Cultural Resources, Partnership and Science Division
Southeast Region
National Park Service
100 Alabama Street, SW
Atlanta, Georgia 30303
(404) 562-3117

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

This manuscript has been authored by Panamerican Consultants, Inc., and Wiss, Janney, Elstner Associates, Inc., under Contract Number P16PD1918 with the National Park Service. The United States Government retains and the publisher, by accepting the article for publication, acknowledges that the United States Government retains a non-exclusive, paid-up, irrevocable, worldwide license to publish or reproduce the published form of this manuscript, or allow others to do so, for United States Government purposes.
Battery Horace Hambright
Fort Pulaski National Monument, Georgia

Historic Structure Report
## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>List of Figures</td>
<td>vii</td>
</tr>
<tr>
<td>Project Team</td>
<td>x</td>
</tr>
<tr>
<td>Foreword</td>
<td>xi</td>
</tr>
<tr>
<td><strong>Management Summary</strong></td>
<td></td>
</tr>
<tr>
<td>Historical Data</td>
<td>1</td>
</tr>
<tr>
<td>Treatment and Use</td>
<td>4</td>
</tr>
<tr>
<td>Administrative Data</td>
<td>4</td>
</tr>
<tr>
<td>Project Scope and Methodology</td>
<td>5</td>
</tr>
<tr>
<td><strong>Developmental History</strong></td>
<td></td>
</tr>
<tr>
<td>Early History of Cockspur Island</td>
<td>9</td>
</tr>
<tr>
<td>Planning of Fort Pulaski</td>
<td>10</td>
</tr>
<tr>
<td>Construction of Fort Pulaski</td>
<td>12</td>
</tr>
<tr>
<td>The Civil War, 1861–1865</td>
<td>13</td>
</tr>
<tr>
<td>Fort Pulaski after the Civil War</td>
<td>16</td>
</tr>
<tr>
<td>Endicott Board, 1885-1886</td>
<td>17</td>
</tr>
<tr>
<td>Endicott System Defensive Theory</td>
<td>18</td>
</tr>
<tr>
<td>Construction of Fort Screven, 1893–1902</td>
<td>19</td>
</tr>
<tr>
<td>Construction of Battery Hambright, 1899–1902</td>
<td>22</td>
</tr>
<tr>
<td>Early Preservation of Fort Pulaski, 1898–1924</td>
<td>24</td>
</tr>
<tr>
<td>Fort Pulaski National Monument, 1924–1933</td>
<td>25</td>
</tr>
<tr>
<td>Stewardship of the National Park Service</td>
<td>26</td>
</tr>
<tr>
<td>Battery Horace Hambright Chronology</td>
<td>34</td>
</tr>
<tr>
<td>Battery Hambright Landscape</td>
<td>37</td>
</tr>
<tr>
<td>Battery Hambright Description</td>
<td>39</td>
</tr>
<tr>
<td>Lower Level</td>
<td>40</td>
</tr>
<tr>
<td>Upper Level</td>
<td>43</td>
</tr>
<tr>
<td>Condition Assessment</td>
<td>46</td>
</tr>
<tr>
<td><strong>Significance and Integrity</strong></td>
<td></td>
</tr>
<tr>
<td>National Register of Historic Places</td>
<td>53</td>
</tr>
<tr>
<td>Significance Criteria</td>
<td>53</td>
</tr>
<tr>
<td>National Register Significance Evaluation</td>
<td>54</td>
</tr>
<tr>
<td>Period of Significance</td>
<td>55</td>
</tr>
<tr>
<td>Character-Defining Features</td>
<td>56</td>
</tr>
<tr>
<td>Assessment of Integrity</td>
<td>56</td>
</tr>
<tr>
<td><strong>Treatment and Use</strong></td>
<td></td>
</tr>
<tr>
<td>Requirements for Treatment and Use</td>
<td>59</td>
</tr>
<tr>
<td>Laws, Regulations, and Functional Requirements</td>
<td>59</td>
</tr>
<tr>
<td>Alternatives for Treatment and Use</td>
<td>61</td>
</tr>
<tr>
<td>Ultimate Treatment and Use</td>
<td>62</td>
</tr>
<tr>
<td>Recommendations</td>
<td>64</td>
</tr>
<tr>
<td>Recommendations for Further Research</td>
<td>72</td>
</tr>
<tr>
<td>Climate Change and Related Environmental Issues</td>
<td>72</td>
</tr>
</tbody>
</table>
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 demi-lune, 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
<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>The south elevation of Battery Hambright</td>
<td>39</td>
</tr>
<tr>
<td>27</td>
<td>The east retaining wall</td>
<td>40</td>
</tr>
<tr>
<td>28</td>
<td>The west retaining wall</td>
<td>40</td>
</tr>
<tr>
<td>29</td>
<td>The east passageway from the upper level</td>
<td>40</td>
</tr>
<tr>
<td>30</td>
<td>The west passageway. Note the wood-framed walkway at the top</td>
<td>40</td>
</tr>
<tr>
<td>31</td>
<td>View north toward the door opening at the east magazine</td>
<td>41</td>
</tr>
<tr>
<td>32</td>
<td>Remnant metal hinges remain at the door jambs</td>
<td>41</td>
</tr>
<tr>
<td>33</td>
<td>The magazine. Note the niche in the far wall and the embedded steel beams in the ceiling</td>
<td>41</td>
</tr>
<tr>
<td>34</td>
<td>A ventilation pipe in the top of the niche</td>
<td>42</td>
</tr>
<tr>
<td>35</td>
<td>The ventilation pipe extends up through the concrete walls and out past the wall</td>
<td>42</td>
</tr>
<tr>
<td>36</td>
<td>The east magazine. Note the niche to the right of the door opening</td>
<td>42</td>
</tr>
<tr>
<td>37</td>
<td>The entrance to the east magazine. Note the drain in the floor of the room</td>
<td>42</td>
</tr>
<tr>
<td>38</td>
<td>The west magazine. Note the niche to the right of the door opening</td>
<td>43</td>
</tr>
<tr>
<td>39</td>
<td>The west staircase that leads to the upper level</td>
<td>43</td>
</tr>
<tr>
<td>40</td>
<td>The wood-framed walkway that connects the center portion of the upper level to the observation station to the east</td>
<td>43</td>
</tr>
<tr>
<td>41</td>
<td>The underside of the wood-framed walkway that connects the center portion of the upper level to the observation station to the east</td>
<td>43</td>
</tr>
<tr>
<td>42</td>
<td>The observation station at the southeast corner of the battery</td>
<td>44</td>
</tr>
<tr>
<td>43</td>
<td>The center portion of the upper level of Battery Hambright. Note the wood-framed walkways in the foreground and background</td>
<td>44</td>
</tr>
<tr>
<td>44</td>
<td>Stairs lead up to the east gun platform</td>
<td>44</td>
</tr>
<tr>
<td>45</td>
<td>The east gun platform</td>
<td>44</td>
</tr>
<tr>
<td>46</td>
<td>The lowering niche at the west side of the east gun platform</td>
<td>45</td>
</tr>
<tr>
<td>47</td>
<td>An ammunition recess is in the east wall at the gun platform</td>
<td>45</td>
</tr>
<tr>
<td>48</td>
<td>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</td>
<td>45</td>
</tr>
<tr>
<td>49</td>
<td>The concrete roof over the west magazine</td>
<td>45</td>
</tr>
<tr>
<td>50</td>
<td>The wood-framed walkway connecting the west and center portions of the upper level of the battery</td>
<td>46</td>
</tr>
<tr>
<td>51</td>
<td>The stairs leading to the west gun platform</td>
<td>46</td>
</tr>
<tr>
<td>52</td>
<td>The west gun platform</td>
<td>46</td>
</tr>
<tr>
<td>53</td>
<td>The lowering niche and ammunition recess at the east wall of the west gun platform</td>
<td>46</td>
</tr>
<tr>
<td>54</td>
<td>A lowering niche on the west wall of the west gun platform</td>
<td>46</td>
</tr>
<tr>
<td>55</td>
<td>Movement and displacement at a joint in the east retaining wall</td>
<td>47</td>
</tr>
<tr>
<td>56</td>
<td>Cracks were observed in the parging throughout the structure</td>
<td>48</td>
</tr>
<tr>
<td>57</td>
<td>The majority of the cracks observed in the parging coat were narrow</td>
<td>48</td>
</tr>
<tr>
<td>58</td>
<td>Delaminated parging coating was observed in several locations</td>
<td>48</td>
</tr>
</tbody>
</table>
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
Project Team

National Park Service

  Laurie Chestnut, Contracting Officer, Southeast Regional Office
  Dr. Ali Miri, Historical Architect, Southeast Regional Office
  Melissa Memory, Superintendent, Fort Pulaski National Monument
  Joel Cadoff, Chief of Interpretation and Education, Fort Pulaski National Monument
  Katherine Purcell, Acting Chief of Facility Management / Exhibit Specialist, Fort Pulaski National Monument
  Laura Waller, Museum Technician, Fort Pulaski National Monument
  Emily Harte, Chief of Facility and Resource Management, Fort Pulaski National Monument

Panamerican Consultants, Inc.

  Kelly Nolte, Project Manager / Historian
  Mark Steinback, Editor

Wiss, Janney, Elstner Associates, Inc.

