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Florida

Fort Pickens and Battery Pensacola

Historic Structures Report



Cultural Resources, Partnerships and Science Division

Interior Region 2: South Atlantic-Gulf

Fort Pickens and Battery Pensacola

Gulf Islands National Seashore

Historic Structures Report

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About the front cover: Casemates at Fort Pickens, view from southeast, 2023. Photograph by Wiss, Janney, Elstner Associates, Inc.

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Fort Pickens and Battery Pensacola

Gulf Islands National Seashore

Historic Structures Report

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Foreword

We are pleased to make available this Historic Structures Report for Fort Pickens and Battery Pensacola at Gulf Islands National Seashore, part of the ongoing effort to provide comprehensive documentation for the landscapes and historic structures of the National Park Service. The success of this project is due in large part to the staff of Gulf Islands National Seashore; the park has long sought to protect and interpret these important resources. Bruce Leutscher, Team Lead, Science & Resource Stewardship, has been instrumental in providing support for this project. We would also like to thank Gulf Islands National Seashore personnel Michael Lockman, Cultural Resource Program Manager and Archeologist, for his work on the project, and Casimer Rosiecki, Lead Park Ranger, for his assistance with the historical background of the fortifications.

We would like to thank the following for their thorough research, rigorous existing conditions documentation, and carefully considered recommendations: from Liz Sargent HLA, Liz Sargent, Project Manager and Jane Jacobs, Historical Landscape Architect; from Wiss, Janney, Elstner Associates, Inc., Deborah Slaton, Conservator; Tim Penich, Historical Architect; Nicole Declet, Architectural Associate and Conservator; Heba Elsayed, Engineering Associate; Genna Davis, Engineering Associate; and Mike Horst, Structural Engineer; from Historical Research Associates, Inc., Matthew Sneddon, Architectural Historian; Jackie Gonzales, Historian; and Amalia Baldwin, Historian; from WFT Architects, P.A., Wes Harp, Architect; and from Maptech, Inc., Chris Pesnell, Professional Surveyor; Bryan Abrams, Surveyor; and Ryan Moore, Surveyor. The Park would also like to thank Interior Region 2 Historical Architect Megan Jenkins for her work as COR and as the primary NPS regional liaison on this project.

Rick Clark
Superintendent
Gulf Islands National Seashore
National Park Service

Management Summary

Management Summary

At the request of the National Park Service (NPS), Liz Sargent Historical Landscape Architect (LSHLA), with its subconsultants, Wiss, Janney, Elstner Associates, Inc. (WJE), Historical Research Associates, Inc. (HRA), WFT Architects, P.A. (WFT), and Maptech, Inc. (Maptech) have developed this Historic Structures Report (HSR) for Fort Pickens and Battery Pensacola on the west end of Santa Rosa Island at Gulf Islands National Seashore. Figure 1 is a map of Gulf Islands National Seashore showing the location of Fort Pickens and Battery Pensacola. Figure 2 is a map showing the Pensacola Area and Santa Rosa Island. Figure 3 is an annotated aerial view showing Fort Pickens and Battery Pensacola and their immediate surroundings.

Fort Pickens and Battery Pensacola sit at the west end of Santa Rosa Island within Gulf Islands National Seashore. Santa Rosa Island is a narrow barrier island that parallels the Florida coast. The west end of the island frames one side of the narrow channel into Pensacola Bay, with Perdido Key to the west. The city of Pensacola is located across the bay to the north.

Gulf Islands National Seashore was established by Public Law 91-660 in 1971 to "recognize, preserve, and interpret" the national historical significance of surviving coastal defense posts.[1] The NPS took control of Fort Pickens and Battery Pensacola in 1972. Gulf Islands National Seashore extends from eastern Mississippi to western Florida, with no portion of the park in Alabama.

Fort Pickens and Battery Pensacola are accessed via Fort Pickens Road which travels generally east–west through the portion of Gulf Islands National Seashore on Santa Rosa Island. A parking area is located north of the fort.

This HSR focuses on Fort Pickens, a pentagon-shaped brick masonry fortification constructed between 1829 and 1834 as a Third System coastal defense military fortification, and Battery Pensacola, a concrete structure built in 1898–1899 on the southern portion of the Fort Pickens parade as part of the Endicott plan. The battery commander's station at Battery Pensacola and the mine casemate building and igloo magazine, both north of Fort Pickens, are also addressed as part of this study.

Fort Pickens and Battery Pensacola as well as the battery commander's station at Battery Pensacola, the mine casemate building, and igloo magazine are all listed in the National Register of Historic Places.

Historical Data

West Florida, including the panhandle, was home to Native American groups for thousands of years prior to European contact. During the early sixteenth century, Spanish explorers such as Ponce de Léon, Pánfilo de Narváez, and Hernando de Soto began visiting the region in sailing vessels. The first Spanish settlement in the vicinity of Pensacola, established in 1559, was short-lived. The Spanish later built a fortification in the vicinity

1. Edwin C. Bearss, *Historic Structure Report and Resource Study; Pensacola Harbor Defense Project* (Denver, Colorado: National Park Service, March 1982), 1.

of Fort Barrancas near the present-day Naval Air Station—Presidio Santa Maria de Galve—in 1698 to protect their commercial interests and nearby shipping lanes. The fort was intended to protect Spanish interests in the region as the French expanded their colonial expectations to the south, down the Mississippi River and into the adjacent gulf. French and Spanish soldiers clashed several times, resulting in the area around Pensacola Harbor changing hands. The French held the fortification from 1719 until 1722, when the territory was returned to the Spanish through a treaty. The French burned the Presidio as they left.

In 1722, the Spanish built a fortification, Presidio Isla Santa Rosa Punta de Siguenza, on Santa Rosa Island. The island was settled by soldiers, officers, and convict laborers. The workers were later joined by their families, who lived in a village to the east. Trees growing on the island likely served as a construction material for buildings. As a low-lying barrier island, Santa Rosa Island was regularly exposed to strong storms and hurricanes, which likely led to frequent rebuilding of elements of the complex. Following a severe hurricane in 1752, the Spanish abandoned the fort in 1755.

Colonial Florida briefly changed hands in 1763 when the British gained control of the region. In 1781, British forces began to build a defensive structure at the western end of Santa Rosa Island. The effort was abandoned by 1783, when the Spanish again gained control of the region. The Spanish maintained control of the region until 1821, when Spain ceded East and West Florida to the United States under the Adams-Onis Treaty of 1819. The United States government immediately selected Pensacola Harbor as a key naval base, which would later require protection from attack by unfriendly forces.

Under United States ownership, West Florida, including the panhandle, quickly became key to control of commerce. The deepwater harbor remained strategically important as a place to position naval ships for quick access to locations throughout the region. Following the establishment of a naval base at Pensacola Harbor, the U.S. government built several military fortifications to protect the approach to the harbor by water, including Fort Pickens on Santa Rosa Island (1829–1834); Fort McRee on the island across the channel opening into the harbor (1834–1839); Fort Barrancas on the peninsula near the U.S. Navy Yard and Depot (1839–1844); and the Advanced Redoubt on higher ground to the north of Fort Barrancas (1845–1870).

Fort Pickens, a Third System fort and coastal defense structure, was constructed first due to its strategic position and ability to aim artillery at likely avenues of attack from Santa Rosa Island. The brick and stone masonry structure was built using materials conveyed to the island by ship to a landing known as the Engineer's Wharf, which was built on the north, or leeward, side of the island to protect it from storms and heavy seas.

During the Civil War, Fort Pickens was one of four forts within the southern United States that remained under U.S. control. Among the troops located at Fort Pickens was the 6th New York Infantry Regiment, also known as Wilson's Zouaves, which camped to the east of the masonry structure, forming Camp Brown.

Federal forces were challenged during the early part of the war by Confederate artillery fire from Fort McRee and Fort Barrancas on November 22 and 23, 1861, and from Fort Barrancas on January 1 and 2, 1862. To further protect the fort, the U.S. Army built additional batteries around the west end of the island. It is likely that the U.S. Army continued to use the Engineer's Wharf for deliveries of supplies and ammunition during the Civil War. Fort Pickens was also used as a prison for captured Confederate soldiers and others.

After the Civil War, Fort Pickens continued to serve as a prison. During the 1880s, Fort Pickens housed Chiricahua Apache prisoners of war associated with the Apache Wars, including Geronimo, between 1886 and 1888. Prisoners were housed in the fort casemates.

A limited garrison remained at Fort Pickens following the Civil War. It was during this period that the first visitors or tourists arrived to see the fort.

In 1885, a board headed by Secretary of War William C. Endicott was tasked with studying how to improve coastal defenses in response to advances in weaponry. The report prepared by the Board of Fortifications in 1886 outlined a modernization program of harbor and coastal defenses that would include reinforced concrete fortifications and the installation of large caliber breechloading artillery and mortar batteries. The resulting fortifications became known as Endicott batteries. Although many sites were proposed to be updated with Endicott batteries in the report, some sites, such as Fort Pickens, were identified as obsolete and taken out of maintenance during the early 1890s. At the same time, other types of defensive military weaponry were installed to protect Pensacola Harbor, such as naval mines placed to explode when coming into contact with a ship or submarine.

Later, small, detached batteries were built to emplace new seacoast defense guns to be sited along the sand ridge extending east from Fort Pickens and within a stand of timber where they would have protective cover. These batteries were designed to sit atop a stable firing platform, oftentimes behind a concrete wall that helped to protect the gun and crew. The batteries were also designed to provide a space for ammunition storage.

During the second half of the 1890s, several new features were added to the Fort Pickens complex, some in association with the masonry structure and some outside of it. A mining casemate was constructed in the northeast bastion of Fort Pickens in 1894–1895 to house the mining equipment used in the harbor. In 1896, the Engineer's Wharf was rebuilt in anticipation of transporting construction materials to build other batteries. Also in 1896, the army built a narrow-gauge railroad from the wharf to some of the proposed battery positions to be used in conveying construction materials.

Battery Pensacola, a reinforced concrete structure, was constructed within the parade of Fort Pickens in 1898, in response to the threat of war with Spain.

In 1899, exploding ordnance in one of the bastions of Fort Pickens led to a large breach in the northwest section of the masonry wall system. Debris from the explosion was later used to create groins to shield Battery Payne from high tides and overwash.

Following the Spanish-American War, advances in coastal defense led to the construction of additional batteries. With the increasing numbers of batteries, Fort Pickens received a larger garrison. Beginning in 1900, housing, administrative offices, and mess structures were built to accommodate troops stationed at Fort Pickens.

During his tenure as Secretary of War, William Howard Taft further expanded on the Endicott battery system to address continued advances in weaponry. Battery Trueman was added in 1905 based on these improvements.

Other additions to the coastal defense systems at Fort Pickens during the first two decades of the twentieth century included the formation of concrete barriers around the batteries and the addition of searchlights as airplanes came into use. It was also during this period that walls of Fort Pickens were lowered to better accommodate the guns emplaced at Battery Pensacola, built within the masonry fort.

After the United States entered World War I in 1917, new anti-aircraft weaponry, searchlights, and towers were built at many existing batteries, and obsolete artillery and equipment was deaccessioned and removed from Fort Pickens.

Following signing of the Treaty of Versailles and the end of World War I, the coastal defense complex at Fort Pickens remained an active United States military base. The status of Fort Pickens changed to be a sub-post of Fort Barrancas on the mainland. Fort Pickens served as a training facility for military programs and provided housing for personnel in temporary barracks and tent cities when needed.

Even though the United States was not formally at war with Germany in 1939, military defenses were

evaluated for readiness. These efforts increased after the bombing of Pearl Harbor by the Japanese in 1941; improvements at Fort Pickens were part of a larger nationwide effort to update coastal defenses to meet the threat posed by the attack. A road was cut through the counterscarp of Fort Pickens to provide access to military features beyond the wall system at this time.

Even as Fort Pickens remained an active military post, portions of Santa Rosa Island were acquired by Escambia County and converted into public park land. The island to the east of Fort Pickens was sold to the county in 1929. Bridges connecting Pensacola to Santa Rosa Island were built in 1931. In 1939, the federal government designated Fort Pickens Santa Rosa Island National Monument; events surrounding World War II, however, led to a delay in transfer of the land.

Following the end of World War II in 1945, the coastal defenses at Fort Pickens were declared obsolete. Fort Pickens was decommissioned in 1947.

Following decommissioning of the post, the property was turned over to the state of Florida. In 1948, proposals were made in Congress to establish Pensacola National Monument at Fort Pickens. These were not implemented, and Fort Pickens remained a state park property through the 1960s. The state made several improvements to accommodate the public, including construction of a paved road to provide access to Fort Pickens in 1953, paved sidewalks within the complex, and the addition of historical markers for interpretive purposes.

In 1971, Gulf Islands National Seashore was established, incorporating Santa Rosa Island. The National Park Service began to administer the site in 1972. Since the 1970s, the National Park Service has worked to protect, stabilize, repair, and interpret Fort Pickens and Battery Pensacola, while also accommodating public visitation by providing walks, recreational trails, restrooms, and exhibits and interpretation.

