoned for
79 several months.

80 Following the war, the US Army sought to
81 modernize the fort in response to its failure to
82 withstand the Union fire directed at it in 1862.
83 Beginning in 1869, the US Army Corps of
84 Engineers made a series of improvements to the
85 fort. These improvements included remodeling
86 the demilune, installing new underground
87 magazines and passageways, and constructing gun
88 emplacements. Construction at Fort Pulaski
89 stopped in 1872 after the US Army Corps of

1. Brig. Gen. Thomas Sherman (1813–1879) is not to be confused with Gen. William Tecumseh Sherman (1820–1891).

1 Engineers made plans to construct a new fort on
2 nearby Tybee Island. In 1873, the remaining Army
3 units stationed at the fort were withdrawn and
4 Fort Pulaski was officially closed, although it
5 remained under army administration as a military
6 reservation.

7 Battery Hambright was constructed near Fort
8 Pulaski in response to the findings of the National
9 Board of Fortifications, headed by Secretary of
10 War William C. Endicott and convened in 1885.
11 The Board's findings articulated a need for a new
12 coastal defense system that would address
13 innovations in rifled artillery, iron-clad naval
14 vessels, and submarine use. The Endicott Board,
15 comprising Army, Navy, and civilian members,
16 conducted an extensive study of the nation's
17 existing coastal defenses and identified
18 deficiencies and the locations that required
19 protection from enemy attack. The Endicott Board
20 submitted a report of its findings that suggested
21 sweeping changes in the nation's coastal defense
22 system. Its recommendations included the need to
23 establish a new system of artillery fortifications at
24 twenty-seven ports or harbors in the continental
25 United States that became known as the Endicott
26 Battery System. The new batteries would be
27 engineered to withstand rifled artillery, and to
28 emplace rifles as well as mortars that would be
29 effective against enemy warships and other vessels.
30 The batteries would be sited to work together with
31 electric mine fields, floating batteries, and small
32 torpedo boats. The total cost of the proposed
33 program, including the cost of manufacturing 577
34 new, heavy rifled artillery, was estimated to be
35 \$126,377,800.

36 Battery Hambright was one of seven batteries
37 constructed as part of Fort Screven, designed to
38 protect Savannah Harbor based on the Endicott
39 Board's recommendations.

40 By 1893, the US Board of Engineers had prepared
41 plans for implementing Endicott System features
42 to be used in the defense of the Tybee Roads area.
43 As approved by the Secretary of War, the plans for
44 Fort Screven called for the construction of seven
45 batteries—later named Batteries Hambright,
46 Brumby, Garland, Fenwick, Backus, Gantt, and
47 Habersham—to house various sizes of gun and

48 support submarine mine placement operations.
49 Mines were placed in the North Channel of the
50 Savannah River in 1898 in response to the threat
51 posed by the Spanish American War. A force was
52 garrisoned at Fort Pulaski and operated the
53 minefield from the demilune, which also
54 contained emplaced artillery. When installed, the
55 mines were anchored to the bottom of the river,
56 with an attached buoy floating just below the
57 water surface. When a passing ship hit the buoy, an
58 electrical signal was sent to the mining casemate in
59 Fort Pulaski, allowing the operators to set off the
60 mine.

61 Battery Hambright was built after the war to
62 protect the minefield. It was the only battery
63 associated with Fort Screven that was located on
64 the south shore of the Savannah River.

65 Construction of Battery Hambright began in 1899
66 and was completed in 1900. Like the other
67 batteries associated with Fort Screven, Battery
68 Hambright is a cast-in-place, reinforced concrete
69 gun emplacement. The battery was designed to
70 hold two, rifled, 3-inch guns on disappearing,
71 masking pedestal mounts. Located to the north of
72 Fort Pulaski, Battery Hambright faced the
73 Savannah River, with a field of fire that extended
74 to the North Channel. The North Channel Pier
75 was used to access the river for the placement of
76 the mines.

77 Despite these preparations, Battery Hambright
78 was never armed. By World War I the technology
79 for which the Endicott fortifications were created
80 had become obsolete, due once again to
81 innovations in armaments, the use of airplanes,
82 fast torpedo boats, and destroyers.

83 In 1915, Fort Pulaski was identified as eligible for
84 preservation as a national monument under the
85 Antiquities Act. In 1924, Fort Pulaski, including
86 Battery Hambright, was designated Fort Pulaski
87 National Monument, to be administered by the
88 War Department. In 1933, administration of Fort
89 Pulaski National Monument, as well as many of
90 the historic military sites that had been the
91 responsibility of the War Department, was
92 transferred to the National Park Service.

1 During the 1930s, Fort Pulaski National Monument
2 benefitted from several New Deal-era programs,
3 including the Public Works Administration (PWA)
4 and Civilian Conservation Corps (CCC). Through
5 the funds and manpower afforded by these
6 programs, Battery Hambright was cleared of
7 overgrown vegetation and the structure was
8 repaired and preserved. During World War II,
9 however, these programs were terminated, and
10 work at Fort Pulaski halted. The US Navy
11 established a section base on Cockspur Island in
12 late 1941. The base, which was used to support
13 coastal patrol ships, remained active until 1947.²

14 At the end of World War II, Fort Screven was
15 closed and the land, including the six adjacent
16 batteries (all except Battery Hambright), was sold
17 to the city, which, in turn, sold it to a development
18 company. The company sold off parts of the
19 fortification. The batteries were incorporated into
20 residential developments, were modified or razed,
21 or were otherwise left to deteriorate through
22 neglect. In 1947, the Navy removed the structures
23 it had used to operate a section base on Cockspur
24 Island; Fort Pulaski National Monument opened
25 to the public soon thereafter.

26 Additional repair and preservation efforts were
27 conducted during the late 1950s and early 1960s as
28 a result of funding afforded by the National Park
29 Service's Mission 66 program. These efforts
30 included a series of repairs to Fort Pulaski as well
31 as Battery Hambright. Additional maintenance and
32 repair projects have been conducted at Fort
33 Pulaski since the 1970s. In 1995, Battery
34 Hambright underwent a third comprehensive
35 repair effort.

36 Today, Battery Hambright is accessible to the
37 public via a paved walk system that connects the
38 visitor parking area with the battery, the old North
39 Pier and an associated overlook, and Fort Pulaski.
40 It is closely edged by the dike and ditch system
41 built to protect the fort and environs from
42 flooding. Much of the landscape associated with

2. J. Faith Meader and Cameron Binkley, ed.,
*Fort Pulaski National Monument
Administrative History* (Atlanta, Georgia:
National Park Service, 2003), 29.

43 Battery Hambright is maintained in mown turf,
44 including the important view toward the river that
45 constitutes the historic field of fire associated with
46 the battery's artillery.

47 Treatment and Use

48 Battery Hambright is a significant structure for its
49 association with Fort Pulaski and the Endicott or
50 Fourth Seacoast Defense System. The structure is
51 preserved and interpreted for the public and is
52 anticipated to remain in this use. The
53 recommended overarching treatment for the
54 structure itself is therefore *Preservation* to support
55 continued protection of historic character-
56 defining features. The recommended treatment
57 for the surrounding landscape is *Rehabilitation*,
58 which allows for appropriate changes to the site,
59 including the accommodation of visitor access and
60 interpretation that does not interfere with the
61 protection of its historic character-defining
62 features.

63 Battery Hambright is generally in fair condition.
64 The concrete requires maintenance and repair.
65 Examples include repair of cracked, delaminated,
66 and spalled concrete; treatment of embedded
67 metal elements; replacement of prior repairs; and
68 cleaning of concrete to remove organic growth
69 and staining. Condition issues associated with the
70 Battery Hambright environs include exposed earth
71 on the berm as well as the area to the south of the
72 battery structure where grass cover is not
73 continuous, suggesting the potential for erosion,
74 and exposed sand on the path leading to the old
75 North Pier.

76 Administrative Data

77 Locational Data

78 *Building Name:* Battery Horace Hambright

79 *Location:* Fort Pulaski National Monument,
80 Georgia

81 *LCS Number:* Battery Horace Hambright is listed
82 as: LCS 012171 (HS-05)

83 *GPS Coordinates:* 17S 510149 / 3543781

1 Related Studies

2 Edward L. Trout, Park Historian, *National Register*
3 *of Historic Places Registration Form: Fort*
4 *Pulaski National Monument*. Approved by the
5 National Register, December 3, 1975.

6 Susan Hitchcock, *Cockspur Island Historic District,*
7 *Fort Pulaski National Monument Cultural*
8 *Landscape Report*. Atlanta, Georgia: National
9 Park Service, Southeast Regional Office,
10 Cultural Resources Division, August 2011.

11 J. Faith Meader, New South Associates, and
12 Cameron Binkley, editor, National Park
13 Service. *Fort Pulaski National Monument*
14 *Administrative History*. Atlanta, Georgia:
15 National Park Service, Southeast Regional
16 Office, Cultural Resources Division,
17 December 2003.

18 Cultural Resource Data

19 Fort Pulaski, with Battery Hambright as a
20 contributing structure, was listed in the National
21 Register of Historic Places in 1975 for its
22 significance in architecture, engineering, and
23 military history.

24 *Period of Significance:* 1899–1930s (Battery
25 Hambright)

26 *Proposed Treatment:* Preservation (Rehabilitation
27 of landscape features)

28 Project Scope and 29 Methodology

30 The goal of the HSR is to develop planning
31 information for use in the repair, maintenance,
32 and preservation of this historically significant
33 structure. First developed by the National Park
34 Service in the 1930s, HSRs are documents
35 prepared for a building, structure, or group of
36 buildings and structures of recognized significance
37 to record and analyze the property's initial
38 construction and subsequent alterations through
39 historical, physical, and pictorial evidence;
40 document the performance and condition of the
41 structure's materials and overall physical stability;

42 identify an appropriate course of treatment; and,
43 following implementation of the recommended
44 work, document alterations made through that
45 treatment.

46 The HSR addresses key issues specific to Battery
47 Horace Hambright, including the history and
48 construction chronology of the building; the
49 existing physical condition of the exterior
50 envelope, structural systems, and primary interior
51 spaces and features, as well as the landscape
52 features that were associated with its development
53 and use; and the historic significance and integrity
54 of the structure and associated landscape.

55 The following project methodology was used for
56 this study.

57 Research and Document Review.

58 Archival research was performed to gather
59 information about the original construction and
60 past modifications and repairs for use in assessing
61 existing conditions and developing treatment
62 recommendations for the battery. Documents
63 reviewed included maps, drawings, specifications,
64 historic photographs, and other written and
65 illustrative documentation about the history of
66 construction and repairs to the battery. The
67 research for this study built upon prior historical
68 and archival research by the National Park Service
69 and others, as outlined in the bibliography
70 provided with this report. Primary reference
71 material for this study was obtained from
72 collection at the Fort Pulaski archives and
73 facilities. Additional research material was
74 obtained from the National Park Service Technical
75 Information Center (TIC) in Denver, Colorado,
76 and the National Archives at College Park,
77 Maryland.

78 Condition Assessment and

79 **Documentation.** Concurrent with the
80 historical research, a condition survey of Battery
81 Horace Hambright was performed and
82 observations documented with digital
83 photographs, field notes, and annotations on
84 baseline drawings. For purposes of the field
85 survey, copies of architectural drawings from
86 original construction were provided to the project

1 team by the Park. The condition assessment
2 addressed the exterior and interior spaces and
3 features of the battery.

4 **Development of History, Chronology
5 of Construction, and Evaluation of
6 Significance.** Based on historical

7 documentation and physical evidence gathered
8 during the study, a context history and a
9 chronology of design and construction were
10 developed. An evaluation of the significance was
11 also prepared, taking into consideration guidelines
12 provided by *National Register Bulletin: How to
13 Apply the National Register Criteria for Evaluation*.³
14 This evaluation of history and significance
15 provided the basis for the development of
16 recommended treatment alternatives.

17 **Guidelines for Preservation.** Based on the
18 evaluation of historical and architectural
19 significance of the structure, guidelines were
20 prepared to assist in the selection and
21 implementation of preservation treatments.

22 **Treatment Recommendations.** The
23 Secretary of the Interior's Standards for the
24 Treatment of Historic Properties guided the
25 development of treatment recommendations for
26 the significant exterior and interior features of the
27 battery, as well as for the features of the landscape
28 included in this study. Following the overall
29 treatment approach of *Preservation* for the battery,
30 the specific recommendations were developed to
31 address the observed existing distress conditions
32 as well as long-term preservation objectives.⁴

3. *National Register Bulletin: How to Apply the
National Register Criteria for Evaluation*
(Washington, D.C.: National Park Service,
National Register of Historic Places, 1997).

4. Anne E. Grimmer, *The Secretary of the
Interior's Standards for the Treatment of
Historic Properties with Guidelines for
Preserving, Rehabilitating, Restoring &
Reconstructing Historic Buildings*
(Washington, D.C.: U.S. Department of the
Interior, National Park Service, Technical
Preservation Services, 2017).

33 **Preparation of Historic Structure**

34 **Report.** Following completion of research, site
35 work, and analysis, a narrative report was
36 prepared summarizing the results of the research
37 and inspection and presenting recommendations
38 for treatment. The HSR was compiled following
39 the organizational guidelines of the NPS
40 *Preservation Brief 43: The Preparation and Use of
41 Historic Structure Reports*, with modifications to
42 organizational structure for purposes of this
43 project.⁵

44

5. Deborah Slaton, *Preservation Brief 43: The
Preparation and Use of Historic Structure
Reports* (Washington, D.C.: National Park
Service, Technical Preservation Services, 2005).

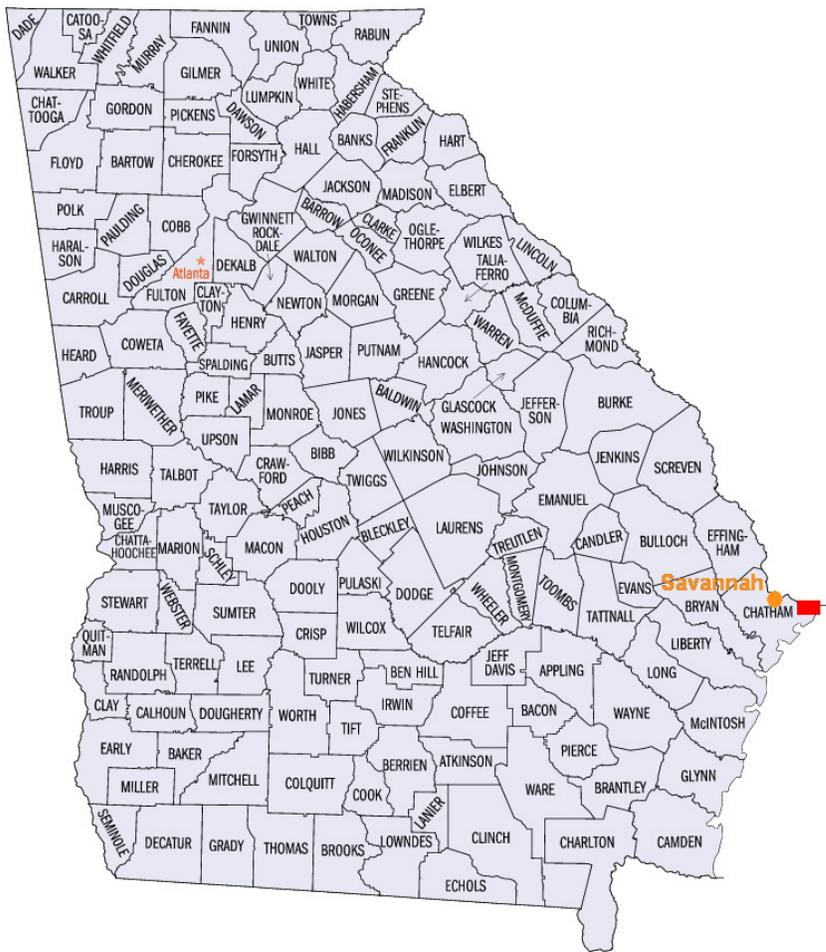


FIGURE 1. Map of Georgia showing location of Fort Pulaski National Monument (red rectangle) on the coast near Savannah (not to scale). (Source: US Census Bureau, modified by the authors)



FIGURE 2. Park map of Fort Pulaski National Monument. (Source: National Park Service)

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Developmental History

1 Early History of Cockspur 2 Island

3 Archeological studies conducted to date have not
4 confirmed prehistoric occupation of Cockspur
5 Island. However, archeological studies at nearby
6 Whitemarsh and Wilmington Islands have found
7 evidence of human habitation during the Middle
8 Woodland (500 BCE to 500 CE) and Late
9 Woodland (500 to 1100 CE) periods.⁶

10 When Spanish explorers traveled along the
11 Georgia coast during the early 1500s, the Euche
12 tribe inhabited nearby Tybee Island. By 1580,
13 Franciscan missionaries from Spain began to
14 establish missions along the southern Georgia
15 coast. The northernmost mission established was
16 the Mission Santa Catalina de Guale, which sat
17 near the mouth of Ogeechee River, approximately
18 15 miles southwest of Cockspur Island. The
19 Franciscan missions continued to thrive along the
20 Georgia and Florida coasts until the 1670s when
21 the British began to settle in the Carolinas.
22 Colonization of the Carolinas by the British led to
23 conflicts with the Spanish. A series of raids on the
24 missions by American Indians allied with the
25 British eventually caused the Spanish to leave
26 Georgia and retreat into Florida. By 1686, Juan
27 Márquez Cabrera, the Spanish Governor of

28 Florida, ordered the removal of all missions north
29 of Amelia Island.⁷

30 On January 30, 1733, six British ships led by Gen.
31 James Oglethorpe sailed into the Savannah River,
32 passing Cockspur Island (then known as Peeper
33 Island) before landing and establishing Savannah
34 at Yamacraw Bluff. Oglethorpe led several
35 subsequent expeditions to Savannah from
36 England. On a later voyage in 1736, Oglethorpe's
37 party, which included Reverend John Wesley, the
38 founder of the Methodist Movement, stopped at
39 Cockspur Island on its way up the Savannah River.

40 In 1758, William DeBrahm and Henry Yonge, joint
41 surveyors-general for the Georgia colony,
42 surveyed Cockspur Island following the purchase
43 of 150 acres by Charleston planter Jonathan Bryan.
44 At this time, 20 acres of land at the eastern end of
45 the island were reserved for public use.⁸

46 During the French and Indian War of 1754–1763
47 (known in Europe as the Seven Years' War [1756–
48 1763]), colonial leaders were concerned about the
49 possibility of an attack on Savannah by the Spanish
50 based in St. Augustine. Such concerns led to the
51 construction of Fort George on the east end of
52 Cockspur Island, beginning in 1761. The fort
53 consisted of a small wooden palisade with a
54 blockhouse in the center. While the fort served as
55 protection for Savannah, it was also utilized for

6. Meader and Binkley, 3, citing John H. Jameson Jr., *Archeological Issues at Fort Pulaski National Monument, Georgia* (Tallahassee, Florida: Southeast Archeological Center, National Park Service, 1998).

7. Susan Hitchcock, *Fort Pulaski National Monument Cockspur Island Historic District Cultural Landscape Report*. (Atlanta, Georgia: National Park Service, 2011), 5.

8. *Ibid.*, 6, citing Guy Prentice, "Trip Report on Site Condition Assessments, Fort Pulaski National Monument, GA, November 28–December 2, 2005" (Tallahassee, Florida: Southeast Archeological Center, 2006), 49.

1 customs and quarantine enforcement. The fort
2 was abandoned in 1776 at the beginning of the
3 Revolutionary War.⁹

4 Several high-ranking British officials, including
5 James Wright, the Royal Governor of Georgia,
6 took refuge on Cockspur Island during the
7 Revolutionary War. For a short time, the island
8 was the Loyalist capital of the Georgia colony until
9 the British reoccupied Savannah in 1778. At that
10 time, the island was once again abandoned.¹⁰

11 Following the conclusion of the Revolutionary
12 War, the United States sought to establish a coastal
13 defense system. In 1794, Congress passed
14 legislation calling for a system of fortifications
15 known as the “First American System of
16 Fortifications.” Soon, the Secretary of War
17 ordered new forts to be built to protect major
18 coastal cities. The new forts would be wooden
19 structures consisting of batteries, magazines, and
20 barracks or blockhouses. Small cannon were
21 placed on the upper stories of the structures.¹¹

22 As part of this new coastal defense system, a new
23 fort was constructed on Cockspur Island to
24 protect Savannah. Named after Revolutionary War
25 hero Nathanael Greene, Fort Greene was
26 constructed between 1794 and 1795 near the site
27 of Fort George. As of 1800, sixty-five officers
28 occupied Fort Greene, which was largely used as a
29 quarantine station during most of its history. In
30 1804, a hurricane struck Cockspur Island,
31 destroying Fort Greene and killing half of the
32 soldiers stationed at the island.¹²

33 In 1807, fearing an attack by the British, Congress
34 authorized the construction of the “Second
35 American System of Fortifications.” The new
36 defense system would consist of fortifications with
37 high stone and masonry walls and multilevel tiers

9. Ibid., 6, citing National Park Service, “Cultural Landscape Inventory (CLI) Fort Pulaski National Monument” (Atlanta, Georgia: Southeast Regional Office, 2000), 5.

10. Ralston Lattimore, *Fort Pulaski National Monument* (Washington, D.C.: National Park Service, 1954), 2.

11. Hitchcock, 8, citing Prentice, 52.

12. Lattimore, 3.

38 with internal casemates and gun positions. The
39 second defense system was under development
40 when the War of 1812 broke out.¹³

41 **Planning of Fort Pulaski**

42 The War of 1812 occurred in part as a result of
43 issues unresolved at the conclusion of the
44 Revolutionary War in 1783. On June 18, 1812, the
45 United States declared war on Great Britain in
46 response to British attempts to restrict trade (in
47 part brought about by Britain’s ongoing war with
48 France), the British Royal Navy’s impressment of
49 American seamen, and Britain’s support of
50 American Indian tribes’ resistance to territorial
51 expansion by the United States. The war was
52 fought partly at sea and on the Great Lakes and
53 Lake Champlain, and involved British blockades
54 of the Atlantic Coast and attacks on coastal
55 resources. Fighting also occurred on both sides of
56 the US-Canada border, along the Gulf Coast of the
57 United States, and in the Mid-Atlantic region.
58 British forces entered Chesapeake Bay and
59 captured Washington, D.C., in August 1814, where
60 they burned government buildings including the
61 White House. In September 1814, Fort McHenry
62 in Baltimore withstood extensive bombardment by
63 the British Navy. The war ended with the Treaty of
64 Ghent, signed on December 24, 1814, but not
65 ratified until the following February. On January 8,
66 1815, not knowing that the treaty had been signed,
67 British forces attacked New Orleans but were
68 defeated by American forces led by Andrew
69 Jackson.

70 The War of 1812 resulted in significant damage to
71 the United States’ coastal defense system,
72 including the new fortifications under
73 development. As a result, Congress created the
74 Board of Fortifications for Sea Coast Defense in
75 1816. Shortly thereafter, the federal government
76 engaged French military engineer Gen. Simon
77 Bernard. Bernard, along with U.S. Army engineers,
78 designed a new coastal defense system known as

13. Meader and Binkley, 5-6, citing John Whiteclay Chambers, ed., *The Oxford Companion to American Military History* (Oxford: Oxford University Press, 1999), 275-276.

1 the “Third System of Coastal Defense.” The
 2 defense system would include the construction of
 3 permanent, modern masonry fortifications along
 4 the Atlantic and Pacific coasts. One of the 200 new
 5 forts proposed was to be constructed at the mouth
 6 of the Savannah River.¹⁴ Other forts constructed as
 7 part of this system of defense included Fort Adams
 8 in Newport, Rhode Island; Fort Jefferson in the
 9 Dry Tortugas, Florida; and Fort Sumter near
 10 Charleston, South Carolina. Forty-two forts were
 11 ultimately constructed or modified as part of this
 12 system.¹⁵

13 In September 1828, the Board of Fortifications for
 14 Sea Coast Defense approved Bernard’s
 15 recommendation to construct a fort on Cockspur
 16 Island near the mouth of the Savannah River. In
 17 December of that year, Maj. Samuel Babcock
 18 began to conduct a topographical survey of the
 19 island.¹⁶ Babcock was also charged with
 20 constructing the workmen’s village, a dock, and a
 21 system of ditches and embankments.¹⁷

22 In 1829, Robert E. Lee, then a recent graduate of
 23 the United States Military Academy, West Point,
 24 was assigned to serve as assistant engineer under
 25 Babcock. Lee would eventually oversee the

26 completion of several tasks when Babcock’s health
 27 began to deteriorate.¹⁸

28 Despite the preparations being made by Major
 29 Babcock on the island, the State of Georgia and a
 30 collection of private owners held the title to
 31 Cockspur Island. In 1830, 150 acres of privately
 32 owned land on the island were deeded by
 33 Alexander Telfair to the United States
 34 government.¹⁹

35 Lt. Joseph K.F. Mansfield took control of the
 36 engineering commission for fort construction
 37 from Major Babcock in December 1830 after the
 38 latter resigned his commission. Lieutenant, later
 39 Captain, Mansfield was to oversee construction of
 40 the fort for the next fourteen years.²⁰ Lee
 41 continued work on the island under Lieutenant
 42 Mansfield until 1831, when Lee received a new
 43 assignment in Virginia.

44 Early plans, completed in 1827, called for a two-
 45 level fort to be constructed. However, the final
 46 plans, as revised per recommendations made by
 47 Mansfield and approved by the Board of
 48 Fortifications in September 1831, proposed a
 49 single-level fort topped with an open terreplein
 50 (Figure 3). The fort was five-sided in plan, with the
 51 gorge containing personnel quarters along the
 52 west side.²¹ As recommended by Mansfield, the
 53 foundation design was changed from stone to
 54 brick masonry supported on timber piles.²²

55

14. Ibid., 6.

15. At least a portion of each of the forty-two forts constructed as part of the “Third System of Defense” is extant. Some of the forts have been significantly modified, while others are presently in a ruinous state. Including Fort Pulaski, eleven of these forts are under National Park Service administration. These forts include Fort Tompkins and Fort Richmond (Staten Island, New York), Fort Hancock (Sandy Hook, New Jersey), Fort Monroe (Hampton, Virginia), Fort Sumter (Charleston, South Carolina), Fort Jefferson (Dry Tortugas, Florida), Fort Pickens (Pensacola, Florida), Fort Massachusetts (Ship Island, Mississippi), and Fort Point and Fort Alcatraz (San Francisco, California).

16. Rogers W. Young, “The Construction of Fort Pulaski,” *The Georgia Historical Quarterly* 20 (1936), 42.

17. Meader and Binkley, 6, citing Willard B. Robinson, *American Forts: Architectural Form and Function* (Urbana: University of Illinois Press, 1977), 86–88.