  Deborah Slaton, Historian / Conservator
  Tim Penich, Historical Architect
  Michael Horst, Structural Engineer
  Liz Sargent, Historian / Historical Landscape Architect
  Rebecca Wong, Preservation Associate
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

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

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

The National Register nomination for Fort Pulaski indicates that the historic property is significant in the areas of architecture, engineering, and military history. The nomination also indicates that Fort Pulaski is noteworthy for the fact that its construction, designed to resist cannon fire, rapidly failed when attacked by relatively new rifled artillery—an event that signaled the need for a new approach to fortification engineering. Battery Hamblight is indicated as a contributing structure in the nomination.

Historical Data

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

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

After the election of Abraham Lincoln, southern states began to consider secession from the Union. South Carolina seceded on December 20, 1860,
Engineers made plans to construct a new fort on nearby Tybee Island. In 1873, the remaining Army units stationed at the fort were withdrawn and Fort Pulaski was officially closed, although it remained under army administration as a military reservation.

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

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

By 1893, the US Board of Engineers had prepared plans for implementing Endicott System features to be used in the defense of the Tybee Roads area. As approved by the Secretary of War, the plans for Fort Screven called for the construction of seven batteries—later named Batteries Hambright, Brumby, Garland, Fenwick, Backus, Gantt, and Habersham—to house various sizes of gun and support submarine mine placement operations. Mines were placed in the North Channel of the Savannah River in 1898 in response to the threat posed by the Spanish American War. A force was garrisoned at Fort Pulaski and operated the minefield from the demilune, which also contained emplaced artillery. When installed, the mines were anchored to the bottom of the river, with an attached buoy floating just below the water surface. When a passing ship hit the buoy, an electrical signal was sent to the mining casemate in Fort Pulaski, allowing the operators to set off the mine.

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

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

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

In 1915, Fort Pulaski was identified as eligible for preservation as a national monument under the Antiquities Act. In 1924, Fort Pulaski, including Battery Hambright, was designed Fort Pulaski National Monument, to be administered by the War Department. In 1933, administration of Fort Pulaski National Monument, as well as many of the historic military sites that had been the responsibility of the War Department, was transferred to the National Park Service.
During the 1930s, Fort Pulaski National Monument benefited from several New Deal-era programs, including the Public Works Administration (PWA) and Civilian Conservation Corps (CCC). Through the funds and manpower afforded by these programs, Battery Hambright was cleared of overgrown vegetation and the structure was repaired and preserved. During World War II, however, these programs were terminated, and work at Fort Pulaski halted. The US Navy established a section base on Cockspur Island in late 1941. The base, which was used to support coastal patrol ships, remained active until 1947. At the end of World War II, Fort Screven was closed and the land, including the six adjacent batteries (all except Battery Hambright), was sold to the city, which, in turn, sold it to a development company. The company sold off parts of the fortification. The batteries were incorporated into residential developments, were modified or razed, or were otherwise left to deteriorate through neglect. In 1947, the Navy removed the structures it had used to operate a section base on Cockspur Island; Fort Pulaski National Monument opened to the public soon thereafter.

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

Today, Battery Hambright is accessible to the public via a paved walk system that connects the visitor parking area with the battery, the old North Pier and an associated overlook, and Fort Pulaski. It is closely edged by the dike and ditch system built to protect the fort and environs from flooding. Much of the landscape associated with Battery Hambright is maintained in mown turf, including the important view toward the river that constitutes the historic field of fire associated with the battery’s artillery.

**Treatment and Use**

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

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

**Administrative Data**

**Locational Data**

*Buidling Name:* Battery Horace Hambright  
*Location:* Fort Pulaski National Monument, Georgia  
*LCS Number:* Battery Horace Hambright is listed as: LCS 012171 (HS-05)  
*GPS Coordinates:* 17S 510149 / 3543781
Related Studies


Cultural Resource Data
Fort Pulaski, with Battery Hambright as a contributing structure, was listed in the National Register of Historic Places in 1975 for its significance in architecture, engineering, and military history.

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

Proposed Treatment: Preservation (Rehabilitation of landscape features)

Project Scope and Methodology
The goal of the HSR is to develop planning information for use in the repair, maintenance, and preservation of this historically significant structure. First developed by the National Park Service in the 1930s, HSRs are documents prepared for a building, structure, or group of buildings and structures of recognized significance to record and analyze the property’s initial construction and subsequent alterations through historical, physical, and pictorial evidence; document the performance and condition of the structure’s materials and overall physical stability; identify an appropriate course of treatment; and, following implementation of the recommended work, document alterations made through that treatment.

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

The following project methodology was used for this study.

Research and Document Review.
Archival research was performed to gather information about the original construction and past modifications and repairs for use in assessing existing conditions and developing treatment recommendations for the battery. Documents reviewed included maps, drawings, specifications, historic photographs, and other written and illustrative documentation about the history of construction and repairs to the battery. The research for this study built upon prior historical and archival research by the National Park Service and others, as outlined in the bibliography provided with this report. Primary reference material for this study was obtained from collection at the Fort Pulaski archives and facilities. Additional research material was obtained from the National Park Service Technical Information Center (TIC) in Denver, Colorado, and the National Archives at College Park, Maryland.

Condition Assessment and Documentation. Concurrent with the historical research, a condition survey of Battery Horace Hambright was performed and observations documented with digital photographs, field notes, and annotations on baseline drawings. For purposes of the field survey, copies of architectural drawings from original construction were provided to the project.
team by the Park. The condition assessment
addressed the exterior and interior spaces and
features of the battery.

Development of History, Chronology
of Construction, and Evaluation of
Significance. Based on historical
documentation and physical evidence gathered
during the study, a context history and a
chronology of design and construction were
developed. An evaluation of the significance was
also prepared, taking into consideration guidelines
provided by National Register Bulletin: How to
Apply the National Register Criteria for Evaluation. This evaluation of history and significance
provided the basis for the development of
recommended treatment alternatives.

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

Treatment Recommendations. The
Secretary of the Interior’s Standards for the
Treatment of Historic Properties guided the
development of treatment recommendations for
the significant exterior and interior features of the
battery, as well as for the features of the landscape
included in this study. Following the overall
treatment approach of Preservation for the battery,
the specific recommendations were developed to
address the observed existing distress conditions
as well as long-term preservation objectives.

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

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

Treatment Recommendations. The
Secretary of the Interior’s Standards for the
Treatment of Historic Properties guided the
development of treatment recommendations for
the significant exterior and interior features of the
battery, as well as for the features of the landscape
included in this study. Following the overall
treatment approach of Preservation for the battery,
the specific recommendations were developed to
address the observed existing distress conditions
as well as long-term preservation objectives.

---

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).

5. Deborah Slaton, Preservation Brief 43: The
Preparation and Use of Historic Structure
Reports (Washington, D.C.: National Park
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)
Management Summary

Left blank intentionally
Developmental History

Early History of Cockspur Island

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

When Spanish explorers traveled along the Georgia coast during the early 1500s, the Euchee tribe inhabited nearby Tybee Island. By 1580, Franciscan missionaries from Spain began to establish missions along the southern Georgia coast. The northernmost mission established was the Mission Santa Catalina de Guale, which sat near the mouth of Ogeechee River, approximately 15 miles southwest of Cockspur Island. The Franciscan missions continued to thrive along the Georgia and Florida coasts until the 1670s when the British began to settle in the Carolinas.

Colonization of the Carolinas by the British led to conflicts with the Spanish. A series of raids on the missions by American Indians allied with the British eventually caused the Spanish to leave Georgia and retreat into Florida. By 1686, Juan Márquez Cabrera, the Spanish Governor of Florida, ordered the removal of all missions north of Amelia Island.7

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

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

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


Developmental History

The fort was abandoned in 1776 at the beginning of the Revolutionary War.\footnote{Ibid., 6, citing National Park Service, “Cultural Landscape Inventory (CLI) Fort Pulaski National Monument” (Atlanta, Georgia: Southeast Regional Office, 2000), 5.}

Several high-ranking British officials, including James Wright, the Royal Governor of Georgia, took refuge on Cockspur Island during the Revolutionary War. For a short time, the island was the Loyalist capital of the Georgia colony until the British reoccupied Savannah in 1778. At that time, the island was once again abandoned.\footnote{Ralston Lattimore, \textit{Fort Pulaski National Monument} (Washington, D.C.: National Park Service, 1954), 2.}

Following the conclusion of the Revolutionary War, the United States sought to establish a coastal defense system. In 1794, Congress passed legislation calling for a system of fortifications known as the “First American System of Fortifications.” Soon, the Secretary of War ordered new forts to be built to protect major coastal cities. The new forts would be wooden structures consisting of batteries, magazines, and barracks or blockhouses. Small cannon were placed on the upper stories of the structures.\footnote{Hitchcock, 8, citing Prentice, 52.}

As part of this new coastal defense system, a new fort was constructed on Cockspur Island to protect Savannah. Named after Revolutionary War hero Nathanael Greene, Fort Greene was constructed between 1794 and 1795 near the site of Fort George. As of 1800, sixty-five officers occupied Fort Greene, which was largely used as a quarantine station during most of its history. In 1804, a hurricane struck Cockspur Island, destroying Fort Greene and killing half of the soldiers stationed at the island.\footnote{Lattimore, 3.}