Treatment and Use

Fort Pickens, Battery Pensacola, and associated structures are listed in the National Register of Historic Places and managed as a cultural resource by the National Park Service. The administratively determined Management Category is "Must Be Preserved and Maintained" and the Ultimate Treatment is "Preservation," as characterized in *The Secretary of the Interior's Standards for Treatment of Historic Properties*. This treatment approach has been confirmed with the park in preparation of this HSR.

Ongoing monitoring, repair, and maintenance are required to ensure continued preservation and use of Fort Pickens and Battery Pensacola.

Administrative Data

Locational Data

Building Names

- Fort Pickens
- Battery Pensacola
    - Battery commander's station
- Mine casemate building
- Igloo magazine

Location: Gulf Islands National Seashore, Santa Rosa Island, Florida

Real Property Information

Dates of construction:

- Fort Pickens (1829–1834)
- Battery Pensacola (1898–1899)
    - Battery commander's station (1907–1908)
- Mine casemate building (1905–1907)
- Igloo magazine (1943)

Numbering Information

- Fort Pickens: CRIS-HS 007459 (Must Be Preserved and Maintained / Preservation)
- Battery Pensacola: CRIS-HS 005411 (Must Be Preserved and Maintained / Preservation)
    - Battery commander's station: CRIS-HS 007473 (Must Be Preserved and Maintained / Preservation)
- Mine casemate building: CRIS-HS 007473 (Must Be Preserved and Maintained / Preservation)
- Igloo magazine: CRIS-HS 005386 (Must Be Preserved and Maintained / Preservation)

Size Information

- Fort Pickens:

  Dimensions: 780 feet by 680 feet

  Height: 40 feet

  Number of rooms: 52

- Battery Pensacola

  Dimensions: 325 feet by 167 feet

  Height: 22 feet

  Number of rooms: 15

    - Battery commander's station

      Dimensions: 10 feet by 10 feet

      Height: 26 feet

      Number of rooms: 1

- Mine casemate building

  Dimensions: 35 feet by 24 feet

  Height: 10-1/2 feet (west end); 14-1/2 feet (east end)

  Number of rooms: 4

- Igloo magazine

  Dimensions: 20 feet by 11 feet

  Height: 7-1/2 feet

  Number of rooms: 1

Related Studies

Edwin C. Bearss, Historic Structure Report, Historical Data Section, Fort Pickens, 1821–1895, Gulf Islands National Seashore, Florida/Mississippi (Denver, Colorado: U.S. Department of the Interior, National Park Service, Denver Service Center, Historic Preservation Division, 1983), NPS Document No. 635-D2013.

_____. *Historic Structure Report and Resource Study: Pensacola Harbor Defense Project, 1890–1947,* Florida Unit, Gulf Islands National Seashore, Escambia & Santa Rosa Counties, Florida (Denver, Colorado: National Park Service, March 1982), NPS Document No. 635-D1878.

Mark A. Berhow, ed., *American Seacoast Defenses: A Reference Guide* (Bel Air, Maryland: Coast Defense Study Group Press, third edition, 2015).

Albert Manucy, *Report on Historic Sites at Pensacola, Florida* (U.S. Department of the Interior, National Park Service, June 19, 1939).

David P. Ogden, compiler, National Park Service, Gulf Islands National Seashore, *A Structural Timeline of Fort Pickens, 1829–2002* (March 21, 2002; edited November 2008).

Deborah Slaton, Liz Sargent, Tim Penich, and Andi Mele, *Pensacola Harbor Defense Project National Register Nomination* (August 26, 2016; entered in the National Register, May 15, 2017).

Panamerican Consultants with Wiss, Janney, Elstner Associates, Inc., and Liz Sargent HLA, *Fort Pickens Unit Cultural Landscape Report* (in progress, May 2023).

Cultural Resource Data

Fort Pickens and Battery Pensacola are listed in the National Register of Historic Places. Four structures that are part of the complex—Fort Pickens, Battery Pensacola, the battery

commander's station at Battery Pensacola, and the mine casemate building (Building 9) are listed as contributing resources in the 2017 Pensacola Harbor Defense Project National Register nomination. The nearby igloo magazine, which was historically associated with operations at Battery Payne, is also a contributing resource.[2]

Period of Significance: 1829–1947

Proposed Treatment: *Preservation*

Project Scope and Methodology

The goal of the HSR is to develop planning information for use in the repair, maintenance, and preservation of historically significant buildings and structures that comprise Fort Pickens and Battery Pensacola. First developed by the NPS in the 1930s, HSRs are documents prepared for a building, structure, or group of buildings and structures of recognized significance. They are developed to record and analyze the property's initial construction and subsequent alterations through historical, physical, and pictorial evidence; to document the performance and condition of the structure's materials and overall physical stability; to identify an appropriate course of treatment; and, following implementation of the recommended work, to document alterations made through that treatment.[3]

The HSR addresses key issues specific to Fort Pickens and Battery Pensacola, as well as the adjacent mine casemate building and igloo magazine. This report documents the general historic context and the history and development and use of the fortification and associated structures. The report also provides the existing physical condition of the structures and their character-defining features and includes specific treatment recommendations to ensure the preservation of Fort Pickens and Battery Pensacola and adjacent structures.

The HSR consists of the management summary, history, description and condition assessment, and significance and integrity evaluation, followed by discussion of the treatment approach and recommendations. Two appendices are included: measured drawings and structural analysis.

The following project methodology was used for this study.

Research and Document Review. Archival research was performed to gather information about the original construction of Fort Pickens and Battery Pensacola and past modifications and repairs. This information was referenced in assessing existing conditions and developing treatment recommendations. Documents reviewed included maps, drawings, specifications, historic photographs, and other written and illustrative documentation about the history of construction and repairs to Fort Pickens and Battery Pensacola. The research for this study built upon prior historical and archival research completed by the NPS and by members of this project team for previous HSRs for other structures, and a current Cultural Landscape Report in progress at the park. Primary reference material for this study was obtained from Gulf Islands National Seashore records at park headquarters in Gulf Breeze, Florida, as well as the park's archival collections, which are held at Timucuan Ecological & Historic Preserve in Jacksonville, Florida. Additional research material was obtained from the National Park Service Technical Information Center (TIC) in Denver, Colorado, the National Archives and Records

2. Deborah Slaton, Liz Sargent, Tim Penich, and Andi Mele, *Pensacola Harbor Defense Project National Register Nomination,* August 26, 2016, entered into the National Register, May 15, 2017. The nomination addresses Battery Pensacola and the battery commander's station as two separate resources, while the scope of this HSR treats the battery commander's station as part of Battery Pensacola.
3. Deborah Slaton, *Preservation Brief 43: The Preparation and Use of Historic Structure Reports* (Washington, D.C.: National Park Service, Technical Preservation Services, 2005).

Administration (NARA) in College Park, Maryland, and the Florida State Archives.

Condition Assessment and Documentation. Concurrent with the historical research, a condition survey of the structures was performed, and observations were documented with digital photographs, field notes, and annotation on baseline drawings prepared by the project team.

In addition to the visual condition assessment, the engineering team reviewed structural concerns identified by the park and gathered information necessary to perform a structural analysis of identified features. The structural analysis considered the effects of wind loads on the building facades and included an investigation of special conditions affecting the facades and outer walls including parapets. Additionally, the project team conducted an inspection of the reinforced concrete at Battery Pensacola using non-destructive evaluation (NDE).

The condition assessment addressed all visible (above-grade) portions of Fort Pickens, Battery Pensacola (including the battery commander's station), mine casemate building, and igloo magazine.

Laser scanning was performed to document the existing conditions of Fort Pickens and Battery Pensacola and the immediate surroundings to support the development of measured drawings completed as part of this study.

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 of the structure was also prepared, taking into consideration guidelines provided by the National Register Bulletin: *How to Apply the National Register Criteria for Evaluation*.[4] This evaluation of history and significance provided the basis for the development of recommended treatment alternatives.

Guidelines for Ultimate Treatment. Based on the evaluation of historical and architectural significance of the structure, guidelines were prepared to assist in the selection and implementation of treatments. Fort Pickens and Battery Pensacola were entered in the National Register of Historic Places in 2017 as contributing structures in the nationally significant Pensacola Harbor Defense Project Historic District (SG100000992). The administratively determined Management Category is "Must Be Preserved and Maintained" and the Ultimate Treatment is "Preservation," as characterized in *The Secretary of the Interior's Standards for Treatment of Historic Properties*.

Treatment Recommendations. *The Secretary of the Interior's Standards for the Treatment of Historic Properties* guided the development of treatment recommendations for the significant features of the structures. Following the overall Ultimate Treatment approach of Preservation for Fort Pickens and Battery Pensacola, specific recommendations were developed to address the observed existing distress conditions as well as long-term preservation objectives.[5] The recommendations developed as part of this HSR outline repair and maintenance protocol relating to the preservation of brick, stone, and interior finishes at Fort Pickens and concrete and steel at Battery Pensacola, recommendations regarding waterproofing and water management at the fort and battery, and other specific recommendations to address treatment of the historic steel hoist at Battery Pensacola. Recommendations are also

4. *National Register Bulletin: How to Apply the National Register Criteria for Evaluation* (Washington, D.C.: National Park Service, National Register of Historic Places, 1997).
5. 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.: National Park Service, Historic Preservation Services, 2017).

included for the mine casemate and igloo magazine.

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 guidance afforded by *Director's Order NPS-28*, *Cultural Resource Management Guideline*, and *NPS Preservation Brief 43: The Preparation and Use of Historic Structure Reports*, with modifications to organizational structure for purposes of this project.[6]

6. NPS-28, *Cultural Resource Management Guideline*, accessed May 2019, https://www.nps.gov/parkhistory/onlinebooks/nps28/28intro.htm; Slaton.



Figure 1. A map of Gulf Islands National Seashore in Florida and Mississippi showing the Pensacola area (blue box) and the location of Fort Pickens and Battery Pensacola. (Source: National Park Service, annotated by authors)



Figure 2. A map of Santa Rosa Island and the Pensacola area showing the location of Fort Pickens. (Source: National Park Service, annotated by authors)



Figure 3. An aerial image of Fort Pickens, Battery Pensacola, and their immediate surroundings. (Source: Google Earth, annotated by authors)

Developmental History

Introduction

The fortifications on the western tip of Santa Rosa Island, Florida, in Gulf Islands National Seashore, draw visitors from around the world and provide a physical connection to U.S. and global history. From this barrier island's white sand beaches, masonry fort, and concrete batteries, National Park Service interpreters tell stories of Native American trade networks, Spanish colonization, the importance of coastal fortification in protecting naval bases, European power dynamics on North American shores, slavery and resistance to slavery, the Civil War, U.S. warfare against Native Americans, World War I, World War II, a legacy of interest in our collective past and preservation of historic buildings, and the effects of environmental change on the places we have protected. Much of the history of Fort Pickens itself, and Battery Pensacola within it, has been recorded in Edwin Bearss' Historic Structure Report and Resource Study of the Pensacola Harbor Defense Project (1890 to 1947), Edwin Bearss' Historic Structure Report of Fort Pickens (1821 to 1895), Fort Pickens Cultural Landscape Report (in progress), and the National Register nomination for the Pensacola Harbor Defense Project.