18. Ibid., 6, citing Rogers W. Young, *Robert E. Lee and Fort Pulaski*, Popular Series 11 (Washington, D.C., National Park Service, 1947).

19. Ibid., 6, citing, “Title Abstract for Cockspur Island,” 2000, Fort Pulaski National Monument archives.

20. Young, 1936, 43.

21. The west wall is termed the gorge as it is the far side of the fort from the direction of enemy attack, assuming a naval assault from the east.

22. Young, 1936, np.

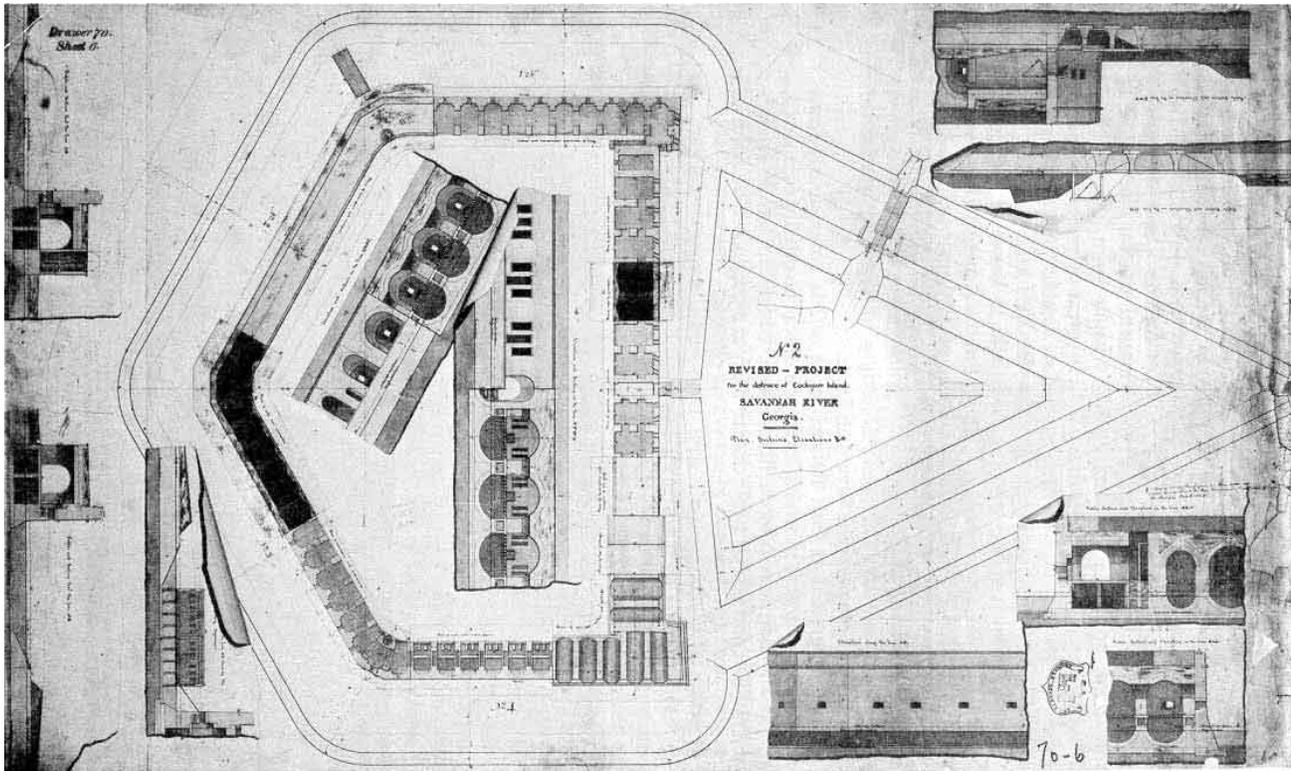


FIGURE 3. 1831 plan of Fort Pulaski, showing the fort as it was constructed. (Source: Fort Pulaski National Monument)

1 **Construction of Fort Pulaski**

2 The new fort planned for Cockspur Island was
 3 named for Polish Count Casimir C. Pulaski in
 4 recognition of his role during the Siege of
 5 Savannah during the American Revolution.

6 In the spring of 1831, work began on a new wharf at
 7 the southern shore of Cockspur Island, and in late
 8 1831, work began on the fort site. The area adjacent
 9 to the fort foundations was excavated to form a
 10 canal, allowing building materials to be transported
 11 by boat to the locations where they were needed.²³

12 In 1833, masonry work began with the foundation
 13 at the north and northeast sides of the fort.²⁴ The
 14 brown brick used to construct the walls were
 15 manufactured at the Hermitage Plantation,
 16 approximately two miles west of Savannah. The
 17 red brick used in the embrasures, arches, and
 18 parade ground walls came from brick
 19 manufacturers in Baltimore, Maryland, and
 20 Alexandria, Virginia. The granite was quarried in

21 New York, while the brown sandstone came from
 22 the Connecticut River Valley.²⁵

23 The fort was constructed using enslaved labor
 24 from nearby rice plantations. In addition, military
 25 servicemen as well as skilled masons and
 26 carpenters, many of whom were recruited from
 27 northern states, participated in construction.²⁶

28 Frequent storms and the inability of Congress to
 29 appropriate funds delayed construction of the fort.
 30 When finally completed in March 1847, the five-
 31 sided masonry fort included a central parade
 32 ground surrounded by casemates. A gorge along
 33 the west elevation included officers' quarters,
 34 while casemates were present on the remaining
 35 four sides of the fort. Above the interior casemates
 36 and gorge rooms was a terreplein. The fort was
 37 designed to hold 146 guns. The demilune area was
 38 surrounded by a breast-high masonry wall,
 39 protected on its exterior by embanked earth. The
 40 demilune included emplacements for an additional
 41 twenty-eight guns. A shot furnace was located
 42 within the demilune.

23. Young, 1936, 43.

24. Ibid.

25. Lattimore, 9.

26. Ibid.

1 **The Civil War, 1861–1865**

2 After the election of Abraham Lincoln, southern
3 states began to consider secession from the Union.
4 South Carolina seceded on December 20, 1860,
5 and, less than a week later, US Army Maj. Robert
6 Anderson moved the small garrison under his
7 command from Fort Moultrie on Sullivan’s Island
8 in Charleston Harbor to nearby Fort Sumter,
9 which was situated in the center of the harbor.

10 On January 1, 1861, Georgia Governor Joseph E.
11 Brown arrived in Savannah at the request of Col.
12 Alexander R. Lawton, commander of the 1st
13 Volunteer Regiment of Georgia. After several
14 meetings, on January 2, 1861, the governor
15 ordered the Georgia militia to seize Fort Pulaski,
16 the same date that Georgia held an election for a
17 special state convention which was to meet to
18 consider secession from the Union.²⁷

19 On January 3, 1861, the Georgia militia seized Fort
20 Pulaski and began to prepare it for possible
21 Federal attack. Preparations included clearing the
22 moat of mud and preparing for the eventual
23 acquisition of guns. By the end of January, Georgia
24 had officially seceded from the Union, and on
25 February 8 became one of the founding states of
26 the Confederate States of America.

27 Early in the morning of April 12, 1861, a
28 Confederate mortar at Fort Johnson fired a shell
29 that burst over nearby Fort Sumter, starting the
30 Civil War. During the summer of 1861, Union
31 forces developed plans for a naval blockade of the
32 South, which included recapturing the southern
33 seacoast fortifications. In order to implement this
34 plan, in late October Brig. Gen. Thomas Sherman
35 devised a plan to bombard the Confederates on
36 Hilton Head and Bay Point Islands from the sea.
37 The Union Navy bombarded the forts, causing the
38 Confederate forces to abandon their
39 fortifications.²⁸

40 Robert E. Lee, now a Confederate General,
41 returned to Fort Pulaski in November 1861. In an
42 attempt to strengthen the Confederacy’s coastal

27. *Ibid.*, 12–13.

28. *Ibid.*, 17–19.

43 defense system, Lee adopted a new strategy, which
44 involved shifting forces from surrounding islands
45 to the mainland. As part of this strategy, an
46 artillery battery at nearby Tybee Island was
47 dismantled, and its heavy guns were moved to Fort
48 Pulaski.²⁹

49 Following the abandonment of Tybee Island by
50 Confederate forces, Union troops occupied the
51 island and established a permanent garrison by the
52 end of 1861. Following the occupation of the
53 island, Union troops prepared for an attack on
54 Fort Pulaski. By early 1862, the waterways north of
55 Cockspar Island had been improved and were
56 guarded.³⁰

57 On the morning of February 13, 1862, the
58 Confederate supply ship *Ida* was blocked from its
59 routine supply run to Fort Pulaski by a brief
60 barrage of heavy Federal guns near Venus Point.
61 The following week, Union troops completed the
62 blockade of Fort Pulaski by constructing another
63 battery on the south bank of the Savannah River
64 and stationing two companies of infantry along the
65 banks of the river. In addition, the telegraph line
66 between Savannah and Cockspar Island was
67 destroyed. By the end of February 1862, the only
68 communication between the fort and Savannah
69 was made by courier.

70 Fort Pulaski had only a six-month supply of food
71 in January 1862, making surrender of the fort
72 inevitable if the blockade could not be broken.
73 Despite this advantage, Union Brig. Gen. Thomas
74 Sherman still sought a quick capture of the fort
75 and the City of Savannah rather than waiting for
76 the Confederates to surrender due to a lack of
77 food and other supplies.³¹

78 **The Attack on Fort Pulaski**

79 The defenders of Fort Pulaski believed that the
80 fort’s 7-1/2-foot-thick solid masonry walls could
81 not be breached, as the marshes surrounding the

29. *Ibid.*, 19.

30. Quincy A. Gillmore, *Siege and Reduction of Fort Pulaski National Monument (1862; reprint, Gettysburg: Thomas Publications, 1988)*.

31. *Ibid.*, 23–24.

1 fort made it impossible for ships to safely come
2 within shooting range of it, while Tybee Island, at
3 1 to 2-1/2 miles away, was thought to be too far for
4 land batteries to be effective. At this time,
5 smoothbore guns and mortars were not capable of
6 breaching a heavy masonry wall at a distance
7 beyond 700 yards.³²

8 However, Federal Capt. (later Maj. Gen.) Quincy
9 Adams Gillmore was familiar with a new weapon,
10 the rifled gun, with which the US Army began
11 experimenting in 1859. In late 1861, convinced
12 that the rifled gun could breach the walls of Fort
13 Pulaski from Tybee Island, Gillmore presented his
14 plan to attack the fort to Sherman. Despite being
15 skeptical of the effectiveness of rifled guns,
16 Sherman approved Gillmore's plan.³³

17 On February 19, Sherman sent Gillmore (by then a
18 brigadier general) to take command of the troops
19 on Tybee Island in preparation for the
20 bombardment of Fort Pulaski.³⁴ Union troops
21 erected eleven batteries of guns and mortars facing
22 Fort Pulaski on the northwest shore of Tybee
23 Island. This work was performed at night, with
24 each night's work concealed by camouflage before
25 dawn.³⁵ Despite the amount of work being
26 performed by Union troops, Col. Charles H.
27 Olmstead, the Confederate commander of Fort
28 Pulaski, wrote that "signs of activity on the part of
29 the enemy were heard but not seen . . . the
30 morning light revealed nothing to the closest
31 scrutiny."³⁶

32 In spring 1862, as the Union troops made their
33 final preparations for the bombardment of Fort
34 Pulaski, Confederate forces prepared to defend
35 the fort from the attack. The Confederate troops
36 believed that the anticipated bombardment of the
37 fort would only pave the way for a direct assault by
38 Union infantry forces, and began to make a

39 number of interior fortification changes and
40 protect some areas with sandbags.³⁷

41 At 8:15 am on the morning of April 10, a 13-inch
42 mortar shell was fired by Union forces from
43 Battery Halleck on Tybee Island (Figure 4). The
44 mortar shell traveled slowly over the fort before
45 exploding in the air. The majority of the early
46 shots fired by Union forces exploded in the air or
47 fell outside of the fort. The few shells that fell on
48 the parade ground of the fort resulted in little or
49 no damage. However, the slow bombardment
50 inflicted significant damage as it continued
51 through the day until nightfall.

52 The bombardment continued at dawn the next
53 morning with Union forces working to breach the
54 walls of the fort as Confederate forces directed fire
55 toward Tybee Island. Shortly after noon, following
56 a barrage of Union fire, the Confederate guns
57 located on the ramparts of the fort were no longer
58 being fired. The southeast angle of the fort was in
59 ruins, with two sizeable holes present, making the
60 inside of the fort visible from Tybee Island (Figure
61 5 and Figure 6).³⁸

62 At approximately 2:30 pm on the afternoon of
63 April 11, the Confederate flag was lowered, a gun
64 was fired from the casemate, and a white sheet was
65 raised. Colonel Olmstead surrendered to General
66 Gillmore and the flag of the United States of
67 America was raised over Fort Pulaski. The fort was
68 once again under Union control.³⁹

69 Following the successful siege of Fort Pulaski by
70 Union forces, Gen. David Hunter noted:

71 The result of this bombardment must cause a
72 change in the construction of fortifications as
73 radical as that foreshadowed in naval
74 architecture by the conflict between the
75 *Monitor* and *Merrimac*. No works of stone or
76 brick can resist the impact of rifled artillery of
77 heavy caliber.⁴⁰

32. *Ibid.*, 25–28.

33. *Ibid.*, 28.

34. *Ibid.*, 23–24.

35. *Ibid.*, 28–29.

36. Meader and Binkley, 9, citing Charles H. Olmstead, "Fort Pulaski," *The Georgia Historical Quarterly* 1, no. 2 (June 1917), 98–105.

37. Lattimore, 28–29.

38. *Ibid.*, 34.

39. *Ibid.*, 34.

40. *Ibid.*, 35–36.

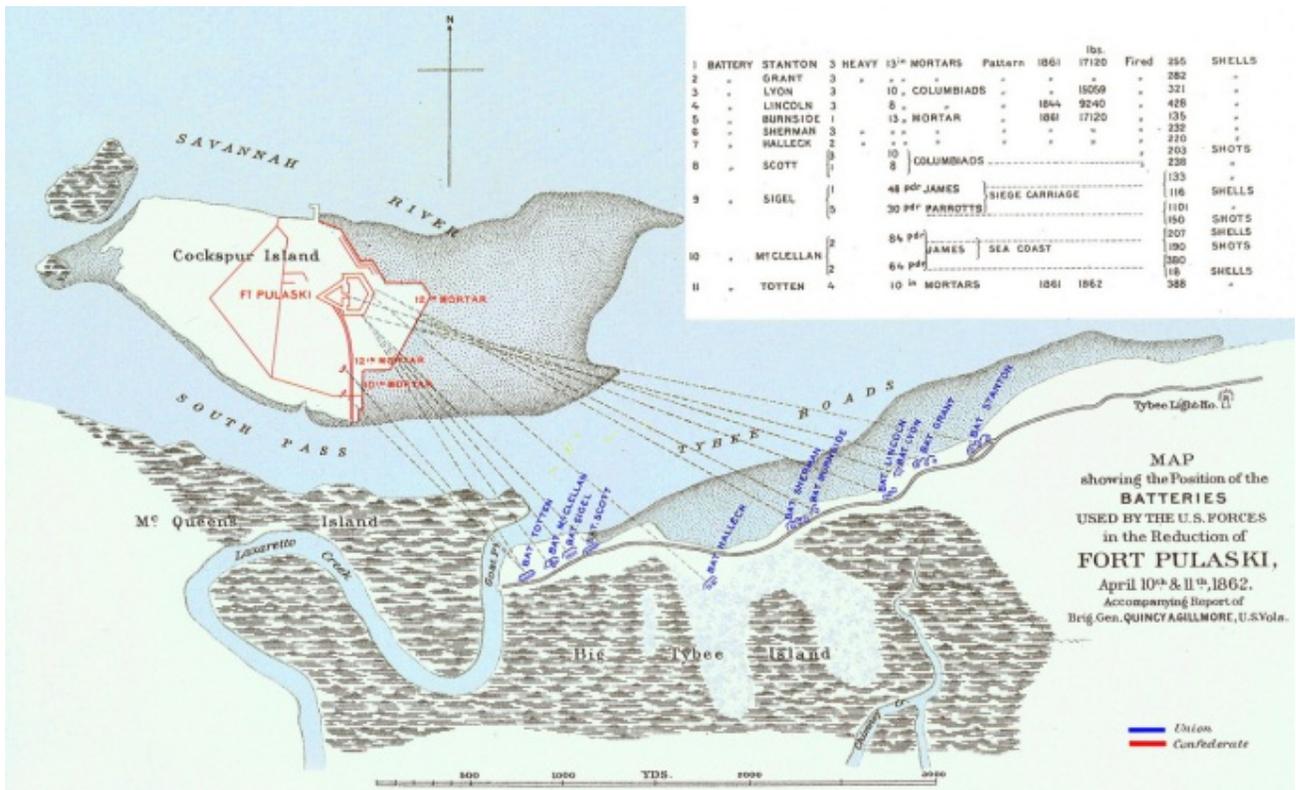


FIGURE 4. A map showing the Union attack on Fort Pulaski in April 1862. (Source: Fort Pulaski National Monument)



1 FIGURE 5. The southeast corner of Fort Pulaski
 2 following the attack, 1862. (Source: Fort Pulaski
 3 National Monument. Photograph by P. Haas)



4 FIGURE 6. Fort Pulaski, 1862, showing damaged
 5 casemate masonry at the southeast corner. (Source:
 6 Fort Pulaski National Monument)

7

1 The Confederate forces captured at Fort Pulaski
2 were sent to Governor’s Island in New York
3 Harbor. The officers were later transferred to
4 Johnson’s Island near Sandusky, Ohio, while the
5 other troops were sent to Fort Delaware. Several
6 of the Confederate prisoners were exchanged for
7 Union prisoners in August, while the officers were
8 exchanged at Vicksburg, Mississippi, in
9 September.⁴¹

10 **Fort Pulaski under Union Control**

11 The 7th Connecticut Regiment, a company of the
12 3rd Rhode Island Heavy Artillery, and a
13 detachment of the Volunteer Engineers were the
14 first Union troops to garrison Fort Pulaski
15 following the Confederate surrender. One of the
16 first efforts made by the Union forces was to erect
17 a wood-framed signal station on the terreplein at
18 the east angle of the fort, allowing the troops at
19 Fort Pulaski to communicate with the Union
20 forces twenty-one miles away at Hilton Head, via
21 intermediate stations at Braddock’s Point and
22 Pope’s Plantation.⁴²

23 The 48th New York Infantry relieved the 7th
24 Connecticut Regiment in June. Upon arriving at
25 Fort Pulaski, the 48th New York Infantry was
26 charged with making repairs to the damaged fort,
27 which included rebuilding the fort’s southeast
28 corner. The 28th Massachusetts Infantry was also
29 involved in repairs to the fort.⁴³

30
31 The batteries on Tybee Island were dismantled,
32 with some of the guns relocated to Fort Pulaski.⁴⁴
33 By June 1863, the fort’s garrison was largely
34 reduced to a holding force as fighting continued
35 elsewhere.

36 During the summer and fall of 1864, at various
37 times Union and Confederate troops and

38 prisoners were moved into the line of fire along
39 the Georgia and South Carolina coast, thus ending
40 bombardments through prisoner exchanges. In
41 1864, in one of these attempts, 549 Confederate
42 prisoners (later known as the “Immortal Six
43 Hundred”) were transferred from Morris Island
44 near Charleston, South Carolina, to Fort Pulaski.⁴⁵

45 Gen. William T. Sherman secured the surrender of
46 Savannah in December 1864, and on January 21,
47 1865, the Savannah District, including Fort
48 Pulaski, was placed under the command of Maj.
49 Gen. Cuvier Grover. On March 5, the 465
50 “Immortal Six Hundred” survivors were returned
51 to Fort Delaware.⁴⁶

52 On April 29, 1865, Union forces fired 200 guns
53 from the ramparts of Fort Pulaski to celebrate the
54 surrender of Gen. Robert E. Lee and the end of the
55 Civil War.

56 **Fort Pulaski after the Civil War**

57 After the war, several Confederate leaders were
58 brought to Fort Pulaski, where many remained
59 imprisoned for several months. Included in this
60 group were Confederate Secretary of State Robert
61 M.T. Hunter, Secretary of the Treasury George
62 Trenholm, and Secretary of War James A.
63 Seddon.⁴⁷

64 Following the war, the US Army sought to
65 modernize the fort after its failure to withstand the
66 Union fire directed at it in 1862. Beginning in 1869,
67 the US Army Corps of Engineers under the
68 direction of General Gillmore made a series of
69 improvements to the fort. These improvements
70 included remodeling the demilune, installing new
71 earth-sheltered magazines and passageways, and
72 constructing gun emplacements. Funds were also

41. Ibid.

42. Henry S. Tafft, *Reminiscences of the Signal Service in the Civil War* (Providence: Rhode Island Historical Society, 1903), 11.

43. Based on archival photographs dating to 1862, it appears the parade ground was regraded following the retaking of the fort by Union forces.

44. Lattimore, 37.

45. Ibid., 39–40.

46. Ibid., 40. A monument to the “Immortal Six Hundred” has been erected just outside Fort Pulaski.

47. Ibid., 40–41.

1 made available to make repairs to the drawbridge
2 wharf, seawalls, and roads.⁴⁸

3 Work at the demilune included the construction of
4 a new earthen battery, with space for nine guns,
5 which was constructed into the demilune. The first
6 two emplacements were completed in the salient
7 in 1873, with seven additional emplacements later
8 completed in 1874–1875. Excavation was
9 completed for two emplacements, but the
10 platforms were never built. Work on the fort
11 ceased in the mid-1870s, with only the demilune
12 battery completed.⁴⁹

13 In October 1873, the remaining Army units
14 stationed at Fort Pulaski were withdrawn, and on
15 October 25, the fort was officially closed. In 1875,
16 the Army acquired land on Tybee Island for a new
17 fort. By 1880, only an Army ordnance sergeant
18 serving as a caretaker inhabited Fort Pulaski, and
19 the fort was set aside by the Army as a military
20 reservation for potential future use.⁵⁰

21 **Fort Pulaski as a Military** 22 **Reservation, 1873–1898**

23 During the 1880s, the only residents of Cockscur
24 Island were the ordnance sergeant who inhabited
25 the fort and two lighthouse keepers.⁵¹

26 A hurricane hit the Georgia coast on August 27,
27 1881, causing significant damage to several
28 structures on Cockscur Island. The storm
29 destroyed the lighthouse keeper's house as well as

48. Meader and Binkley, 13, citing Quartermaster Gen. to Belknap, Secretary of War, December 4, 1869, Townsend, Adj. Gen., to Maj. Gen. Halleck, August 25, 1870.

49. Glen Williford, "American Seacoast Defense Sites of the 1870s, Part II Delaware River - San Francisco." *Coast Defense Journal*. Coast Defense Study Group. Volume 21, Issue 4, November 2007.

50. Meader and Binkley, 13, citing *Preliminary Inventory of the Records of U.S. Army Continental Commands, 1821–1920*, Volume IV, Military Installations, 1999, R.G. 393, National Archives, Washington, D.C.

51. National Park Service, *Cultural Landscape Inventory, Fort Pulaski National Monument Landscape* (Atlanta: NPS-SERO, 2012), 49–50.

30 the construction village that had been built in 1831
31 for the fort. The fort itself was left largely
32 undamaged by the storm.

33 In 1884, the Corps of Engineers assumed
34 responsibility for the maintenance of Fort Pulaski.
35 At this time, General Gillmore returned to the fort
36 to inspect the site.⁵² The Corps of Engineers, in an
37 attempt to improve navigation, constructed a
38 series of jetties at the mouth of the Savannah River.
39 The construction of the jetties led to sand
40 depositions that expanded the east side of
41 Cockscur Island.

42 On August 27, 1893, a major storm, later known as
43 the Sea Islands Hurricane, struck the coast,
44 bringing a 16-foot storm surge and killing between
45 1,000 and 2,000 persons in Georgia and South
46 Carolina. On Cockscur Island, the lighthouse
47 keeper's house was again destroyed. After the 1881
48 and 1893 hurricanes, the lighthouse keepers
49 resided inside casemates at the fort.⁵³

50 In the late 1890s, Congress appropriated funds to
51 allow the War Department to bolster coastal
52 defenses. Despite being unable to resist attack by
53 rifled cannon during the Civil War, Fort Pulaski
54 was still militarily important as a result of its
55 location, and elements of the new Endicott coastal
56 fortification system were placed on Cockscur
57 Island.

58 **Endicott Board, 1885–1886**

59 During the Civil War, the advancement of
60 weaponry featuring rifled bores rendered masonry
61 forts obsolete, as the attack by Union forces on
62 Fort Pulaski illustrated. Military planners were
63 also concerned about the high walls and easily
64 seen profiles of old fortifications becoming
65 obvious targets. Nevertheless, there was much

52. Meader and Binkley, 13, citing General Gillmore to Capt. Thomas Baily, December 5, 1884, "Fort Pulaski National Monument," Georgia State Historic Preservation Office files, Atlanta.

53. Letter from Capt. J.C. Sanford, US Corps of Engineers, to Light-House Board, Washington, D.C., May 11, 1901. National Archives, R.G. 26.

1 debate within the military and the government as
 2 to what direction military weaponry should
 3 evolve—the big Rodman-style, smooth bore guns
 4 that could pound fortifications to pieces or the
 5 smaller, more modern, built-up rifled pieces like
 6 those that caused the surrender of Fort Pulaski in
 7 less than 30 hours.⁵⁴

8 In 1875 and for the next fifteen years, Congress
 9 refused to fund any further seacoast fortification
 10 program until some effective fortification plan was
 11 devised. Various boards were appointed to help
 12 resolve the issues surrounding the character of
 13 ordnance that should be adopted and used, and to
 14 advise as to the manner of procuring it and the
 15 places where it should be deployed. The Getty
 16 Board on Heavy Ordnance in 1881 and the Gun
 17 Foundry Board in 1883, both created by
 18 Congressional acts, as well as the Senate-
 19 appointed “Select Committee on Ordnance and
 20 Warships,” all reached no real conclusions.⁵⁵

21 In 1885, President Grover Cleveland appointed a
 22 National Board of Fortifications, headed by
 23 Secretary of War William C. Endicott and
 24 composed of Army and Navy members, whose
 25 duty it was to conduct a complete review of the
 26 coastal defenses of the United States and to make
 27 recommendations for a new program. Not since
 28 1816, when a four-man board headed by General
 29 Simon Bernard of France resulted in the Third
 30 System of coastal fortification, had fortifications,
 31 the type of armaments, and other features been so
 32 intensely scrutinized and studied.⁵⁶ The Endicott
 33 Board on Fortifications made its final report on
 34 January 23, 1886.