In 1807, fearing an attack by the British, Congress authorized the construction of the “Second American System of Fortifications.” The new defense system would consist of fortifications with high stone and masonry walls and multilevel tiers with internal casemates and gun positions. The second defense system was under development when the War of 1812 broke out.\footnote{Meader and Binkley, 5-6, citing John Whiteclay Chambers, ed., \textit{The Oxford Companion to American Military History} (Oxford: Oxford University Press, 1999), 275-276.}

**Planning of Fort Pulaski**

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

The War of 1812 resulted in significant damage to the United States’ coastal defense system, including the new fortifications under development. As a result, Congress created the Board of Fortifications for Sea Coast Defense in 1816. Shortly thereafter, the federal government engaged French military engineer Gen. Simon Bernard. Bernard, along with U.S. Army engineers, designed a new coastal defense system known as...
the “Third System of Coastal Defense." The
defense system would include the construction of
permanent, modern masonry fortifications along
the Atlantic and Pacific coasts. One of the 200 new
forts proposed was to be constructed at the mouth
of the Savannah River. Other forts constructed as
part of this system of defense included Fort Adams
in Newport, Rhode Island; Fort Jefferson in the
Dry Tortugas, Florida; and Fort Sumter near
Charleston, South Carolina. Forty-two forts were
ultimately constructed or modified as part of this
system.

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

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

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

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

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

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

---

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).
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
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.
Construction of Fort Pulaski

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

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

In 1833, masonry work began with the foundation at the north and northeast sides of the fort. The brown brick used to construct the walls were manufactured at the Hermitage Plantation, approximately two miles west of Savannah. The red brick used in the embrasures, arches, and parade ground walls came from brick manufacturers in Baltimore, Maryland, and Alexandria, Virginia. The granite was quarried in New York, while the brown sandstone came from the Connecticut River Valley.

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

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

23. Young, 1936, 43.
24. Ibid.
25. Lattimore, 9.
26. Ibid.
The Civil War, 1861–1865

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

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

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

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

Robert E. Lee, now a Confederate General, returned to Fort Pulaski in November 1861. In an attempt to strengthen the Confederacy’s coastal defense system, Lee adopted a new strategy, which involved shifting forces from surrounding islands to the mainland. As part of this strategy, an artillery battery at nearby Tybee Island was dismantled, and its heavy guns were moved to Fort Pulaski.29

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

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

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

The Attack on Fort Pulaski

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

27. Ibid., 12–13.
28. Ibid., 17–19.
29. Ibid., 19.
31. Ibid., 23–24.
Developmental History

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

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

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

In spring 1862, as the Union troops made their final preparations for the bombardment of Fort Pulaski, Confederate forces prepared to defend the fort from the attack. The Confederate troops believed that the anticipated bombardment of the fort would only pave the way for a direct assault by Union infantry forces, and began to make a number of interior fortification changes and protect some areas with sandbags.37

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

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

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

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

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

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)

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

FIGURE 6. Fort Pulaski, 1862, showing damaged casemate masonry at the southeast corner. (Source: Fort Pulaski National Monument)
The Confederate forces captured at Fort Pulaski were sent to Governor’s Island in New York Harbor. The officers were later transferred to Johnson’s Island near Sandusky, Ohio, while the other troops were sent to Fort Delaware. Several of the Confederate prisoners were exchanged for Union prisoners in August, while the officers were exchanged at Vicksburg, Mississippi, in September.41

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

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

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

During the summer and fall of 1864, at various times Union and Confederate troops and prisoners were moved into the line of fire along the Georgia and South Carolina coast, thus ending bombardments through prisoner exchanges. In 1864, in one of these attempts, 549 Confederate prisoners (later known as the “Immortal Six Hundred”) were transferred from Morris Island near Charleston, South Carolina, to Fort Pulaski.45

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

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

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

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

41. Ibid.
42. Henry S. Taftt, 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.
made available to make repairs to the drawbridge wharf, seawalls, and roads.\textsuperscript{48}

Work at the demilune included the construction of a new earthen battery, with space for nine guns, which was constructed into the demilune. The first two emplacements were completed in the salient in 1873, with seven additional emplacements later completed in 1874–1875. Excavation was completed for two emplacements, but the platforms were never built. Work on the fort ceased in the mid-1870s, with only the demilune battery completed.\textsuperscript{49}

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

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

During the 1880s, the only residents of Cockspur Island were the ordnance sergeant who inhabited the fort and two lighthouse keepers.\textsuperscript{51}

A hurricane hit the Georgia coast on August 27, 1881, causing significant damage to several structures on Cockspur Island. The storm destroyed the lighthouse keeper’s house as well as the construction village that had been built in 1831 for the fort. The fort itself was left largely undamaged by the storm.

In 1884, the Corps of Engineers assumed responsibility for the maintenance of Fort Pulaski. At this time, General Gillmore returned to the fort to inspect the site.\textsuperscript{52} The Corps of Engineers, in an attempt to improve navigation, constructed a series of jetties at the mouth of the Savannah River. The construction of the jetties led to sand depositions that expanded the east side of Cockspur Island.

On August 27, 1893, a major storm, later known as the Sea Islands Hurricane, struck the coast, bringing a 16-foot storm surge and killing between 1,000 and 2,000 persons in Georgia and South Carolina. On Cockspur Island, the lighthouse keeper’s house was again destroyed. After the 1881 and 1893 hurricanes, the lighthouse keepers resided inside casemates at the fort.\textsuperscript{53}

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

**Endicott Board, 1885–1886**

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

\begin{itemize}
  \item \textsuperscript{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.
  \item \textsuperscript{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.
  \item \textsuperscript{51} National Park Service, Cultural Landscape Inventory, Fort Pulaski National Monument Landscape (Atlanta: NPS-SERO, 2012), 49–50.
  \item \textsuperscript{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.
\end{itemize}
Developmental History

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

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

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

The Endicott Board’s findings were startling in its sweeping new recommendations: a completely new system of artillery fortifications should be constructed at twenty-seven ports or harbors in the continental United States and these gun and mortar batteries should be supplemented with submarine minefields, floating batteries, and small torpedo boats. The total cost of this program including the cost of manufacturing 577 heavy rifled guns, was estimated to be $126,377,800.  

On March 29, 1887, Secretary of War Endicott gave orders to the US Army Board of Engineers to begin preparation of plans for the defense of the most important American harbors: Boston, New York, Portland, Washington, D.C., and Hampton Roads. Congressional appropriations for construction, however, did not commence until 1890, except for some appropriations for guns. The ports selected in 1890 were Boston, Washington, D.C., New York, and San Francisco. Port appropriations followed in 1893, 1894, 1895, 1896, and 1897, with the last appropriation for port construction in 1898. Funds were approved “for the defense of Tybee Roads and the Savannah River” in 1893. The program was continually underfunded and behind schedule as members of Congress argued over money and the usefulness of these fortifications to their districts.  

Endicott System Defensive Theory

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

55. Ibid., n.p.  
of batteries farther up the river or harbor. These
minefields were protected from counter-mining
and removal by a battery with a wide range of fire-
fast and small caliber guns. The batteries within
the Endicott system were much smaller, very low
in profile, and easily concealed. Their size and
profile made it more difficult for a ship to
concentrate its fire on such a small target, while
the dispersed Endicott batteries could easily fire
intensively on enemy ships.

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

Construction of Fort Screven,
1893–1902

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

Plans for a permanent US fortification at the north
end of Tybee Island date from well before the
Endicott period. In 1872, the Army Corps of
Engineers drew up plans for an installation, and in
1875, land acquisition followed, but no actual
work was initiated for a fort.

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

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

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

61. Snell, 6-7.
62. Ibid., 7.
64. Richard J. Lenz, "Tybee Island: Fort Screven,
North and Mid-Beach Areas," Sherpa Guides,
Online, 2002.
66. Snell, 8.
67. Ibid., 10.
68. Ibid., 11.
Developmental History

James Screven, who was killed in action in Liberty County near Midway, Georgia, in 1778. Actual construction began in 1898 and continued slowly through 1902, as the construction engineer continually asked for the anticipated appropriations, and received money in sporadically or not at all.

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

**Battery Brumby.** Battery Brumby was the only battery at Fort Screven in service during the Spanish-American War. It is largest of the battery complexes and was erected by the Venerable Construction Company in 1897–1898. It is a poured-in-place, reinforced concrete gun emplacement. The battery is named after Lt. Thomas M. Brumby, who served with the US Navy during the Spanish-American War as Adm. George Dewey’s Flag Lieutenant in the Battle of Manila Bay.

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

Each of the four 8-inch guns on Battery Brumby weighed 32,000 pounds and had a range of about ten miles. These guns were mounted on Buffington Crozier disappearing carriages. After firing, the recoil would lower the gun back and down below the protective parapet. The operation of the battery required four officers and 157 men. The guns were dismantled and shipped to France during World War I. In recent years the westernmost gun emplacement in the battery has been used as a foundation for a private beach residence.