Prehistory in the Pensacola Region

Humans have occupied Florida for at least 10,000 years, but archeologists have found minimal evidence of human occupation of the Pensacola area prior to about 3,000 years before the present. Santa Rosa Island has even a shorter documented history of inhabitation, with few signs of an established presence of humans prior to the contact period. Archeologists who have studied the Florida Gulf Coast intermittently since 1883, and more consistently beginning in 1955, note that rising sea levels and coastal erosion may have obliterated traces of past occupation and settlement. Settlements dating to the Archaic Period (11500 BCE–3000 BCE) have been found in parts of the Florida panhandle, but most of the early archeological sites within GUIS boundaries (not on Santa Rosa Island) date to the Woodland Period (3000 BCE–1000 BCE), where shell middens provide evidence of past coastal subsistence practices. During the Mississippian Period (1450 BCE–500 BCE) agricultural practices developed along the inland river valleys of the Florida panhandle, but coastal soils were less agriculturally productive, and there is little evidence of Mississippian agriculture within GUIS.[7] Native American populations increased in the Florida panhandle around 1200 CE, but there

7. Susan Hammersten, ed., *An Archeological Overview and Assessment of Gulf Islands National Seashore* (Tallahassee, Florida: Southeast Archeological Center, National Park Service, March 1989), 21; National Park Service, *Final General Management Plan/Environmental Impact Statement, Gulf Islands National Seashore, Florida and Mississippi* (Washington D.C.: U.S. Department of the Interior, July 2014), 193–194.

is little evidence that American Indians had any strong association with Santa Rosa Island.[8]

European Colonization and the Establishment of Pensacola

Following Christopher Columbus's expedition to the Americas, Spain took an interest in learning more about the Americas and claiming territory across the Caribbean and the Gulf Coast. In 1519, Juan Ponce de León arrived in what is now the Southeastern United States. His crew included some of the first enslaved men of African descent to arrive on the continent. Other Spanish explorers followed Ponce de León, including Alonso Álvarez de Pineda, who may have been the first European to explore Pensacola Bay in 1519, and Hernando de Soto who also brought enslaved men and provided some of the first detailed descriptions of the Indigenous people living in the locations he visited. The Spanish government used information from these expeditions to begin colonizing the land. In August 1559, Spain appointed Tristán de Luna y Arellano to the position of Viceroy of New Spain and charged him with building a settlement in Bahía de Santa Maria Filpina (Pensacola Bay). Luna brought 500 soldiers and 1,000 civilians with him to Pensacola. He discovered the dangers of living along the Gulf Coast almost immediately upon arrival, when a hurricane destroyed the ships holding his food and supplies. Luna's settlement struggled to survive for three years before moving to the Carolinas, and the Pensacola region remained effectively uncolonized for the next century and a half.[9]

French interest in the Caribbean and Southeastern North America propelled Spain back to Pensacola Bay, a reliable and defendable port on the Gulf Coast, in the last few years of the seventeenth century. Spain's reconnaissance of the bay in 1693 provided the first mention of Santa Rosa Island, which Spain called Siguenza after a member of the 1693 party. Using convict and military labor, Andrés de Arriola built a settlement along the bay in 1698. He soon learned that agriculture did not flourish along the coast. The new settlement was primarily supplied by ship from Spain and through trade with Native Americans (Cherokee, Chickasaw, Muskogee Creek, and Upper Creek Confederacy), giving it a precarious existence. Beyond its troubles with subsistence, the Spanish community at Pensacola was repeatedly attacked by the British and their American Indian allies, who were seeking to dislodge the Spanish from the region. Over the next fifty years, European conflicts spilled over to the Gulf Coast, and the Pensacola region changed hands from Spanish to French to Spanish again. During this time, the community of Pensacola moved out to Santa Rosa Island, where it struggled to feed itself, and back to the mainland again.[10]

8. Hammersten, ed., *An Archeological Overview and Assessment of Gulf Islands National Seashore*, 11–12; National Park Service, Bureau of Sport Fisheries and Wildlife, Bureau of Outdoor Recreation, *A Report for the Proposed Gulf Islands National Seashore* (Washington, D.C.: U.S. Department of the Interior, January 1968), 27; Jerald T. Milanich, *Archaeology of Precolumbian Florida* (Gainesville, Florida: University Press of Florida, 1994), 115; Judith A. Bense, "Overview of the Mississippian Stage in the Southeastern United States," *Revista de Arqueología Americana*, no. 10, January–June 1996, 53–71; National Park Service, *Final General Management Plan/Environmental Impact Statement, Gulf Islands National Seashore, Florida and Mississippi*, 265.
9. Matthew Restall, "Black Conquistadors: Armed Africans in Early Spanish America," *The Americas* 57, no. 2, October 2000, 176–178; Jerald T. Milanich and Charles Hudson, *Hernando de Soto and the Indians of Florida* (Gainesville: University Press of Florida, 1992); Hammersten, ed., *An Archeological Overview and Assessment of Gulf Islands National Seashore*, 21; National Park Service, *Final General Management Plan/Environmental Impact Statement, Gulf Islands National Seashore, Florida and Mississippi*, 194.
10. The site of Santa Rosa Pensacola is an archeological resource located "near the Fort Pickens Campground area." Hammersten, ed., *An Archeological Overview and Assessment of Gulf Islands National Seashore*, 52; Ronald

By the late 1750s, Pensacola was firmly established as an important port city on the Gulf Coast mainland. It continued to serve as a trade center between Native Americans and Europeans, and it developed an industry around making pitch and tar for waterproofing naval vessels. Trade and industry available at Pensacola drew those escaping slavery and as the city changed hands between Spanish, French, and British officials, a mixed-heritage population and blended culture developed, containing elements of African, Upper Creek, Lower Creek, Choctaw, Chickasaw, Spanish, French, and British traditions. When the British took control of the city in 1763, making Pensacola their capital of West Florida, they converted a signal post the Spanish had built on Santa Rosa Island into a small fort, thus establishing Santa Rosa Island as a protector of the Pensacola Harbor (Figure 4). The small island failed to serve as a barrier in 1781, when Spanish ships retook Pensacola during the American Revolution.[11]

Wayne Childers, "The Presidio System in Spanish Florida 1565–1763," *Historical Archaeology* 38, no. 3, 2004, 24–32; Matthew J. Clavin, *Aiming for Pensacola: Fugitive Slaves on the Atlantic and Southern Frontiers* (Cambridge, Massachusetts: Harvard University Press, 2015), 1–5; Steven Hahn, *The Invention of the Creek Nation, 1670–1763* (Lincoln: University of Nebraska Press, 2004), 98; Hammersten, ed., *An Archeological Overview and Assessment of Gulf Islands National Seashore;* Herbert E. Kahler and C. E. Vinten, *Preliminary Report on Historic Sites at Pensacola, Florida* (St. Augustine, Florida: National Park Service, January 1938), 4–6.

11. Peter Wood, *Black Majority: Negroes in Colonial South Carolina from 1670 through the Stono Rebellion* (New York: Alfred A. Knopf, 1974), 113–14, 239–40, 259–60; Ira Berlin, "From Creole to African: Atlantic Creoles and the Origins of African-American Society in Mainland North America," *William and Mary Quarterly* 53, no. 2, April 1996, 251–88; Kathleen A. Deagan, "Mestizaje in Colonial St. Augustine," *Ethnohistory* 20, no. 1, Winter 1973, 55–65; Barbara L. Voss, "Gender, Race, and Labor in the Archaeology of the Spanish Colonial Americas," *Current Anthropology* 49, no. 5, October 2008, 861–93; Sylvie Dubois and Megan Melançon, "Creole is, Creole ain't: Diachronic and Synchronic Attitudes toward Creole Identity in Southern Louisiana," *Language in Society* 29, no. 2, April 2000, 237–258; Mike Bunn, *Fourteenth Colony: The Forgotten Story of the Gulf South During America's Revolutionary Era* (Montgomery, Alabama: New South Books, 2020), 9, 82; National Park Service, Region One, "Fort Pickens Military Reservation, Escambia County, Florida, WAA Registry No. W-FLA-148, Report on Application by the Florida Board of Forestry and Parks for Transfer of Surplus Properties for Historic Monument Purposes, Requested by War Assets Administration, Region 6, Atlanta, Georgia," 3, in Box 651–4, Folder 102, Gulf Islands National Seashore Park Archives, Historic Documents (GUIS Acc. 651); Hammersten, ed., *An Archeological Overview and Assessment of Gulf Islands National Seashore*, 17.



Figure 4. Italian map of the Pensacola area circa 1763, possibly showing British fort at location of future Fort Pickens. (Source: Library of Congress)

Trade, an emerging naval industry, and a multicultural community continued to expand in Pensacola under Spanish rule at the end of the eighteenth century. Enslaved people and Cherokees sought refuge and work in the growing city, but the practice of human trafficking also flourished there. Spain signed a treaty with Upper Creek leaders, ending some of the hostilities between Native Americans and Europeans in the region. Pensacola increasingly needed brick masons, carpenters, blacksmiths, shoemakers, tailors, tanners, guides, clerks, dockworkers, lumberjacks, farmers, sailors, and soldiers. The multicultural nature of the city, and the willingness of urban slaveholders to rent their enslaved people out for jobs, meant that free men and women of African descent and enslaved men and women of the same background often worked side by side.[12]

Although Pensacola prospered at the end of the century, its political future remained unstable as

12. Kathleen DuVal, *Independence Lost: Lives on the Edge of the American Revolution* (New York: Random House, 2016), 239, 256–62; Gregory Evans Dowd, *A Spirited Resistance: The North American Indian Struggle for Unity, 1745–1815* (Baltimore: Johns Hopkins University Press, 1993), 93; Colin G. Calloway, *The American Revolution in Indian Country: Crisis and Diversity in Native American Communities* (New York: Cambridge University Press, 1995), 208; Kathryn E. Holland Braund, *Deerskins & Duffels: The Creek Indian Trade with Anglo-America, 1685–1815* (Lincoln: University of Nebraska Press, 1993), 173–174; Claudio Saunt, *A New Order of Things: Property, Power, and the Transformation of the Creek Indians, 1733–1816* (New York: Cambridge University Press, 1999), 54–61; Benjamin Quarles, *The Negro in the American Revolution* (Chapel Hill: University of North Carolina Press, 1961; reprinted 2012), 123, 125; Robert Paulett, *An Empire of Small Places: Mapping the Southeastern Anglo-Indian Trade 1732–1795* (Athens, Georgia: University

tensions grew between the United States and Great Britain, as well as between the United States and Native nations in the South.

Building American Coastal Defenses, 1821 to 1861

The War of 1812 between the United States and the British and the affiliated Creek War between the United States and the Red Stick Creek (who were aided and supported by the British and Spanish) extended across what is now Florida, Georgia, and Alabama. The conflict brought significant changes to life in Pensacola. During the War of 1812, Pensacolan men (both free and enslaved) sided with the British. During the Creek War, Pensacola supplied, supported, and harbored the Red Stick Creek as they fought against the United States. Both actions made the city the target of U.S. General Andrew Jackson's forces, and in 1814 Pensacola fell to Jackson. Spain officially transferred Florida to the United States in 1821. The United States then began an era of military spending and fortification construction in the city.[13]

Prior to the War of 1812, the United States had primarily built temporary fortifications under what have been called the country's First (1794–1802) and Second (1807–1812) Systems of Defense. Construction of fortifications during these periods lacked a coherent vision and occurred during periods of crisis. Following the War of 1812, during which U.S. military leaders had recognized how vulnerable the country was without the support of a strong navy, Congress established a Board of Engineers to design a more holistic system of defense that included coastal fortifications. The period of peace following the War of 1812 provided the new Board of Engineers the time necessary to develop a more deliberate Third System of Defense, which the board presented to Congress in an 1821 report. Using the board report as guidance through the 1850s, Congress began to support a long-term defense strategy by making appropriations that targeted coastal fortifications and formalized military training, including that of engineers. Key priorities of the Third System were to close important harbors to enemies but keep them open to the U.S. Navy, to prevent enemies from establishing positions on U.S. land, to protect cities and navy bases from attack, to protect internal waterways from enemy blockades, and to protect friendly coastal navigation.[14]

In the years following the 1821 report, the Board of Engineers and the Navy studied Pensacola as a potential location for a Navy yard and associated defenses. After approval for a Navy yard near Pensacola was secured in 1825, the U.S. Army Corps of Engineers saw the western end of Santa Rosa Island as playing a critical role in its defense. Corps of Engineers officers Lt. Col. Joseph Totten and Capt. William Chase provided the original design of the fort, which was later updated by Gen. Simon Bernard, head of the Board of Engineers. The plans called for a five-bastioned structure for the island with one level of casemates under an earthen terreplein and a level of barbettes on top of the casemates to defend the harbor from entry

of Georgia Press, 2012), 111–114; Christina Snyder, "Conquered Enemies, Adopted Kin, and Owned People: the Creek Indians and Their Captives," *Journal of Southern History* 73, no. 2, May 2007, 255–88, esp. 256.

13. Robert Owens, *Red Dreams, White Nightmares: Pan-Indian Alliances in the Anglo-American Mind, 1763–1815* (Norman, Oklahoma: University of Oklahoma Press, 2007), 210–14, 224; Clavin, *Aiming for Pensacola: Fugitive Slaves on the Atlantic and Southern Frontiers*, 46; Kathryn H. Braund, *The African American Experience and the Creek War, 1813–14: An Annotated Bibliography* (National Park Service), 4; Kathleen DuVal, review of Matthew J. Clavin, *Aiming for Pensacola: Fugitive Slaves on the Atlantic and Southern Frontiers*, *Early American Literature* 52, no. 1 (2017), 220–221.
14. Clinton W. Brown, *Coastal Fortifications and National Military Policy, 1815–1835* (Fort Leavenworth, Kansas: School of Advanced Military Studies, United States Army Command and General Staff College, 2015), iii, 1–3, 6, 28–32; Wiss, Janney, Elstner Associates, Inc., *Fort Pickens Mine Support Structures: Historic Structures Report* (Atlanta, Georgia: Cultural Resources Division, Southeast Regional Office, National Park Service, July 2015), 11.