35 The Endicott Board’s findings were startling in its
 36 sweeping new recommendations: a completely

54. “Seacoast Fortification - Endicott System,”
GlobalSecurity.org. Last modified May 7, 2011,
 accessed October 23, 2017.
<https://www.globalsecurity.org/military/facility/coastal-forts-endicott.htm>.

55. *Ibid.*, n.p.

56. Charles W. Snell, *Battery Horace Hambright, Historic Structure Report, Historical Data Section, Fort Pulaski National Monument (Draft)*, Georgia (Denver, Colorado: National Park Service, Denver Service Center, 1977), 3.

37 new system of artillery fortifications should be
 38 constructed at twenty-seven ports or harbors in
 39 the continental United States and these gun and
 40 mortar batteries should be supplemented with
 41 submarine minefields, floating batteries, and small
 42 torpedo boats. The total cost of this program
 43 including the cost of manufacturing 577 heavy
 44 rifled guns, was estimated to be \$126,377,800.⁵⁷

45 On March 29, 1887, Secretary of War Endicott
 46 gave orders to the US Army Board of Engineers to
 47 begin preparation of plans for the defense of the
 48 most important American harbors: Boston, New
 49 York, Portland, Washington, D.C., and Hampton
 50 Roads. Congressional appropriations for
 51 construction, however, did not commence until
 52 1890, except for some appropriations for guns.
 53 The ports selected in 1890 were Boston,
 54 Washington, D.C., New York, and San Francisco.
 55 Port appropriations followed in 1893, 1894, 1895,
 56 1896, and 1897, with the last appropriation for
 57 port construction in 1898.⁵⁸ Funds were approved
 58 “for the defense of Tybee Roads and the Savannah
 59 River” in 1893.⁵⁹ The program was continually
 60 underfunded and behind schedule as members of
 61 Congress argued over money and the usefulness of
 62 these fortifications to their districts.⁶⁰

63 Endicott System Defensive 64 Theory

65 The operational defensive theory of the Endicott
 66 fortification system was based on four
 67 components: heavy, rifled guns; submarine
 68 minefields; fast-gun batteries; and low-profile,
 69 widely scattered concrete fortifications. In this
 70 system, heavy, rifled guns were mounted on
 71 disappearing carriages and were widely dispersed
 72 so that their fire could be concentrated and
 73 targeted. Well-developed fields of mines were
 74 created at the entrances of harbors and rivers so
 75 that enemy ships could be trapped and then
 76 intensively fired upon, preventing the overrunning

57. Snell, 3.

58. *Ibid.*, 5.

59. *Ibid.*, 7, citing ARCE for Fiscal Year, 1893,
 Serial no. 3199, 4.

60. “Seacoast Fortification - Endicott System,” n.p.

1 of batteries farther up the river or harbor. These
 2 minefields were protected from counter-mining
 3 and removal by a battery with a wide range of fire-
 4 fast and small caliber guns.⁶¹ The batteries within
 5 the Endicott system were much smaller, very low
 6 in profile, and easily concealed. Their size and
 7 profile made it more difficult for a ship to
 8 concentrate its fire on such a small target, while
 9 the dispersed Endicott batteries could easily fire
 10 intensively on enemy ships.⁶²

11 The Secretary of War believed that the adoption of
 12 the Endicott plan, with its tendency toward a
 13 reduction in caliber of heavy ordnance mounted
 14 on disappearing carriages, particularly for the 12-
 15 inch gun, enabled the United States to avoid costly
 16 experiments in armored turrets, cupolas, and
 17 casemates. While there was not a general program
 18 of definite numbers or calibers of rapid-fire guns
 19 assigned in the earlier projects, Endicott
 20 considered that subsequent revisions to the plan
 21 would result in a regular program for rapid-fire
 22 armament based on a reduction in the number and
 23 caliber of heavy guns, a reduction in the number of
 24 mortars, and a general elimination of armored
 25 defenses. Overall, he believed that marked
 26 economies were secured by the Endicott system
 27 defensive plan without any sacrifice of defensive
 28 requirements.⁶³

29 **Construction of Fort Screven,** 30 **1893–1902**

31 The strategic importance of the north end of
 32 Tybee Island had been recognized for hundreds of
 33 years. The Spanish, the French, and, later, the
 34 Americans all took a special interest in the island.⁶⁴

35 Plans for a permanent US fortification at the north
 36 end of Tybee Island date from well before the
 37 Endicott period. In 1872, the Army Corps of
 38 Engineers drew up plans for an installation, and in

39 1875, land acquisition followed, but no actual
 40 work was initiated for a fort.

41 The initial twenty-seven harbors and ports
 42 identified by the 1886 Endicott findings included
 43 Savannah as number sixteen, while the 1902
 44 revised list of thirty-one ports and harbors
 45 included Savannah as number eighteen, indicating
 46 that Savannah remained a significant port during
 47 the last round of funding.⁶⁵ By 1893, the Endicott
 48 plans completed by the Board of Engineers for
 49 Tybee Roads and the Savannah River included the
 50 construction of Fort Screven, with seven batteries
 51 with various sizes of guns and a submarine mine
 52 casemate. All of these structures were constructed
 53 at Fort Screven with the exception of a battery
 54 holding two three-inch guns and the mining
 55 casemate, both of which were located at Fort
 56 Pulaski.⁶⁶ The Corps of Engineers officers
 57 responsible for the defense of Savannah, who
 58 prepared the plans and oversaw construction,
 59 were Capt. Oberlin M. Carter (July 1, 1893 – July
 60 1897), and Capt. Cassius E. Gillette (July 21, 1897 –
 61 July 30, 1902).⁶⁷

62 As a war measure, a temporary mining casemate
 63 consisting of a wooden room was buried in the
 64 sand on the beach at Fort Screven until the
 65 permanent Endicott mining casemate could be
 66 installed at Fort Pulaski. On July 13, 1900, the
 67 appropriation for the permanent submarine
 68 mining casemate was received; construction began
 69 in August 1900 and was completed in December
 70 1900. These measures included the installation of a
 71 dynamo, oil engine, cooling tank, storage battery,
 72 and other appliances. All connections were made
 73 by June 1901, and the submarine mining casemate
 74 was ready for use.⁶⁸

75 Appropriations for construction at Fort Screven
 76 were slow in coming, and it was not until 1896 that
 77 contracts were let for construction. The new fort
 78 was originally going to be called Fort Tybee, then
 79 Camp Graham, but finally it was named Fort
 80 Screven in honor of Revolutionary War hero Gen.

61. Snell, 6-7.

62. *Ibid.*, 7.

63. "Seacoast Fortification - Endicott System," n.p.

64. Richard J. Lenz, "Tybee Island: Fort Screven, North and Mid-Beach Areas," *Sherpa Guides*, Online, 2002.

65. "Seacoast Fortification - Endicott System," n.p.

66. Snell, 8.

67. *Ibid.*, 10.

68. *Ibid.*, 11.

1 James Screven, who was killed in action in Liberty
2 County near Midway, Georgia, in 1778.⁶⁹ Actual
3 construction began in 1898 and continued slowly
4 through 1902, as the construction engineer
5 continually asked for the anticipated
6 appropriations, and received money in
7 sporadically or not at all.

8 The appropriations for the six batteries associated
9 with Fort Screven began with Battery Brumby on
10 February 10, 1897.

11 **Battery Brumby.** Battery Brumby was the only
12 battery at Fort Screven in service during the
13 Spanish-American War.⁷⁰ It is largest of the battery
14 complexes and was erected by the Venerable
15 Construction Company in 1897–1898.⁷¹ It is a
16 poured-in-place, reinforced concrete gun
17 emplacement. The battery is named after Lt.
18 Thomas M. Brumby, who served with the US Navy
19 during the Spanish-American War as Adm. George
20 Dewey's Flag Lieutenant in the Battle of Manila
21 Bay.⁷²

22 The original gun emplacements were connected
23 by a labyrinth of catwalks and corridors leading to
24 magazines below. Originally, this battery was
25 buffered on the sea side by large sand dunes and
26 sand embankments to conceal it and serve as
27 added protection for the magazines below. The
28 dunes and embankments were removed in the
29 early 1920s to serve as fill for the building of the
30 causeway to the island.⁷³

31 Each of the four 8-inch guns on Battery Brumby
32 weighed 32,000 pounds and had a range of about
33 ten miles. These guns were mounted on
34 Buffington Crozier disappearing carriages.⁷⁴ After

35 firing, the recoil would lower the gun back and
36 down below the protective parapet. The operation
37 of the battery required four officers and 157 men.
38 The guns were dismantled and shipped to France
39 during World War I.⁷⁵ In recent years the
40 westernmost gun emplacement in the battery has
41 been used as a foundation for a private beach
42 residence.⁷⁶

43 **Battery Garland.** Battery Garland, completed in
44 1898, was the second battery completed for the
45 defense of Savannah.⁷⁷ It is a poured-in-place,
46 reinforced concrete gun emplacement and like
47 Battery Brumby, Garland consists of a series of
48 catwalks and corridors leading to interior
49 magazines. The battery was named for Brig. Gen.
50 John Garland, who served in the War of 1812, the
51 Seminole Wars, the Mexican War, and the Civil
52 War.⁷⁸

53 Battery Garland was armed in 1899 with one 12-
54 inch rifled gun mounted on a non-disappearing
55 barbette carriage and required forty-seven men
56 and two officers for operation. The gun remained
57 in place until World War II when it was melted for
58 scrap.⁷⁹

59 The original sand embankment has been removed
60 from the seaward side of the battery, revealing a
61 blank, reinforced-concrete wall overlooking the
62 beach area.⁸⁰ This battery currently houses the
63 Tybee Island Historical Society Museum.

64 **Battery Fenwick.** Battery Fenwick was the third
65 battery completed in 1898. It is a poured-in-place,
66 reinforced concrete gun emplacement very similar
67 to Battery Brumby.⁸¹ The battery was named in

69. Richard Cloues, *NRHP Inventory Nomination Form: Fort Screven Historic District* (Atlanta, Georgia: Georgia Department of Natural Resources, 1980/1982; and Lenz, 2002, n.p.

70. Snell, 8, and Peter Payette, *Battery Brumby*, American Forts Network, 2014.

71. Cloues, 2.

72. Sarah Pearson Jones, "Light on the Past – July 2010," *The Tybee Times*, August 4, 2010, Online. Accessed February 24, 2017.

73. Cloues, 2.

74. Ibid.

75. Payette, np.

76. Cloues, 2.

77. Jones, np.

78. Ibid.

79. Payette, np.; Mark A. Berhow, ed. *American Seacoast Defenses: A Reference Guide*, second edition (McLean, Virginia: CDSG Press, 2004), 211.

80. Cloues, 3.

81. Ibid.

1 honor of Brig. Gen. John R. Fenwick, 4th Artillery
2 US Army, who served in the War of 1812.⁸²

3 The battery was armed with one 12-inch barbette
4 carriage gun.⁸³ The gun had an effective range of
5 seven to eight miles and was removed in 1942.⁸⁴
6 Today this battery has been converted into a private
7 residence.

8 **Battery Backus.** Batteries Backus and Gantt
9 were constructed simultaneously in 1899, after
10 completion of Battery Fenwick. Battery Backus is a
11 poured-in-place, reinforced concrete gun
12 emplacement. This battery is oriented in a
13 northerly direction and was intended to control
14 the minefield area in Tybee Roads.⁸⁵ The battery is
15 named for Lt. Col. Electus Backus of the First US
16 Dragoons, who died of wounds suffered during
17 action at Sacketts Harbor, New York, on May 28,
18 1813, while holding the line with his dismounted
19 dragoons against British troops invading from
20 Canada.⁸⁶

21 Originally, Battery Backus housed three 6-inch
22 rapid-fire British Armstrong pedestal mount
23 guns.⁸⁷ In 1905, two of those guns were replaced
24 with 4.7-inch British Armstrong pedestal mount
25 guns that were previously mounted at Fort
26 Morgan on Wassaw Island.⁸⁸

27 In recent years, the Battery Backus complex has
28 served as the foundation for a single-family home.
29 Only the lower shore side portion of the battery
30 and the magazine entrances remain visible to the
31 public.⁸⁹

32 **Battery Gantt.** Battery Gantt was constructed at
33 the same time as Battery Backus. Similar to Battery
34 Backus, it is a poured-in-place, reinforced
35 concrete gun emplacement. The battery is named
36 for 1st Lt. Levi Gantt, 7th US Infantry, the
37 grandson of Benjamin Stoddert, Secretary of the

38 Navy. Gantt was killed on the summit of Cerro
39 Gardo during the siege at Chapultepec, Mexico, in
40 1847.⁹⁰

41 The battery carried two 3-inch rifled guns on
42 masking pedestal mount carriages for control of
43 the minefield.⁹¹ One officer and twenty-five men
44 were needed to operate this battery.⁹²

45 **Battery Habersham.** Battery Habersham is a
46 large M-shaped battery that contains eight 12-inch
47 mortars. This battery was placed inland and to the
48 west of the other shoreline batteries and contained
49 the fort's greatest medium- and long-range
50 firepower. At either side of this battery, atop the
51 magazines, are stairways leading up to spotting
52 platforms for the fire-control officers. These two
53 rounded observation towers give this gun
54 emplacement a character different than that of the
55 other batteries.⁹³ The battery was named after Maj.
56 Joseph Habersham of the Continental Army, who
57 rendered distinguished service to the army and the
58 nation as Mayor of Savannah (1792–1793),
59 Postmaster General of the United States (1795–
60 1801), and president of the Savannah branch of the
61 Bank of the United States until his death in 1815
62 (1802–1815).⁹⁴

63 The mortars contained in Battery Habersham were
64 divided into two groups of four and separated by
65 thick, reinforced concrete bunkers that housed the
66 battery's magazines. Each mortar was supplied by
67 a magazine immediately adjacent to the carriage on
68 the same level, unlike the other batteries, in which
69 the magazines were located below the level of the
70 carriages.⁹⁵ Seven officers and 219 men were
71 needed to operate this battery.⁹⁶

72 The mortars were removed and shipped to France
73 during World War I. During the Second World

82. Jones, n.p.

83. Berhow, 211.

84. Jones, n.p.

85. Cloues, 3.

86. Find a Grave, *LTC Electus Backus*, 2006.

87. Payette, n.p.

88. Payette, n.p.; Berhow, 211.

89. Cloues, 3.

90. Find a Grave, *1LT Levi Gantt*, 2007.

91. Cloues, 3; Berhow, 211.

92. Payette, n.p.

93. Cloues, 3.

94. Congressional Directory, *Habersham, Joseph*, 2017.

95. Cloues, 3.

96. Payette, np; Cloues, 3.

1 War, this battery was altered to mount anti-aircraft
2 guns.⁹⁷

3 **Construction of Battery** 4 **Hambright, 1899–1902**

5 As part of the Endicott defense of Savannah
6 Harbor, a submerged minefield was installed to
7 guard the harbor entrance. The mines were
8 anchored to the bottom of the Savannah River,
9 and floating above each mine, but below the water
10 surface, was a buoy. When passing ships hit the
11 buoy, an electrical signal would be sent ashore to
12 the mining casemate in Fort Pulaski. To provide
13 additional protection of the minefield, Battery
14 Hambright was constructed.⁹⁸ It was the only
15 battery associated with Fort Screven that was
16 located on the south shore of the Savannah River.
17 Batteries Backus and Gantt had been constructed
18 earlier, also to guard this important feature.

19 In 1898, the Office of the Chief of Engineers
20 advised Capt. Cassius Gillette that funds for the
21 construction of gun and mortar batteries for the
22 defense of Savannah were available under the
23 Deficiency Act of 1898. These funds included
24 monies for the construction of the battery at Fort
25 Pulaski. Captain Gillette was ordered to submit
26 plans and estimates for the battery and maps
27 showing proposed locations and fields of fire. The
28 Office of the Chief of Engineers provided type-
29 plans for emplacements.⁹⁹

30 Captain Gillette requested and received an
31 allotment of \$200 on November 3, 1898, to
32 develop plans for the emplacements. Gillette
33 prepared the plans for two gun emplacements at
34 Fort Pulaski, as well as correspondence related to
35 the construction and cost of the battery, and
36 submitted this information to the Chief of
37 Engineers. The total cost for the battery was
38 \$12,800.00.¹⁰⁰

39 Construction of the battery began on June 1, 1899.
40 A total of 1,800 cubic yards of sand was hauled and
41 placed as a foundation, in addition to 30,000 old
42 bricks from former quarters. The bricks were used
43 to protect the sand fill from storm tides. A 3-inch-
44 diameter artesian well, 122 feet deep, was driven to
45 provide water. A 100-foot-long shell road was
46 constructed to replace that occupied by the
47 battery. Further, scattered stone from old jetties
48 was gathered and built into a new jetty to protect
49 the site.¹⁰¹

50 Like the other batteries associated with Fort
51 Screven, Battery Hambright is a poured-in-place,
52 reinforced concrete gun emplacement. The battery
53 was designed to hold two rifled 3-inch guns on
54 disappearing, masking pedestal mounts.¹⁰² The
55 battery magazines are located below each gun. The
56 battery is sited facing northeast, facing the harbor
57 at what was once the defensive minefield.

58 The construction of Battery Hambright is
59 described as:

60 . . . of unreinforced, rammed concrete placed in
61 forms in individual horizontal lifts of 12 to 24
62 inches each. The battery was constructed in
63 separate sections consisting of two elevated
64 gun emplacements rising approximately 12 feet
65 above grade, a rear platform behind each gun
66 and a concrete perimeter all that support an
67 earthen berm placed in front of the guns. There
68 are three rooms on the lower level that were
69 used as magazines. Access between the rooms
70 and the upper level was gained by two sets of
71 steps leading to the rear platforms behind each
72 of the gun decks. Adjacent to the upper landing
73 of the step is an elevated catwalk connecting
74 the east rear platform to the west rear platform.
75 There is another elevated catwalk that
76 connects the east rear platform to a small
77 observation deck located on the east side of the
78 structure.

79 Each building section is separated by a cold
80 joint that probably was filled with akum,
81 asphaltum or some other waterproofing
82 material used at the time for maintaining a
83 weathertight seal . . .

97. Payette, n.p.

98. *Ibid.*

99. Snell, 11.

100. *Ibid.*, 11 and 13.

101. *Ibid.*, 13.

102. Berhow, 211.

1 The three magazines are constructed of formed
2 and placed concrete walls. The ceilings are of
3 formed concrete placed between steel I-beams
4 on 24-inch centers spanning the room . . . It is
5 believed that this is the only structural steel
6 used in the original construction.¹⁰³

7 The battery was completed, with the exception of
8 setting the fixed ironwork for mounting the guns,
9 by March 31, 1900. No further work was done on
10 the battery in 1901 and 1902 because the 3-inch
11 rapid-fire guns and their pedestal mounts had not
12 yet been furnished by the Ordnance Department.
13 In 1902, drain holes were cut in the floors of the
14 magazines to help with flooding caused by a poor
15 foundation that had settled. Captain Gillette
16 proposed taking up the floors and relaying them
17 with a positive slope to the rear; this would also
18 solve the problem of the need for more headroom.
19 The Chief of Engineers ordered Captain Gillette to
20 present a project for relaying the floors in the
21 battery at a cost not to exceed \$300, the initial cost
22 estimate for completing this project.¹⁰⁴ No records
23 were found that could verify that this work was
24 completed.

25 In 1904, War Department General Orders 194,
26 Series 1904, named the fast gun battery at Fort
27 Pulaski "Battery Horace Hambright."¹⁰⁵ The
28 battery was named in honor of 2nd Lt. Horace
29 George Hambright, born September 24, 1869, in
30 Loudon, Tennessee. Hambright was first admitted
31 to the US Military Academy at West Point in June,
32 1887, but resigned from it on November 15, 1887.
33 He was re-admitted to the Academy the following
34 year, attending from June 16, 1888, to June 11,
35 1892, graduating last in his class. Upon graduation,
36 he was promoted to 2nd Lieutenant, Infantry, and
37 assigned to the 22nd Infantry. Hambright served
38 on garrison duty at Fort Keogh and Camp Merritt,
39 Montana, and at Fort Yates, North Dakota. At
40 Fort Yates, he was thrown from his horse and died

41 of his injuries several days later, on April 15,
42 1896.¹⁰⁶

43 Batteries are typically named after military heroes
44 who died in battle or rendered invaluable services
45 to their county. Battery Hambright was named
46 after a likely charming young officer whose *Army*
47 *and Navy Journal* obituary stated that the death of
48 Lieutenant Hambright:

49 . . . has been a painful shock to his numerous
50 friends, especially at Fort Keogh, his former
51 post of duty. He was a young officer of great
52 promise and by his genial disposition and
53 gallant bearing had greatly endeared himself to
54 his brother officers and the various members of
55 their families during his term of service with
56 them.¹⁰⁷

57 Lieutenant Hambright did come from an
58 impressive line of American military officers. His
59 forebears included Colonel Frederick Hambright,
60 who fought during the American Revolution at
61 Kings Mountain in South Carolina where he
62 incurred a wound to his leg that caused him to
63 limp for the remainder of his life.¹⁰⁸ Another
64 ancestor was Col. (later Gen.) Henry Augustus
65 Hambright, a hero of the Mexican War, notable
66 for raising the 79th Pennsylvania and fighting
67 bravely in its ranks, thus becoming a preeminent
68 name in the nineteenth-century military tradition
69 of Lancaster County, Pennsylvania.¹⁰⁹ Perhaps
70 Lieutenant Hambright's friends, believing he had
71 the seeds of greatness in him, sought to
72 memorialize what might have been.

73 Battery Hambright never received the guns it was
74 created to hold. In fact, it never saw military action
75 of any type during the period after its
76 construction. By the first quarter of the twentieth

103. Fort Pulaski National Monument, "FY 95 Cyclical Project: Battery Hambright Repairs," (Archives Fort Pulaski National Monument, 1995).

104. Snell, 14 and 15.

105. *Ibid.*, 16.

106. Bill Thayer, *Cullum's Register*, "Horace G. Hambright," USMA, 1892, 2016 and Association of Graduates West Point Military Academy, "Horace Hambright," *Annual Reunion 1896*, 2017.

107. Association of Graduates West Point Military Academy, 1896, 150.

108. Michael E. Goins, "Hambright, Frederick," *Directory of North Carolina Biography*, 1988.

109. "Better Know an Officer: Henry A. Hambright," *Lancaster at War*, 2011.

1 century, Fort Pulaski was no longer of interest to
2 the military, and Battery Hambright was
3 considered outdated.

4 As outdated American fortifications were
5 abandoned or put to other uses, the fates of
6 Battery Hambright and its sister fortifications,
7 Batteries Gantt, Habersham, Backus, Fenwick, and
8 Garland, became tied to the desirability of their
9 locations and the perseverance of preservationists.

10 **Early Preservation of Fort** 11 **Pulaski, 1898–1924**

12 By the early twentieth century, Fort Pulaski was
13 showing signs of deterioration, and the parade
14 ground, terreplein, and demilune were becoming
15 overgrown with vegetation (Figure 7, Figure 8, and
16 Figure 9). In addition, Battery Hambright appears
17 to have not even been a consideration. A 1913
18 inspection of the fort indicated that it was
19 essentially abandoned, and Col. Dan C. Kingman
20 of the Corps of Engineers described the condition
21 of Fort Pulaski in a letter to the Adjutant General
22 at Governor’s Island:

23 Fort Pulaski is a fine specimen of a brick fort. . .
24 The wet ditch is filled with mud and grown up
25 with weeds, the drawbridge is gone, and the
26 gates are in such condition as would hardly
27 exclude anyone who cared to enter it. I think
28 that all these forts should be maintained. The
29 time may come when they will be found useful
30 . . . it seems a pity to see the forces of nature
31 gradually destroying them.¹¹⁰

32 Following the inspection of the fort and the plea
33 for funding, a full-time caretaker was found for the
34 Fort Pulaski, but this was a temporary measure.

35 On July 17, 1915, the War Department announced
36 that Fort Pulaski, including Battery Hambright,
37 had been selected for consideration as a national
38 monument under the American Antiquities Act of
39 1906. However, efforts to preserve the site were

110. Meader and Binkley, 15–16, citing Col. Kingman to Adjutant General, Headquarters Eastern Division, Governors Island, New York, February 18, 1913, R.G. 77, Box 1, National Archives, Atlanta.

40 postponed due to World War I.¹¹¹ In 1917, after
41 visiting the fort, Col. John Millis, the District
42 Engineer of the US Army Corps of Engineers in
43 Savannah, recommended its immediate
44 preservation. Millis, with the help of Thomas
45 Purse, secretary of the Savannah Board of Trade,
46 sought War Department funds for use in the
47 improvement of Fort Pulaski. Slowly, in 1918 and
48 1919, funds became available to clear brush and
49 make improvements to the site.



50 **FIGURE 7.** Casemates and the parade ground, circa
51 1900. (Source: HABS, image GA-2158-65)



52 **FIGURE 8.** The parade ground and casemates, circa
53 1907. (Source: Library of Congress, image
54 LC-D4-70132, glass plate negative by Detroit
55 Publishing Co., gift of the State Historical Society of
56 Colorado, 1949)

111. Lattimore, 43.



1 **FIGURE 9.** Aerial view of Fort Pulaski, before 1925. Note the overgrowth of trees and shrubs at the parade ground
 2 and demilune, low plants in the former moats, caretaker's house atop the terreplein, and small outbuilding on the
 3 parade ground. (Source: Fort Pulaski National Monument)

4 **Fort Pulaski National Monument,** 5 **1924–1933**

6 As improvements were made at Fort Pulaski, more
 7 groups and individuals became interested in its
 8 preservation. The City of Savannah expressed
 9 interest in acquiring the fort and converting the
 10 site to a public park, while the Savannah Board of
 11 Trade inspected the site and concluded that a
 12 preserved Fort Pulaski could attract tourists from
 13 around the world.¹¹² Soon, the Savannah Board of
 14 Trade, along with Col. F.W. Alstaetter, Colonel
 15 Millis's successor as District Engineer,
 16 campaigned for the fort to be declared a national

112. Ibid., citing "Make Pulaski Public Park," *The Savannah Press*, June 10, 1924, R.G. 77, Box 1, National Archives, Atlanta.

17 monument. In January 1924, Congressman
 18 Charles G. Edwards of Georgia introduced
 19 legislation that would designate Fort Pulaski as
 20 such. Later that year, on October 15, Fort Pulaski
 21 was made a national monument in a proclamation
 22 by President Calvin Coolidge.¹¹³ The fort was to be
 23 managed by the US War Department, which also
 24 maintained other Civil War sites such as Antietam,
 25 Gettysburg, and Shiloh national military parks.