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

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

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

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

---


71. Cloues, 2.


73. Cloues, 2.

74. Ibid.

75. Payette, np.

76. Cloues, 2.

77. Jones, np.

78. Ibid.


80. Cloues, 3.

81. Ibid.
honor of Brig. Gen. John R. Fenwick, 4th Artillery US Army, who served in the War of 1812. 82 The battery was armed with one 12-inch barbette carriage gun. 83 The gun had an effective range of seven to eight miles and was removed in 1942. 84 Today this battery has been converted into a private residence.

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

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

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

Battery Gandt. Battery Gandt was constructed at the same time as Battery Backus. Similar to Battery Backus, it is a poured-in-place, reinforced concrete gun emplacement. The battery is named for 1st Lt. Levi Gantt, 7th US Infantry, the grandson of Benjamin Stoddert, Secretary of the Navy. Gantt was killed on the summit of Cerro Gordo during the siege at Chapultepec, Mexico, in 1847. 90

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

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

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

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

Historic Structure Report: Battery Horace Hambright

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

Construction of Battery Hambright, 1899–1902

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

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

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

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

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

The construction of Battery Hambright is described as:

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

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

98. Ibid.
99. Snell, 11.
100. Ibid., 11 and 13.
101. Ibid., 13.
102. Berhow, 211.
The three magazines are constructed of formed and placed concrete walls. The ceilings are of formed concrete placed between steel I-beams on 24-inch centers spanning the room. It is believed that this is the only structural steel used in the original construction.103

The battery was completed, with the exception of setting the fixed ironwork for mounting the guns, by March 31, 1900. No further work was done on the battery in 1901 and 1902 because the 3-inch rapid-fire guns and their pedestal mounts had not yet been furnished by the Ordnance Department. In 1902, drain holes were cut in the floors of the magazines to help with flooding caused by a poor foundation that had settled. Captain Gillette proposed taking up the floors and relaying them with a positive slope to the rear; this would also solve the problem of the need for more headroom.

The Chief of Engineers ordered Captain Gillette to present a project for relaying the floors in the battery at a cost not to exceed $300, the initial cost estimate for completing this project.104 No records were found that could verify that this work was completed.

In 1904, War Department General Orders 194, Series 1904, named the fast gun battery at Fort Pulaski “Battery Horace Hambrigt.”105 The battery was named in honor of 2nd Lt. Horace George Hambrigt, born September 24, 1869, in Loudon, Tennessee. Hambrigt was first admitted to the US Military Academy at West Point in June, 1887, but resigned from it on November 15, 1887. He was re-admitted to the Academy the following year, attending from June 16, 1888, to June 11, 1892, graduating last in his class. Upon graduation, he was promoted to 2nd Lieutenant, Infantry, and assigned to the 22nd Infantry. Hambrigt served on garrison duty at Fort Keogh and Camp Merritt, Montana, and at Fort Yates, North Dakota. At Fort Yates, he was thrown from his horse and died of his injuries several days later, on April 15, 1896.106

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

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

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

Battery Hambrigt never received the guns it was created to hold. In fact, it never saw military action of any type during the period after its construction. By the first quarter of the twentieth century.
Developmental History

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

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

Early Preservation of Fort Pulaski, 1898–1924

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

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

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

On July 17, 1915, the War Department announced that Fort Pulaski, including Battery Hambright, had been selected for consideration as a national monument under the American Antiquities Act of 1906. However, efforts to preserve the site were postponed due to World War I.111 In 1917, after visiting the fort, Col. John Millis, the District Engineer of the US Army Corps of Engineers in Savannah, recommended its immediate preservation. Millis, with the help of Thomas Purse, secretary of the Savannah Board of Trade, sought War Department funds for use in the improvement of Fort Pulaski. Slowly, in 1918 and 1919, funds became available to clear brush and make improvements to the site.

---

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.

111. Lattimore, 43.
Fort Pulaski National Monument, 1924–1933

As improvements were made at Fort Pulaski, more groups and individuals became interested in its preservation. The City of Savannah expressed interest in acquiring the fort and converting the site to a public park, while the Savannah Board of Trade inspected the site and concluded that a preserved Fort Pulaski could attract tourists from around the world. Soon, the Savannah Board of Trade, along with Col. F.W. Alstaetter, Colonel Millis’s successor as District Engineer, campaigned for the fort to be declared a national monument. In January 1924, Congressman Charles G. Edwards of Georgia introduced legislation that would designate Fort Pulaski as such. Later that year, on October 15, Fort Pulaski was made a national monument in a proclamation by President Calvin Coolidge. The fort was to be managed by the US War Department, which also maintained other Civil War sites such as Antietam, Gettysburg, and Shiloh national military parks.

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

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

113. Lattimore, 43.
recommendations for its preservation. Major Sultan estimated that initially $6,930 would be necessary to preserve the landscape surrounding the fort, including the nearby ditches and embankments.114 These funds would not be sufficient to restore the fort itself, as the US Army Corps of Engineers sought first to make the property and structure accessible to visitors.

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

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

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

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

New Deal Programs at Fort Pulaski, 1933–1941

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


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.


Developmental History

The work completed by these groups was extensive and included interior, exterior, and grounds renovations and changes. However, work on Battery Hambright was not undertaken until the very end of these programs. Work at Battery Hambright and the demilune (which contained the mining casemate) was completed as PCP No. M-31, Work Order No. B-2, Job No. 4, 1940. The description of work to be completed at Battery Hambright was described as follows:

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

Preservation of the Structure – Part of the concrete gun mount on the northern side of the works has cracked very badly and the supporting earth underneath has washed out. It is our intention under this job approval to correct this dangerous condition by removing a portion of the concrete steps and gun placement floor. Earth or a mixture of sand and shell will be placed in the space to original level. The concrete referred to above will be broken up with sledge hammers and removed and further broken into small pieces of about 1-1/2 inches for use as a coarse aggregate. New concrete will be placed to original grade of gun mounts and gun emplacements. The concrete steps will be replaced where broken. 150 bags of cement and 2000 BM of form lumber at a cost of $140.00 will be necessary, sand is available on the island.

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

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

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


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

Developmental History

FIGURE 11. According to 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.” The site had to be cleared once again in the 1960s. (Source: Fort Pulaski National Monument Archives)

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

Sand was hauled to the site for concrete floors, gun mounts, and other uses from a pit one mile away. Two deteriorated wood footbridges were replaced with metal and wood bridges made from “supplies now on hand.” Broken guard rails on the battery were replaced with steel rails to match the originals. The new rails were coated in red lead and painted steel gray with rust-resisting paint (Figure 12).

Aside from labor, the project costs included:

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>150 bags of cement</td>
<td>$90.00</td>
</tr>
<tr>
<td>2000 BM pine form lumber</td>
<td>50.00</td>
</tr>
<tr>
<td>48 carriage bolts (for bridges)</td>
<td>2.88</td>
</tr>
<tr>
<td>2 - 1 ½” pipe and fittings</td>
<td>7.38</td>
</tr>
<tr>
<td>Total cost</td>
<td>$150.26</td>
</tr>
</tbody>
</table>

123. NPS, “Preservation of Battery Hambright,” (Job Application).
124. Ibid.
126. NPS, “Preservation of Battery Hambright,” (Job Application).

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

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

127. This stucco covering is likely the surface replaced in the 1960s by the currently extant cementitious parged coat.
The entrance of the United States into World War II in December 1941 prompted the termination of New Deal-era programs such as the CCC and PWA. The US Navy established a section base on Cockspur Island in late 1941. The base, which was used to support coastal patrol ships, remained active until 1947. During this time, the fort was maintained by one laborer and was closed to the public.

FIGURE 15. “View northward from top of Battery Hambright showing vista out through the river,” 1940. (Source: Fort Pulaski National Monument Archives)

Fort Pulaski after World War II, 1947–1957

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

129. Meader and Binkley, 29.
Mission 66 at Fort Pulaski, 1956–1966

In the years following World War II, visitation at national parks grew significantly. In 1940, there were 17 million visitors to national parks; by 1955, there were over 55 million visitors. As park use increased, however, national park budgets remained unchanged.\(^\text{132}\)

By the 1950s, conditions in the national parks were generally in a state of deterioration. Improvements had not been made to public facilities since the New Deal-era programs of the 1930s. The desperate need for building maintenance and funding was further amplified by the rapid increase in visitors following World War II. At Fort Pulaski National Monument, the fort and its surroundings fell into disrepair.\(^\text{133}\)

In February 1955, Conrad Wirth, the director of the National Park Service, conceived a comprehensive conservation program to revitalize the national parks. The ten-year capital program, which would be called Mission 66, aimed to modernize and expand the national park system. Wirth put together a working committee as well as a steering committee to help outline the scope and budget of the program. He also instructed park superintendents to prepare lists of work that needed to be done in the various parks.\(^\text{134}\)

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

In 1956, the Mission 66 Final Prospectus for Fort Pulaski National Monument was completed. The document called for all park structures to be properly maintained and made safe, while new interpretive services were also proposed. Most importantly, the prospectus called for an increase in funds and personnel to allow for the proper maintenance and interpretation of the national monument.\(^\text{135}\) In 1964, a freestanding visitor center was constructed.