(Figure 5). The fort's pentagon shape placed primary emphasis on defending the channel between the Gulf and the Bay, with a tower bastion pointing directly at the entrance to the bay between two "fronts" of casemates and barbettes angled to send projectiles into the passage between open water and the bay. The engineers also designed the fort to meet a land-based attack from the eastern end of the island.[15]

Construction of the fort began in May 1829, with Chase overseeing operations. In keeping with common Corps of Engineers practices in the South, Chase hired contractors that used enslaved labor or directly rented enslaved people from their owners to build much of the fort.[16] The laborers used millions of bricks in the construction of the fort, challenging the market to provide enough material. Lead was used to waterproof the fort's arches and to construct gutters and drains, while granite was used in traverses, sills, and steps. The officer's quarters had marble mantels and Venetian blinds. The parade ground was covered with crushed oyster shell from local suppliers. Chase moved the laborers as rapidly on construction as possible to avoid delays from weather and fever. Despite a wait caused by incomplete plans, Chase had the foundations laid by September 1830 and most of the masonry work done by October 1831. Work continued during 1832 despite lack of appropriations and storm damage. In May 1833, with the masonry work nearing completion, the Army named the defenses Fort Pickens, after Revolutionary War hero (and slaveholder) Maj. Gen. Andrew Pickens.[17] Waterproofing work and parade ground preparation occupied much of 1834 but after five years of construction, Chase alerted the War Department that the fort was ready to be garrisoned in October 1834. The first troops, Company H of the U.S. 2nd Artillery, arrived at the fort a few weeks later, but the fort was not fully armed, and their stay was brief.[18]

15. Bearss, "Fort Pickens 1821–1895: Historic Structures Report, Historic Data Section," 2–3; F. Ross Holland Jr. and Russell Jones, *Special History Study: Masonry Forts of the National Park Service* (Denver: Denver Service Center, Historic Preservation Team, National Park Service, August 1973), 110–111.
16. Mark A. Smith, "Engineering Slavery: The U.S. Army Corps of Engineers and Slavery at Key West," *Florida Historical Quarterly* 86, Spring 2008, 498–499.
17. National Park Service, "William H. Chase," last updated December 23, 2019, https://www.nps.gov/people/william-chase.htm; Thomas Hatley, *The Dividing Paths: Cherokees and South Carolinians through the Era of Revolution* (New York: Oxford University Press, 1993), 230–242; Colin G. Calloway, *The American Revolution in Indian Country: Crisis and Diversity in Native American Communities* (New York: Cambridge University Press, 1995), 199–212; Greg O'Brien, *Choctaws in a Revolutionary Age, 1750–1830* (Lincoln: University of Nebraska Press, 2002), 58–61.
18. Bearss, "Fort Pickens 1821–1895: Historic Structures Report, Historic Data Section," 2–7; Clavin, *Aiming for Pensacola: Fugitive Slaves on the Atlantic and Southern Frontiers*, 69–71; DuVal, review of Clavin, *Aiming for Pensacola: Fugitive Slaves on the Atlantic and Southern Frontiers*, 221.

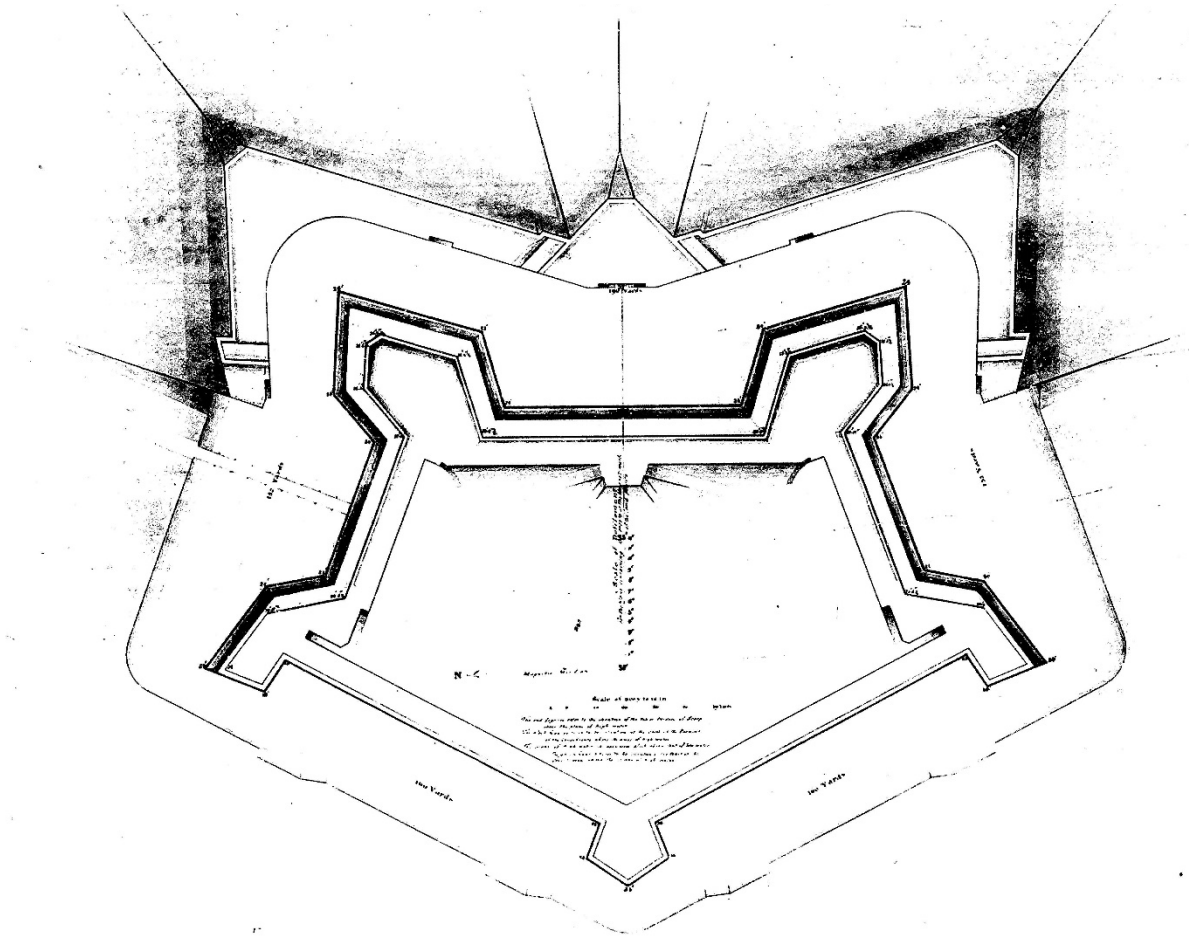


Figure 5. U.S. Corps of Engineers caption: "plan of a fort projected at Santa Rosa Point, Florida 1829." (Source: NPS)

Stationing troops for only short periods at the fort became common practice over the next few decades when coastal defense was less important than the U.S. government's campaigns to remove Indigenous peoples and resolve its borders. Infantry companies stayed briefly at the fort between postings, and the fort was only partially armed. While only occasionally occupied, the fort kept engineers and laborers busy with a near constant stream of repairs and rebuilds. In 1835, the northeast bastion scarp collapsed after heavy winter rains and had to be rebuilt with increased width. Casemates started leaking, causing bricks in the masonry arches to crumble and fall. Chase noticed movement on the east front curtain in the early 1840s and had laborers erect three counterforts along the curtain over the summer to stabilize it, while also stabilizing the southwest bastion to handle a wider parapet. By 1845, Chase was faced with strengthening all scarps, which seemed poorly designed for the action of sand that was constant on the barrier island. Despite Chase's efforts, the fort remained leaky and damp and mosquitoes bred in the ditches, making for miserable living conditions during military companies' short stays. Several companies were transferred to the recently constructed Fort Barrancas near Pensacola because of the conditions at Fort Pickens.[19]

By the 1850s, renewed concern about the need for coastal defense against European powers brought congressional funding and War Department attention back to Fort Pickens under the direction

19. Bearss, "Fort Pickens 1821–1895: Historic Structures Report, Historic Data Section," 5, 8–15.

of a new engineer, Lt. John Newton. Despite Chase's earlier efforts, an 1857 inspection found the fort in significant disrepair. The War Department called for an overhaul and repair of the fort, preparing it for the possibility of facing the heavier guns installed on European ships. This included reconstructing the tower bastion's barbette tier, repairing leaking roofs and casemates, and reinforcing all gun carriages to hold 32-pounders instead of 24-pounders. The fort still needed repair work when Newton was replaced by Lt. Frederick Prime, but rising sectional tensions within the United States prevented further work on the fort (Figure 6).[20]

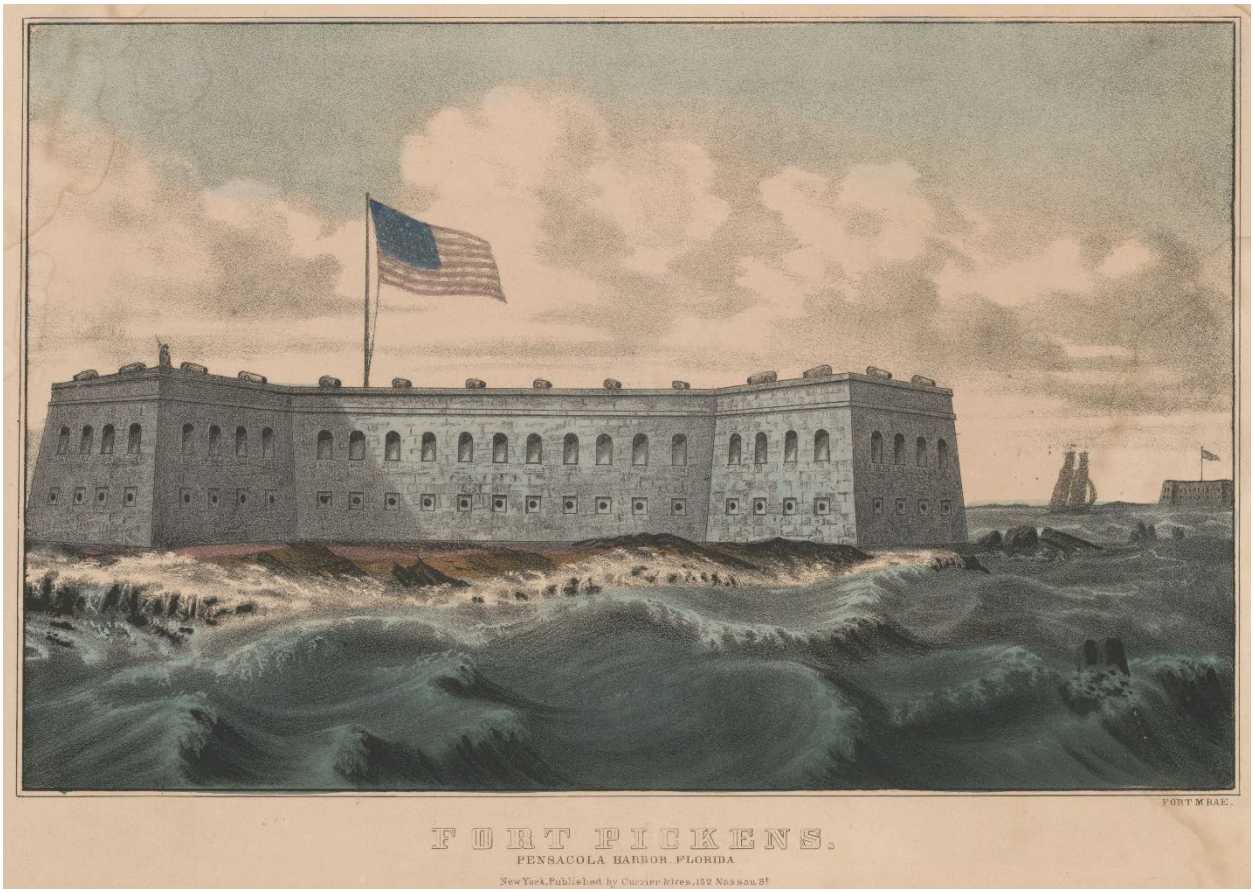


Figure 6. Lithograph of Fort Pickens from around 1860, Currier & Ives. (Source: Library of Congress Prints and Photographs Division)

20. Bearss, "Fort Pickens 1821–1895: Historic Structures Report, Historic Data Section," 15–16; David Ogden, comp., "A Structural Timeline of Fort Pickens, 1829–2002" (n.p., March 21, 2002).