26 Following the declaration of Fort Pulaski as a
 27 National Monument, the directors of the
 28 Savannah Board of Trade pledged their support
 29 for the restoration of the fort. In January 1925,
 30 Maj. Dan I. Sultan of the US Army Corps of
 31 Engineers inspected the fort and made

113. Lattimore, 43.

1 recommendations for its preservation. Major
 2 Sultan estimated that initially \$6,930 would be
 3 necessary to preserve the landscape surrounding
 4 the fort, including the nearby ditches and
 5 embankments.¹¹⁴ These funds would not be
 6 sufficient to restore the fort itself, as the US Army
 7 Corps of Engineers sought first to make the
 8 property and structure accessible to visitors.

9 Supervision of Fort Pulaski was transferred from
 10 the US Army Corps of Engineers office in
 11 Savannah to the US Army Quartermaster
 12 Department in August 1925. As a result, the
 13 Quartermaster at Fort Screven on Tybee Island
 14 was placed in charge of Fort Pulaski.¹¹⁵

15 Attempts to obtain funding for the preservation of
 16 Fort Pulaski continued in January 1926, when
 17 Congressman Edwards introduced legislation that
 18 would transfer the fort to the City of Savannah
 19 while providing an appropriation of \$100,000 for
 20 the preservation of the structure.¹¹⁶ The War
 21 Department opposed the bill, wanting to retain the
 22 fort for future use. As a result, the bill failed. A year
 23 later, Edwards introduced another bill, calling for
 24 an appropriation of \$12,040 to rebuild the
 25 caretaker's house, which had burned in 1925. The
 26 appropriation would also be used to provide a
 27 salary for a caretaker and to maintain the fort for
 28 one year. Congress rejected this legislation as
 29 well.¹¹⁷

114. Meader and Binkley, 18, citing US Army Corps of Engineers, "Estimate on Maintenance and Preservation of Fort Pulaski," January 1925, R.G. 77, Box 1, National Archives, Atlanta.

115. *Ibid.*, 20, citing, "Fort Pulaski in Charge Quartermaster," *The Savannah Press*, August 13, 1925, RG 77, Box 1, National Archives, Atlanta.

116. *Ibid.*, citing, "Edwards Wants to Save Fort Pulaski," *The Savannah Press*, January 7, 1926, RG 77, Box 1, National Archives, Atlanta.

117. *Ibid.*, citing, "Introduces Bill for Fort Pulaski," *The Savannah Morning News*, January 19, 1927, R.G. 77, Box 1, National Archives, Atlanta.

30 Stewardship of the National 31 Park Service

32 On June 10, 1933, President Franklin D. Roosevelt
 33 signed Executive Order 6166, granting the
 34 National Park Service jurisdiction over all historic
 35 sites, battlefields, monuments, and parks
 36 previously administered by the War Department,
 37 the Department of Agriculture, and the Office of
 38 Public Buildings and Public Parks of the National
 39 Capitol.¹¹⁸ As a result, Fort Pulaski National
 40 Monument and approximately 20 acres of
 41 adjacent land were placed under the
 42 administrative responsibility of the National Park
 43 Service.

44 Following the transfer of Fort Pulaski to the
 45 National Park Service, the State of Georgia
 46 donated 297.39 acres to the Department of the
 47 Interior in 1935. This included the east end of
 48 Cockspur Island, as well as portions of the former
 49 right-of-way of the Central Georgia Railroad on
 50 McQueen's Island, south of Cockspur Island. An
 51 Act of Congress extended the western boundary of
 52 the monument to the eastern property line of the
 53 US Public Health Service Quarantine Station
 54 situated on the west end of the island. These
 55 measures expanded the size of the monument to
 56 nearly 500 acres. The legislation also authorized
 57 the Secretary of the Interior to accept lands,
 58 easements, and improvements on nearby
 59 McQueen's and Tybee islands. A bridge was also
 60 to be constructed between Cockspur Island and
 61 McQueen's Island with these funds.¹¹⁹

62 New Deal Programs at Fort Pulaski, 63 1933–1941

64 **Work on Battery Hambright.** At the time the
 65 National Park Service gained jurisdiction over Fort
 66 Pulaski, several new agencies were created as part of
 67 President Franklin Roosevelt's New Deal program.
 68 These agencies, including the Civil Works

118. Barry MacKintosh, *The National Parks: Shaping the System* (Washington, D.C.: U.S. Department of the Interior, 1991), 24.

119. Farris Cadle, "Title Abstract for Cockspur Island," 2000. Park files, Fort Pulaski National Monument.

1 Administration, the Civilian Conservation Corps,
2 and the Public Works Administration, all of which
3 played a role in the preservation of Fort Pulaski
4 during the 1930s.

5 The work completed by these groups was
6 extensive and included interior, exterior, and
7 grounds renovations and changes. However, work
8 on Battery Hambright was not undertaken until
9 the very end of these programs. Work at Battery
10 Hambright and the demilune (which contained the
11 mining casemate) was completed as PCP No. M-
12 31, Work Order No. B-2, Job No. 4, 1940.¹²⁰

13 The description of work to be completed at
14 Battery Hambright was described as follows:

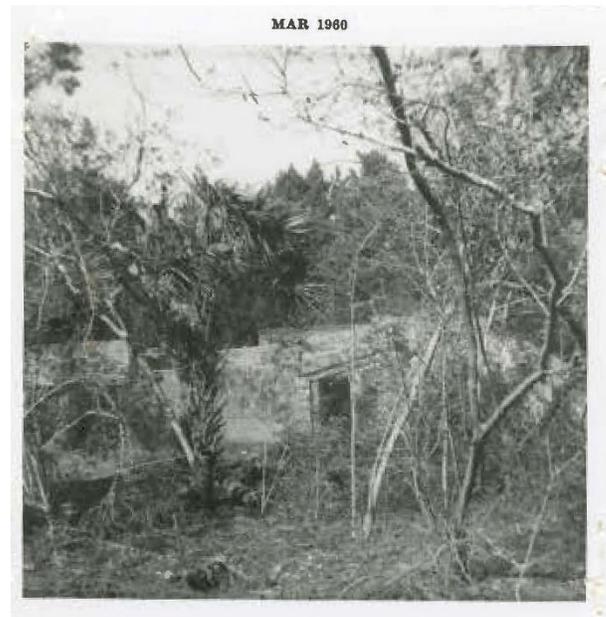
15 All the earthen portion of the work will be
16 cleared of obnoxious weeds and bushes and
17 dead and down trees. Care will be given to
18 preserve all desirable vegetation, such as trees
19 and shrubs, none of which will be moved
20 without the approval of the resident landscape
21 architect. The deteriorated condition of the
22 fortification has led to the washing out of earth
23 to the concrete base which has trapped water
24 behind it in the magazines leading to an
25 unhealthy condition. This will be corrected as
26 part of the general cleanup.

27 Preservation of the Structure – Part of the
28 concrete gun mount on the northern side of the
29 works has cracked very badly and the
30 supporting earth underneath has washed out. It
31 is our intention under this job approval to
32 correct this dangerous condition by removing a
33 portion of the concrete steps and gun placement
34 floor. Earth or a mixture of sand and shell will be
35 placed in the space to original level. The
36 concrete referred to above will be broken up
37 with sledge hammers and removed and further
38 broken into small pieces of about 1-1/2 inches
39 for use as a coarse aggregate. New concrete will
40 be placed to original grade of gun mounts and
41 gun emplacements. The concrete steps will be

42 replaced where broken. 150 bags of cement and
43 2000 BM of form lumber at a cost of \$140.00 will
44 be necessary, sand is available on the island.¹²¹

45 The first task that needed to be undertaken in the
46 restoration of the battery was clearing of the site
47 (Figure 10 and Figure 11). According to National
48 Park Service records of the time, both Battery
49 Hambright and the demilune were:

50 . . . heavily overgrown with trees and shrubs,
51 which masked the earthworks and concealed
52 with military aspect. More than 2,000 trees,
53 bushes, and shrubs were removed, roots and
54 all. This material was sawed into transportable
55 lengths, loaded in our truck and transported to
56 a safe burning location on the South Channel
57 of the Savannah River where it was burned.
58 This debris amounted to more than 500
59 truckloads.¹²²



60 **FIGURE 10.** The 1940 New Deal program *Narrative*
61 *Report of Battery Hambright* included this “Before
62 Restoration” photograph. (Source: Fort Pulaski
63 National Monument Archives)

120. National Park Service, “Narrative Report of Restoration of Demilune and Battery Hambright” (Archives Fort Pulaski National Monument, circa 1940), and National Park Service, “Preservation of Battery Hambright,” 1940 (Archives Fort Pulaski National Monument).

121. NPS, “Preservation of Battery Hambright,” np (*Job Application*).

122. NPS, “Narrative Report of Restoration of Demilune and Battery Hambright,” np.



1 **FIGURE 11.** According to the 1940 *Narrative Report*,
 2 “Battery Hambright was buried under jungle foliage.
 3 The battery itself was encased in a tangle of creepers
 4 and smilax. [This view] shows laborers clearing the
 5 site.” The site had to be cleared once again in the
 6 1960s. (Source: Fort Pulaski National Monument
 7 Archives)

8 When all undesirable weeds, grass, and other
 9 foliage was removed, the area was planted with
 10 Bermuda grass.¹²³

11 Sand was hauled to the site for concrete floors, gun
 12 mounts, and other uses from a pit one mile away.
 13 Two deteriorated wood footbridges were replaced
 14 with metal and wood bridges made from “supplies
 15 now on hand.”¹²⁴ Broken guard rails on the battery
 16 were replaced with steel rails to match the originals.
 17 The new rails were coated in red lead and painted
 18 steel gray with rust-resisting paint (Figure 12).¹²⁵
 19 Aside from labor, the project costs included:

| | | |
|----|---------------------------------|-------------------------|
| 20 | 150 bags of cement | \$90.00 |
| 21 | 2000 BM pine form lumber | 50.00 |
| 22 | 48 carriage bolts (for bridges) | 2.88 |
| 23 | 2 - 1 ½” pipe and fittings | 7.38 |
| 24 | Total cost | \$150.26 ¹²⁶ |

123. NPS, “Preservation of Battery Hambright,”
 (*Job Application*).

124. *Ibid.*

125. NPS, “Narrative Report of Restoration of
 Demilune and Battery Hambright,” n.p.

126. NPS, “Preservation of Battery Hambright,”
 (*Job Application*).



25 **FIGURE 12.** Battery Hambright as it is “Nearing
 26 Completion” of the 1940 New Deal restoration.
 27 (Source: Fort Pulaski National Monument Archives)

28 When the project was completed, Battery
 29 Hambright had been completely “restored.” This
 30 restoration included the complete clearing of the
 31 land, repair of the foundation, caulking of all
 32 cracks, and the application of a “covering of
 33 waterproof stucco.”¹²⁷ The steel rails were painted
 34 as indicated, and two new wood and metal
 35 drawbridges were added. The earthworks were
 36 “restored” with the “brick facing on the eastward
 37 side excavated and exposed to view” (Figure 13
 38 and Figure 14). To the north of the battery, “a vista
 39 [was] opened to show the relationship of the
 40 battery to the river”¹²⁸ (Figure 15).

127. This stucco covering is likely the surface
 replaced in the 1960s by the currently extant
 cementitious parge coat.

128. NPS, “Narrative Report of Restoration of
 Demilune and Battery Hambright,” n.p.



1 **FIGURE 13.** Battery Hambright as seen from the
 2 "North, or seaward face . . . from west to east." Note
 3 the exposed brick wall that looks like a series of
 4 steps, 1940. (Source: Fort Pulaski National Monument
 5 Archives)



6 **FIGURE 14.** Battery Hambright as seen from the
 7 "North or seaward face... from east to west," 1940.
 8 (Source: Fort Pulaski National Monument Archives)

9 The entrance of the United States into World War
 10 II in December 1941 prompted the termination of
 11 New Deal-era programs such as the CCC and
 12 PWA. The US Navy established a section base on
 13 Cockspur Island in late 1941. The base, which was
 14 used to support coastal patrol ships, remained

15 active until 1947.¹²⁹ During this time, the fort was
 16 maintained by one laborer and was closed to the
 17 public.¹³⁰



18 **FIGURE 15.** "View northward from top of Battery
 19 Hambright showing vista out through the river,"
 20 1940. (Source: Fort Pulaski National Monument
 21 Archives)

22 **Fort Pulaski after World War II,** 23 **1947–1957**

24 After the war, most of the buildings associated
 25 with the Navy's occupation of the fort were
 26 removed from the island. (The maintenance shop
 27 remains from the war years, and Navy ordnance
 28 magazines remain on Cockspur Island.) On
 29 October 15, 1947, Fort Pulaski National
 30 Monument reopened to the public. At that time,
 31 park staff consisted of a superintendent, historical
 32 aide, cashier, and two laborers. Visitation to the
 33 fort soon eclipsed and doubled annual pre-war
 34 visitation to the park.¹³¹

129. Meader and Binkley, 29.

130. "Mission 66 for Fort Pulaski National Monument" (National Park Service, nd [circa 1960]), 3–4.

131. "Mission 66 for Fort Pulaski National Monument," 3–4.

1 **Mission 66 at Fort Pulaski, 1956–**
 2 **1966**

3 In the years following World War II, visitation at
 4 national parks grew significantly. In 1940, there
 5 were 17 million visitors to national parks; by 1955,
 6 there were over 55 million visitors. As park use
 7 increased, however, national park budgets
 8 remained unchanged.¹³²

9 By the 1950s, conditions in the national parks were
 10 generally in a state of deterioration. Improvements
 11 had not been made to public facilities since the
 12 New Deal-era programs of the 1930s. The
 13 desperate need for building maintenance and
 14 funding was further amplified by the rapid
 15 increase in visitors following World War II. At
 16 Fort Pulaski National Monument, the fort and its
 17 surroundings fell into disrepair.¹³³

18 In February 1955, Conrad Wirth, the director of
 19 the National Park Service, conceived a
 20 comprehensive conservation program to revitalize
 21 the national parks. The ten-year capital program,
 22 which would be called Mission 66, aimed to
 23 modernize and expand the national park system.
 24 Wirth put together a working committee as well as
 25 a steering committee to help outline the scope and
 26 budget of the program. He also instructed park
 27 superintendents to prepare lists of work that
 28 needed to be done in the various parks.¹³⁴

29 The Mission 66 program sought to improve
 30 conditions at the parks, not only through the
 31 construction of new roads, trails, and visitor
 32 facilities but also through the establishment of
 33 increased operating budgets to maintain the parks
 34 in the future.

35 In 1956, the Mission 66 Final Prospectus for Fort
 36 Pulaski National Monument was completed. The
 37 document called for all park structures to be
 38 properly maintained and made safe, while new

132. Ethan Carr, *Mission 66: Modernism and the National Park Dilemma* (Amherst: University of Massachusetts Press, 2007), 4.

133. Meader and Binkley, 24, citing "Superintendent Lattimore's Monthly Reports," August 1950.

134. Carr, 10.

39 interpretive services were also proposed. Most
 40 importantly, the prospectus called for an increase
 41 in funds and personnel to allow for the proper
 42 maintenance and interpretation of the national
 43 monument.¹³⁵ In 1964, a freestanding visitor center
 44 was constructed.

45 Several Mission 66 projects were undertaken at
 46 Fort Pulaski National Monument, beginning in the
 47 late 1950s. Some of the early projects included the
 48 reconstruction of the parking area; improvements
 49 to the water, power, drainage, dike, and telephone
 50 systems; a series of repairs to the fort; and repairs
 51 to the north pier.¹³⁶

52 Also undertaken at this time were repairs to
 53 Battery Hambright, as follows:

54 A major contract was performed on the battery
 55 in the early 1960's. Major components of that
 56 contract consisted of the application of a skim
 57 coat of portland cement stucco over the entire
 58 structure and reconstruction of the catwalks . . .
 59 the skim coat was an inappropriate
 60 treatment.¹³⁷

61 The National Register nomination prepared in
 62 1974 for Fort Pulaski National Monument
 63 indicates that the following repairs were made to
 64 Battery Hambright by the park maintenance staff
 65 in 1960: ". . . dense vegetation was stripped away;
 66 all cracks in the concrete calked [sic] and entire
 67 work given a coat of waterproofing; all steel
 68 elements cleaned and painted with antirust paint;
 69 and the east and brick face toward the river
 70 restored."¹³⁸

-
- 135. Meader and Binkley, 30, citing, "Mission 66 for Fort Pulaski National Monument," 1956, Park files, Fort Pulaski National Monument.
 - 136. Ibid., 31, citing "Mission 66 Final Prospectus," 1956, Park files, Fort Pulaski National Monument.
 - 137. Fort Pulaski National Monument, "FY 95 Cyclical Project: Battery Hambright Repair's," (Archives Fort Pulaski National Monument, 1995).
 - 138. Edward L. Trout, Park Historian, National Register of Historic Places Nomination Form: Fort Pulaski National Monument, December 11, 1974; listed December 9, 1975.

Continued Maintenance of Fort Pulaski National Monument, 1966 to Present

Following the conclusion of the Mission 66 program in 1966, maintenance became the top priority at Fort Pulaski National Monument. Maintenance has been wide-ranging including interior and exterior fortification repairs, infrastructure upgrades, landscaping, and, in the 1990s, repairs to Battery Hambright.

By 1995, Battery Hambright needed significant repairs. A series of exterior horizontal cracks had opened above the magazines; the cementitious stucco coat was deteriorated, revealing structural movement issues; and numerous small cracks covered the entire battery. Causes of cracking were noted to include thermal expansion, settlement, or lateral pressure from the earthen berm. The Park proposed to have a core sample of the concrete professionally analyzed; remove all delaminated or loose concrete and plaster; remove metal railing system and catwalks; high pressure water blast the whole structure to remove molds, growths, and accretions of salts and calcareous materials; widen small cracks so that a flexible backer rod and joint sealer could be accepted; epoxy all surface cracks of 1/8 inch or less; make surface repairs based on the concrete mix from analysis; reinstall the wood walkway based on a historic plan; and make necessary repairs to exterior coating, even though it was non-historic.¹³⁹

The proposal for repair was accepted by the Deputy Associate Regions Director, Southeast Region, in May 1995, and in that same month, the Southeast Region Historic Architecture Division visited the battery to assess particular needs.¹⁴⁰ It is not clear when work began or that all the desired

changes were made, especially the application of epoxy to all of the small cracks.¹⁴¹

While standard maintenance has been ongoing since 1995, it does not appear that any other significant work has been completed at Battery Hambright. In 2016, trial repairs to address major cracks in the exterior concrete were conducted by park personnel, as further discussed in the Condition Assessment chapter of this report.

Historic American Buildings Survey (HABS) documentation of Fort Pulaski and Cockspur Island was conducted in 1992. In 1998, an addendum was published titled “History of Fort Pulaski and Cockspur Island.”¹⁴² The documentation provides a detailed record of the scale, configuration, and materials used in the construction of Fort Pulaski features.

The National Park Service has also documented the conditions associated with the park’s historic landscape through preparation of a Cultural Landscape Inventory in 1997, and a Cultural Landscape Report in 2011.¹⁴³

A series of severe weather events has affected Fort Pulaski National Monument in recent years, including severe storms in early 2016, followed by Hurricane Matthew in October 2016, a tornado in May 2017, and Hurricane Irma in September 2017. In addition to damage to built resources, the site, and trees during these weather events, the historic ditch and dike system has not been able to manage water collecting on site. This has resulted in recurring flooding within the park. Increasing use of the North Channel by large container ships has led to shoreline erosion, also threatening Battery Hambright and its environs. The Park has

139. FY 95 Cyclic Project, (Memorandum, Office of Historic Architect), n.p. The references to “plaster” and “coating” in the proposal may be intended to mean the cementitious parge coat present on exposed exterior surfaces.

140. Ibid.

141. Ibid. (Note on fact sheet for Sonneborn Penetrating Sealer states, “Not recommended at the time.”)

142. Historic American Buildings Survey, “History of Fort Pulaski and Cockspur Island” HABS No. GA-2158 (Washington, D.C.: National Park Service, 1998).

143. National Park Service, *Cultural Landscape Inventory Fort Pulaski National Monument* (Atlanta, Georgia: Southeast Regional Office, 1997); Hitchcock, n.p.

1 implemented measures to address these concerns,
 2 as further discussed in the Treatment chapter of
 3 this report.

4 **Changes to Fort Screven and**
 5 **Associated Batteries**

6 Like Fort Pulaski, Fort Screven became a
 7 fortification of the past, but Fort Screven’s
 8 location alongside a highway with access to
 9 Savannah made its land desirable for single-family
 10 vacation homes or homes for those who desired a
 11 spectacular water view. Fort Screven was used
 12 during World War II by the US Engineers Diving
 13 and Salvage group as a training center for the
 14 salvage and repair of war-damaged ports.
 15 Immediately after the war, the fort was declared
 16 surplus and land was sold to the city, which in turn
 17 sold it to a development company.¹⁴⁴

18 Almost immediately, private individuals, the
 19 municipality, the county, and other organizations
 20 began to buy, sell, and trade land associated with
 21 the fort and its six batteries. As the fort was slowly
 22 being disassembled, several groups and individuals
 23 became interested in preserving its remains. In
 24 1982, the Fort Screven Historic District was placed
 25 on the National Register of Historic Places
 26 including the remaining collection of military
 27 buildings, six batteries (Brumby, Habersham,
 28 Gantt, Backus, Garland, and Fenwick—Hambright
 29 was not included), the Screven Lighthouse, and
 30 associated lighthouse properties (Figure 16).¹⁴⁵

31 By 1982, many changes had occurred within the
 32 fortifications at Fort Screven, and the batteries,
 33 spread out along the waterfront, were particularly
 34 hard hit. In the 1920s, the dunes and sand
 35 embankments that sheltered the shoreward side of
 36 Battery Brumby were removed to create the
 37 causeway from the mainland, exposing that side to
 38 constant battering by the elements. Battery
 39 Garland had been turned into a museum, and it
 40 too was missing its shoreward side sand bank
 41 (Figure 17). Battery Fenwick had become the

144. “Preservationist Try to Protect Battery Backus,” *Savannah Now*, September 26, 2008, accessed February 8, 2017.

145. Cloues, n.p.

42 foundation of a house, with no remaining evidence
 43 of the gun emplacements. Similarly, a portion of
 44 Battery Backus had been incorporated into a
 45 house, with only the lower shore side and
 46 magazine entrance visible to the public. Only
 47 Battery Gantt and Battery Habersham were
 48 completely intact.¹⁴⁶



49
 50 **FIGURE 16.** View northeast of Battery Brumby at Fort
 51 Screven, 2016. (Source: All photographs by authors
 52 unless otherwise noted)



53 **FIGURE 17.** View of Battery Garland, now the Tybee
 54 Island Museum, at Fort Screven, 2016.

55 In 2009, Battery Backus was included in the State
 56 of Georgia’s “10 Places in Peril,” a yearly list
 57 created by the Georgia Trust for Historic
 58 Preservation, as a place or object considered most
 59 in danger of disappearing through neglect,
 60 development, or some other means. Battery
 61 Backus was included in the list because, at the
 62 time, it was for sale for \$2.1 million by its current

146. *Ibid.*, 2–3.

1 owner, and speculation was that the property
2 would be bought and the battery torn down.¹⁴⁷
3 The Georgia Trust became involved because
4 Battery Gantt had been largely lost to a beach
5 house at an unspecified time, leaving Battery
6 Habersham, an atypical battery, as the only battery
7 in the complex, aside from Hambright, without
8 any changes.¹⁴⁸ Battery Backus did not sell and the
9 owner has been unable to secure the necessary
10 permits to build on it in the intervening years.
11 Nevertheless, its location and that of the
12 remaining batteries puts them in peril of alteration
13 or demolition.

14

-
147. "Preservationist Try to Protect Battery Backus," *Savannah Now*, n.p.
148. The *Savannah Now* article indicates that Battery Gantt had been sold and used as the foundation of a beach house. It is possible the article is talking about Fenwick, but that is doubtful as one of the persons talking about the beach house is Ed Crawley, the director of the Fort Screven Preservation Organization. This suggest that Gantt was sold and built upon sometime between 1980 and 2008.

BATTERY HORACE HAMBRIGHT CHRONOLOGY
(with other Fort Screven battery highlights)

| | |
|-----------|---|
| 1847 | Fort Pulaski completed |
| 1861–1865 | Civil War, Fort Pulaski severely damaged |
| 1872–1875 | Demilune modified |
| 1873 | Fort Pulaski closed and set aside by the US Army as military reservation for potential future use |
| 1881 | Fort Pulaski Military Reservation established |
| 1885 | National Board of Fortifications (Endicott Board) appointed |
| 1893 | Construction of Fort Screven initiated |
| 1894-1895 | Mining casemate at Fort Pulaski completed |
| 1897 | Construction of Battery Brumby initiated |
| 1898 | Construction of Batteries Garland and Fenwick initiated; Spanish-American War (April through August) |
| 1898 | Emergency battery constructed |
| 1899 | Construction of Batteries Backus, Fenwick, and Hambright initiated |
| 1900 | Construction of Battery Habersham initiated |
| 1901 | Engine room for mining casemate constructed |
| 1904 | Battery Hambright officially named for 2nd Lt Horace George Hambright |
| 1914–1918 | World War I |
| 1915 | Fort Pulaski selected for consideration as a National Monument |
| 1924 | Fort Pulaski, including Battery Hambright, designated a National Monument to be administered by the War Department |
| 1933 | Administration of Fort Pulaski National Monument transferred to the National Park Service |
| 1933–1941 | Battery Hambright repaired with the assistance of CWA, CCC, and PWA program funding and personnel |
| 1935 | The earthen berm portion of Battery Hambright graded and seeded with Bermuda grass |
| 1941-1945 | World War II |
| 1941 | Dense foliage covering Battery Hambright removed. Riprap placed along the river shoreline to prevent further damage to the north gun platform and stairs |
| 1942 | Cockspur Island turned over to the Navy; island closed to the public for the duration of the war |
| 1947 | Naval use of the island ends, and buildings constructed to support military use removed. Fort Screven closed and the land on Tybee Island sold. Fort Pulaski National Monument opened to the public |
| 1948 | Fort Pulaski returned to the NPS |
| 1956 | National Park Service Mission 66 program initiated |
| 1960s | Battery Hambright underwent second repair effort. Trees and shrubs removed from the earthen berm and surrounding landscape |
| 1975 | Fort Pulaski and Battery Hambright listed in the National Register of Historic Places |
| 1977 | Several large eastern red cedar trees removed from Battery Hambright |

| | |
|------|--|
| 1982 | Fort Screven Historic District—composed of Batteries Brumby, Garland, Fenwick (now only a foundation), Backus, Gantt, and Habersham—listed in the National Register of Historic Places |
| 1995 | Battery Hambright again repaired |
| 1997 | Historic American Buildings Survey Addendum for Fort Pulaski that includes Battery Hambright completed |
| 2008 | Battery Backus placed on the “10 Georgia Places in Peril” list |
| 2009 | Battery Backus offered for sale at auction for \$2.1 million; no buyer emerges |
| 2014 | Owner of Battery Backus denied permit to build on the site as a result of the fragility of the dune system |

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Physical Description and Condition Assessment

1 Battery Hambright Landscape

2 Battery Hambright is a concrete, steel, and earthen
3 coastal defense battery structure located
4 northwest of Fort Pulaski at Fort Pulaski National
5 Monument on Cockspur Island. The battery sits
6 immediately south of the dike and ditch system
7 built along with Fort Pulaski during the early
8 nineteenth century to protect it from flooding
9 (Figure 18). It is located in an open grassy area
10 edged to the east and west by thickets of trees and
11 shrubs (Figure 19). The structure is edged to the
12 north by an earthen berm designed to diffuse the
13 impact of incoming artillery.