Several Mission 66 projects were undertaken at Fort Pulaski National Monument, beginning in the late 1950s. Some of the early projects included the reconstruction of the parking area; improvements to the water, power, drainage, dike, and telephone systems; a series of repairs to the fort; and repairs to the north pier.\(^\text{136}\)

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

A major contract was performed on the battery in the early 1960’s. Major components of that contract consisted of the application of a skim coat of portland cement stucco over the entire structure and reconstruction of the catwalks . . . the skim coat was an inappropriate treatment.\(^\text{137}\)

The National Register nomination prepared in 1974 for Fort Pulaski National Monument indicates that the following repairs were made to Battery Hambright by the park maintenance staff in 1960: “ . . . dense vegetation was stripped away; all cracks in the concrete calked [sic] and entire work given a coat of waterproofing; all steel elements cleaned and painted with antirust paint; and the east and brick face toward the river restored.”\(^\text{138}\)


\(^{133}\) Meader and Binkley, 24, citing “Superintendent Lattimore’s Monthly Reports,” August 1950.

\(^{134}\) Carr, 10.
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.  

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. 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.

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.” 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.

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.”)


143. National Park Service, Cultural Landscape Inventory Fort Pulaski National Monument (Atlanta, Georgia: Southeast Regional Office, 1997); Hitchcock, n.p.
implemented measures to address these concerns, as further discussed in the Treatment chapter of this report.

Changes to Fort Screven and Associated Batteries

Like Fort Pulaski, Fort Screven became a fortification of the past, but Fort Screven’s location alongside a highway with access to Savannah made its land desirable for single-family vacation homes or homes for those who desired a spectacular water view. Fort Screven was used during World War II by the US Engineers Diving and Salvage group as a training center for the salvage and repair of war-damaged ports. Immediately after the war, the fort was declared surplus and land was sold to the city, which in turn sold it to a development company. Almost immediately, private individuals, the municipality, the county, and other organizations began to buy, sell, and trade land associated with the fort and its six batteries. As the fort was slowly being disassembled, several groups and individuals became interested in preserving its remains. In 1982, the Fort Screven Historic District was placed on the National Register of Historic Places including the remaining collection of military buildings, six batteries (Brumby, Habersham, Gantt, Backus, Garland, and Fenwick—Hambright was not included), the Screven Lighthouse, and associated lighthouse properties (Figure 16). By 1982, many changes had occurred within the fortifications at Fort Screven, and the batteries, spread out along the waterfront, were particularly hard hit. In the 1920s, the dunes and sand embankments that sheltered the shoreward side of Battery Brumby were removed to create the causeway from the mainland, exposing that side to constant battering by the elements. Battery Garland had been turned into a museum, and it too was missing its shoreward side sand bank (Figure 17). Battery Fenwick had become the foundation of a house, with no remaining evidence of the gun emplacements. Similarly, a portion of Battery Backus had been incorporated into a house, with only the lower shore side and magazine entrance visible to the public. Only Battery Gantt and Battery Habersham were completely intact.

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


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


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

\textsuperscript{147} “Preservationist Try to Protect Battery Backus,” \textit{Savannah Now}, n.p.

\textsuperscript{148} The \textit{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)

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1847</td>
<td>Fort Pulaski completed</td>
</tr>
<tr>
<td>1861–1865</td>
<td>Civil War, Fort Pulaski severely damaged</td>
</tr>
<tr>
<td>1872–1875</td>
<td>Demilune modified</td>
</tr>
<tr>
<td>1873</td>
<td>Fort Pulaski closed and set aside by the US Army as military reservation for potential future use</td>
</tr>
<tr>
<td>1881</td>
<td>Fort Pulaski Military Reservation established</td>
</tr>
<tr>
<td>1885</td>
<td>National Board of Fortifications (Endicott Board) appointed</td>
</tr>
<tr>
<td>1893</td>
<td>Construction of Fort Screven initiated</td>
</tr>
<tr>
<td>1894-1895</td>
<td>Mining casemate at Fort Pulaski completed</td>
</tr>
<tr>
<td>1897</td>
<td>Construction of Battery Brumby initiated</td>
</tr>
<tr>
<td>1898</td>
<td>Construction of Batteries Garland and Fenwick initiated; Spanish-American War (April through August)</td>
</tr>
<tr>
<td>1899</td>
<td>Emergency battery constructed</td>
</tr>
<tr>
<td>1900</td>
<td>Construction of Batteries Backus, Fenwick, and Hambright initiated</td>
</tr>
<tr>
<td>1901</td>
<td>Engine room for mining casemate constructed</td>
</tr>
<tr>
<td>1904</td>
<td>Battery Hambright officially named for 2nd Lt Horace George Hambright</td>
</tr>
<tr>
<td>1914–1918</td>
<td>World War I</td>
</tr>
<tr>
<td>1915</td>
<td>Fort Pulaski selected for consideration as a National Monument</td>
</tr>
<tr>
<td>1924</td>
<td>Fort Pulaski, including Battery Hambright, designated a National Monument to be administered by the War Department</td>
</tr>
<tr>
<td>1933</td>
<td>Administration of Fort Pulaski National Monument transferred to the National Park Service</td>
</tr>
<tr>
<td>1933–1941</td>
<td>Battery Hambright repaired with the assistance of CWA, CCC, and PWA program funding and personnel</td>
</tr>
<tr>
<td>1935</td>
<td>The earthen berm portion of Battery Hambright graded and seeded with Bermuda grass</td>
</tr>
<tr>
<td>1941-1945</td>
<td>World War II</td>
</tr>
<tr>
<td>1941</td>
<td>Dense foliage covering Battery Hambright removed. Riprap placed along the river shoreline to prevent further damage to the north gun platform and stairs</td>
</tr>
<tr>
<td>1942</td>
<td>Cockspur Island turned over to the Navy; island closed to the public for the duration of the war</td>
</tr>
<tr>
<td>1947</td>
<td>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</td>
</tr>
<tr>
<td>1948</td>
<td>Fort Pulaski returned to the NPS</td>
</tr>
<tr>
<td>1956</td>
<td>National Park Service Mission 66 program initiated</td>
</tr>
<tr>
<td>1960s</td>
<td>Battery Hambright underwent second repair effort. Trees and shrubs removed from the earthen berm and surrounding landscape</td>
</tr>
<tr>
<td>1975</td>
<td>Fort Pulaski and Battery Hambright listed in the National Register of Historic Places</td>
</tr>
<tr>
<td>1977</td>
<td>Several large eastern red cedar trees removed from Battery Hambright</td>
</tr>
<tr>
<td>Year</td>
<td>Event</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
</tr>
<tr>
<td>1982</td>
<td>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</td>
</tr>
<tr>
<td>1995</td>
<td>Battery Hambright again repaired</td>
</tr>
<tr>
<td>1997</td>
<td>Historic American Buildings Survey Addendum for Fort Pulaski that includes Battery Hambright completed</td>
</tr>
<tr>
<td>2008</td>
<td>Battery Backus placed on the &quot;10 Georgia Places in Peril&quot; list</td>
</tr>
<tr>
<td>2009</td>
<td>Battery Backus offered for sale at auction for $2.1 million; no buyer emerges</td>
</tr>
<tr>
<td>2014</td>
<td>Owner of Battery Backus denied permit to build on the site as a result of the fragility of the dune system</td>
</tr>
</tbody>
</table>
Developmental History

Left blank intentionally
Physical Description and Condition Assessment

Battery Hambright Landscape

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

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

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

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

Visitors reach Battery Hambright by traveling the North Pier Trail from the main visitor parking area located to the south (Figure 20). The 0.75-mile...
A concrete-paved loop trail leads visitors through a wooded area before reaching the open, grassy area associated with Battery Hambright (Figure 21). The trail continues past the battery to the historic North Pier (Figure 22). Another portion of the trail continues in an easterly direction, to the north of Battery Hambright, into a wooded area, eventually returning to the parking area (Figure 23). A memorial to Reverend John Wesley is located along the south portion of the trail loop, in a small opening of the wooded area (Figure 24). Visitors can also reach a picnic area to the west by following the trail.

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

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

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

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

**FIGURE 24.** The John Wesley Memorial.
Battery Hambright Description

Measured drawings of the battery are provided in Appendix A.

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

The structure consists of two levels, with three enclosed rooms on the lower level. Two of these enclosed spaces are magazines and the other is described in archival documentation as a “bomb-proof” room.\(^{149}\) The upper level, which is not covered, houses two gun platforms and an observation station.

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

The concrete structure appears to be unreinforced, although 10-inch-tall steel I-beams are embedded in the concrete slabs that form the ceilings of the interior spaces at the lower level. The exposed portions of the steel I-beams are painted. Additionally, the original construction documents specified the use of asphaltum on the walls of the magazines, likely as waterproofing, before these areas of the structure were covered in earth. A non-original cementitious parget coating appears to have been added to the exposed concrete walls on the exterior of the structure. The parget coating appears to be approximately 1/4 inch thick.

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

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

\(^{149}\). “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.
FIGURE 27. The east retaining wall.

FIGURE 28. The west retaining wall.

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

---

Lower Level

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

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

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

---


FIGURE 29. The east passageway from the upper level.