Fort Pickens at War, 1861–1865

As friction between the Northern and Southern states mounted, the War Department did not ready the coastal Pensacola forts for fighting and even allowed Lt. Frederick Prime and commanding officers in the region to go on leave. While travelling north in December 1860, Prime learned that South Carolina had seceded, and by the time he arrived in New York state troops were attempting to occupy some U.S. forts in the South. When Florida became the third state to secede on January 10, 1861, with both the commanding and executive officers absent on leave, 33-year-old First Lt. Adam Slemmer decided to consolidate his command of Company G, 1st U.S. Artillery, abandoning Fort Barrancas and the coastal Pensacola forts for the more defensible Fort Pickens (Figure 7). Slemmer resisted pleas from Chase, who had joined the Florida troops, to surrender the fort to the Southern militias. His company mounted guns and prepared to defend Fort Pickens, while the Pensacola Navy Yard fell to the Florida and Alabama troops.[21]

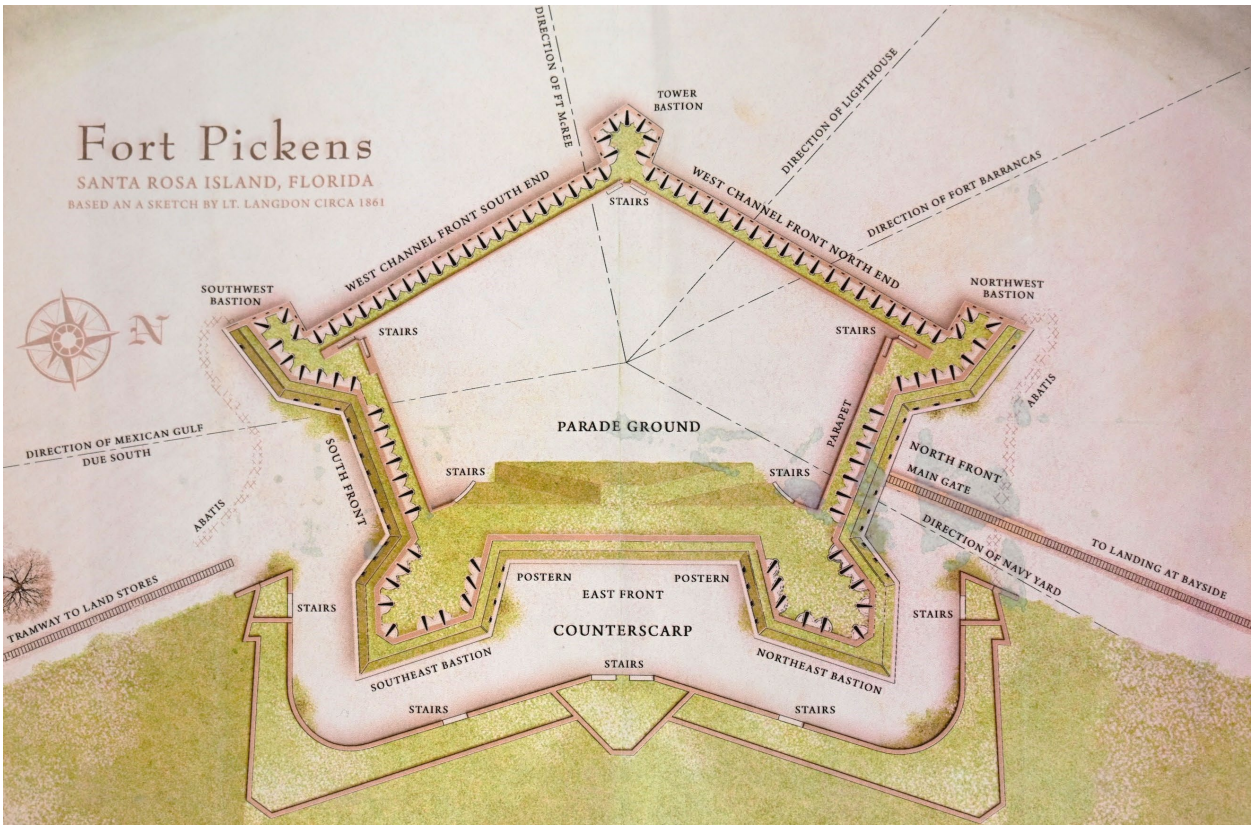


Figure 7. Plan and features of Fort Pickens, 1861. (Source: NPS)

21. Bearss, "Fort Pickens 1821–1895: Historic Structures Report, Historic Data Section," 18–21.

With Confederates in control of the Pensacola coastline, federal troops used their time to mount more guns at Fort Pickens. Florida Senator Stephen Mallory and President James Buchanan—then in his last weeks of office—agreed that the Confederates would not attack Fort Pickens if Buchanan did not reinforce the federal troops at the fort. While quiet reigned on the island, eight enslaved people escaped to Fort Pickens, seeking refuge behind Union lines. Lieutenant Slemmer returned the refugees to Pensacola, perhaps to prevent a flood of escapees and keep the fragile peace. In a departure from Buchanan's policy, when President Lincoln took office on March 4, 1861, he sent reinforcements to Fort Pickens. After some time at anchor, the force finally landed between April 11 and 12, breaking the peace in Pensacola. Although met with outrage by southerners, the situation at Pensacola was overshadowed by the firing on the federal garrison at Fort Sumter on April 12, beginning the Civil War. Col. Harvey Brown took command of Fort Pickens, and a new engineer, Maj. Zealous Tower, oversaw defensive planning at the fort (Figure 8 through Figure 10).

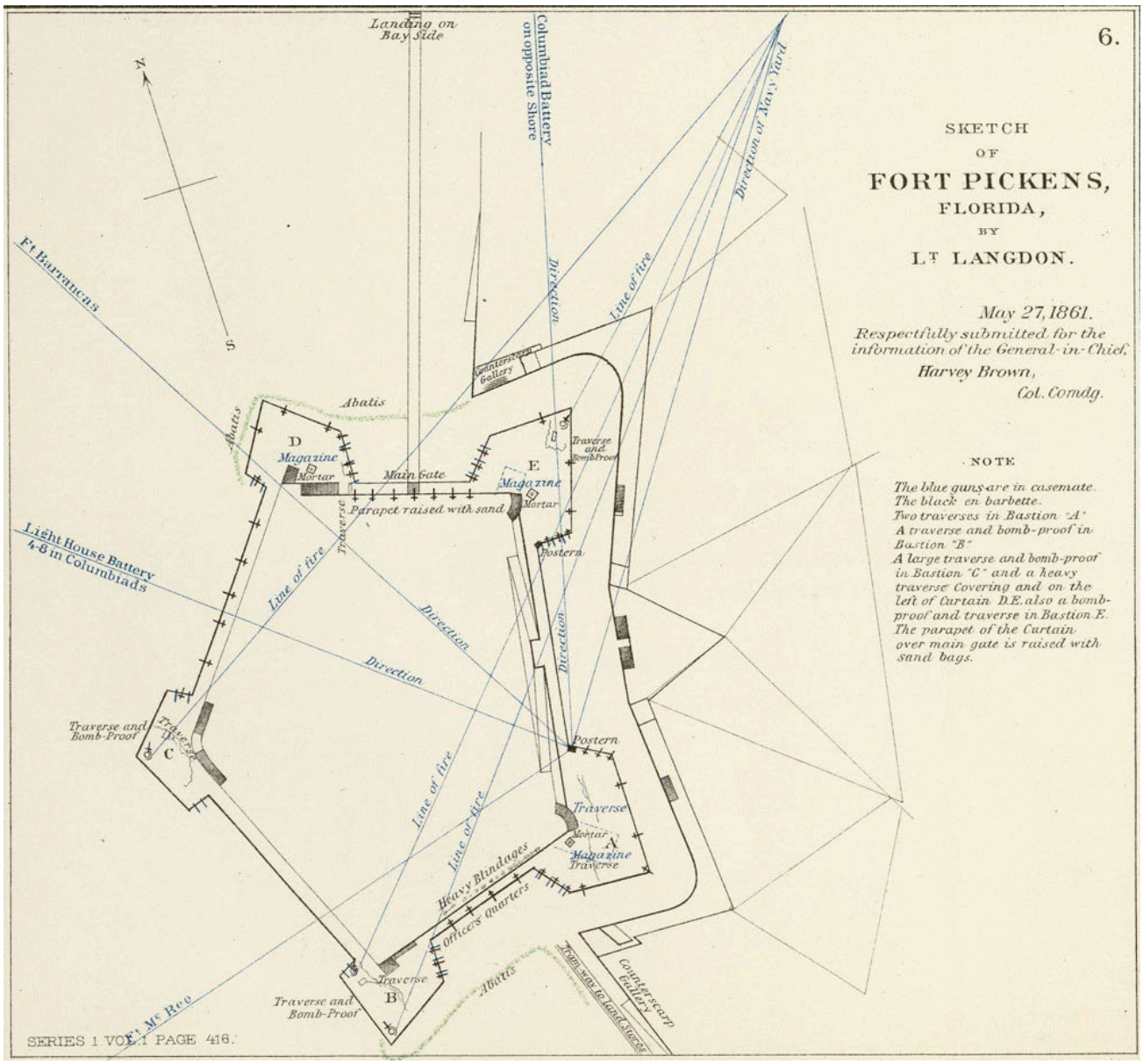


Figure 8. Sketch of Fort Pickens, Florida, by Lieutenant Langdon, 1861. (Source: "Fort Pickens," https://military-history.fandom.com/wiki/Fort_Pickens)

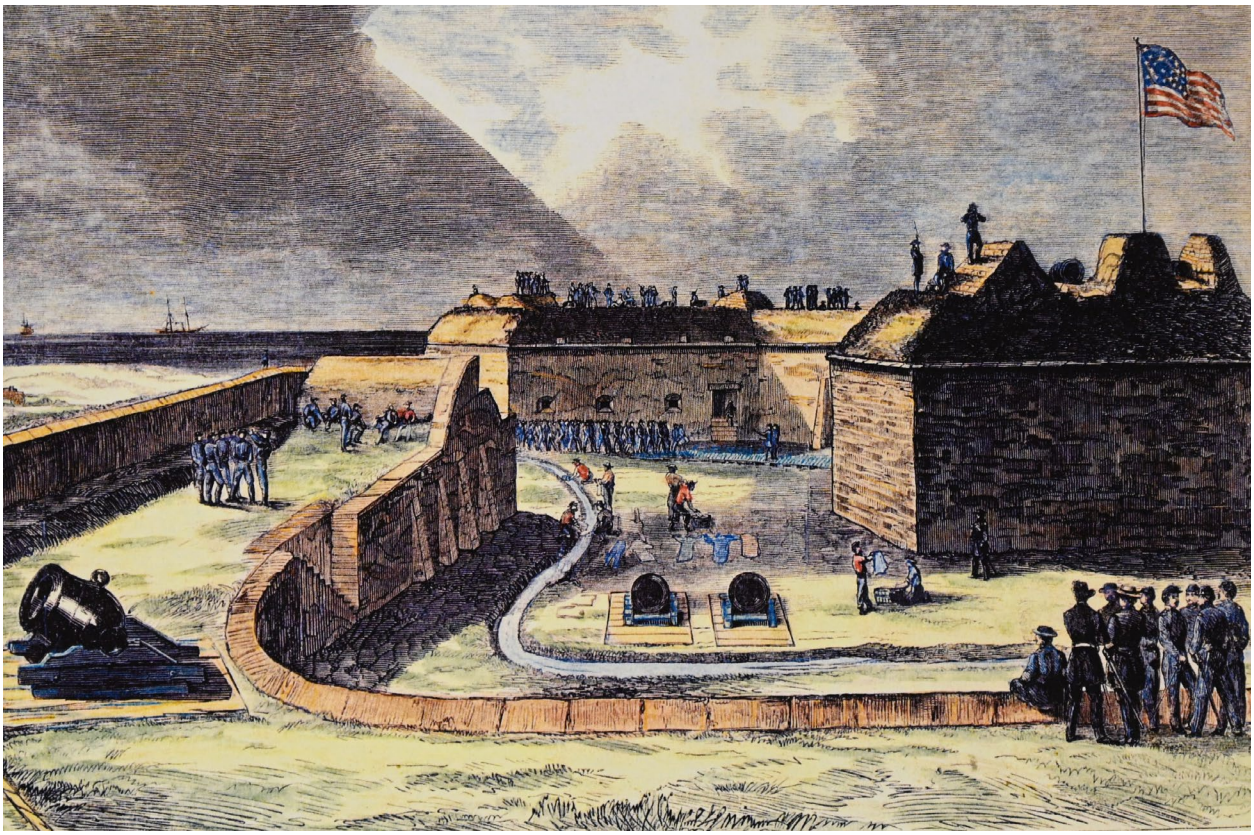


Figure 9. Caption from *Harper's Weekly*: "Wilson's Zouaves in ditch and covered way on the land in front of Fort Pickens," 1861. (Source: *Harper's Weekly*, July 27, 1861)

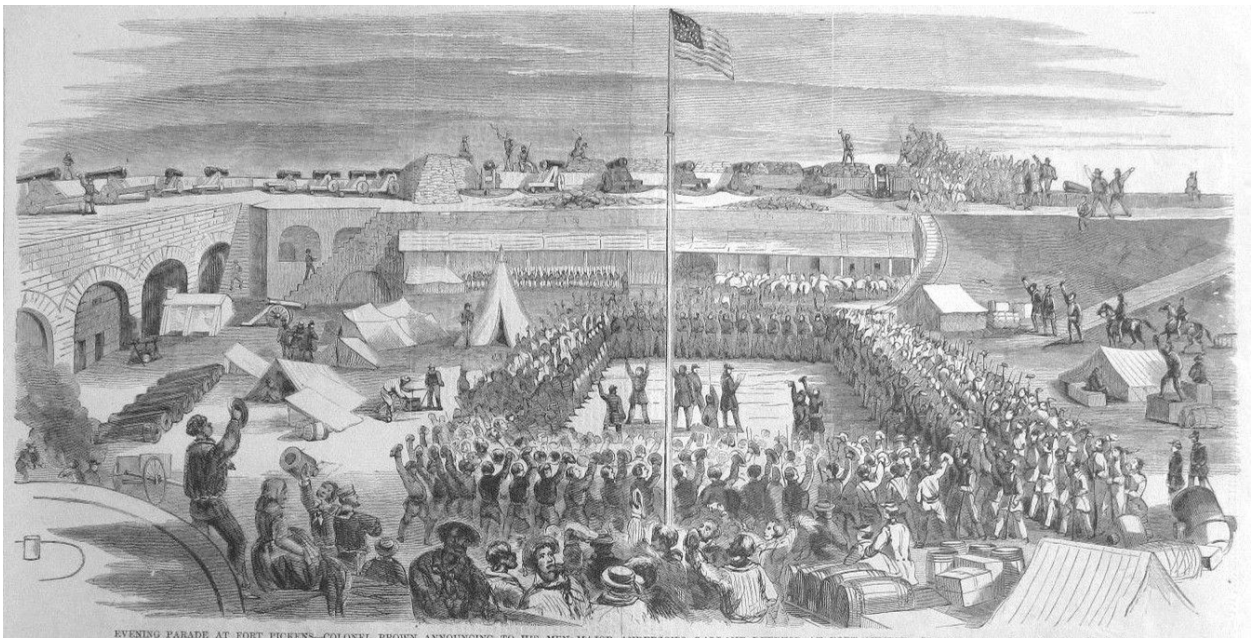


Figure 10. Interior of Fort Pickens in May 1861. (Source: "Evening Parade at Fort Pickens," *Harper's Weekly,* May 25, 1861)