14 **FIGURE 18.** The historic dike north of Battery
15 Hambright. Note the North Pier Trail in the
16 background to the right.

17 Battery Hambright is also located south of the
18 historic North Pier that extends from the shoreline
19 of Cockspur Island into the North Channel of the
20 Savannah River. The battery was designed to face
21 the North Channel, where electric mines were
22 placed, to fire on the enemy. The sight line to the
23 river is an important feature of the battery.



24 **FIGURE 19.** Battery Hambright from the south
25 showing the grassy area surrounding the structure.

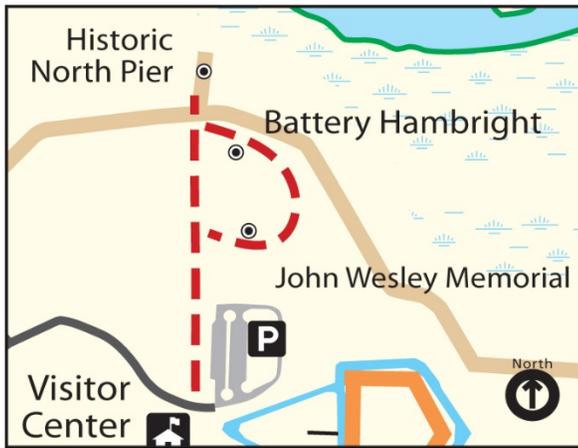
26 Battery Horace Hambright measures
27 approximately 90 feet in length, is 55 feet wide,
28 and stands 15 feet in height. The structure features
29 three ammunition magazines and two gun
30 emplacements designed to hold two 3-inch rapid-
31 fire rifles. The earthen berm that characterizes the
32 front of the structure is planted in grass.

33 The area around the battery is maintained in open
34 turf grass cover dotted with several palm trees.

35 Ramped stairs lead to the top of the battery
36 structure. These were added in 1960 by the
37 National Park Service to provide access that did
38 not contribute to ongoing problems with
39 settlement. Because the battery proved too heavy
40 for the soils of Cockspur Island, the concrete has
41 settled and cracked in several places. The stairway
42 allows visitors to reach the gun pits without
43 climbing on the berm and further dislodging the
44 soil.

45 Visitors reach Battery Hambright by traveling the
46 North Pier Trail from the main visitor parking area
47 located to the south (Figure 20). The 0.75-mile

1 concrete-paved loop trail leads visitors through a
2 wooded area before reaching the open, grassy area
3 associated with Battery Hambright (Figure 21).
4 The trail continues past the battery to the historic
5 North Pier (Figure 22). Another portion of the trail
6 continues in an easterly direction, to the north of
7 Battery Hambright, into a wooded area, eventually
8 returning to the parking area (Figure 23). A
9 memorial to Reverend John Wesley is located
10 along the south portion of the trail loop, in a small
11 opening of the wooded area (Figure 24). Visitors
12 can also reach a picnic area to the west by
13 following the trail.



14 **FIGURE 20.** A map of the North Pier Trail showing the
15 locations of Battery Hambright and the John Wesley
16 Memorial. (Source: Trail Guide, Fort Pulaski National
17 Monument)



18 **FIGURE 21.** Visitors can access Battery Hambright
19 from the North Pier Trail.



20 **FIGURE 22.** The historic North Pier is located north of
21 Battery Hambright.



22 **FIGURE 23.** The North Pier Trail as it appears north of
23 Battery Hambright.



24 **FIGURE 24.** The John Wesley Memorial.

1 Battery Hambright Description

2 Measured drawings of the battery are provided in
3 Appendix A.

4 Battery Hambright is a one-story concrete
5 structure measuring approximately 90 feet in
6 length, including the retaining walls at its east and
7 west ends, and 55 feet in width. The battery is
8 covered by an earthen berm on all sides except for
9 the south (Figure 25).



10 **FIGURE 25.** A view from the north of the berm that
11 covers Battery Hambright.

12 The structure consists of two levels, with three
13 enclosed rooms on the lower level. Two of these
14 enclosed spaces are magazines and the other is
15 described in archival documentation as a “bomb-
16 proof” room.¹⁴⁹ The upper level, which is not
17 covered, houses two gun platforms and an
18 observation station.

19 The cast-in-place concrete structure consists of
20 walls that vary in thickness from 1 foot 6 inches
21 thick at the walls along the south elevation to 7 feet
22 thick at some of the walls around the enclosed
23 magazines. The structure sits on a concrete slab
24 foundation which is typically 1 foot thick.

25 The concrete structure appears to be
26 unreinforced, although 10-inch-tall steel I-beams
27 are embedded in the concrete slabs that form the

149. “Emplacements for 15 pdr. rapid-fire guns on balanced pillar mount at Fort Pulaski, Georgia,” April 1, 1899, two sheets. Fort Pulaski National Monument archives, flat files.

28 ceilings of the interior spaces at the lower level.
29 The exposed portions of the steel I-beams are
30 painted. Additionally, the original construction
31 documents specified the use of asphaltum on the
32 walls of the magazines, likely as waterproofing,
33 before these areas of the structure were covered in
34 earth. A non-original cementitious parge coating
35 appears to have been added to the exposed
36 concrete walls on the exterior of the structure. The
37 parge coating appears to be approximately 1/4
38 inch thick.

39 The concrete structure of the battery is visible
40 from the south elevation (Figure 26). The majority
41 of the elevation consists of 7-foot-tall walls. At the
42 east end of the structure, the wall extends to a
43 height of 8 feet, and then to 13 feet to
44 accommodate the observation station at the
45 southeast corner of the battery.



46 **FIGURE 26.** The south elevation of Battery Hambright.

47 At the east and west ends of the south elevation are
48 retaining walls that support the earthen berm. The
49 walls are 1 foot 6 inches thick and slope down
50 toward the ground, following the slope of the
51 berm. Both walls are approximately 13 feet in
52 height at their tallest point. The retaining wall at
53 the east is flush with the south elevation of the
54 structure and extends approximately 19 feet past
55 the end of the structure (Figure 27). The west
56 retaining wall extends toward the south
57 approximately 16 feet beyond the face of the
58 structure (Figure 28).



1 **FIGURE 27.** The east retaining wall.



2 **FIGURE 28.** The west retaining wall.

3 There are two openings that lead into the
4 structure, each 7 feet wide. Wood-framed
5 walkways are present over the openings,
6 connecting the various portions of the upper level
7 of the battery. The wood framing at the walkways
8 is anchored to the adjacent concrete walls with
9 steel angles. The walkway over the easternmost
10 opening slopes upward to accommodate the
11 change in height between the concrete walls. A 36-
12 inch-tall railing composed of 2-inch-diameter steel
13 pipe extends the length of the south elevation at
14 the upper level. According to archival
15 documentation, CCC workers replaced an
16 “original” handrail that was present on the
17 structure.¹⁵⁰

150. National Park Service, “Preservation of Battery Hambricht,” 1940. Fort Pulaski National Monument Archives.

18 **Lower Level**

19 Both of the openings into the battery lead to small
20 passageways, each approximately 7 feet by 7 feet in
21 plan. Both passageways have concrete floors and
22 connect to the interior spaces within the battery,
23 as well as to one of the two staircases that lead to
24 the upper level.

25 The passageway on the east leads to a magazine to
26 the north and the bomb-proof room to the east
27 (Figure 29). The north and east walls of the
28 passageway rise approximately 13 feet from the
29 concrete floor. A concrete stair on the west side of
30 the passageway leads to the upper level.

31 The west passageway leads to a magazine to the
32 north and a set of concrete stairs (Figure 30). The
33 north wall of the passageway rises 13 feet from the
34 concrete floor.



35 **FIGURE 29.** The east passageway from the upper
36 level.



37 **FIGURE 30.** The west passageway. Note the wood-
38 framed walkway at the top.

1 The door openings that lead to the interior spaces
 2 on the lower level are similar (Figure 31). The
 3 outermost portion of each opening is typically 4
 4 feet wide with a chamfered edge. The opening
 5 steps inward, narrowing to a width of 3 feet at the
 6 interior. No doors are present at the openings,
 7 although the original construction documents
 8 show that doors were once present.¹⁵¹ Remnant
 9 metal elements that were part of the door hinge
 10 system remain embedded in the concrete walls at
 11 the door jambs (Figure 32). Although referred to in
 12 Park correspondence as iron, the hinges have a
 13 green patination, suggesting that they are bronze.
 14 In addition, ferrous staining of the substrate that
 15 would be expected with embedded iron is not
 16 present.



17 **FIGURE 31.** View north toward the door
 18 opening at the east magazine.



19 **FIGURE 32.** Remnant metal hinges remain at the door
 20 jambs.

21 The magazine at the southeast corner of the
 22 battery is approximately 12 feet by 8 feet in plan
 23 (Figure 33). The walls, floors, and ceiling are all
 24 concrete. No parge coating was applied to the
 25 concrete surfaces of the east magazine. The
 26 bottom of the steel I-beams embedded in the
 27 ceiling are visible. On the south wall of the room is
 28 a small niche. The niche is approximately 3 feet 3
 29 inches above the floor, 1 foot wide, and 3 feet 6
 30 inches tall. The niche, which was likely used for
 31 ventilation, has an open pipe at the top that
 32 extends to the exterior of the building (Figure 34).
 33 The pipe extends out from the exterior wall
 34 (Figure 35).



35 **FIGURE 33.** The magazine. Note the niche in the far
 36 wall and the embedded steel beams in the ceiling.

151. "Emplacements for 15 pdr. Rapid-fire guns on balanced pillar mount at Fort Pulaski, Georgia," April 1, 1899.



1 **FIGURE 34.** A ventilation pipe in the top of the niche.



19 **FIGURE 36.** The east magazine. Note the niche to the
20 right of the door opening.



2 **FIGURE 35.** The ventilation pipe extends up through
3 the concrete walls and out past the wall.



21 **FIGURE 37.** The entrance to the east magazine. Note
22 the drain in the floor of the room.

4 The east magazine is located adjacent to the bomb-
5 proof room (Figure 36). The magazine is 9 feet by
6 15 feet in plan, with a floor-to-ceiling height of
7 approximately 6 feet 7 inches. The walls, floors,
8 and ceiling are all concrete. A floor drain, added in
9 1902, is present near the center of the concrete
10 floor (Figure 37). No parge coating was applied to
11 the concrete surfaces of the east magazine. The
12 bottoms of the steel I-beams embedded in the
13 ceiling are visible. West of the door, in the south
14 wall of the room, is a small niche, similar in size to
15 the niche seen in the bomb-proof room. The niche
16 in the east magazine has an open ventilation pipe
17 at the top that extends past the exterior wall of the
18 building.

23 The west magazine is accessed from the west
24 passageway and is nearly identical to the east
25 magazine (Figure 38). Like the east magazine, it is 9
26 feet by 15 feet in plan, with a floor-to-ceiling
27 height of approximately 6 feet 7 inches. The walls,
28 floors, and ceiling are all concrete. In 1902, a floor
29 drain was added to the west magazine. The
30 bottoms of steel I-beams embedded in the
31 concrete ceiling are visible. No parge coating was
32 applied to the concrete surfaces of the bomb-
33 proof room. West of the door, in the south
34 wall of the room is a small niche. Similar in size to the
35 niches seen in the bomb-proof room and east
36 magazine, the niche in the east magazine has an
37 open ventilation pipe at the top that extends past
38 the exterior wall of the building.



1 **FIGURE 38.** The west magazine. Note the niche to the
2 right of the door opening.

3 **Upper Level**

4 Two sets of stairs lead from the lower level to the
5 upper level (Figure 39). Both concrete stairs are
6 approximately 7 feet wide and consist of eight
7 risers ranging in height from 8 inches to 10 inches.
8 The treads are typically 10 inches deep.

9 The upper level consists of three areas connected
10 by two wood-framed walkways that cross over the
11 passageways on the lower level. According to
12 archival documentation, a bridge with railings
13 originally connected the three portions of the
14 battery at the south. The floors and walls of the
15 upper level are concrete.¹⁵²



16 **FIGURE 39.** The west staircase that leads to the upper
17 level.

18 The deck at the east portion of the upper level,
19 within the observation station, is situated at a
20 slightly higher elevation than the rest of the upper
21 level. A wood-framed walkway connects the
22 middle section to the east section (Figure 40 and
23 Figure 41). Steel pipe railings are located on each
24 side of the walkway. The observation station is
25 approximately 5 feet by 5 feet in plan and is
26 surrounded by concrete walls 4 feet 4 inches in
27 height (Figure 42). The top of the 1-foot-6-inch-
28 thick wall is sloped toward the exterior of the
29 structure.



30 **FIGURE 40.** The wood-framed walkway that connects
31 the center portion of the upper level to the
32 observation station to the east.



33 **FIGURE 41.** The underside of the wood-framed
34 walkway that connects the center portion of the
35 upper level to the observation station to the east.

152. "Emplacements for 15 pdr. Rapid-fire guns on balanced pillar mount at Fort Pulaski, Georgia," April 1, 1899.



1 **FIGURE 42.** The observation station at the southeast
2 corner of the battery.

3 The center portion of the upper level consists of a
4 concrete landing at the top of the stairs. The
5 landing is approximately 14 feet by 15 feet in plan
6 (Figure 43.). The landing provides access to the
7 wood walkway that leads to the east and west
8 portions of the upper level, as well as to the gun
9 platform to the north. A series of concrete stairs
10 leads to the gun platform from the landing (Figure
11 44). The stairs extend the entire width of the
12 landing. The stairs consist of three risers, typically
13 8 inches in height, and 10-inch-deep treads.

14 The east gun platform is semi-circular in plan and
15 approximately 15 feet in diameter (Figure 45). The
16 gun platform is surrounded by a concrete wall, 3
17 feet tall and 4 feet thick. At the west side is the
18 lowering niche for the gun, which is situated 2 feet
19 above the floor at the top of the wall (Figure 46).



20 **FIGURE 43.** The center portion of the upper level of
21 Battery Hambright. Note the wood-framed walkways
22 in the foreground and background.



23 **FIGURE 44.** Stairs lead up to the east gun platform.

24 At the east side of the space, an ammunition recess
25 is located in the wall adjacent to the stair (Figure
26 47).

27 East of the gun platform is a tapered concrete roof
28 located directly over the east magazine (Figure 48).
29 The roof is approximately 15 feet by 20 feet 6
30 inches in plan and slopes downward toward the
31 northeast. The walls of the east gun platform and
32 observation station abut the concrete roof.

33 Between the east gun platform at the center
34 portion of the upper level and the west gun
35 platform at the west portion of the upper level is a
36 tapered concrete roof. The roof is located directly
37 over the west magazine (Figure 49). The roof is
38 sloped inward toward its center.



39 **FIGURE 45.** The east gun platform.



1 **FIGURE 46.** The lowering niche at the west side of the
2 east gun platform.



3 **FIGURE 47.** An ammunition recess is in the east wall
4 at the gun platform.

5 At the west portion of the upper level, at the top of
6 the west stair, is a concrete landing. The landing is
7 trapezoidal in plan and narrows to the north. The
8 landing leads to the wood-framed walkway
9 between the west and center portions of the upper
10 level (Figure 50). Steel pipe railings are present on
11 each side of the walkway. A series of concrete
12 stairs lead to the west gun platform from the
13 landing (Figure 51). The stairs extend the entire
14 width of the landing and consist of three risers,
15 typically 8 inches in height, and treads 10 inches
16 deep.

17 The west gun platform is circular in plan, with a
18 diameter of approximately 15 feet (Figure 52.).
19 The gun platform is surrounded by a concrete
20 wall, 4 feet 4 inches in height and 4 feet thick. At
21 the east side, is the lowering niche situated 2 feet
22 above the floor at the top of the wall. North of the

23 lowering niche is an ammunition recess adjacent
24 to the stair (Figure 53.). A second lowering niche
25 is located at the west side of the gun platform
26 (Figure 54). The wall around the west gun
27 platform is integrated into the west retaining wall
28 that extends south from the main portion of the
29 battery.



30 **FIGURE 48.** The concrete roof over the east magazine.
31 Note that the roof abuts the wall of the gun
32 platform and the wall of the observation station.



33 **FIGURE 49.** The concrete roof over the west
34 magazine.



1 **FIGURE 50.** The wood-framed walkway connecting
2 the west and center portions of the upper level of
3 the battery.



4 **FIGURE 51.** The stairs leading to the west gun
5 platform.



6 **FIGURE 52.** The west gun platform.



7 **FIGURE 53.** The lowering niche and ammunition
8 recess at the east wall of the west gun platform.



9 **FIGURE 54.** A lowering niche on the west wall of the
10 west gun platform.

11 **Condition Assessment**

12 The following notable conditions were observed
13 during site work conducted for this study:

14 **Site and Landscape**

- 15 ■ The grassy area surrounding the battery
16 structure, including the earthen berm,
17 includes areas that have become denuded, or
18 where the grass is patchy. These areas may
19 become subject to erosion.
- 20 ■ There are trees growing around the battery
21 that could potentially fall on the structure as a
22 result of storm damage or disease. These trees
23 require regular evaluation for their condition
24 to determine the potential for them to become
25 hazardous.

- 1 ■ Grass is growing through the concrete walk in
2 some locations.
- 3 ■ The grass path leading to the North Pier has
4 eroded to sand soil at the northern end,
5 exposing the brick and concrete pads of the
6 benches.
- 7 ■ The North Pier is in ruinous condition.
8 Although it has been stabilized, there remain
9 abrupt changes in grade and materials, broken
10 and deteriorated materials, and potential trip
11 hazards remain. These safety concerns need to
12 be communicated to visitors, while limitations
13 may need to be placed on visitor access in
14 certain locations.
- 15 ■ The North Channel shoreline and North Pier
16 are exhibiting problems with erosion.
17 Increasing use of the North Channel by large
18 container ships and associated wave action has
19 led to ongoing shoreline erosion, threatening
20 Battery Hambright and its environs. The Park
21 has implemented measures to address these
22 concerns, as further discussed in the
23 Treatment chapter of this report.

24 Battery

- 25 ■ A parge coating was applied to most of the
26 exterior exposed concrete surfaces
27 throughout the battery. The parge coat is
28 thought to have been added in 1960 as part of
29 extensive repairs undertaken at the battery.¹⁵³
- 30 ■ Movement of concrete at a vertical joint near
31 the east end of the south elevation was
32 observed. The section of wall to the east
33 appears to have been displaced outward, likely
34 due to pressure from the earthen berm behind.
35 A patch was previously installed at this
36 location and was observed to be displaced
37 outward, away from the surface of the wall
38 (Figure 55). Although the displacement
39 outward creates a noticeable difference in

40 plane between adjacent sections of the wall on
41 either side of the joint, the wall that appears to
42 have moved outward is still essentially vertical,
43 and does not currently require structural
44 stabilization.

- 45 ■ There are cracks in the parge coating
46 throughout the structure (Figure 56). The
47 cracks are present in walls as well as the floors
48 of the upper level. The width of the cracks was
49 found to be as great as 1/4 inch, but most
50 cracks were narrower and many were hairline
51 in width (Figure 57).
- 52 ■ The parge coating is delaminated in many
53 areas, exposing the original concrete beyond
54 (Figure 58).
- 55 ■ Cracking of the concrete was observed
56 extending through the parge coat and into the
57 structural concrete beyond, particularly at the
58 south walls (Figure 59 and Figure 60).



59 **FIGURE 55.** Movement and displacement
60 at a joint in the east retaining wall.

153. Narrative Report - Restoration of Demilune and Battery Hambright. PCP No. M-31, circa 1960. Fort Pulaski National Monument Archives.



1 **FIGURE 56.** Cracks were observed in the parge
2 coating throughout the structure.



7 **FIGURE 59.** Cracking extended through the parge
8 coating and the concrete structure.



3 **FIGURE 57.** The majority of the cracks observed in the
4 parge coat were narrow.



9 **FIGURE 60.** Cracking in the concrete structure
10 extended beyond the parge coating. This crack,
11 along the south wall, appears to have been routed,
12 but not repaired.



5 **FIGURE 58.** Delaminated parge coating was observed
6 in several locations.



13 **FIGURE 61.** Sealant has been installed at routed-out
14 cracks throughout the structure.

15

- 1 ■ Several of the larger cracks have been routed out and filled with sealant (Figure 61).
 2 Typically, the routed and sealed cracks are approximately 3/8 to 1/2 inch wide. The
 3 sealant is white in color. The sealant varied in
 4 condition but in many locations exhibited
 5 cohesive and adhesive failure.
 6
 7
 8 ■ Cracks appear to have been routed out but not
 9 filled with sealant in several locations,
 10 particularly along the south walls (Figure 62.).
 11 The width of these routed cracks is as great as
 12 1 inch.
 13
 14 ■ Many of the previously installed patch repairs
 15 are cracked and show signs of failure (Figure
 16 63.). Small cracks were observed in the face of
 17 larger concrete patches.
 18
 19 ■ Additionally, previous patch repairs were
 20 found to be delaminated from the substrate
 21 (Figure 64 and Figure 65). Patches were found
 22 to be visibly debonded and sounded hollow
 23 when tapped.
 24
 25 ■ Small plants were observed growing in joints
 26 at isolated locations, particularly at the
 27 intersection between stairs and adjacent walls
 28 (Figure 66).
 29
 30 ■ Biological growth was observed on skyward
 31 facing concrete surfaces (Figure 67). This
 32 growth was typically green or orange in color.



29 **FIGURE 62.** An open crack at the south wall that was
 30 routed out but not repaired.



31 **FIGURE 63.** Previous crack repairs and patches are
 32 cracked and debonded.



33 **FIGURE 64.** Delaminated patch repairs at the floor of
 34 the observation station.



35 **FIGURE 65.** Previous patch repairs are cracked and
 36 delaminated.



1 **FIGURE 66.** Biological growth was observed at a joint
2 between stairs and an adjacent wall.

3

4 ■ Leaching in the form of white deposits was
5 observed along cracks in several locations.
6 These deposits result from within the concrete
7 being carried by water moving through the
8 structure (Figure 68).

9 ■ Black staining caused by biological growth and
10 soil accumulation was observed throughout
11 the structure, particularly at vertical surfaces
12 (Figure 69). This staining is particularly
13 prevalent on upward facing surfaces where
14 water can collect, and at areas of water run-
15 down on vertical surfaces.

16 ■ Light surface corrosion was observed on the
17 painted steel I-beams embedded in the
18 concrete ceilings in the magazines and bomb-
19 proof room (Figure 70).

20 ■ Run-down staining, associated with the
21 embedded steel beams, was observed on the
22 interior walls of the magazines and the bomb-
23 proof room (refer to Figure 70).



24 **FIGURE 67.** Biological growth observed at the top of
25 a concrete wall.



26 **FIGURE 68.** Leaching from the concrete was observed
27 in several locations, particularly near cracks.



28 **FIGURE 69.** Staining from organic growth and soil
29 accumulation at the east retaining wall and
30 observation station.



1 **FIGURE 70.** Surface corrosion of the embedded steel
 2 beams was observed in all interior spaces. Note the
 3 run-down staining associated with the steel beams at
 4 the back wall.

5 **Recent Repairs**

6 In May 2016, the Park conducted trial repairs with
 7 Krystol Repair Grout at the eastern entrance to
 8 Battery Hambright, on the west wall beneath the
 9 wooden walkway (Figure 71 and Figure 72).

10 Based on information provided by the Park, trial
 11 repairs were conducted at a crack approximately 5
 12 feet 6 inches above the ground. A section of crack
 13 approximately 2 feet in length and exhibiting a
 14 range of surface conditions was selected for trials.
 15 The crack was cut out with a grinder and hand
 16 chiseled, rinsed, and allowed to drain. The repair
 17 grout was mixed according to the manufacturer's
 18 instructions, at a ratio of four parts powder to one
 19 part water. The crack was filled by hand with
 20 approximately 1/2 inch of material in each of two
 21 lifts, after which a putty knife and trowel were
 22 used to install additional material. After setting for
 23 10 to 15 minutes, the remainder of the mix was
 24 troweled into place. A variety of finishing
 25 techniques were used, including brush tamped,
 26 open surface (back trowel), half troweled, smooth,
 27 and dry sponge tamping. Park personnel
 28 concluded that the mix worked well in the
 29 standardized crack area, but slumped considerably
 30 over large or deep sections, noting that multiple
 31 lifts with a setting time between may be required
 32 (pending further discussion with the
 33 manufacturer.) In addition, it was noted that the
 34 material did not appear to adhere well to the top of
 35 the crack.



36 **FIGURE 71.** Joint preparation for crack repair testing
 37 implemented by the Park in May 2016. (Source: Fort
 38 Pulaski National Monument)



39 **FIGURE 72.** Crack repair testing implemented by the
 40 Park in May 2016. (Source: Fort Pulaski National
 41 Monument)

Physical Description and Condition Assessment

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Significance and Integrity

1 National Register of Historic 2 Places

3 The National Register of Historic Places is the
4 official list of the nation’s historic places worthy of
5 preservation. Authorized by the National Historic
6 Preservation Act of 1966, the National Register of
7 Historic Places is part of a national program to
8 coordinate and support public and private efforts
9 to identify, evaluate, and protect America’s
10 historic and archeological resources.¹⁵⁴

11 Properties are nominated to the National Register
12 of Historic Places through preparation of
13 documentation related to the historical
14 development, current conditions, and historic
15 integrity of its resources. National Register
16 nominations also include a significance evaluation
17 that identifies the important historical associations
18 of the property, and comments on its architectural,
19 archeological, and social value as they relate to the
20 criteria for listing in the National Register of
21 Historic Places. A property’s significance is tied to
22 a discrete period of time in which its important
23 contributions were made and to relevant national,
24 state, and local historic contexts.