FIGURE 30. The west passageway. Note the wood-framed walkway at the top.
The door openings that lead to the interior spaces on the lower level are similar (Figure 31). The outermost portion of each opening is typically 4 feet wide with a chamfered edge. The opening steps inward, narrowing to a width of 3 feet at the interior. No doors are present at the openings, although the original construction documents show that doors were once present. Remnant metal elements that were part of the door hinge system remain embedded in the concrete walls at the door jambs (Figure 32). Although referred to in Park correspondence as iron, the hinges have a green patination, suggesting that they are bronze. In addition, ferrous staining of the substrate that would be expected with embedded iron is not present.

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

---

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

**Upper Level**

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

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

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

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

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

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

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

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

The east gun platform is connected to the west gun platform by a stairway. The stairway is located within the tapered concrete roof and is approximately 15 feet by 20 feet 6 inches in plan. The stairs consist of three risers, typically 8 inches in height, and 10-inch-deep treads. At the west side is the lowering niche for the gun, which is situated 2 feet above the floor at the top of the wall (Figure 46).
At the west portion of the upper level, at the top of the west stair, is a concrete landing. The landing is trapezoidal in plan and narrows to the north. The landing leads to the wood-framed walkway between the west and center portions of the upper level (Figure 50). Steel pipe railings are present on each side of the walkway. A series of concrete stairs lead to the west gun platform from the landing (Figure 51). The stairs extend the entire width of the landing and consist of three risers, typically 8 inches in height, and treads 10 inches deep.

The west gun platform is circular in plan, with a diameter of approximately 15 feet (Figure 52). The gun platform is surrounded by a concrete wall, 4 feet 4 inches in height and 4 feet thick. At the east side, is the lowering niche situated 2 feet above the floor at the top of the wall. North of the lowering niche is an ammunition recess adjacent to the stair (Figure 53). A second lowering niche is located at the west side of the gun platform (Figure 54). The wall around the west gun platform is integrated into the west retaining wall that extends south from the main portion of the battery.
Physical Description and Condition Assessment

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

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

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

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

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

**Condition Assessment**

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

**Site and Landscape**

- The grassy area surrounding the battery structure, including the earthen berm, includes areas that have become denuded, or where the grass is patchy. These areas may become subject to erosion.

- There are trees growing around the battery that could potentially fall on the structure as a result of storm damage or disease. These trees require regular evaluation for their condition to determine the potential for them to become hazardous.
Grass is growing through the concrete walk in some locations.

The grass path leading to the North Pier has eroded to sand soil at the northern end, exposing the brick and concrete pads of the benches.

The North Pier is in ruinous condition. Although it has been stabilized, there remain abrupt changes in grade and materials, broken and deteriorated materials, and potential trip hazards remain. These safety concerns need to be communicated to visitors, while limitations may need to be placed on visitor access in certain locations.

The North Channel shoreline and North Pier are exhibiting problems with erosion. Increasing use of the North Channel by large container ships and associated wave action has led to ongoing shoreline erosion, threatening Battery Hambright and its environs. The Park has implemented measures to address these concerns, as further discussed in the Treatment chapter of this report.

**Battery**

A parge coating was applied to most of the exterior exposed concrete surfaces throughout the battery. The parge coat is thought to have been added in 1960 as part of extensive repairs undertaken at the battery.

Movement of concrete at a vertical joint near the east end of the south elevation was observed. The section of wall to the east appears to have been displaced outward, likely due to pressure from the earthen berm behind. A patch was previously installed at this location and was observed to be displaced outward, away from the surface of the wall (Figure 55). Although the displacement outward creates a noticeable difference in plane between adjacent sections of the wall on either side of the joint, the wall that appears to have moved outward is still essentially vertical, and does not currently require structural stabilization.

There are cracks in the parge coating throughout the structure (Figure 56). The cracks are present in walls as well as the floors of the upper level. The width of the cracks was found to be as great as 1/4 inch, but most cracks were narrower and many were hairline in width (Figure 57).

The parge coating is delaminated in many areas, exposing the original concrete beyond (Figure 58).

Cracking of the concrete was observed extending through the parge coat and into the structural concrete beyond, particularly at the south walls (Figure 59 and Figure 60).

---

Physical Description and Condition Assessment

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

2 FIGURE 57. The majority of the cracks observed in the parge coat were narrow.

3 FIGURE 58. Delaminated parge coating was observed in several locations.

4 FIGURE 59. Cracking extended through the parge coating and the concrete structure.

5 FIGURE 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.

6 FIGURE 61. Sealant has been installed at routed-out cracks throughout the structure.
Several of the larger cracks have been routed out and filled with sealant (Figure 61). Typically, the routed and sealed cracks are approximately 3/8 to 1/2 inch wide. The sealant is white in color. The sealant varied in condition but in many locations exhibited cohesive and adhesive failure.

Cracks appear to have been routed out but not filled with sealant in several locations, particularly along the south walls (Figure 62). The width of these routed cracks is as great as 1 inch.

Many of the previously installed patch repairs are cracked and show signs of failure (Figure 63). Small cracks were observed in the face of larger concrete patches.

Additionally, previous patch repairs were found to be delaminated from the substrate (Figure 64 and Figure 65). Patches were found to be visibly debonded and sounded hollow when tapped.

Small plants were observed growing in joints at isolated locations, particularly at the intersection between stairs and adjacent walls (Figure 66).

Biological growth was observed on skyward facing concrete surfaces (Figure 67). This growth was typically green or orange in color.
Leaching in the form of white deposits was observed along cracks in several locations. These deposits result from within the concrete being carried by water moving through the structure (Figure 68).

- Black staining caused by biological growth and soil accumulation was observed throughout the structure, particularly at vertical surfaces (Figure 69). This staining is particularly prevalent on upward facing surfaces where water can collect, and at areas of water runoff on vertical surfaces.

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

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

Recent Repairs

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

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

Left blank intentionally
Significance and Integrity

National Register of Historic Places

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

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

Significance Criteria

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

A. That are associated with events that have made a significant contribution to the broad patterns of our history; or

B. That are associated with the lives of persons significant in our past; or

C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. That has yielded, or may be likely to yield, information important in prehistory or history.

Criteria Considerations

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

a. A religious property deriving primary significance from architectural or artistic distinction or historical importance; or

Significance and Integrity

b. A building or structure removed from its original location but which is primarily significant for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or

c. A birthplace or grave of a historical figure of outstanding importance if there is no appropriate site or building associated with his or her productive life; or

d. A cemetery that derives its primary importance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events; or

e. A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived; or

f. A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own exceptional significance; or

g. A property achieving significance within the past 50 years if it is of exceptional importance.155

National Register Significance Evaluation

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

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

Under Criterion A, Battery Hambright is representative of the new defensive theory of seacoast fortifications articulated by the Endicott Board in 1885. The Board conducted research and evaluation of existing coastal defenses that led to recommendations for establishing a new system of fortifications to meet the needs of modern artillery. The Endicott System featured dispersed small batteries that were low in profile, small, and concealed behind earthen berms. The concrete structures were designed to emplace a variety of weapons, including “disappearing” guns that could be lowered out of view from the water after firing. The small size and low profile of these fortifications were intended to be more difficult to hit from a ship. The dispersed placement of the batteries was also difficult to target, but afforded various angles from which to fire on enemy ships.157 The Endicott System was thus a complete departure from the massive masonry fortifications of the Third System of coastal defenses that featured large concentrations of artillery in a single location.

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

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

156. Trout, n.p.
Screven, of which Battery Hambright is a part, has been determined significant for its Endicott System design.\textsuperscript{158} Battery Hambright is representative of batteries constructed during the Endicott period. These batteries were typically constructed of concrete with gun platforms and well-protected magazines, some of which were placed underground. The distinctive features of Battery Hambright, such as the concrete structure, gun platforms, and earthen berms, all represent innovations in military defense that address the need for concealment from the water and support the heavy artillery of the period. The siting of the battery in a strategic location that allowed the guns to fire on ships within the North Channel as they navigated a nearby minefield in approaching Savannah Harbor was also part of the design of the battery. The field of fire—the visual sight line used to identify and fire upon an enemy—was also a critical component of the design of the battery. To ensure a clear field of fire, trees and other obstructions that might obstruct the view were removed.

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

Fort Pulaski is also significant under Criterion D as a resource that has yielded, or may be likely to yield, information important in prehistory or history. Numerous archeological studies conducted at Cockspur Island have indicated the presence of historic resources. At the battery itself, archeological testing has not revealed any significant intact deposits, and has demonstrated severe disturbance in the general stratigraphy. While cannon were recovered at the site in the 1970s, and further archeological study of the area surrounding the battery may yield additional information, the site of Battery Hambright does not seem likely to be significant under Criterion D.\textsuperscript{159} Battery Hambright survives with sufficient integrity to convey its historic associations.

**Period of Significance**

The period of significance for Battery Hambright begins with the start of construction of the battery in 1899 and continues through CCC work completed at the battery in the 1930s.\textsuperscript{160} The battery also contributes to the larger historic district of Fort Pulaski National Monument. The National Register nomination completed in 1975 for the historic district identifies periods of significance of 1829–1847, 1861–1872, and briefly during the 1890s.\textsuperscript{161} The more recently completed Cultural Landscape Report for Fort Pulaski National Monument Cockspur Island Historic District identifies a period of significance of 1829–1895. The beginning date is the start of the initial construction of Fort Pulaski, while the closing is

\textsuperscript{158.} Cloues, n.p.