With new leadership in place and active war, escaped enslaved people again began appearing at the fort, and this time they were not turned away. During the summer of 1861, one or two escaped enslaved people arrived at Fort Pickens each day, using canoes, skiffs, and wooden planks to cross over to the island, facing dogs and snakes in the swamps near Pensacola and snipers and sharks on

the water. Some of the men who crossed to Fort Pickens had worked on the Pensacola forts, had navigated ships through the bay, or possessed information about Confederate positions. They assisted with the war effort, while others were sent north on Union ships.[22]

Tensions began to mount between Fort Pickens, held by federal troops and blocking entrance to Pensacola Bay, and Forts McRee and Barrancas, held by Confederate troops who could not access the open ocean. Federal forces surveilled Confederate efforts to bring a dry dock near the Navy yard into operation with concern, and suspected the Confederates were fitting out schooner *William H. Judah* as a privateer at the naval yard. On September 14, a federal raiding party boarded the *Judah*, burned it to the waterline and spiked a cannon at the Navy yard. In retaliation, on the night of October 9, 1861, leader of the Pensacola-area Confederates Gen. Braxton Bragg mounted an attack by land against Fort Pickens. The so-called Battle of Santa Rosa was short-lived, with Confederate troops failing to reach the fort walls before retreating. Both sides suffered casualties, and the animosity between the two sides sparked gun battles between Fort Pickens and the Pensacola coastline batteries, including Fort McRee, in November 1861 and January 1862 (Figure 11). In February 1862, the Confederate government ordered the troops in Pensacola to travel north to reinforce losses in Kentucky and Tennessee, directing them to burn or destroy any useful supplies in Pensacola before leaving. The Confederates left in May 1862, and the Union took control of the largely abandoned city, the harbor, and much of the adjacent waters.[23]

Once the Confederate Army fled, leaving scorched earth behind it, Pensacola was a near ghost town, populated primarily by Union soldiers, escaped enslaved people, and a small number of civilians who had remained during the fighting. Formerly enslaved people were more vulnerable in Pensacola than they had been at Fort Pickens and could still be returned to their owners while the war was ongoing. Many found work with the federal government building roads or digging trenches for military actions. After President Lincoln issued the Emancipation Proclamation in January 1863, the formerly enslaved were free to join the Union Army, and many did so in Pensacola. In the final year of the war, the War Department sent the 25th U.S. Colored Troops from Philadelphia to recruit Black men to the Union Army. Some of these recruiters were stationed at Fort Pickens.[24]

22. Hammersten, ed., *An Archeological Overview and Assessment of Gulf Islands National Seashore*, 19; Matthew J. Clavin, "Interracialism and Revolution on the Southern Frontier: Pensacola in the Civil War," *Journal of Southern History* 80, no. 4, November 2014, 791–797, 802; Edwin C. Bearss, "Fort Pickens 1821–1895: Historic Structures Report, Historic Data Section," 31–37.
23. Bearss, "Fort Pickens 1821–1895: Historic Structures Report, Historic Data Section," 38–42; Albert Manucy, "Report on Historic Sites, Pensacola, Florida" (n.p., June 19, 1939), 34.
24. Clavin, "Interracialism and Revolution on the Southern Frontier: Pensacola in the Civil War," 806, 809, 811, 820.

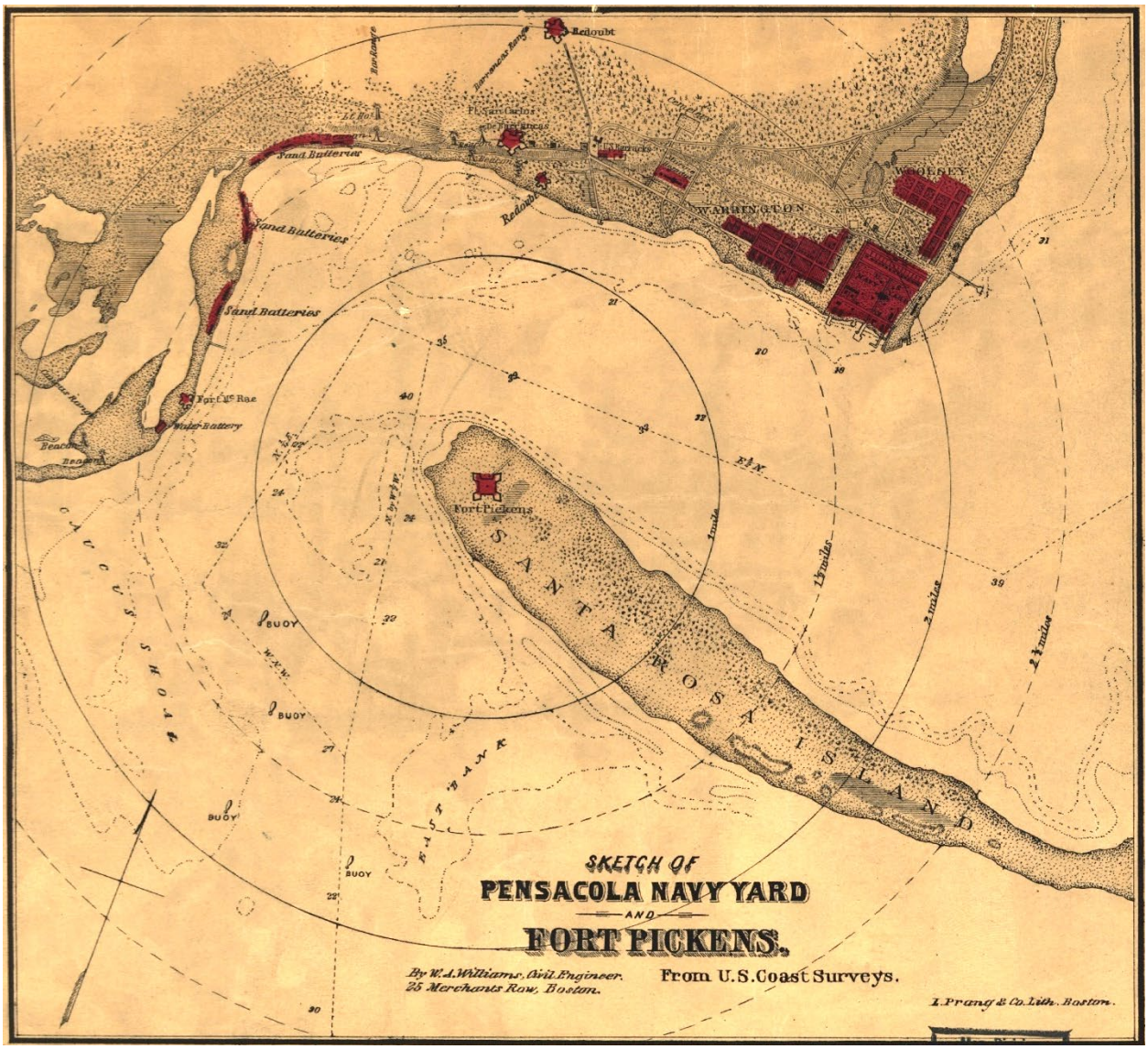


Figure 11. "Sketch of Pensacola Navy Yard and Fort Pickens from U.S. coast surveys," circa 1860. Note circles between 1 and 2.5 mile radii centered on Fort Pickens. (Source: Library of Congress)

A New Battery at Fort Pickens, 1866–1915

Fort Pickens suffered little damage during the Civil War, and what little had occurred was repaired by the War Department at the end of the war, in some cases using masonry from the nearly destroyed Fort McRee. Fort Pickens was occupied only intermittently after the war, however, and it rapidly fell into disrepair. By 1868, the fort was in such bad condition that the tower bastion was being upheld by timbers. Federal finances after the war were such that Congress funded little repair work. In 1876, the Army carried out minor repairs on the southwest bastion, and in the mid-1880s it repaired masonry, the southwest cistern, and the north curtain wall. But between 1876 and 1890, the federal government focused only on critical repairs rather than new construction or major rebuilding of coastal forts (Figure 12).[25]

25. Bearss, "Fort Pickens 1821–1895: Historic Structures Report, Historic Data Section," 43–49; Ogden, "A Structural Timeline of Fort Pickens, 1829–2002," 6–7.

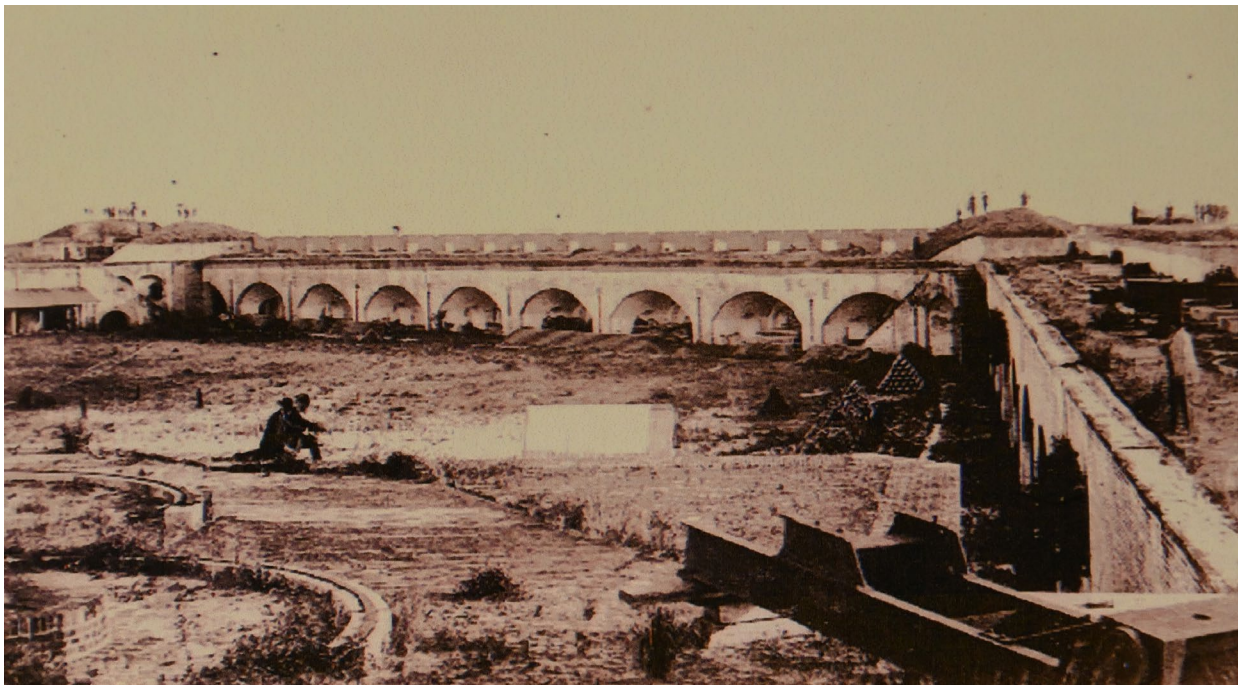


Figure 12. View east from top of southwest bastion, 1880. (Source: NPS GUIS Headquarters)

Nevertheless, Fort Pickens did not sit idle. Thanks to the lobbying efforts of influential Pensacola citizens, Geronimo and other Chiricahua and Warm Spring Apache men captured by the United States at the end of the Apache Wars were transferred to Fort Pickens in October 1886. The Army forces guarding the prisoners and the prisoners themselves conducted repairs on the fort's doors, windows, and grounds. The troops divided the casemates along the southern wall into housing for the prisoners, and in February 1887, the Army began allowing curious civilians into the fort to see Geronimo. The prisoners' wives and children joined them at Fort Pickens in April 1887, requiring an expansion of the prisoner housing into the former hospital along the north wall casemates. The fifteen men, twenty-one women, and ten children housed at Fort Pickens may have been the fort's longest residents other than the troops who were garrisoned there during the Civil War. The War Department moved the prisoners to the Mt. Vernon Barracks near Mobile, Alabama, in April 1888, leaving the fort mostly empty and again vulnerable to deterioration.[26] At the same time that U.S. coastal forts were falling into disrepair, technological developments in military ordnance had recast approaches to coastal defense. Guns that became available in the late nineteenth century could launch projectiles over far greater distances and with better accuracy than those of the past. Armored steam-powered vessels replaced the wooden sailing vessels of the pre-Civil War era, carrying much more powerful weaponry.