25 Significance Criteria

26 In order for a property to be eligible for inclusion
27 in the National Register of Historic Places, it must
28 possess significance under one of four criteria. The
29 Criteria for Evaluation for listing in the National
30 Register of Historic Places state:

154. National Park Service, “National Register of
Historic Places,” accessed January 29, 2017.
<http://www.nps.gov/nr/>.

31 The quality of significance in American history,
32 architecture, archeology, engineering, and
33 culture is present in districts, sites, buildings,
34 structures, and objects that possess integrity of
35 location, design, setting, materials,
36 workmanship, feeling, and association, and:

- 37 A. That are associated with events that have
38 made a significant contribution to the
39 broad patterns of our history; or
- 40 B. That are associated with the lives of
41 persons significant in our past; or
- 42 C. That embody the distinctive
43 characteristics of a type, period, or method
44 of construction, or that represent the work
45 of a master, or that possess high artistic
46 values, or that represent a significant and
47 distinguishable entity whose components
48 may lack individual distinction; or
- 49 D. That has yielded, or may be likely to yield,
50 information important in prehistory or
51 history.

52 Criteria Considerations

53 Ordinarily cemeteries, birthplaces, graves of
54 historical figures, properties owned by
55 religious institutions or used for religious
56 purposes, structures that have been moved
57 from their original locations, reconstructed
58 historic buildings, properties primarily
59 commemorative in nature, and properties that
60 have achieved significance within the past fifty
61 years are not considered eligible for the
62 National Register. However, such properties
63 *will qualify* if they are integral parts of districts
64 that do meet the criteria or if they fall within
65 the following categories:

- 66 a. A religious property deriving primary
67 significance from architectural or
68 artistic distinction or historical
69 importance; or

- 1 b. A building or structure removed from
2 its original location but which is
3 primarily significant for architectural
4 value, or which is the surviving
5 structure most importantly associated
6 with a historic person or event; or
- 7 c. A birthplace or grave of a historical
8 figure of outstanding importance if
9 there is no appropriate site or building
10 associated with his or her productive
11 life; or
- 12 d. A cemetery that derives its primary
13 importance from graves of persons of
14 transcendent importance, from age,
15 from distinctive design features, or from
16 association with historic events; or
- 17 e. A reconstructed building when
18 accurately executed in a suitable
19 environment and presented in a
20 dignified manner as part of a restoration
21 master plan, and when no other
22 building or structure with the same
23 association has survived; or
- 24 f. A property primarily commemorative in
25 intent if design, age, tradition, or
26 symbolic value has invested it with its
27 own exceptional significance; or
- 28 g. A property achieving significance
29 within the past 50 years if it is of
30 exceptional importance.¹⁵⁵

31 **National Register Significance** 32 **Evaluation**

33 Fort Pulaski National Monument was
34 administratively listed in the National Register of
35 Historic Places on October 15, 1966, under the
36 National Historic Preservation Act.
37 Documentation of Fort Pulaski National
38 Monument, including Battery Hambright, was
39 added to the National Register of Historic Places
40 on December 9, 1975. The property is described as
41 a historic district and is noted as significant in the
42 areas of Architecture, Engineering, and Military
43 history.¹⁵⁶

155. Code of Federal Regulations, Title 36, Part 60,
"The National Register Criteria for
Evaluation."

156. Trout, n.p.

44 Although the nomination does not cite the
45 National Register criteria in its assessment of the
46 significance of Battery Hambright, research
47 conducted for this study indicates the battery is
48 significant under Criteria A, C, and D.

49 Under Criterion A, Battery Hambright is
50 representative of the new defensive theory of
51 seacoast fortifications articulated by the Endicott
52 Board in 1885. The Board conducted research and
53 evaluation of existing coastal defenses that led to
54 recommendations for establishing a new system of
55 fortifications to meet the needs of modern
56 artillery. The Endicott System featured dispersed
57 small batteries that were low in profile, small, and
58 concealed behind earthen berms. The concrete
59 structures were designed to emplace a variety of
60 weapons, including "disappearing" guns that could
61 be lowered out of view from the water after firing.
62 The small size and low profile of these
63 fortifications were intended to be more difficult to
64 hit from a ship. The dispersed placement of the
65 batteries was also difficult to target, but afforded
66 various angles from which to fire on enemy
67 ships.¹⁵⁷ The Endicott System was thus a complete
68 departure from the massive masonry fortifications
69 of the Third System of coastal defenses that
70 featured large concentrations of artillery in a single
71 location.

72 Battery Hambright is part of a group of seven
73 batteries that made up Fort Screven on Tybee
74 Island. These batteries constituted the new
75 Endicott defense system for the Tybee Roads area
76 and the Savannah River. Battery Hambright is the
77 only battery placed on the south bank of the
78 Savannah River. Battery Hambright is also the only
79 battery associated with Fort Screven that remains
80 relatively unaltered and has been preserved and
81 maintained.

82 Under Criterion C, Battery Hambright
83 embodies the distinctive characteristics of a
84 type, period, or method of construction—the
85 innovative engineered design of earthen and
86 concrete battery structures associated with the
87 Endicott System realized during the late
88 nineteenth and early twentieth centuries. Fort

157. Snell, n.p.

1 Screven, of which Battery Hambright is a part,
2 has been determined significant for its
3 Endicott System design.¹⁵⁸

4 Battery Hambright is representative of
5 batteries constructed during the Endicott
6 period. These batteries were typically
7 constructed of concrete with gun platforms
8 and well-protected magazines, some of which
9 were placed underground. The distinctive
10 features of Battery Hambright, such as the
11 concrete structure, gun platforms, and earthen
12 berms, all represent innovations in military
13 defense that address the need for concealment
14 from the water and support the heavy artillery
15 of the period. The siting of the battery in a
16 strategic location that allowed the guns to fire
17 on ships within the North Channel as they
18 navigated a nearby minefield in approaching
19 Savannah Harbor was also part of the design
20 of the battery. The field of fire—the visual
21 sight line used to identify and fire upon an
22 enemy—was also a critical component of the
23 design of the battery. To ensure a clear field of
24 fire, trees and other obstructions that might
25 obstruct the view were removed.

26 Battery Hambright continues to reflect the
27 coastal defense innovations associated with
28 the Endicott battery system in terms of design
29 and construction of the structure, its siting,
30 and the treatment of its environs. Therefore,
31 Battery Hambright is significant under
32 Criterion C in the area of Engineering for its
33 associations with the Endicott Battery
34 program.

35 Fort Pulaski is also significant under Criterion
36 D as a resource that has yielded, or may be
37 likely to yield, information important in
38 prehistory or history. Numerous archeological
39 studies conducted at Cockscur Island have
40 indicated the presence of historic resources.
41 At the battery itself, archeological testing has
42 not revealed any significant intact deposits,
43 and has demonstrated severe disturbance in
44 the general stratigraphy. While cannon were
45 recovered at the site in the 1970s, and further

46 archeological study of the area surrounding
47 the battery may yield additional information,
48 the site of Battery Hambright does not seem
49 likely to be significant under Criterion D.¹⁵⁹

50 Battery Hambright survives with sufficient
51 integrity to convey its historic associations.

52 **Period of Significance**

53 The period of significance for Battery Hambright
54 begins with the start of construction of the battery
55 in 1899 and continues through CCC work
56 completed at the battery in the 1930s.¹⁶⁰

57 The battery also contributes to the larger historic
58 district of Fort Pulaski National Monument. The
59 National Register nomination completed in 1975
60 for the historic district identifies periods of
61 significance of 1829–1847, 1861–1872, and briefly
62 during the 1890s.¹⁶¹

63 The more recently completed Cultural Landscape
64 Report for Fort Pulaski National Monument
65 Cockscur Island Historic District identifies a
66 period of significance of 1829–1895. The
67 beginning date is the start of the initial
68 construction of Fort Pulaski, while the closing is

159. Correspondence by project team with Melissa Memory, Superintendent, Fort Pulaski National Monument, August 2017.

160. Berhow, 211. Berhow notes that Battery Hambright was in service in 1903. The date of construction of the battery is variously documented in different sources; reference to the history section of this report for additional discussion. The recommended end date of 1930s for the period of significance for the battery is based on consultation by Fort Pulaski National Monument staff with the Georgia SHPO, leading to a determination of this end date for Fort Pulaski National Monument. Since there is one site designation and work was completed by the CCC at Battery Hambright during the 1930s, this end date is appropriate for the battery as well.

161. *National Register of Historic Places Nomination Form: Fort Pulaski National Monument.*

158. Cloues, n.p.

1 the date of completion of the southeast magazine
2 at the demilune.¹⁶²

3 Battery Hambright was used for interpretive
4 purposes after the establishment of Fort Pulaski
5 National Monument in 1924.

6 During the 1930s, funds and manpower from
7 several New Deal era programs, including the
8 PWA and CCC, contributed to work at Fort
9 Pulaski including Battery Hambright. The battery
10 was cleared of overgrown vegetation, while the
11 structure was repaired and preserved. During
12 World War II, however, these programs were
13 terminated, and work at Fort Pulaski halted. The
14 US Navy established a section base on Cockspur
15 Island in late 1941. The base, which was used to
16 support coastal patrol ships, remained active until
17 1947.¹⁶³

18 In 1960, extensive repairs were made to Battery
19 Hambright, including the installation of sealant at
20 cracks in the concrete, cleaning and coating of
21 steel elements, and restoration of the surrounding
22 landscape. The concrete parge coating is also
23 thought to have been added at this time as a
24 waterproofing measure.

25 Significant repairs were made to Battery
26 Hambright again in 1995. These repairs included
27 the compositional analysis of the original concrete,
28 cleaning of the structure with high pressure water,
29 the repair of the wood walkways, repair of spalled
30 concrete, and repair of the parge coating, which
31 was determined to be non-historic.

32 **Character-Defining Features**

33 The historic nature of significant buildings,
34 structures, and landscapes is defined by their
35 character, which is embodied in identifying, or
36 character-defining, physical features. Character-
37 defining features can include the shape of a
38 building; its materials, craftsmanship, interior

39 spaces, and features, as well as the components of
40 its surroundings.¹⁶⁴

41 The following list identifies character-defining
42 features of Battery Hambright:

- 43 ▪ General configuration, plan, and orientation
- 44 ▪ Earthen berm parapet
- 45 ▪ Open landcover associated with the berm and
46 area surrounding the battery
- 47 ▪ Site line extending from the gun platforms to
48 the North Channel of the Savannah River that
49 comprised the field of fire for the battery
50 artillery
- 51 ▪ Visual connection to the North Pier
- 52 ▪ Concrete structure (exterior and interior)
- 53 ▪ Stairs and landings
- 54 ▪ Gun platforms
- 55 ▪ Interior rooms
- 56 ▪ Other built-in fixtures, including ventilation
57 nooks, lowering niches, and ammunition
58 recesses.

59 **Assessment of Integrity**

60 Assessment of integrity is based on an evaluation
61 of the existence and condition of the physical
62 features that date to a property's period of
63 significance, taking into consideration the degree
64 to which the individual qualities of integrity are
65 present. The seven aspects of integrity as defined
66 in the National Register Criteria for Evaluation are
67 location, design, setting, materials, workmanship,
68 feeling, and association. As noted in the National

162. Hitchcock, n.p.

163. Meader and Binkley, 29.

164. Lee H. Nelson, FAIA, *Preservation Brief 17: Architectural Character: Identifying the Visual Aspects of Historic Buildings as an Aid to Preserving Their Character* (Washington, D.C.: National Park Service, Technical Preservation Services, 1988).

1 Register Bulletin, *How to Apply the National*
2 *Register Criteria for Evaluation*:

3 Location is the place where the historic
4 property was constructed or the place where
5 the historic event occurred. . . . Design is the
6 combination of elements that create the form,
7 plan, space, structure, and style of a
8 property. . . . Setting is the physical
9 environment of a historic property. . . .
10 Materials are the physical elements that were
11 combined or deposited during a particular
12 period of time and in a particular pattern or
13 configuration to form a historic property. . . .
14 Workmanship is the physical evidence of the
15 crafts of a particular culture or people during
16 any given period in history or prehistory. . . .
17 Feeling is a property's expression of the
18 aesthetic or historic sense of a particular period
19 of time. . . . Association is the direct link
20 between an important historic event or person
21 and a historic property.¹⁶⁵

22 The property must retain the essential physical
23 features that enable it to convey its historical
24 significance. The essential physical features are
25 those features that define both why a property is
26 significant (National Register criteria) and when it
27 was significant (period of significance). The
28 National Register Bulletin, *How to Apply the*
29 *National Register Criteria for Evaluation*, defines
30 integrity as “the ability of a property to convey its
31 significance.”¹⁶⁶

32 **Integrity of Location.** The battery retains a
33 high degree of integrity of location. The location
34 of the battery has remained unchanged since
35 construction began in 1899. The battery continues
36 to face the North Channel of the Savannah River it
37 was designed to defend from enemy ships.

38 **Integrity of Design.** The battery retains a high
39 degree of integrity of design. Although repairs have
40 somewhat altered the appearance of the structure,
41 the original design remains largely intact.

42 **Integrity of Setting.** The battery retains a high
43 degree of integrity of setting. Its visual relationship
44 with the Savannah River and North Pier remains,
45 with sight lines between the river and battery
46 preserved.

47 **Integrity of Materials and Workmanship.**
48 The battery retains a moderate degree of integrity
49 of materials and workmanship. The concrete on
50 the structure has been covered with a parge
51 coating, and extensive cracking is present.
52 Additionally, previously implemented crack
53 repairs have somewhat diminished the integrity of
54 materials and workmanship at some locations.

55 **Integrity of Feeling.** Battery Hambright retains
56 a high degree of integrity of feeling. The battery
57 was built to serve specific defensive functions.
58 While the battery no longer serves a military
59 function, it remains a tangible and characteristic
60 example of coastal defense construction from the
61 Endicott period. Diminishing integrity of feeling
62 are the paved trail, the thicket of trees and shrubs
63 surrounding the open clearing surrounding the
64 battery, and the various palm trees that dot the
65 open turf lawn.

66 **Integrity of Association.** The battery retains a
67 high degree of integrity of association. The battery
68 was built to provide a view of the Savannah River
69 in an effort to track and target enemy ships. The
70 views to the river afforded from the gun platforms
71 remain a distinctive aspect of the battery today.
72 The battery also retains its association with Fort
73 Pulaski and with other coastal defenses of the
74 Endicott period, such as Fort Screven.

165. National Register Bulletin, *How to Apply the National Register Criteria for Evaluation* (Washington, D.C.: Government Printing Office, 1997), 44–45.

166. *Ibid.*

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Treatment and Use

1 Requirements for Treatment 2 and Use

3 Although not individually listed in the
4 National Register of Historic Places, Battery
5 Hambright is a contributing structure of the
6 Fort Pulaski National Monument Historic
7 District. Battery Hambright is representative
8 of coastal defenses constructed under the
9 Endicott Battery System, and retains sufficient
10 integrity to convey its historic associations.

11 Therefore, treatment and use of Battery
12 Hambright should be considered within the
13 context of the legal mandates and policy directives
14 established by National Park Service Cultural
15 Resources Management Guideline (Director's
16 Order 28) for the protection of cultural resources.
17 Battery Hambright should be understood for its
18 association with Endicott period military
19 resources—particularly Fort Screven on Tybee
20 Island, of which Battery Hambright was originally
21 a part—and the evolution of Fort Pulaski, and
22 preserved for the enjoyment of present and future
23 generations.

24 Laws, Regulations, and Functional 25 Requirements

26 Key laws, regulations, and functional requirements
27 that apply to the recommended work include the
28 following:

- 29 ■ National Park Service Cultural Resources
30 Management Guideline (Director's Order 28),
31 which requires planning for the protection of
32 cultural resources on park property.
- 33 ■ Section 106 of the National Historic
34 Preservation Act (NHPA), which mandates

35 that federal agencies, including the National
36 Park Service, take into account the effects of
37 their actions on properties listed or eligible for
38 listing in the National Register of Historic
39 Places and give the Advisory Council on
40 Historic Preservation a reasonable
41 opportunity to comment.

42 Treatment of historic structures and sites is also to
43 be guided by the following:

- 44 ■ *Secretary of Interior's Standards for the*
45 *Treatment of Historic Properties*
- 46 ■ *Secretary of Interior's Guidelines for the*
47 *Treatment of Cultural Landscapes*
- 48 ■ National Park Service Management Policies,
49 2006
- 50 ■ Architectural Barriers Act Accessibility
51 Standards (ABAAS)
- 52 ■ International Building Code (IBC), 2015
- 53 ■ International Existing Building Code (IEBC),
54 2015
- 55 ■ International Plumbing Code (IPC)
- 56 ■ National Electrical Safety Code (NESC)
- 57 ■ National Fire Protection Association (NFPA)
58 101: Life Safety Code (LSC), 2015, and NFPA
59 1 Uniform Fire Code
- 60 ■ NPS Guiding Principles of Sustainable Design

61 (Note that some of the above codes and standards,
62 such as the IPC and NESC, may not pertain to

1 specific projects or to work on a particular
2 structure. For example, as plumbing and electrical
3 work are not likely to be conducted at Battery
4 Hambright, these codes would not apply.)

5 The State of Georgia has adopted the 2012 IBC but
6 not the IEBC for statewide applicability. The
7 National Park Service is self-regulating in terms of
8 enacting and enforcing building code standards.
9 Fort Pulaski National Monument is, therefore, not
10 legally subject to local or state building code
11 requirements. When undertaking repairs to
12 buildings and structures, NPS endeavors to have
13 the work comply with model building code
14 standards. At this time, the 2015 IBC is the model
15 building code used by the NPS for design and
16 construction.

17 With historic structures, attempts to achieve strict
18 conformance with model building code standards
19 that are intended for new buildings can lead to
20 destruction of the historic fabric. Alternative
21 compliance procedures, such as Chapter 12 of the
22 IEBC relating to historic buildings, should be
23 referenced in determining code compliance. For
24 Battery Hambright, alternatives to full prescriptive
25 legislative and code compliance should be
26 considered where such compliance would
27 compromise the integrity of the structure.

28 The 2015 IEBC includes the following statements
29 in Section 408, Historic Buildings:

30 **408.1 Historic buildings.** The provisions of
31 this code that require improvements relative to
32 a building’s existing condition or, in the case of
33 repairs, that require improvements relative to a
34 building’s predamage condition, shall not be
35 mandatory for historic buildings unless
36 specifically required by this section.

37 **408.2 Life safety hazards.** The provisions of
38 this code shall apply to historic buildings
39 judged by the building official to constitute a
40 distinct life safety hazard.

41 **408.3 Flood hazard areas.** Within flood
42 *hazard areas* established in accordance with
43 Section 1612.3 of the *International Building*
44 *Code*, or Section R322 of the *International*
45 *Residential Code*, as applicable, where the work
46 proposed constitutes *substantial improvement*,

47 the building shall be brought into compliance
48 with Section 1612 of the *International Building*
49 *Code*, or Section R322 of the *International*
50 *Residential Code*, as applicable:

51 **Exception:** *Historic buildings* need not be
52 brought into compliance that are:

- 53 1. Listed or preliminarily determined to be
54 eligible for listing in the National Register of
55 Historic Places;
- 56 2. Determined by the Secretary of the US
57 Department of the Interior as **contributing** to
58 the historical significance of a registered
59 historic district or a district preliminarily
60 determined to qualify as an historic district; or
- 61 3. Designated as historic under a state or local
62 historic preservation program that is approved
63 by the Department of Interior.¹⁶⁷

64 The IEBC exceptions noted above pertain to Fort
65 Pulaski National Monument, including Battery
66 Hambright, as a property listed in the National
67 Register.

68 In addition, Executive Order 13514 issued in 2009
69 directs all federal agencies to implement
70 sustainable design and construction practices. For
71 Fort Pulaski, the relevant guidelines in this
72 executive order require:

73 managing existing building systems to reduce
74 the consumption of energy, water, and
75 materials, and identifying alternatives to
76 renovation that reduce existing assets’ deferred
77 maintenance costs . . . [and] ensuring that
78 rehabilitation of federally owned historic
79 buildings utilizes best practices and
80 technologies in retrofitting to promote long
81 term viability of the buildings.¹⁶⁸

167. International Code Council, Inc., *International Existing Building Code, 2015* (Country Club Hills, Illinois: International Code Council, 2014).

168. “Executive Order 13514 of October 5, 2009: Federal Leadership in Environmental, Energy, and Economic Performance” (Washington, D.C.: *Federal Register* 74, no. 194, October 8, 2009).

1 Also, newly installed electrical systems and
 2 components, including any significant alterations
 3 to existing electrical systems, should comply with
 4 applicable provisions of the NFPA 70: National
 5 Electrical Code (NEC).

6 **Alternatives for Treatment** 7 **and Use**

8 The National Park Service has developed
 9 definitions for the four major treatments that may
 10 be applied to historic structures: preservation,
 11 rehabilitation, restoration, and reconstruction.
 12 The four definitions are as follows:

13 **Preservation** is defined as the act or process of
 14 applying measures necessary to sustain the
 15 existing form, integrity, and materials of an
 16 historic property. Work, including preliminary
 17 measures to protect and stabilize the property,
 18 generally focuses upon the ongoing
 19 maintenance and repair of historic materials
 20 and features rather than extensive replacement
 21 and new construction. New exterior additions
 22 are not within the scope of this treatment;
 23 however, the limited and sensitive upgrading of
 24 mechanical, electrical, and plumbing systems
 25 and other code-required work to make
 26 properties functional is appropriate within a
 27 preservation project.

28 **Rehabilitation** is defined as the act or process
 29 of making possible a compatible use for a
 30 property through repair, alterations, and
 31 additions while preserving those portions or
 32 features which convey its historical, cultural, or
 33 architectural values.

34 **Restoration** is defined as the act or process of
 35 accurately depicting the form, features, and
 36 character of a property as it appeared at a
 37 particular period of time by means of the
 38 removal of features from other periods in its
 39 history and reconstruction of missing features
 40 from the restoration period. The limited and
 41 sensitive upgrading of mechanical, electrical,
 42 and plumbing systems and other code-required
 43 work to make properties functional is
 44 appropriate within a restoration project.

45 **Reconstruction** is defined as the act or process
 46 of depicting, by means of new construction, the
 47 form, features, and detailing of a non-surviving

48 site, landscape, building, structure, or object
 49 for the purpose of replicating its appearance at
 50 a specific period of time and in its historic
 51 location.¹⁶⁹

52 Of the four treatment approaches, *preservation*,
 53 which involves sustaining the building in its
 54 existing form, is most appropriate for Battery
 55 Hambright, given the significance and integrity of
 56 the structure. Preservation is to some extent in
 57 progress as a result of ongoing repair and cyclical
 58 maintenance implemented by the Park. Alterations
 59 and repairs to the battery since the period of
 60 significance have in most cases retained historic
 61 features and materials. Non-original material, such
 62 as the wood at the walkways, is not intrusive and
 63 does not detract from the historic character of the
 64 battery.

65 Within this overarching approach, the historic
 66 structure report recommends preservation of the
 67 battery, including making all of the repairs
 68 necessary to stabilize and preserve the fort in its
 69 existing state for continued interpretation by the
 70 park. The treatment *preservation* permits selective
 71 restoration of character-defining elements where
 72 missing or altered, if appropriate archival
 73 documentation is available. For example, if further
 74 research provides information about original
 75 doors present at the interior spaces, those features
 76 could be restored. In addition, *preservation*
 77 permits minor alterations. (Refer to the
 78 Developmental History and the Significance and
 79 Integrity chapters for further discussion of
 80 character-defining features.)

81 As for the landscape associated with Battery
 82 Hambright, a *rehabilitation* treatment is
 83 recommended as the most appropriate, given the
 84 need to provide safe access to the site for visitors
 85 and to interpret its history through the installation
 86 of wayside exhibits and other visual aids.
 87 Rehabilitation is defined as allowing for a new use
 88 that requires minimal change to the defining
 89 characteristics of the site and environment. As
 90 such, treatment of the landscape associated with
 91 Battery Hambright will accommodate visitor
 92 access, interpretation, and cultural and natural

169. Grimmer.

1 resource management in such a way as to respect
2 and minimally alter character defining features of
3 the structure and site.

4 Future use of Battery Hambright is anticipated to
5 be similar to its current function—a historic
6 structure interpreted for visitors. The distinctive
7 materials, features, and spaces of the battery are
8 essentially intact, and the structure retains its
9 historic integrity. Repair of original materials and
10 character-defining features is practical and
11 appropriate. For the historic landscape resources
12 associated with Battery Hambright, the goal of
13 treatment is to protect the earthen berm associated
14 with the battery through maintenance of an
15 appropriate land cover, such as mown turf, the
16 sight line associated with the battery’s field of fire,
17 and the visual connection to the North Pier. Trees
18 located within falling distance of Battery
19 Hambright should be regularly evaluated for their
20 health and potential to become hazardous to
21 visitors or the battery structure. The turf lawn as
22 well as the trail system leading to the battery and
23 between the battery and the North Pier should be
24 maintained in good condition to prevent erosion
25 and other degradation of the battery environs.
26 Consideration should be paid to managing the turf
27 that characterizes much of the Battery Hambright
28 environs to promote sustainability, diversity, and
29 environmental health. This may include replacing
30 non-native invasive species with native species
31 adapted to the cultural conditions of the site.
32 Finally, treatment of the shoreline at the North
33 Pier to reduce the potential for erosion from the
34 wake associated with passing large ships and
35 storms is also warranted. The ruinous condition of
36 the North Pier may merit safety improvements to
37 apprise visitors of potentially dangerous
38 conditions associated with broken and
39 deteriorated materials, abrupt changes in
40 elevation, and trip hazards.

41 **Ultimate Treatment and Use**

42 **Guidelines for Treatment**

43 The guidelines and requirements for treatment
44 included later in this chapter have been defined
45 based on the preservation objectives and
46 requirements for treatment and use outlined above

47 for the Battery Hambright. All treatment
48 guidelines and recommendations were developed
49 in accordance with the *Secretary of Interior’s*
50 *Standards for Preservation*. (*The Secretary of the*
51 *Interior’s Standards for the Treatment of Historic*
52 *Properties with Guidelines for the Treatment of*
53 *Cultural Landscapes* were referenced in
54 development of treatment guidelines and
55 recommendations for landscape features
56 addressed in this study.)