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

\textsuperscript{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.

\textsuperscript{161.} *National Register of Historic Places Nomination Form: Fort Pulaski National Monument.*
Significance and Integrity

the date of completion of the southeast magazine at the demilune.  

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

During the 1930s, funds and manpower from several New Deal era programs, including the PWA and CCC, contributed to work at Fort Pulaski including Battery Hambright. The battery was cleared of overgrown vegetation, while the structure was repaired and preserved. During World War II, however, these programs were terminated, and work at Fort Pulaski halted. The US Navy established a section base on Cockspur Island in late 1941. The base, which was used to support coastal patrol ships, remained active until 1947.

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

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

Character-Defining Features

The historic nature of significant buildings, structures, and landscapes is defined by their character, which is embodied in identifying, or character-defining, physical features. Character-defining features can include the shape of a building; its materials, craftsmanship, interior spaces, and features, as well as the components of its surroundings.

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

- General configuration, plan, and orientation
- Earthen berm parapet
- Open landcover associated with the berm and area surrounding the battery
- Site line extending from the gun platforms to the North Channel of the Savannah River that comprised the field of fire for the battery artillery
- Visual connection to the North Pier
- Concrete structure (exterior and interior)
- Stairs and landings
- Gun platforms
- Interior rooms
- Other built-in fixtures, including ventilation nooks, lowering niches, and ammunition recesses.

Assessment of Integrity

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

163. Meader and Binkley, 29.
Physical Description and Condition Assessment

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

Location is the place where the historic property was constructed or the place where the historic event occurred. . . . Design is the combination of elements that create the form, plan, space, structure, and style of a property. . . . Setting is the physical environment of a historic property. . . . Materials are the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property. . . . Workmanship is the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory. . . . Feeling is a property’s expression of the aesthetic or historic sense of a particular period of time. . . . Association is the direct link between an important historic event or person and a historic property.165

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

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

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

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

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

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

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

166. Ibid.
Significance and Integrity

Left blank intentionally
Treatment and Use

Requirements for Treatment and Use

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

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

Laws, Regulations, and Functional Requirements

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

- National Park Service Cultural Resources Management Guideline (Director’s Order 28), which requires planning for the protection of cultural resources on park property.
- Section 106 of the National Historic Preservation Act (NHPA), which mandates that federal agencies, including the National Park Service, take into account the effects of their actions on properties listed or eligible for listing in the National Register of Historic Places and give the Advisory Council on Historic Preservation a reasonable opportunity to comment.
- Treatment of historic structures and sites is also to be guided by the following:
  - Secretary of Interior’s Standards for the Treatment of Historic Properties
  - Secretary of Interior’s Guidelines for the Treatment of Cultural Landscapes
  - National Park Service Management Policies, 2006
  - Architectural Barriers Act Accessibility Standards (ABAAS)
  - International Building Code (IBC), 2015
  - International Existing Building Code (IEBC), 2015
  - International Plumbing Code (IPC)
  - National Electrical Safety Code (NESC)
  - NPS Guiding Principles of Sustainable Design

(Note that some of the above codes and standards, such as the IPC and NESC, may not pertain to
specific projects or to work on a particular structure. For example, as plumbing and electrical work are not likely to be conducted at Battery Hambright, these codes would not apply.)

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

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

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

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

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

408.3 Flood hazard areas. Within flood hazard areas established in accordance with Section 1612.3 of the International Building Code, or Section R322 of the International Residential Code, as applicable, where the work proposed constitutes substantial improvement, the building shall be brought into compliance with Section 1612 of the International Building Code, or Section R322 of the International Residential Code, as applicable:

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

1. Listed or preliminarily determined to be eligible for listing in the National Register of Historic Places;

2. Determined by the Secretary of the US Department of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined to qualify as an historic district; or

3. Designated as historic under a state or local historic preservation program that is approved by the Department of Interior.167

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

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

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

---


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

Alternatives for Treatment and Use

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

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

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

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

Reconstruction is defined as the act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location.

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

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

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

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

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

**Ultimate Treatment and Use**

**Guidelines for Treatment**

The guidelines and requirements for treatment included later in this chapter have been defined based on the preservation objectives and requirements for treatment and use outlined above for the Battery Hambright. All treatment guidelines and recommendations were developed in accordance with the Secretary of Interior’s Standards for Preservation. (The Secretary of the Interior’s Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes were referenced in development of treatment guidelines and recommendations for landscape features addressed in this study.)

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

1. A property will be used as it was historically, or be given a new use that maximizes the retention of distinctive materials, features, spaces, and spatial relationships. Where a treatment and use have not been identified, a property will be protected and, if necessary, stabilized until additional work may be undertaken.

2. The historic character of a property will be retained and preserved. The replacement of intact or repairable historic materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.

3. Each property will be recognized as a physical record of its time, place, and use. Work needed to stabilize, consolidate, and conserve existing historic materials and features will be physically and visually compatible, identifiable upon close inspection, and properly documented for future research.

4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.

5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.

6. The existing condition of historic features will be evaluated to determine the appropriate level of intervention needed. Where the severity of deterioration requires repair or limited replacement of a distinctive feature, the new material will
match the old in composition, design, color, and texture.

7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.

8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.\(^{170}\)

The Secretary of the Interior’s Standards for Rehabilitation are as follows:

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.

2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.

3. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.

4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.

5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a historic property shall be preserved.

6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.

7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.

8. Significant archeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.

10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.\(^{171}\)

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

- Undertake all work on the structure in compliance with the Secretary of the Interior’s Standards for Preservation.

- Undertake all work on the landscape in compliance with the Secretary of the Interior’s Standards for Rehabilitation.

- Retain the character of the historic structure and environs by protecting the battery and its significant site features.

---

\(^{170}\) Ibid. The guidelines that accompany the Standards also note that new materials should be distinguishable from old.

\(^{171}\) Ibid.
Treatment and Use

- Ensure that proposed new elements or construction are compatible with the historic character of the structure and its site.
- Protect adjacent natural resources during construction activities.
- Document through detailed as-built drawings, photographs, and written narrative all changes and treatments to the building and its immediate site. Maintain records of treatments and preserve documentation according to professional archival standards. Maintain a copy of records in the NPS archives.
- Retain features and materials at both the exterior and interior of the buildings that survive from the period of significance to the greatest extent possible.
- Incorporate sustainable design principles in all future projects that respect the preservation principles listed above.

Prioritization of Treatment

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

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

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

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

In addition to the specific repairs recommended, cyclical maintenance tasks such as inspection, painting of exterior wood and metal elements, preparation and resealing of joints, and other ongoing maintenance tasks must be continually implemented to avoid damage to the historic structure and to reduce the need for large-scale repair projects in the future. (Planning and trial repairs for repair and maintenance have been in progress by the Park, and will be informed by the findings and recommendations developed as part of this Historic Structure Report.)

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

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

Recommendations

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

Responses to Code Provisions and Safety Issues

Safety issues associated with Battery Hambright are primarily related to visitors accessing and climbing on the concrete battery and earthen berm. The Park has noted that its primary safety concerns relative to the battery include the possibility of persons climbing onto the berm and falling onto the upper level of the battery, or falling
while walking up or down the stairs within the battery. The edges of the shoreline near the battery, as well as the pier, also present safety concerns, as noted above as part of the landscape discussion. These conditions do not meet code-mandated requirements for non-historic or new construction; however, the NPS is not required by code to implement modifications to address these conditions in historic structures such as Battery Hambright unless the NPS itself determines that such changes are warranted and appropriate. (Chapter 12—Historic Buildings of the 2012 International Existing Building Code provides general guidance on repair, alteration, relocation, and change of occupancy of historic structures. The code generally defers to the code official—in this case, the National Park Service—to determine whether specific conditions are acceptable or are considered to require modification.)

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

- Conduct an updated safety assessment of the battery and its environs, informed by the findings of the Park's review of safety issues at Fort Pulaski (the masonry fortification) and recent NPS review of fort safety issues for various fortifications in the National Park System.

- Include Battery Hambright in safety briefings given to park personnel by a designated Park safety officer on a regular basis, as well as in proactive safety briefings provided by the Park to visitors.

- Maintain vegetation on the berm so that it does not obscure the edge or create tripping hazards.

- Consider limiting access to the battery, or by certain tour groups (e.g., schoolchildren). Installation of railings or cautionary signage would be visually intrusive to the historic character of the berm. Also, as the site of the battery is not staffed by Park personnel, limiting access by certain tour groups (e.g., schoolchildren) does not appear to be a practical approach.

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

**Landscape and General Recommendations**

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

Recommendations for the Battery Hambright landscape include:

1. Preserve and protect the concrete structure of the historic battery.

2. Retain the visual connection between Battery Hambright and the adjacent landscape.

3. Retain the visual connection between Battery Hambright and the Savannah River, the location of the mine field it was created to protect.

4. Retain and maintain the historic patterns of spatial organization that include the relationship of the battery to the earthen dike, North Pier, and shoreline.

5. Maintain the area around the battery in open (low-growing) landcover conditions.
6. Repair any areas of turf that are in poor condition to reduce erosion potential.

7. Consider managing the turf that characterizes much of the Battery Hambright environs to promote sustainability, diversity, and environmental health. This may suggest replacing non-native invasive species with native species adapted to the cultural conditions of the site.