In the face of such naval advances, along with public alarm at the deteriorating state of American fortifications, President Grover Cleveland authorized a board composed of Army, Navy, and civilian leaders and headed by Secretary of War William C. Endicott to survey the U.S. coastal defense system and make recommendations for its improvement. In 1886, the Endicott Board reported back to the president, recommending an expenditure of approximately $126 million to fortify the seacoast at twenty-seven places with a combination of batteries, floating batteries, submarine minefields, and torpedo boats. Although the proposal greatly exceeded the

26. Bearss, "Fort Pickens 1821–1895: Historic Structures Report, Historic Data Section," 50–53; Edwin C. Bearss, *Historic Structure Report and Resource Study: Pensacola Harbor Defense Project, 1890–1947, Florida Unit* (Gulf Islands National Seashore, Florida: National Park Service, 1982), 3–4; National Park Service, "Apaches at Fort Pickens" [wayside text], 2018.

United States' capacity to implement it, in 1887 Secretary Endicott instructed the Board of Engineers for Fortifications to begin planning defense improvements for the most important seacoast ports. The engineers completed detailed planning for the defense of twenty-three important harbors, including Pensacola, between 1887 and 1896, and Congress resumed funding new construction projects.[27] At the same time U.S. coastal forts were falling into disrepair, technological developments in military ordnance had recast approaches to coastal defense. Guns that became available in the late nineteenth century could launch projectiles over far greater distances and with better accuracy than those of the past. Armored steam-powered vessels replaced the wooden sailing vessels of the pre-Civil War era, carrying much more powerful weaponry.

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The Board of Engineers completed its study of Pensacola Harbor in June 1893. Its report recognized the value of the harbor as a lumber port (more than 500 foreign ships had visited the harbor the previous year for such purposes), an excellent anchorage in the Gulf, and a safe harbor for merchant marine and supply cruisers during war. At Fort Pickens, the planning engineers determined that the original masonry fort was too deteriorated and obsolete to justify an attempt to modernize it. Instead, the engineers chose to place a new, modern battery within the walls of the historic fort, as well as supporting technology such as a mining casemate, additional detached batteries, a submarine mine field in Pensacola Bay, and a cable gallery (Figure 13). The plan estimated that the new Fort Pickens battery would cost $449,000 to construct. While the battery was under construction (and as war with Spain loomed on the horizon), the War Department replaced the aging guns and Rodman gun carriages along the Fort Pickens walls. The Fort Pickens enhancements would be complemented by new guns at the site of Fort McRee (which was no longer intact) and three new batteries around Fort Pickens (Battery Cullum, Battery Van Swearingen, and Battery Worth).[29]

The construction of the new battery within Fort Pickens was fast-tracked after the destruction of the USS *Maine* brought the United States closer to war with Spain and prompted Congress to authorize $3.8 million for improving coastal defenses through the National Defense Act of March 9, 1898. Less than ten days after President

27. Bearss, *Historic Structure Report and Resource Study: Pensacola Harbor Defense Project, 1890–1947, Florida Unit,* 3–4; Bearss, "Fort Pickens 1821–1895: Historic Structures Report, Historic Data Section," 53.
28. Bearss, *Historic Structure Report and Resource Study: Pensacola Harbor Defense Project, 1890–1947, Florida Unit,* 3–4; Bearss, "Fort Pickens 1821–1895: Historic Structures Report, Historic Data Section," 53.
29. Bearss, "Fort Pickens 1821–1895: Historic Structures Report, Historic Data Section," 53; Bearss, *Historic Structure Report and Resource Study: Pensacola Harbor Defense Project, 1890–1947, Florida Unit*, 8–9, 297–298; Wiss, Janney, Elstner Associates, Inc., *Gulf Islands National Seashore: Battery 234 CRF/BCS Tower, Pensacola Bay, Florida: Historic Structures Report* (Atlanta, Georgia: Cultural Resources Division, Southeast Regional Office, National Park Service, May 2015), 1–2.

William McKinley signed the act, the Corps of Engineers Chief Engineer informed his superiors that the work on a Fort Pickens emplacement (two 12-inch guns on disappearing carriages) would begin immediately (Figure 14). The battery was designed such that its left (north-facing) gun projectiles would guard the Gulf side of Santa Rosa Island, while its right (south-facing) gun would protect the entrance to the harbor. The constructing engineer determined that the most efficient way of making the battery operational was to remove the breast-height wall on the south side of Fort Pickens to allow the guns to clear it. Although the gun platforms were ready by the end of June 1898 while the United States was engaged in the Spanish-American War, the battery as a whole was not yet complete. The battery stood structurally independent of Fort Pickens but cut across its parade grounds in such a way that it essentially divided the fort into two parts, which limited access to the southern casemates. In September and October 1898, the engineer directed the construction of a tunnel to provide quick access to the casemates and completed the battery's concrete work. Over the winter of 1898–1899, laborers installed an overhead ammunition conveyor, electric light, and a power plant; and removed the breast-height wall and a parapet. At the end of June 1899, after the Spanish-American War had ended, the Corps of Engineers transferred the battery to the Artillery. The two 12-inch breech-loading rifles and their disappearing gun carriages were mounted on the battery at the end of the year. In May 1900, the War Department named it Battery Pensacola. Like the older fort that surrounded it, the new battery faced leakage problems almost immediately.[30]

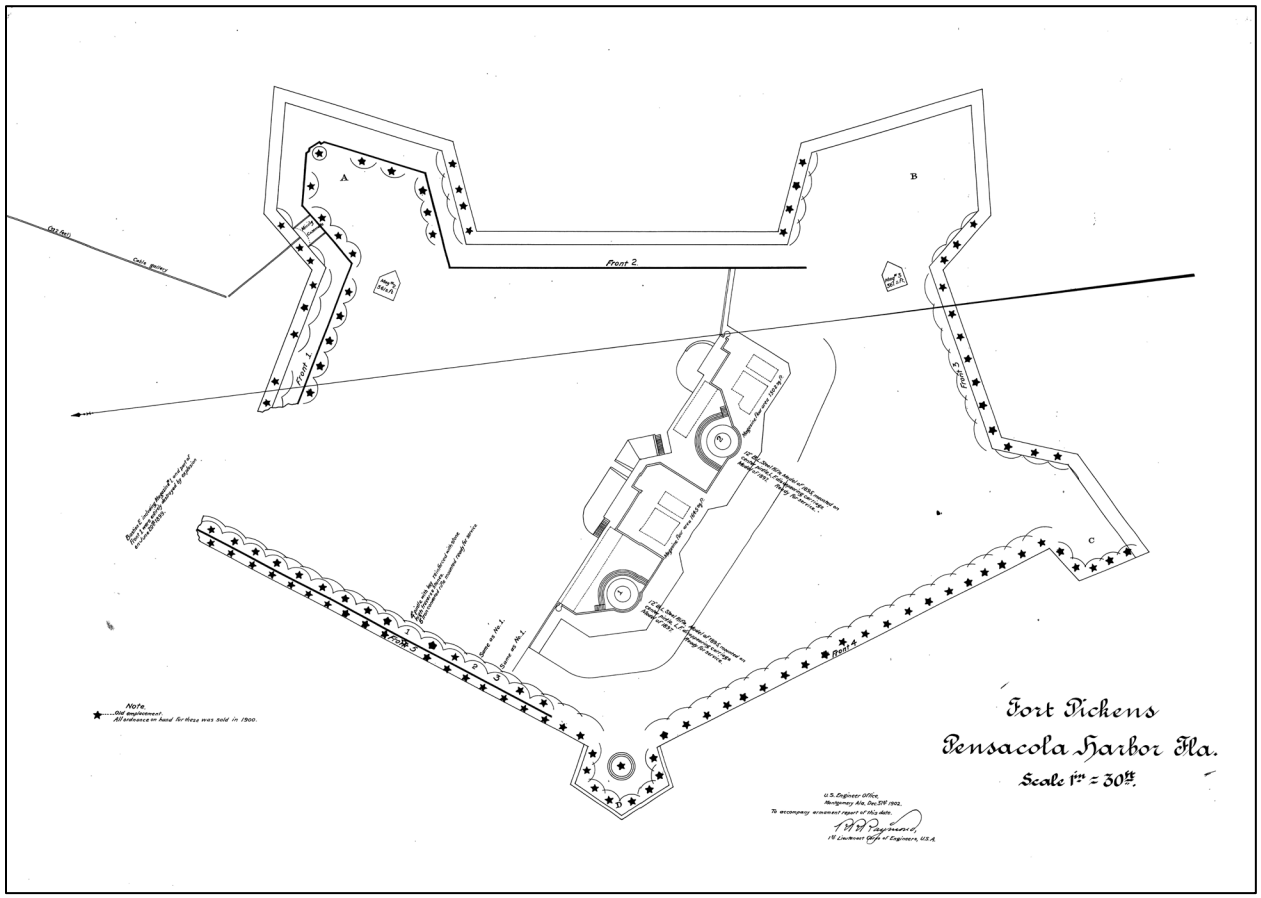


Figure 13. U.S. Army Corps of Engineers drawing from 1900 showing new Battery Pensacola within Fort Pickens. (Source: NPS)

30. Bearss, *Historic Structure Report and Resource Study: Pensacola Harbor Defense Project, 1890–1947, Florida Unit,* 93–96, 103–111.

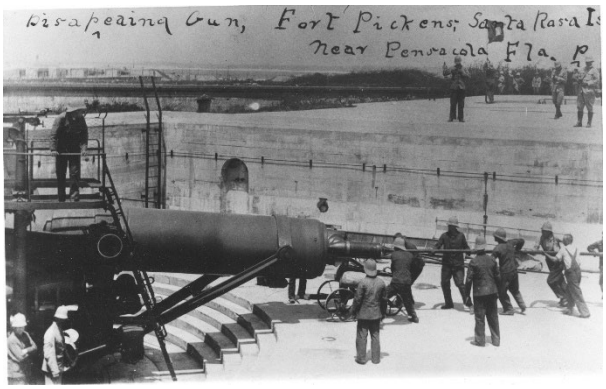


Figure 14. Disappearing 12-inch gun at Battery Pensacola, circa 1900. (Source: Photographer unknown; photograph courtesy of National Park Service, Gulf Islands National Seashore, image no. 13)

While Battery Pensacola construction involved removal of part of the breast-height wall of the original Fort Pickens (and took much of its parade ground), an accident destroyed one of the old fort's bastions. One night in June 1899, a fire ignited in one of the north wall casemates west of the Fort Pickens sally port. Troops fought the fire using a bucket brigade, but heat from the fire pushed them back and they were unable to stop it from reaching the northwest bastion magazine, which held stores of the fort's powder. When the fire reached the powder, it triggered a deafening blast that was felt across the bay in Pensacola. An inspection found that although the fire had caused some damage to the contents of the casemates, the explosion had done far worse—it obliterated the bastion, destroyed structures associated with the submarine mine defenses near the bastion, and cracked the nearby cistern such that it lost its water. Battery Pensacola was largely undamaged, and with Fort Pickens no longer an active defensive structure, the War Department authorized salvage operations on the fort (using the bastion bricks for later shoreline stabilization) but did not reconstruct it. As further evidence of the fort's obsolescence, the War Department scrapped Fort Pickens's guns between 1900 and 1903.[31]

The War Department continued to invest in Battery Pensacola and Fort Pickens area defenses in the early 1900s, even while transitioning the Navy to a more active, offensive role in coastal warfare (Figure 15). Between 1904 and 1906, the War Department constructed Batteries Payne, Trueman, and Cooper to defend the harbor against fast-moving torpedo boats and minesweepers. In 1907, the Corps of Engineers built a battery commander's station at Battery Pensacola, and, in 1908, following flooding caused by hurricanes in 1906, the engineers completed a seawall to protect the fortifications from storm surges. The coastal branch of the Army's new Corps of Artillery was assigned to the battery, providing a more consistent presence as compared to past years. The artillerists were not housed in the damp and deteriorating Fort Pickens, but in wood barracks in the vicinity or at Fort Barrancas, traveling across the bay only to participate in training on the heavy artillery.[32]

31. Bearss, *Historic Structure Report and Resource Study: Pensacola Harbor Defense Project, 1890–1947, Florida Unit,* 195–197, 297–298.
32. "Mayor Bliss on Press Reports," *Pensacola (Florida) Journal*, October 2, 1906; Bearss, *Historic Structure Report and Resource Study: Pensacola Harbor Defense Project, 1890–1947, Florida Unit,* 10–11, 226–227; Ogden, "A Structural Timeline of Fort Pickens, 1829–2002"; David P. Ogden, "Military Life in Pensacola in the 1930s and '40s: The Fort Barrancas Oral History Project" (n.p., December 2, 1987), 8–9.