57 The Secretary of the Interior’s Standards for
58 Preservation are as follows:

- 59 1. A property will be used as it was
60 historically, or be given a new use that
61 maximizes the retention of distinctive
62 materials, features, spaces, and spatial
63 relationships. Where a treatment and use
64 have not been identified, a property will be
65 protected and, if necessary, stabilized until
66 additional work may be undertaken.
- 67 2. The historic character of a property will be
68 retained and preserved. The replacement
69 of intact or repairable historic materials or
70 alteration of features, spaces, and spatial
71 relationships that characterize a property
72 will be avoided.
- 73 3. Each property will be recognized as a
74 physical record of its time, place, and use.
75 Work needed to stabilize, consolidate, and
76 conserve existing historic materials and
77 features will be physically and visually
78 compatible, identifiable upon close
79 inspection, and properly documented for
80 future research.
- 81 4. Changes to a property that have acquired
82 historic significance in their own right will
83 be retained and preserved.
- 84 5. Distinctive materials, features, finishes,
85 and construction techniques or examples
86 of craftsmanship that characterize a
87 property will be preserved.
- 88 6. The existing condition of historic features
89 will be evaluated to determine the
90 appropriate level of intervention needed.
91 Where the severity of deterioration
92 requires repair or limited replacement of a
93 distinctive feature, the new material will

- 1 match the old in composition, design,
2 color, and texture.
- 3 7. Chemical or physical treatments, if
4 appropriate, will be undertaken using the
5 gentlest means possible. Treatments that
6 cause damage to historic materials will not
7 be used.
- 8 8. Archeological resources will be protected
9 and preserved in place. If such resources
10 must be disturbed, mitigation measures
11 will be undertaken.¹⁷⁰

12 The Secretary of the Interior's Standards for
13 Rehabilitation are as follows:

- 14 1. A property shall be used for its historic
15 purpose or be placed in a new use that
16 requires minimal change to the defining
17 characteristics of the building and its site
18 and environment.
- 19 2. The historic character of a property shall
20 be retained and preserved. The removal of
21 historic materials or alteration of features
22 and spaces that characterize a property
23 shall be avoided.
- 24 3. Each property shall be recognized as a
25 physical record of its time, place, and use.
26 Changes that create a false sense of
27 historical development, such as adding
28 conjectural features or architectural
29 elements from other buildings, shall not be
30 undertaken.
- 31 4. Most properties change over time; those
32 changes that have acquired historic
33 significance in their own right shall be
34 retained and preserved.
- 35 5. Distinctive features, finishes, and
36 construction techniques or examples of
37 craftsmanship that characterize a historic
38 property shall be preserved.
- 39 6. Deteriorated historic features shall be
40 repaired rather than replaced. Where the
41 severity of deterioration requires
42 replacement of a distinctive feature, the

170. Ibid. The guidelines that accompany the Standards also note that new materials should be distinguishable from old.

- 43 new feature shall match the old in design,
44 color, texture, and other visual qualities
45 and, where possible, materials.
46 Replacement of missing features shall be
47 substantiated by documentary, physical, or
48 pictorial evidence.
- 49 7. Chemical or physical treatments, such as
50 sandblasting, that cause damage to historic
51 materials shall not be used. The surface
52 cleaning of structures, if appropriate, shall
53 be undertaken using the gentlest means
54 possible.
- 55 8. Significant archeological resources
56 affected by a project shall be protected and
57 preserved. If such resources must be
58 disturbed, mitigation measures shall be
59 undertaken.
- 60 9. New additions, exterior alterations, or
61 related new construction shall not destroy
62 historic materials that characterize the
63 property. The new work shall be
64 differentiated from the old and shall be
65 compatible with the massing, size, scale,
66 and architectural features to protect the
67 historic integrity of the property and its
68 environment.
- 69 10. New additions and adjacent or related new
70 construction shall be undertaken in such a
71 manner that if removed in the future, the
72 essential form and integrity of the historic
73 property and its environment would be
74 unimpaired.¹⁷¹

75 Guidelines for implementing the treatment
76 recommendations provided herein are as follows:

- 77 ■ Undertake all work on the structure in
78 compliance with the *Secretary of the Interior's*
79 *Standards for Preservation*.
- 80 ■ Undertake all work on the landscape in
81 compliance with the *Secretary of the Interior's*
82 *Standards for Rehabilitation*.
- 83 ■ Retain the character of the historic structure
84 and environs by protecting the battery and its
85 significant site features.

171. Ibid.

Treatment and Use

- 1 ▪ Ensure that proposed new elements or
2 construction are compatible with the historic
3 character of the structure and its site.
- 4 ▪ Protect adjacent natural resources during
5 construction activities.
- 6 ▪ Document through detailed as-built drawings,
7 photographs, and written narrative all changes
8 and treatments to the building and its
9 immediate site. Maintain records of
10 treatments and preserve documentation
11 according to professional archival standards.
12 Maintain a copy of records in the NPS
13 archives.
- 14 ▪ Retain features and materials at both the
15 exterior and interior of the buildings that
16 survive from the period of significance to the
17 greatest extent possible.
- 18 ▪ Incorporate sustainable design principles in all
19 future projects that respect the preservation
20 principles listed above.

21 **Prioritization of Treatment**

22 Based on the condition assessment performed as
23 part of this Historic Structure Report, the
24 following prioritization is recommended for work
25 on Battery Hambright.

26 The displacement observed at the vertical joint
27 toward the east end of the south wall should be
28 investigated and repaired.

29 Trial repairs should be conducted to determine
30 the most appropriate repair mixes for patches, and
31 to confirm techniques for repairs.

32 Cracks and spalls in the exterior concrete should
33 be addressed, and exposed steel on the interior
34 prepared and coated.

35 In addition to the specific repairs recommended,
36 cyclical maintenance tasks such as inspection,
37 painting of exterior wood and metal elements,
38 preparation and resealing of joints, and other
39 ongoing maintenance tasks must be continually
40 implemented to avoid damage to the historic
41 structure and to reduce the need for large-scale

42 repair projects in the future. (Planning and trial
43 repairs for repair and maintenance have been in
44 progress by the Park, and will be informed by the
45 findings and recommendations developed as part
46 of this Historic Structure Report.)

47 All work performed on the building and site
48 features should be documented through notes,
49 photographs, and measured drawings and / or
50 sketches, or with as-built annotations to
51 construction documents at project completion.
52 These records should be placed in Park archives as
53 part of the permanent record of Fort Pulaski, and
54 to provide information for future repairs and
55 ongoing maintenance. The project work orders
56 currently developed using the NPS Facility
57 Management Software System can provide a basis
58 for this documentation.

59 These records should be permanently archived at
60 the NPS or Park archives as a part of the
61 permanent record of the building and to provide
62 information for future repairs and ongoing
63 maintenance. In addition, these records will allow
64 future observers to identify which materials are
65 historic.

66 **Recommendations**

67 The following specific recommendations for
68 treatment of Battery Hambright respond to the
69 overarching treatment approach *preservation* for
70 the battery itself, which involves sustaining the
71 structure in its existing form, and *rehabilitation* for
72 the historic landscape resources associated with
73 the battery, to allow for modification of vegetation
74 while protecting physical evidence of the battery
75 structure, and maintaining important views and
76 viewsheds, as noted above.

77 **Responses to Code Provisions and 78 Safety Issues**

79 Safety issues associated with Battery Hambright
80 are primarily related to visitors accessing and
81 climbing on the concrete battery and earthen
82 berm. The Park has noted that its primary safety
83 concerns relative to the battery include the
84 possibility of persons climbing onto the berm and
85 falling onto the upper level of the battery, or falling

1 while walking up or down the stairs within the
 2 battery. The edges of the shoreline near the
 3 battery, as well as the pier, also present safety
 4 concerns, as noted above as part of the landscape
 5 discussion. These conditions do not meet code-
 6 mandated requirements for non-historic or new
 7 construction; however, the NPS is not required by
 8 code to implement modifications to address these
 9 conditions in historic structures such as Battery
 10 Hambright unless the NPS itself determines that
 11 such changes are warranted and appropriate.
 12 (Chapter 12—Historic Buildings of the 2012
 13 *International Existing Building Code* provides
 14 general guidance on repair, alteration, relocation,
 15 and change of occupancy of historic structures.
 16 The code generally defers to the code official—in
 17 this case, the National Park Service—to determine
 18 whether specific conditions are acceptable or are
 19 considered to require modification.)

20 As part of the overall safety program, the following
 21 approaches are recommended in response to
 22 safety concerns noted at Battery Hambright:

- 23 ■ Conduct an updated safety assessment of the
 24 battery and its environs, informed by the
 25 findings of the Park’s review of safety issues at
 26 Fort Pulaski (the masonry fortification) and
 27 recent NPS review of fort safety issues for
 28 various fortifications in the National Park
 29 System.
- 30 ■ Include Battery Hambright in safety briefings
 31 given to park personnel by a designated Park
 32 safety officer on a regular basis, as well as in
 33 proactive safety briefings provided by the Park
 34 to visitors.
- 35 ■ Maintain vegetation on the berm so that it
 36 does not obscure the edge or create tripping
 37 hazards.
- 38 ■ Consider limiting access to the battery, or by
 39 certain tour groups (e.g., schoolchildren).

40 Installation of railings or cautionary signage would
 41 be visually intrusive to the historic character of the
 42 berm. Also, as the site of the battery is not staffed
 43 by Park personnel, limiting access by certain tour

44 groups (e.g., schoolchildren) does not appear to be
 45 a practical approach.

46 Although consideration could be given to updating
 47 the electrical and lighting system present at the
 48 battery (e.g., for safety and security reasons), the
 49 Park has indicated that this work is not desirable
 50 or in keeping with goals for the site. Specifically,
 51 the Park noted that visitors should not be present
 52 from dusk to dawn; that there is little or no need
 53 for electricity at the site; and that renovation or
 54 additions to the electrical system would interfere
 55 with integrity of the battery and increase
 56 maintenance costs.

57 **Landscape and General** 58 **Recommendations**

59 For the historic landscape resources associated
 60 with Battery Hambright, the goal of treatment is to
 61 protect the earthen berm associated with the
 62 battery through maintenance of an appropriate
 63 land cover, such as mown turf, the sight line
 64 associated with the battery field of fire, the visual
 65 connection to the North Pier, and to maintain the
 66 trails and paths that connect the battery with the
 67 North Pier. In addition, measures to control
 68 erosion of the North Channel shoreline are
 69 warranted.

70 Recommendations for the Battery Hambright
 71 landscape include:

- 72 1. Preserve and protect the concrete structure of
 73 the historic battery.
- 74 2. Retain the visual connection between Battery
 75 Hambright and the adjacent landscape.
- 76 3. Retain the visual connection between Battery
 77 Hambright and the Savannah River, the
 78 location of the mine field it was created to
 79 protect.
- 80 4. Retain and maintain the historic patterns of
 81 spatial organization that include the
 82 relationship of the battery to the earthen dike,
 83 North Pier, and shoreline.
- 84 5. Maintain the area around the battery in open
 85 (low-growing) landcover conditions.

- 1 6. Repair any areas of turf that are in poor
2 condition to reduce erosion potential. 42 affect the battery's historic character and
43 historic materials.
- 3 7. Consider managing the turf that characterizes 44
4 much of the Battery Hambright environs to 45
5 promote sustainability, diversity, and
6 environmental health. This may suggest 46
7 replacing non-native invasive species with 47
8 native species adapted to the cultural 48
9 conditions of the site. 49
- 10 8. Evaluate annually all trees located within 50
11 falling distance of Battery Hambright to 51
12 determine their health and potential to 52
13 become hazardous to visitors or the battery 53
14 structure. 54
- 15 9. Avoid constructing new features that interfere 55
16 with views to and from the battery. 56
- 17 10. Protect the setting of the battery from changes 57
18 that will affect its historic integrity. 58
- 19 11. Retain and maintain the character-defining 59
20 qualities and characteristics of the battery, 60
21 while allowing for visitor access and 61
22 interpretation. 62
- 23 12. Continue to interpret Battery Hambright in 63
24 relation to the evolution of Fort Pulaski, as 64
25 well as the historic context of the Endicott 65
26 program and nearby Fort Screven as 66
27 representative of that period. 67
- 28 13. Maintain the contemporary trail and walk 68
29 system leading to the battery, and between the 69
30 battery and the North Pier, in good condition 70
31 to prevent erosion and other degradation of 71
32 the battery environs. Repair areas where 72
33 vegetation is growing through paved surfaces, 73
34 and reestablish grass cover on turf paths where 74
35 it has been lost. 75
- 36 14. Implement contemporary effective 76
37 preservation methods that stabilize and 77
38 preserve historic features and materials in 78
39 good condition. 79
- 40 15. Avoid adding new features or altering existing 80
41 non-historic features in ways that adversely 81
82
83
84
85
86 affect the battery's historic character and
historic materials.
16. Consider sustainability in the choice of
materials and energy use.
17. Continue to facilitate and provide access to
Battery Hambright, including the
accommodation of universal accessibility to
the site. Universal access to the battery is
considered inappropriate given the extensive
changes that would be required to the
structure, and given the small size of the
battery that renders it largely visible from
adjacent grade.
18. Establish a monitoring program that regularly
assesses the health and viability of turf
growing on the berm, and adjacent landscape
features, and identifies the need for any repair
or replacement. Keep records that may suggest
repeat problems associated with specific
locations. Use the records to employ an
adaptive strategy whereby adjustments can be
made to management and maintenance
practices as needed that will ensure the
perpetuation of turf cover.
19. Document all work performed on the battery
with notes, photographs, and measured
drawings and / or sketches, or with as-built
annotations to construction documents at
project completion. The development of
comprehensive organized documentation of
all work performed on the fort and its
landscape is essential to the preservation and
maintenance of the historic resources.
Records of future research, condition
assessments, investigations, testing, trial
repairs, and treatment should be permanently
archived at the park and copies provided to
other relevant NPS archives.
20. Preserve the historic configuration of the dike
and ditch system located to the north of
Battery Hambright, including the restored
elevation of the dike and ditch system and the
brick-faced tide gates associated with the ditch
system. Consider adaptations to system as
needed to address increasing flooding from

1 severe storms, as further discussed under
2 Climate Change and Related Environmental
3 Issues, below.

4 21. Preserve the stabilized North Pier, including
5 the granite curbing installed in the 1960s.

6 22. Consider alternatives for protecting the North
7 Pier and the adjacent shoreline from erosion
8 resulting from the wake of large ships passing
9 through the Savannah River, as further
10 discussed under Climate Change and Related
11 Environmental Issues, below.

12 **Recommendations Related to the** 13 **Structure**

14 **Concrete**

15 Concrete deterioration and distress should be
16 repaired using concrete repair techniques and
17 procedures that include the following steps:

18 **Cleaning**

- 19 • The concrete should be cleaned with a
20 biocide / detergent at affected areas to remove
21 organic growth. Cleaning mock-ups should be
22 performed to evaluate cleaning systems to be
23 used overall and to determine concrete
24 appearance for matching of concrete repair
25 materials. The gentlest effective cleaning
26 system should be used. Cleaners containing
27 strong acids (hydrofluoric acid, hydrochloric
28 acid, ammonium bifluoride) should not be
29 used.

30 Three general types of cleaning systems are
31 available for removal of soiling and staining
32 from building facades: microabrasive,
33 chemical, and water methods. The selection of
34 a cleaning method must take into
35 consideration both the type of soiling to be
36 removed and the nature and condition of the
37 substrate.

38 The removal method selected should be based
39 on successful trials and should follow the
40 Secretary of the Interior's Standards for the
41 Treatment of Historic Properties, which states
42 that the gentlest most effective cleaning

43 methods should be selected. Methods and
44 materials that result in damage to the substrate
45 or that are harmful to humans, animals, and
46 the environment should not be used.

47 Microabrasive methods include the physical
48 removal of soiling from the surface.
49 Microabrasive methods commonly used in
50 facade cleaning include a variety of abrasive
51 media delivered to the surface at very low
52 pressures, either in a stream of water used to
53 soften the soiling and buffer the impact of the
54 media, or dry. Although these techniques are
55 typically not damaging to sound concrete,
56 trials are required to confirm the effectiveness
57 of the system and also that it will not damage
58 the substrate. (Some microabrasive
59 techniques, such as "soda blasting," have been
60 found to be damaging to substrates.)

61 A wide range of chemical cleaning products
62 are available to address atmospheric soiling,
63 biological growth, and coating removal, as well
64 as graffiti removal (see further discussion of
65 graffiti mitigation, below). The chemicals
66 selected should not result in damage to the
67 substrate material and should not be
68 hazardous to workers or the environment.
69 Poultices—an active chemical mixed with an
70 inert vehicle such as clay or diatomaceous
71 earth—are generally effective in removing
72 deep set or severe localized staining. Specific
73 chemical cleaners are effective in removing
74 particular staining types; for example,
75 efflorescence deposits (calcium carbonate
76 leaching at locations of water movement
77 through cracks) can usually be removed with
78 mild acidic cleaners. Localized ferrous staining
79 can typically be removed by an oxalic acid
80 solution or poultice. Biological growth can be
81 removed by chemical cleaners; however,
82 treatment with a biocide will inhibit
83 recurrence of the biological growth. It should
84 be noted that the biocide will need to be
85 reapplied on a cyclical basis to continue to
86 inhibit new growth.

87 Water methods typically include low pressure
88 washing, steam cleaning, and hot water

1 pressure washing. These methods can be
2 effective on light soiling.

3 **Monitoring**

4 • Cracks should be monitored to confirm that
5 they are non-moving. Crack length as well as
6 width measurements (with a crack gauge /
7 comparator) should be taken on a regular basis
8 (e.g., seasonally), together with photographs to
9 document existing conditions.

10 • Where leaching is observed, deposits should
11 be monitored and cracks investigated to
12 identify sources of moisture entering the
13 structure at these locations.

14 **Repair of Displacement**

15 • The displacement observed along the vertical
16 joint near the east end of the south wall should
17 be investigated and repaired as needed. Based
18 on conditions currently observed, structural
19 stabilization is not needed at this time. Repairs
20 will likely include removal of concrete in a
21 vertical configuration and replacement with a
22 formed patch (see discussion of repair of
23 deteriorated concrete, below). This condition
24 should be monitored and any further
25 displacement, as indicated by additional
26 cracking or opening of the joint, should be
27 documented. Should extensive movement be
28 observed, stabilization may be required.

29 **Repair of Deteriorated Concrete**

30 • Concrete repair mixes should be developed to
31 match the color, finish, and texture of the
32 original concrete.

33 Trial repairs and mock-ups should be
34 performed to determine the exact concrete
35 mix designs and repair techniques. Multiple
36 samples of various mixes will be required.
37 Initial small samples should be prepared off-
38 structure and in unobtrusive locations on-
39 structure, followed by larger mock-ups of
40 selected repair mixes and techniques on the
41 battery, as needed to achieve a match to
42 original surface finishing, texture, and color.

43 • Areas of spalling, severe cracking, and
44 previous patches should be removed and
45 proper repairs installed (see previous item).
46 The concrete repair material should be placed
47 within formwork constructed for the specific
48 repair location; trowel-applied patches should
49 not be used, as these will be less durable than
50 formed and placed repairs.

51 Repair of localized concrete deterioration
52 requiring patch repairs should include the
53 following steps:

54 • A 3/4-inch deep sawcut should be made
55 around the entire perimeter of each repair
56 area, close to the perimeter of the spall in
57 order to retain as much sound concrete
58 beyond the spalled area as possible. The
59 sawcut may align with edges of the
60 formboard profile when appropriate.

61 • Chipping hammers should be used to
62 remove concrete within the spalled area to
63 a depth of at least 3/4 inches beyond the
64 exposed reinforcing steel. (Sound
65 concrete beyond the repair area should be
66 protected during this work.)

67 • The exposed concrete surfaces and
68 exposed reinforcing steel within the repair
69 area should be abrasively blasted and air
70 blasted to remove corrosion and roughen
71 and clean the surface. (Sound concrete
72 beyond the repair area should be
73 protected during this work.)

74 • The exposed steel reinforcing bars should
75 be inspected for loss of section due to
76 corrosion and repaired, supplemented, or
77 replaced as necessary.

78 • After cleaning, the exposed steel
79 reinforcing bars should be immediately
80 covered with two coats of a corrosion-
81 inhibiting coating in accordance with the
82 coating manufacturer's recommendations.

83 • Formwork should be installed to match
84 the original profile of the surface,
85 including matching the original board
86 form finish.

1 • Repair concrete, customized to match the
2 original concrete color, finish, and texture
3 (as discussed above), should be placed and
4 consolidated.

5 • The concrete repair should be wet cured.

6 (Repair of spalls and severe cracks not
7 associated with embedded steel would follow
8 the same process as described above, although
9 preparation and treatment of embedded
10 reinforcing would not be required.)

11 • Non-moving cracks should be repaired by
12 installation of a cementitious patch material.
13 The type of repair will need to be determined
14 by the size of the cracks; some previously
15 routed cracks that comprise large openings
16 may require formed patches, while somewhat
17 smaller non-moving cracks may be repairable
18 by cementitious grout. Epoxy repairs do not
19 appear indicated by conditions observed.
20 Hairline cracks do not require repair.

21 • Moving cracks should be repaired by
22 installation of sealant. Cementitious crack
23 repairs (i.e., concrete or mortar) will not
24 accommodate movement; sealant repairs will
25 accommodate movement at cracks, but are
26 more difficult to make visually unobtrusive.
27 Careful color matching and proper installation
28 will help conceal these repairs. Techniques to
29 make the sealant less visually apparent, such as
30 broadcasting sand into the sealant before
31 curing, should be evaluated through trial
32 repairs.

33 **Repair of Deteriorated Cementitious Parge** 34 **Coat**

35 • Several treatment approaches can be
36 considered for the cementitious parge coat,
37 depending upon the Park's short- and long-
38 term goals for repair and maintenance of the
39 battery. Although the parge coat is non-
40 original, likely dating from work on the battery
41 in the 1960s, it is intact in many areas and
42 provides protection for the original concrete.
43 If the parge coating is to remain in place rather
44 than be removed (see below), it could be

45 repaired to provide consistent cover over the
46 original concrete.

47 At areas of failed parge coating where spalling
48 and severe cracking exists, the deteriorated
49 and debonded patch material should be
50 removed and the original concrete substrate
51 examined to determine its condition and
52 whether it requires repair. Development of a
53 protocol for removal of the failed coating at
54 trial areas would also inform future planning,
55 should the Park determine that it wishes to
56 remove the parge coating. Trial repairs would
57 assess whether it is possible to remove the
58 existing parge coat without damage to the
59 underlying original concrete.

60 In addition, selective removal of deteriorated
61 or failed parge coat would permit
62 documentation of the exposed original
63 surface, which could be compared to archival
64 documentation to determine if it retains its
65 historic appearance.

66 The spalled areas of parge coat could then be
67 replaced with a compatible render, matching
68 the original surface appearance in color,
69 texture, and finish. The new coating would
70 provide protection for the underlying original
71 concrete, and would need to be removable
72 without damage to the substrate (i.e.,
73 reversible).

74 Very fine crazing and hairline cracks may be
75 left unrepaired, as these conditions do not
76 permit moisture to enter the coating.

77 • Extant drain holes in the lower level
78 magazines should be kept clear and open, as
79 part of cyclical maintenance.

80 **Surface Treatment for Moisture Resistance**

81 The use of a surface treatment to provide
82 protection against moisture penetration into the
83 concrete overall (e.g., a silane-based treatment)
84 does not appear to be warranted, given the very
85 thick concrete of the structure and the fact that the
86 battery is partially enclosed and covered by a
87 berm. Use of clear, penetrating sealers is generally

1 avoided on concrete surfaces unless explicitly
2 needed to improve resistance to moisture
3 penetration, primarily because these penetrating
4 sealers are a non-reversible treatment (although
5 the sealers do lose effectiveness over time).

6 (See further discussion of clear sealers used in
7 graffiti mitigation, below.)

8 **Graffiti Mitigation**

9 Graffiti does not appear to be a current or past
10 problem at Battery Hambright. However, at the
11 Park’s request, graffiti mitigation measures are
12 discussed here should graffiti become a problem in
13 the future.

14 Although graffiti can occur in many forms, the
15 most typical are applied coatings including but not
16 limited to ink, indelible marker, wax markings, and
17 paint. Graffiti can also occur in the form of
18 abrasive markings.

19 Approaches that can be considered to mitigate the
20 effects of graffiti include cleaning to remove the
21 markings, application of a sacrificial surface
22 treatment to make removal of future graffiti that
23 may occur easier, and application of a film-
24 forming coating to conceal existing graffiti that
25 cannot be sufficiently removed by cleaning.

26 The selection of a cleaning method to remove
27 graffiti must take into consideration both the type
28 of graffiti to be removed and the nature and
29 condition of the substrate. In regard to removal of
30 painted graffiti, the sooner a cleaning product can
31 be applied, the more likely it is to be successful.¹⁷²

172 In addition to this report, several sources exist to help guide the selection of appropriate cleaning materials for removal of graffiti. Examples include National Park Service *Preservation Brief 38: Removing Graffiti from Historic Masonry* (available online at <http://www.nps.gov/tps/how-to-preserve/briefs/38-remove-graffiti.htm>), and *Keeping it Clean: Removing Exterior Dirt, Paint, Stains, and Graffiti from Historic Masonry Buildings* (available online at <http://www.nps.gov/tps/how-to-preserve/preservedocs/Keeping-It-Clean.pdf>).

32 As with other treatments, the graffiti removal
33 method selected should be based on successful
34 trials and should follow the Secretary of the
35 Interior’s Standards for the Treatment of Historic
36 Properties, which states that the gentlest, most
37 effective cleaning methods should be selected.
38 Methods and materials that result in damage to the
39 substrate or that are harmful to humans, animals,
40 and the environment should not be used.

41 Due to the bond between the graffiti and the
42 substrate, microabrasive methods are often
43 unsuccessful in removing graffiti without affecting
44 the underlying surface. Also, in the removal of
45 isolated graffiti, even when used at very low
46 pressures, microabrasive cleaning may etch a
47 shadow of the graffiti image into the substrate.
48 Chemical cleaning methods include a wide range
49 of products (paint strippers or coating removers)
50 that can be used to address graffiti. As with other
51 chemical cleaners, the products selected must not
52 result in damage to the substrate material and
53 should not be hazardous to workers or the
54 environment. (Many paint removers contain
55 components that are considered potential health
56 hazards.) Poultices are generally effective in
57 removing graffiti and can be applied to specific
58 locations and remain active in place for several
59 hours, thus helping to dissolve and draw out the
60 stain. Water methods alone are generally not
61 found to be effective in removing most painted
62 graffiti, as water lacks the ability to dissolve most
63 common graffiti coatings.

64 Overpainting—covering the graffiti with paint
65 instead of removing it—may be appropriate for
66 substrates that were painted historically. However,
67 this treatment is not an appropriate means to
68 address graffiti on a historic structure such as
69 Battery Hambright, which was not originally
70 painted.