8. Evaluate annually all trees located within falling distance of Battery Hambright to determine their health and potential to become hazardous to visitors or the battery structure.

9. Avoid constructing new features that interfere with views to and from the battery.

10. Protect the setting of the battery from changes that will affect its historic integrity.

11. Retain and maintain the character-defining qualities and characteristics of the battery, while allowing for visitor access and interpretation.

12. Continue to interpret Battery Hambright in relation to the evolution of Fort Pulaski, as well as the historic context of the Endicott program and nearby Fort Screven as representative of that period.

13. Maintain the contemporary trail and walk system leading to the battery, and between the battery and the North Pier, in good condition to prevent erosion and other degradation of the battery environs. Repair areas where vegetation is growing through paved surfaces, and reestablish grass cover on turf paths where it has been lost.

14. Implement contemporary effective preservation methods that stabilize and preserve historic features and materials in good condition.

15. Avoid adding new features or altering existing non-historic features in ways that adversely 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...
severe storms, as further discussed under Climate Change and Related Environmental Issues, below.

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

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

Recommendations Related to the Structure
Concrete

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

Cleaning

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

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

The removal method selected should be based on successful trials and should follow the Secretary of the Interior’s Standards for the Treatment of Historic Properties, which states that the gentlest most effective cleaning methods should be selected. Methods and materials that result in damage to the substrate or that are harmful to humans, animals, and the environment should not be used.

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

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

Water methods typically include low pressure washing, steam cleaning, and hot water methods.
pressure washing. These methods can be effective on light soiling.

**Monitoring**

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

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

**Repair of Displacement**

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

**Repair of Deteriorated Concrete**

- Concrete repair mixes should be developed to match the color, finish, and texture of the original concrete.

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

- Repair of localized concrete deterioration requiring patch repairs should include the following steps:
  - A 3/4-inch deep sawcut should be made around the entire perimeter of each repair area, close to the perimeter of the spall in order to retain as much sound concrete beyond the spalled area as possible. The sawcut may align with edges of the formboard profile when appropriate.
  - Chipping hammers should be used to remove concrete within the spalled area to a depth of at least 3/4 inches beyond the exposed reinforcing steel. (Sound concrete beyond the repair area should be protected during this work.)
  - The exposed concrete surfaces and exposed reinforcing steel within the repair area should be abrasively blasted and air blasted to remove corrosion and roughen and clean the surface. (Sound concrete beyond the repair area should be protected during this work.)
  - The exposed steel reinforcing bars should be inspected for loss of section due to corrosion and repaired, supplemented, or replaced as necessary.
  - After cleaning, the exposed steel reinforcing bars should be immediately covered with two coats of a corrosion-inhibiting coating in accordance with the coating manufacturer’s recommendations.
  - Formwork should be installed to match the original profile of the surface, including matching the original board form finish.
• Repair concrete, customized to match the original concrete color, finish, and texture (as discussed above), should be placed and consolidated.

• The concrete repair should be wet cured.

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

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

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

Repair of Deteriorated Cementitious Parge Coat

• Several treatment approaches can be considered for the cementitious parge coat, depending upon the Park’s short- and long-term goals for repair and maintenance of the battery. Although the parge coat is non-original, likely dating from work on the battery in the 1960s, it is intact in many areas and provides protection for the original concrete. If the parge coating is to remain in place rather than be removed (see below), it could be repaired to provide consistent cover over the original concrete.

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

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

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

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

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

Surface Treatment for Moisture Resistance

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

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

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

Graffiti Mitigation

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

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

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

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

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

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

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

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

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

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

Steel and Other Metals

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

- Where minor surface corrosion exists on exposed steel I-beams, the following is recommended:
  - The existing surface coating and rust scale should be removed to bare steel using abrasive blasting in preparation for a new coating system. Containment will be necessary during the surface coating removal and preparation process and new coating application. Prior to paint removal, the existing coatings should be sampled to check for potentially hazardous materials, such as existing lead-containing paints. If hazardous materials are present, it may be necessary to first use chemical paint strippers and/or water blasting to remove the coating, followed by abrasive blasting to prepare the steel surface to receive the new coating system.\(^\text{173}\)
  - The steel surfaces should be pressure washed to remove chloride contamination.
  - Where previously coated, exposed steel surfaces should be coated with a zinc-rich primer and high-performance coating system. Mock-ups of coating removal, surface preparation, and application of the new coating system should be performed to evaluate work processes and to serve as a standard for the overall work.

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

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

Wood

Existing wood elements at Battery Hambright consists of the non-historic walkway components. Wood elements should be monitored for deterioration and repaired or replaced as necessary. Although the existing walkways are 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.
deteriorated original wood walkway and should therefore be retained.

**Recommendations for Further Research**

The Fort Pulaski National Monument archives have been very well organized by Park staff and provide a great deal of information about the park’s historic resources, including Battery Ham bright. Additional research conducted at the National Archives on behalf of this study has provided some additional information. For Battery Ham bright, further research would be useful to identify additional documentation related to the history and evolution of Fort Screven and the relationship of Battery Ham bright to the fortifications on Tybee Island. In addition, further research would be useful to support more detailed understanding of repairs made to Battery Ham bright during the Mission 66 era and to confirm the extent to which work proposed in the 1990s was implemented.

**Climate Change and Related Environmental Issues**

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

Hurricane Matthew moved up the coast of the southeastern United States, making landfall on the South Carolina coast on October 8, 2016. The hurricane caused extensive flooding and damage from Florida to the Carolinas. The storm surge and concurrent high tide led to a record tide level and a storm surge of nearly 8 feet at Fort Pulaski. Wind speeds neared 100 miles per hour, and at least 300 trees were downed across Cockspur Island. At Fort Pulaski, in addition to lost trees and flooding of the landscape, damage included displacement of both of the fort’s moat bridges and a majority of the wooden floors, and flooding of interior spaces with mud and debris. Battery Ham bright was not significantly affected by the storm, although mud had to be cleaned from the interior and debris from the surrounding landscape. However, the storm underscored ongoing and growing concerns about potential damage from storm-related flooding on the earthen component of the battery in the long term, (e.g., increased erosion, increased pressure on and potential destabilization of the south face retaining wall, effects on the foundations, etc.).

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

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

Increasingly frequent strong storms and heavy rainfall have been noted for several years across the southeastern United States. A study entitled, *Climate Change Impacts to Natural Resources in South Carolina*, by the South Carolina Department of Natural Resources and published in 2013 noted: “A predicted result of climate change is the increase in intense storm events causing greater water inputs in shorter periods of time, affecting...
flood frequency and duration." Coastal Georgia is similarly affected; studies indicate, for example, that sea levels have risen by 8 inches at Fort Pulaski since 1935.

Because loss of historic resource integrity may occur as a result of the impacts of severe storms associated with climate change, documentation and analysis of change over time using data collection are anticipated to be an important part of the response to mitigating anticipated loss or diminishment. Data collected through documentation can also be used as a tool used to plan for the impacts associated with climate change. This Historic Structure Report, including the historical narrative, condition assessment, and recommendations, together with photographs and measured drawings, is an example of the type of documentation that is relevant to this purpose. As part of future efforts to build on and update the documentation provided in this Historic Structures Report, the National Park Service should consider such approaches as more detailed documentation resulting from new three-dimensional scanning technology. Monitoring of weather-related deterioration will also support an understanding of what additional protection and repairs may be needed in response to ongoing and specific weather events.

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

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


Prior to implementing any adaptive strategies that may be proposed by the consultant cultural landscape and restoration ecology team, the Park is working on cleaning out the ditches and providing a more effective tide gate. Using a survey prepared by the US Army Corps of Engineers, the Park is also adding fill to some low-lying areas that have been noted as vulnerable to flooding. The Park is also researching previous strategies used to control flooding on the island. Recommendations in the Park archives dating from twenty years ago suggested breaching the outer part of the dike system and allowing it to become salt marsh. The goal of the effort was to enhance views, which had been lost due to tree growth once the National Park Service stopped allowing that area to be flooded. Current work by the University of Georgia consultants suggests that restoration of the salt marsh may serve as the most sustainable approach and an initial line of defense against flooding. Added benefits will include enhanced habitat for wildlife and plants.

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

The placement of the dredge spoils offshore in the North Channel is intended to restore the underwater topography that helps to dissipate wave action from passing ships. So far the effort appears to be very successful. Before the beneficial dredge placement, waves at high tide were lapping over the dike adjacent to the north slope of the battery. Today, plantings in the marsh area are coming back behind the deposit, and the new barrier island has retained about 40 percent of its overall size despite continued passage of ships in the channel. Even if erosion continues to occur, spoils placement can be repeated every few years when the Corps dredges the river. It is hoped that
this will become part of a broader solution to addressing the flooding problem and maintaining the shoreline. 177

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

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

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.
Left blank intentionally
Bibliography

Accessed October 23, 2017,
https://babel.hathitrust.org/cgi/pt?id=coo.31924015176179;view=1up;seq=559.


Bibliography


_____. *Cultural Landscape Inventory, Fort Pulaski National Monument Landscape*. Atlanta, Georgia: Southeast Regional Office, 2012.


Appendix A: Measured Drawings