71 Various clear film-forming protective coatings
72 (also known as sacrificial or barrier coatings) have
73 been developed in an attempt to protect the
74 underlying substrate from the graffiti application,
75 and facilitate the removal of the graffiti. In
76 accordance with the Secretary of the Interior’s
77 Standards for the Treatment of Historic
78 Properties, treatments applied to historic buildings

1 should be reversible. Long-lasting film-forming
 2 clear protective coatings are not reversible and
 3 their effect over multiple decades of weathering is
 4 not well documented or understood. Therefore,
 5 long-lasting clear protective coatings are not
 6 recommended. Sacrificial clear protective coatings
 7 are water-based and, if additional graffiti occurs,
 8 are removed as part of the graffiti cleaning process.
 9 The coating is then reapplied after each graffiti
 10 removal event. However, as graffiti has not been a
 11 problem in the past at Battery Hambright, the use
 12 of clear protective treatments for this purpose is
 13 likely not warranted.

14 As public access is readily available to Battery
 15 Hambright and Park personnel are not present on
 16 site much of the time, increased security does not
 17 appear appropriate as a means to discourage
 18 graffiti. However, as graffiti has not been a
 19 problem in the past, it is hoped that visitors will
 20 continue to respect the historic structure. In
 21 addition, prompt removal of graffiti (should it
 22 occur) may tend to discourage repetition of this
 23 vandalism.

24 **Steel and Other Metals**

25 The steel I-beams in concrete ceilings, and other
 26 steel accessories and fixtures, are vulnerable to
 27 corrosion as the battery is located in a coastal
 28 marine environment. As such, it is exposed to
 29 chloride salts in the air that are deposited on the
 30 steel and coated steel surfaces and have the
 31 potential to accelerate corrosion.

- 32 • Where minor surface corrosion exists on
 33 exposed steel I-beams, the following is
 34 recommended:
- 35 • The existing surface coating and rust scale
 36 should be removed to bare steel using
 37 abrasive blasting in preparation for a new
 38 coating system. Containment will be
 39 necessary during the surface coating
 40 removal and preparation process and new
 41 coating application. Prior to paint
 42 removal, the existing coatings should be
 43 sampled to check for potentially
 44 hazardous materials, such as existing lead-
 45 containing paints. If hazardous materials

46 are present, it may be necessary to first use
 47 chemical paint strippers and / or water
 48 blasting to remove the coating, followed
 49 by abrasive blasting to prepare the steel
 50 surface to receive the new coating
 51 system.¹⁷³

- 52 • The steel surfaces should be pressure
 53 washed to remove chloride
 54 contamination.
- 55 • Where previously coated, exposed steel
 56 surfaces should be coated with a zinc-rich
 57 primer and high-performance coating
 58 system. Mock-ups of coating removal,
 59 surface preparation, and application of the
 60 new coating system should be performed
 61 to evaluate work processes and to serve as
 62 a standard for the overall work.

63 Refer to discussion of concrete repairs, above, for
 64 recommendations for repair of steel reinforcement
 65 within concrete elements.

66 Remnant metal hinges that were part of the door
 67 hinge system remain embedded in the concrete
 68 walls at the door jambs. These hinges appear to be
 69 bronze and are not corroding or damaging the
 70 adjacent concrete. The hinges should be retained
 71 and monitored to determine if any treatment (e.g.,
 72 cleaning and protection with a clear coating) is
 73 required in future.

74 **Wood**

75 Existing wood elements at Battery Hambright
 76 consists of the non-historic walkway components.
 77 Wood elements should be monitored for
 78 deterioration and repaired or replaced as
 79 necessary. Although the existing walkways are
 80 non-original, they were constructed to replace

173. Although abrasive blasting is not appropriate for historic masonry materials (with the exception of some very low pressure microabrasive systems), abrasive blasting is appropriate for preparation of steel such as embedded reinforcement in spall locations prior to application of protective coatings to the steel and installation of a formed concrete patch. The concrete beyond the patch location is protected during this process.

1 deteriorated original wood walkway and should
2 therefore be retained.

3 **Recommendations for Further** 4 **Research**

5 The Fort Pulaski National Monument archives
6 have been very well organized by Park staff and
7 provide a great deal of information about the
8 park's historic resources, including Battery
9 Hambright. Additional research conducted at the
10 National Archives on behalf of this study has
11 provided some additional information. For Battery
12 Hambright, further research would be useful to
13 identify additional documentation related to the
14 history and evolution of Fort Screven and the
15 relationship of Battery Hambright to the
16 fortifications on Tybee Island. In addition, further
17 research would be useful to support more detailed
18 understanding of repairs made to Battery
19 Hambright during the Mission 66 era and to
20 confirm the extent to which work proposed in the
21 1990s was implemented.

22 **Climate Change and Related** 23 **Environmental Issues**

24 Located near the Atlantic coastline, on low-lying
25 terrain, the Fort Pulaski National Monument
26 including Battery Hambright is vulnerable to
27 current and future threats associated with climate
28 change. In particular, damage and flooding have
29 occurred in the park following severe storms in
30 early 2016, Hurricane Matthew in October 2016, a
31 tornado in May 2017, and Hurricane Irma in
32 September 2017.

33 Hurricane Matthew moved up the coast of the
34 southeastern United States, making landfall on the
35 South Carolina coast on October 8, 2016. The
36 hurricane caused extensive flooding and damage
37 from Florida to the Carolinas. The storm surge
38 and concurrent high tide led to a record tide level
39 and a storm surge of nearly 8 feet at Fort Pulaski.
40 Wind speeds neared 100 miles per hour, and at
41 least 300 trees were downed across Cockspur
42 Island. At Fort Pulaski, in addition to lost trees and
43 flooding of the landscape, damage included

44 displacement of both of the fort's moat bridges
45 and a majority of the wooden floors, and flooding
46 of interior spaces with mud and debris. Battery
47 Hambright was not significantly affected by the
48 storm, although mud had to be cleaned from the
49 interior and debris from the surrounding
50 landscape. However, the storm underscored
51 ongoing and growing concerns about potential
52 damage from storm-related flooding on the
53 earthen component of the battery in the long term,
54 (e.g., increased erosion, increased pressure on and
55 potential destabilization of the south face retaining
56 wall, effects on the foundations, etc.).

57 In response to Hurricane Matthew and resultant
58 damage and flooding, Fort Pulaski National
59 Monument was closed to the public while the
60 National Park Service conducted extensive repair
61 and clean-up efforts. The park reopened to the
62 public in early November 2016. The park was
63 again closed to the public in May 2017 following
64 the aforementioned tornado, and for a month
65 following Hurricane Irma in September 2017.

66 Each severe weather event was followed by
67 assessment of damage by Park personnel and
68 incident teams, and intensive recovery work to
69 repair damage built resources, conduct site clean-
70 up, remove of downed trees and branches, and
71 efforts to address flooding of the site and
72 structures, and the increasing periods during
73 which standing water remains on site following a
74 storm event (Figure 73 and Figure 74). Even after
75 the park reopened following Hurricane Irma,
76 potable water was not available, and some
77 amenities such as public restrooms and hiking
78 trails remained unusable due to flooding and other
79 storm-related damage. Standing water has
80 remained present in some areas of the park since
81 Hurricane Irma in September 2017.

82 Increasingly frequent strong storms and heavy
83 rainfall have been noted for several years across
84 the southeastern United States. A study entitled,
85 *Climate Change Impacts to Natural Resources in*
86 *South Carolina*, by the South Carolina Department
87 of Natural Resources and published in 2013 noted:
88 "A predicted result of climate change is the
89 increase in intense storm events causing greater
90 water inputs in shorter periods of time, affecting

1 flood frequency and duration.”¹⁷⁴ Coastal Georgia
 2 is similarly affected; studies indicate, for example,
 3 that sea levels have risen by 8 inches at Fort
 4 Pulaski since 1935.¹⁷⁵



5 **FIGURE 73.** Aerial view of Fort Pulaski after Hurricane
 6 Irma, showing the dike system holding in floodwater.
 7 (Source: Fort Pulaski National Monument)



8 **FIGURE 74.** View of the dike south of the fort
 9 retaining floodwater after Hurricane Irma (channel is
 10 on right in photo). (Source: Fort Pulaski National
 11 Monument)

12 Because loss of historic resource integrity may
 13 occur as a result of the impacts of severe storms
 14 associated with climate change, documentation
 15 and analysis of change over time using data
 16 collection are anticipated to be an important part

174. Bob Perry, compiler and editor, *Climate Change Impacts to Natural Resources in South Carolina* (Columbia: South Carolina Department of Natural Resources, 2013), 16, accessed 2016, <http://www.dnr.sc.gov>.

175. University of Georgia, Georgia Sea Grant, “Sea Level Rise in Georgia,” accessed 2016. http://georgiaseagrant.uga.edu/article/sea_level_rise_in_georgia/.

17 of the response to mitigating anticipated loss or
 18 diminishment. Data collected through
 19 documentation can also be used as a tool used to
 20 plan for the impacts associated with climate
 21 change. This Historic Structure Report, including
 22 the historical narrative, condition assessment, and
 23 recommendations, together with photographs and
 24 measured drawings, is an example of the type of
 25 documentation that is relevant to this purpose. As
 26 part of future efforts to build on and update the
 27 documentation provided in this Historic
 28 Structures Report, the National Park Service
 29 should consider such approaches as more detailed
 30 documentation resulting from new three-
 31 dimensional scanning technology. Monitoring of
 32 weather-related deterioration will also support an
 33 understanding of what additional protection and
 34 repairs may be needed in response to ongoing and
 35 specific weather events.

36 Although documentation and monitoring of
 37 existing conditions are important, more immediate
 38 and active measures are required at Fort Pulaski
 39 National Monument in response to climate
 40 change. Battery Hambright escaped severe damage
 41 during the hurricanes and tornado discussed
 42 above; however, the battery is not only
 43 threatened—it is also being impacted by climate
 44 change (Figure 75 and Figure 76).

45 The 2011 Cultural Landscape Report for Fort
 46 Pulaski National Monument recommended
 47 preserving all historic landscape features and the
 48 historic dike and ditch system, and retaining water
 49 to a depth of 18 inches in the ditches.¹⁷⁶ Given the
 50 changes that have occurred within the site since
 51 the CLR was completed, including what appears to
 52 be accelerating evidence of climate change
 53 resulting in rising water levels, more frequent and
 54 severe storms, and associated flooding and periods
 55 of standing water, as well as impacts associated
 56 with shipping use of the river channel and related
 57 dredging efforts, the Park is exploring alternatives
 58 for adaptation of the ditch and dike system to
 59 protect the site and its resources. As part of this
 60 effort, the Park has engaged a team of cultural
 61 landscape and restoration ecology consultants,
 62 through a memorandum of agreement between

176. Hitchcock, *Cultural Landscape Report*, 122.

1 the National Park Service and the University of
2 Georgia, which is working on an integrated
3 management plan designed to help address the
4 issues surrounding flooding and resource
5 protection that will likely entail adaptations to the
6 ditch and dike system.



7 **FIGURE 75.** View from top of Battery Hambright after
8 Hurricane Matthew, looking north. (Source: Fort
9 Pulaski National Monument)



10 **FIGURE 76.** Rack line on Battery Hambright, several
11 days after Hurricane Matthew after floodwaters had
12 receded. (Source: Fort Pulaski National Monument)

13 Prior to implementing any adaptive strategies that
14 may be proposed by the consultant cultural
15 landscape and restoration ecology team, the Park
16 is working on cleaning out the ditches and
17 providing a more effective tide gate. Using a survey
18 prepared by the US Army Corps of Engineers, the
19 Park is also adding fill to some low-lying areas that
20 have been noted as vulnerable to flooding. The
21 Park is also researching previous strategies used to
22 control flooding on the island. Recommendations
23 in the Park archives dating from twenty years ago
24 suggested breaching the outer part of the dike
25 system and allowing it to become salt marsh. The
26 goal of the effort was to enhance views, which had
27 been lost due to tree growth once the National
28 Park Service stopped allowing that area to be

29 flooded. Current work by the University of
30 Georgia consultants suggests that restoration of
31 the salt marsh may serve as the most sustainable
32 approach and an initial line of defense against
33 flooding. Added benefits will include enhanced
34 habitat for wildlife and plants.

35 Erosion along the north shore of the channel has
36 significant potential to affect Battery Hambright
37 (Figure 77). The US Army Corps of Engineers
38 completed a beneficial dredge project of the
39 channel in October 2015. The spoils from the
40 dredging project were deposited near the
41 shoreline associated with the park rather than the
42 north side of the river as is usually done. This
43 effort was conducted in consultation with the
44 National Park Service Southeast Archeological
45 Center, which oversaw the protection of
46 significant historic features such as the north pier,
47 in order to create a “barrier island” that would
48 promote oyster colonization as a stabilization
49 technique. It is known that oyster bars were
50 historically found in this location, but had been
51 undercut and eroded as far as the dike located in
52 front Battery Hambright due to the wake caused
53 by large vessels, including container ships, passing
54 through the channel. Although the Park is studying
55 ways to potentially restore oyster bars, the
56 challenges posed by the passage of so many ships
57 through the channel suggest that oyster bar
58 restoration is unlikely to succeed at this location.
59 (An approach similar to oyster bar restoration is
60 being considered for the area around Cockspur
61 Island Lighthouse.)

62 The placement of the dredge spoils offshore in the
63 North Channel is intended to restore the
64 underwater topography that helps to dissipate
65 wave action from passing ships. So far the effort
66 appears to be very successful. Before the beneficial
67 dredge placement, waves at high tide were lapping
68 over the dike adjacent to the north slope of the
69 battery. Today, plantings in the marsh area are
70 coming back behind the deposit, and the new
71 barrier island has retained about 40 percent of its
72 overall size despite continued passage of ships in
73 the channel. Even if erosion continues to occur,
74 spoils placement can be repeated every few years
75 when the Corps dredges the river. It is hoped that



1 **FIGURE 77.** Container ship traveling along the North Channel near Fort Pulaski. (Source: Fort Pulaski National
2 Monument)

3 this will become part of a broader solution to
4 addressing the flooding problem and maintaining
5 the shoreline.¹⁷⁷

6 Climate change poses challenges and potential
7 disruptions that are only now beginning to be
8 understood and anticipated. It will be necessary to
9 consider and imagine a wide spectrum of possible
10 responses to the threat, which may need to be
11 implemented concurrently and nimbly, with the
12 ability to refine and update regularly as conditions
13 change. Historic cultural responses used by coastal
14 communities to combat flooding, and ecological
15 processes within wetland environments, coupled
16 with appropriate application of emerging
17 technology, should all be considered in devising

18 responses to the challenge of protecting significant
19 cultural resources.

20 Efforts conducted for Fort Pulaski National
21 Monument, including Battery Hambright, will
22 benefit from coordination with other planning and
23 documentation projects to address effects of
24 climate change under consideration or in the
25 process of being implemented by the National
26 Park Service in the Southeast Region. Future
27 severe weather events, rising sea levels, and other
28 impacts related to climate change should be
29 anticipated and considered in planning for
30 protection and maintenance of the site and its
31 resources.

32

177. Correspondence by the authors with Superintendent Melissa Memory, Fort Pulaski National Monument, August 2017 and April 2018. Shoreline erosion resulting from large ships traveling along the North Channel, already a significant concern, may become more severe in future. Increases in ship traffic are likely if a proposed new port is constructed across the channel from Fort Pulaski.

Treatment and Use

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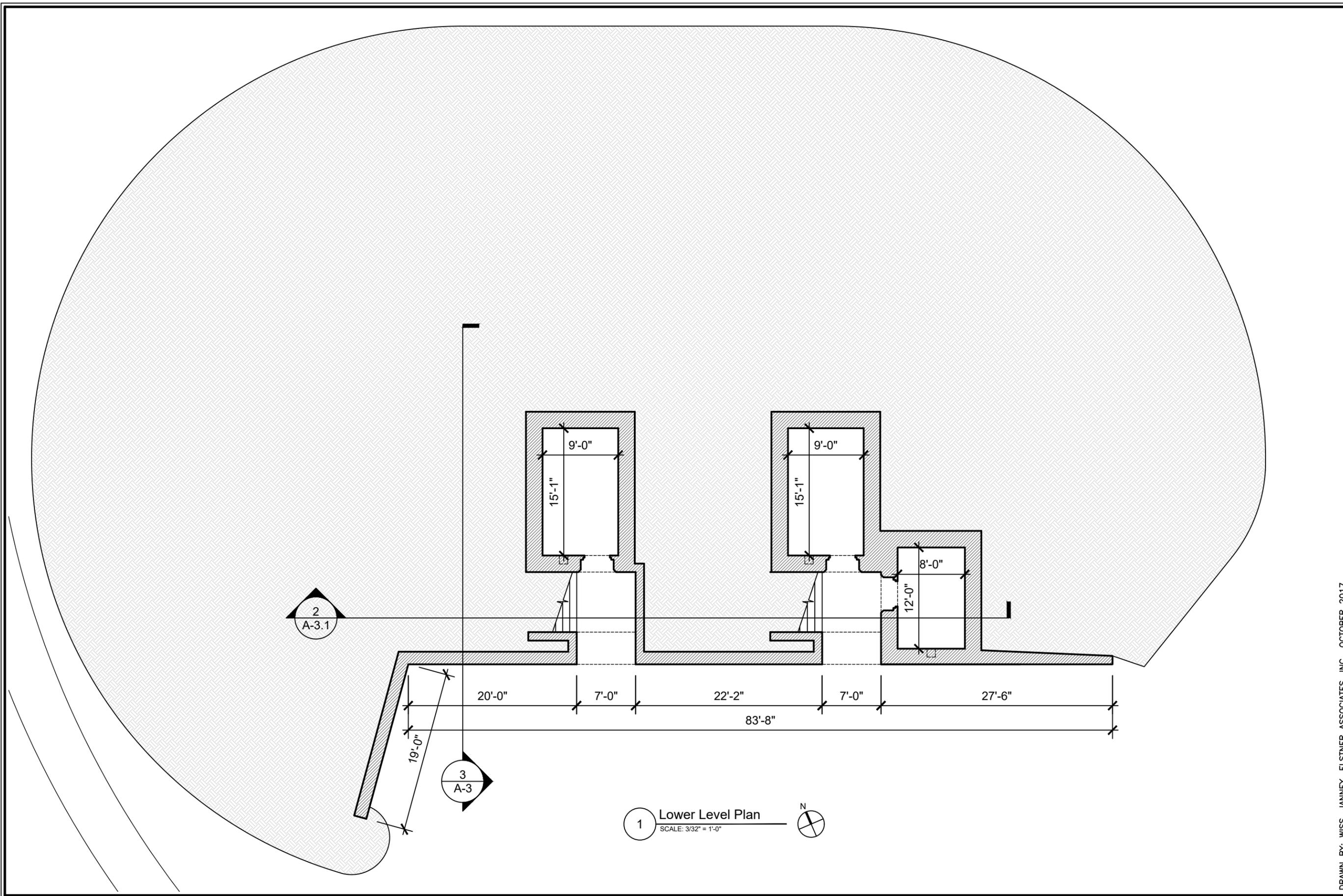
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Appendix A: Measured Drawings



1 Lower Level Plan
SCALE: 3/32" = 1'-0"

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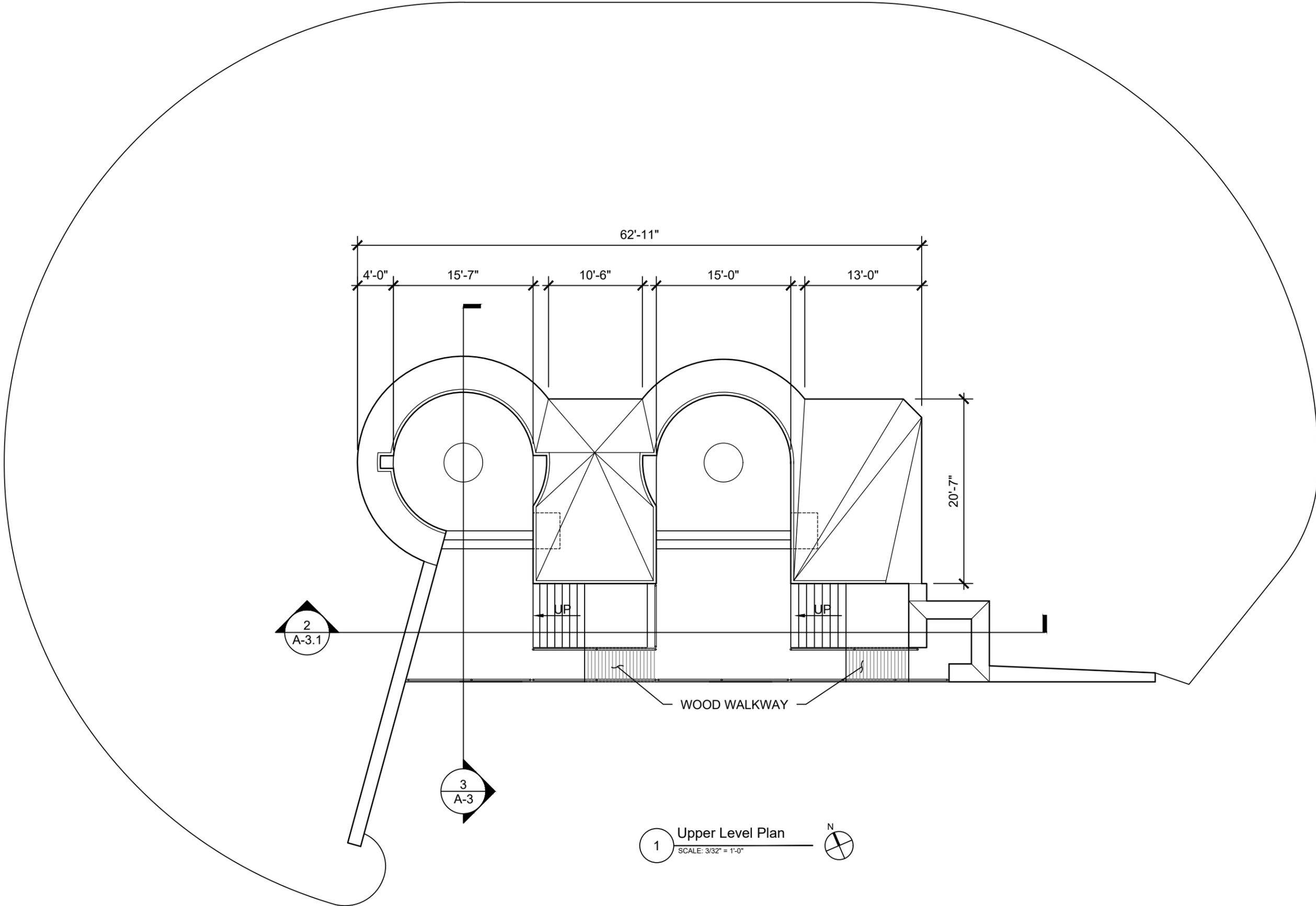
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BATTERY HAMBRIGHT
FORT PULASKI NATIONAL MONUMENT

GEORGIA

HISTORIC STRUCTURE REPORT

SHEET
1 OF 3



1 Upper Level Plan
 SCALE: 3/32" = 1'-0"

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 A-3.1

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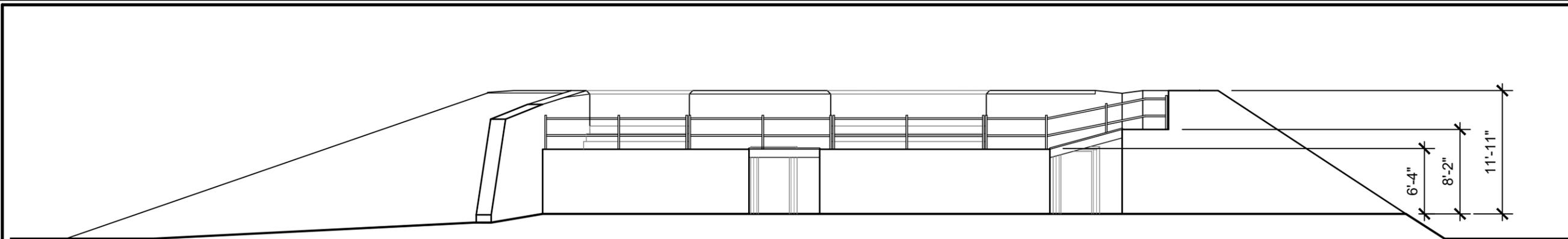
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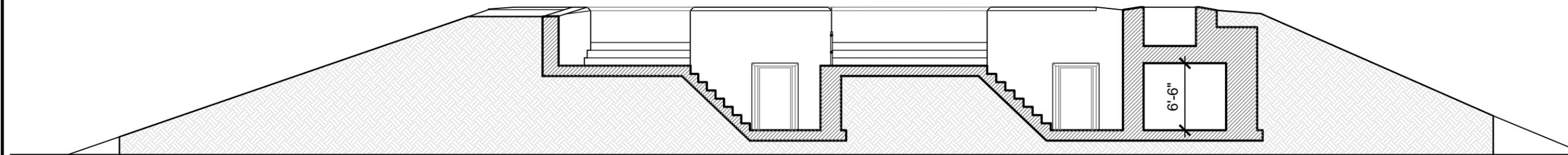
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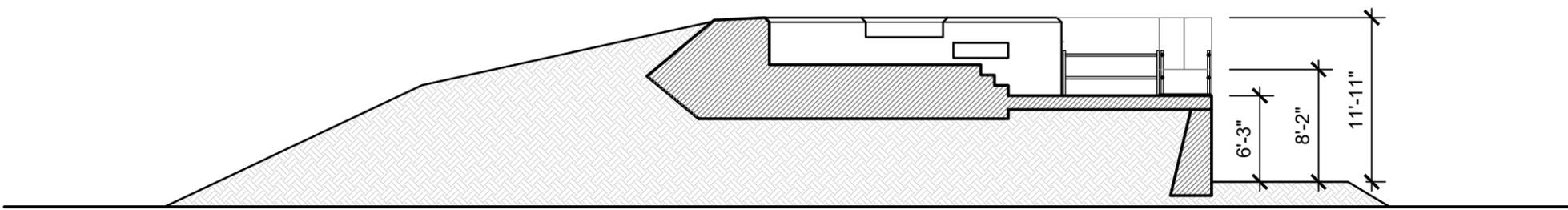
SHEET
 2 OF 3



1 South Elevation
SCALE: 3/32" = 1'-0"



2 East - West Section
SCALE: 3/32" = 1'-0"



3 North - South Section
SCALE: 3/32" = 1'-0"

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3 OF 3

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