Figure 15. Rendering of Battery Pensacola, circa 1910. (Source: NPS)

The World Wars and the End of Coastal Defense, 1916-1947

With war threatening in Europe in 1914, the United States assessed the condition of its coastal fortifications. On Santa Rosa Island, the War Department recommended more gun emplacements on the western end of the island (Batteries Langdon and Fixed) and the removal of more of the Fort Pickens walls to provide clearer views for Battery Pensacola to the south (Figure 16 and Figure 17). In 1916, the Army directed the lowering of some of the fort's south walls, thereby destroying some of the casemates that had once held Apache prisoners. After U.S. entry into the war in 1917, with the lessons of the German Zeppelins and Gotha bombers in mind, the Coastal Artillery added two 3-inch anti-aircraft guns near Battery Worth.[33]

33. Bearss, *Historic Structure Report and Resource Study: Pensacola Harbor Defense Project, 1890–1947, Florida Unit,* 114–120, 289; Wiss, Janney, Elstner Associates, Inc., *Gulf Islands National Seashore: Battery 234 CRF/BCS Tower, Pensacola Bay, Florida: Historic Structures Report* (Atlanta, Georgia: Cultural Resources Division, Southeast Regional Office, National Park Service, May 2015), 1–2.



Figure 16. Fort Pickens, showing mine command building on top of northeast bastion, relatively recently filled in dry moat, rail line through sally port, and structures inside former parade ground, 1918. (Source: Library of Congress)

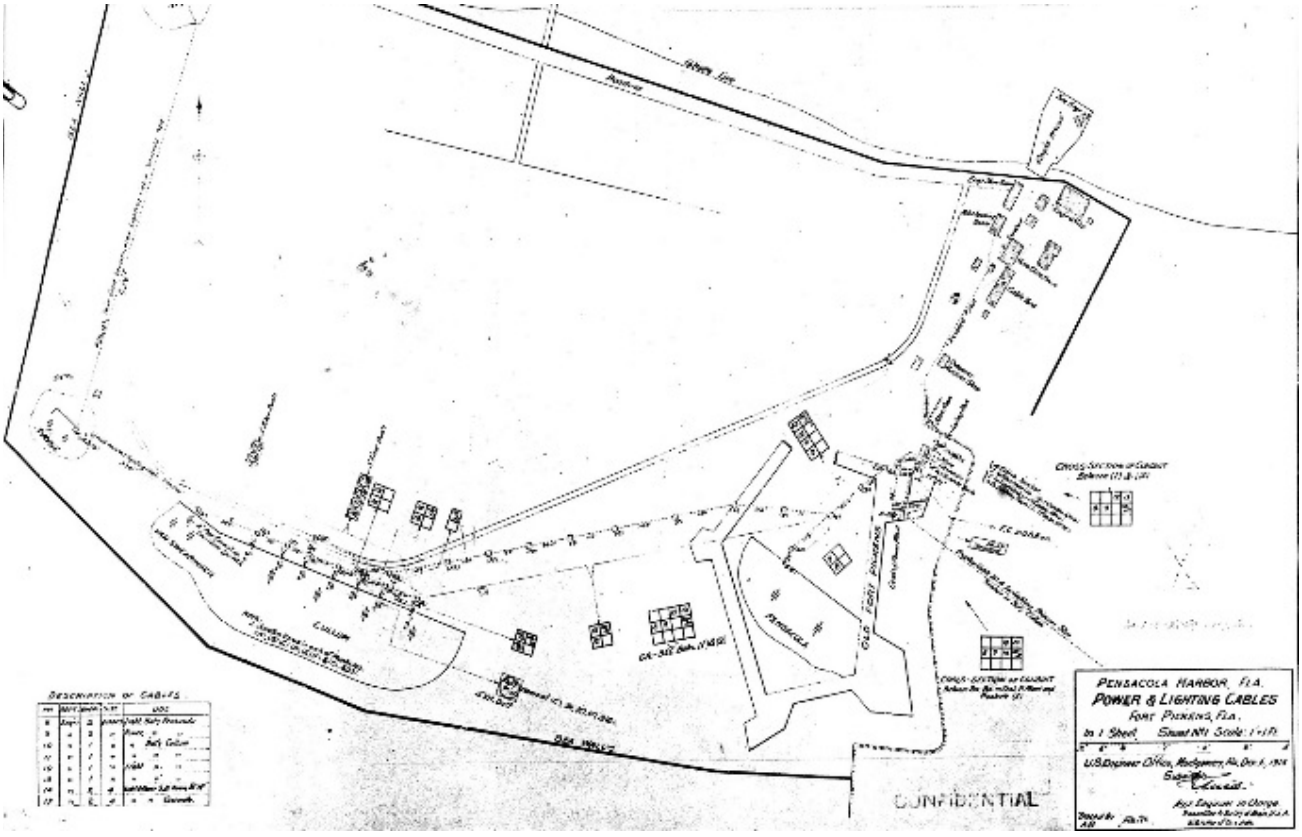


Figure 17. Plan of Fort Pickens, 1918. (Source: NPS DSC e-TIC, NPS Drawing No. 635-60960)

Pensacola saw no action during World War I, but in the years that followed the War Department reevaluated the necessity of large coastal defense complexes (Figure 18). The rise of air power and larger battleships had again made the Fort Pickens defenses obsolete, and the Army considered transfer of antiquated military installments such as Fort Pickens to public recreation purposes. In April 1929 (as amended in 1932), the federal government sold a portion of the Fort Pickens Military Reservation (not including the fort or nearby batteries) to Escambia County, along with other lands on Santa Rosa Island, for use as places of public recreation. The sale caught the attention of the National Park Service, which recognized that Santa Rosa was a relatively undeveloped barrier island with great recreational potential. As the NPS began conducting its first investigations of Santa Rosa Island, the War Department declared Battery Pensacola surplus and directed the Army to disconnect the battery's power, and, in October 1934, to send its guns to a factory.[34]

While the fortifications around Fort Pickens remained in the War Department's hands and those that still held guns were used in artillery training exercises, in 1938 the NPS and Escambia County began the transfer of the recreational lands the War Department had sold to Escambia County to the NPS. In 1939, President Roosevelt created the Santa Rosa National Monument, which included the entire island except that portion of the Fort Pickens Military Reservation still owned by the War Department. A 1938 *Preliminary Report on Historic Sites at Pensacola* advised the NPS to take control of the historic fortifications around Pensacola (including Fort Pickens) as the War Department released them. Another report completed the following year, however, was less enthusiastic about Fort Pickens, arguing that it was typical of other structures already held in the park system.[35]

34. Bearss, *Historic Structure Report and Resource Study: Pensacola Harbor Defense Project, 1890–1947, Florida Unit,* 120–121; Arno B. Cammerer to Assistant Secretary of the Interior, March 23, 1938, 1–3; National Park Service, Bureau of Sport Fisheries and Wildlife, Bureau of Outdoor Recreation, *A Report for the Proposed Gulf Islands National Seashore* (Washington, D.C.: National Park Service, January 1968), 14.
35. Arno B. Cammerer to Assistant Secretary of the Interior, March 23, 1938, 1–3; Director of Procurement, Treasury Department, Procurement Division, Washington, to Secretary of the Interior, December 27, 1938; U.S. Department of the Interior, "Memorandum for the Press," May 25, 1939; Ogden, "Military Life in Pensacola in the 1930s and '40s: The Fort Barrancas Oral History Project," 8; Herbert E. Kahler and C. E. Vinten, *Preliminary Report on Historic Sites at Pensacola, Florida* (St. Augustine, Florida: National Park Service, January 1938), 9–16; Albert Manucy, "Report on Historic Sites, Pensacola, Florida" (n.p., June 19, 1939), 27, 54.



Figure 18. Aerial view of Fort Pickens, December 1928. (Source: Gulf Islands National Seashore, image no. 626)

The build up to World War II, beginning in 1940, hampered both the NPS's efforts to develop Santa Rosa Island for recreation and the War Department's progress in decommissioning historic structures. The War Department planned new coastal defense systems in 1940, which included the installation of two batteries in the Pensacola Defense Project: Battery 233 (on the western side of the channel into Pensacola Harbor) and Battery 234 (on Santa Rosa Island just outside the Fort Pickens seawall) each housing guns with a fifteen-mile range. The War Department also installed Battery AMTB (anti-motor torpedo boat), which consisted of two 90-millimeter guns placed on the Gulf side of the Fort Pickens seawall and directed the Army to re-occupy the fort grounds so that artillerists would be near their posts. A tent city and temporary quarters sprang up around Fort Pickens. The old fort got new use for the duration of the war – serving as a dispensary and hospital for non-critical patients. As part of the wartime construction, the Army built an access road that cut through the southeast wall of the old counterscarp and skirted the south edge of the fort. After the attack on Pearl Harbor, the active guns around Fort Pickens were manned twenty-four hours a day. The installations and military activity made consideration of a transfer of historic Fort Pickens to the NPS impossible, and the national focus on defense and the war meant no funding came through for the new national monument.

By the end of World War II, the atomic bomb, German V-2 ballistic missiles, and successful Allied invasions along protected coasts made it clear to the War Department that fixed concrete coastal defenses were obsolete. The Army integrated the Coast Artillery branch into the Field Artillery branch and began divesting itself of its coastal fortifications. The War Department had already sent the gun carriages on Battery Pensacola to be used as scrap during the war. In

April 1947, the War Department decommissioned the Fort Pickens Military Reserve, and the last soldiers left the island.[36] In addition, the U.S. disestablished the Santa Rosa National Monument after the war and donated the federal lands not taken by the War Department back to Escambia County.[37]

Given the earlier interest and attempts at creating a national monument in the Pensacola area, upon hearing of the decommissioning of coastal fortifications, the NPS directed the Coordinating Superintendent of Southeastern National Monuments, C. R. Vinten, to assess the value of including the Pensacola area forts in a possible Pensacola National Monument (as introduced in legislation by Florida Congressman Bob Sikes). In July 1947, Vinten sent a report to the Regional NPS Director on the historic fortifications. Vinten had collaborated with Captain Sinton, Commanding Officer of the Pensacola Naval Air Station, in evaluating the sites, which had included walk throughs of Forts San Carlos, Barrancas, and Redoubt but not Fort Pickens. According to Vinten, Capt. Sinton was "deeply interested in the preservation and proper use of these historic structures and advised me that the Navy has neither the personnel nor the facilities and funds to give the proper protection and interpretation."[38] Despite Sinton's enthusiasm for historic preservation, Vinten reported that the men had determined:

> that the inaccessibility of Fort Pickens and its association with other military buildings would give the area little advantage as far as national monument status is concerned. The inclusion of Fort Pickens in any plan was mutually agreed upon as involving unnecessary complications of administration and operation. It is not accessible to visitation and the establishment of boat service could be a very doubtful financial venture for an operator, as its drawing power is obviously very limited.[39]

In the report summary Vinten wrote, "Fort Pickens has little national monument value and its administration and operation would involve duplication of effort at an inaccessible location having little possibility for public use."[40] The War Department's War Assets Administration formally offered the property to state or local governments in June 1948. Following Vinten's determination, and the recommendation made by the Advisory Board on National Parks, Historic Sites, Buildings, and Monuments, in December 1948, the NPS recommended that the historic Pensacola forts be transferred to the State of Florida as a historical park as they did not qualify for national monument status.[41]

36. Ogden, "Military Life in Pensacola in the 1930s and '40s: The Fort Barrancas Oral History Project," 2, 28, 33; Bearss, *Historic Structure Report and Resource Study: Pensacola Harbor Defense Project, 1890–1947, Florida Unit,* 121; "Ownership and Legal Control of Santa Rosa Island Defined," *Pensacola (Florida) News Journal*, April 20, 1947, 7; Newton B. Drury, Director, National Park Service, to Secretary of the Interior, December 2, 1948.
37. Bearss, *Historic Structure Report and Resource Study: Pensacola Harbor Defense Project, 1890–1947, Florida Unit,* 291, 299; Wiss, Janney, Elstner Associates, Inc., *Gulf Islands National Seashore: Battery 234 CRF/BCS Tower, Pensacola Bay, Florida: Historic Structures Report* (Atlanta, GA: Cultural Resources Division, Southeast Regional Office, National Park Service, May 2015), 1–2; National Park Service, Bureau of Sport Fisheries and Wildlife, Bureau of Outdoor Recreation, *A Report for the Proposed Gulf Islands National Seashore* (Washington, D.C.: National Park Service, January 1968), 1; C. Girard Davidson Deed to Escambia County, Florida, Filed January 15, 1947; Ogden, "Military Life in Pensacola in the 1930s and '40s: The Fort Barrancas Oral History Project," 8–34.
38. C. R. Vinten, "Memorandum for the Regional Director, Region One" July 15, 1947, 2.
39. C. R. Vinten, "Memorandum for the Regional Director, Region One" July 15, 1947, 1.
40. C. R. Vinten, "Memorandum for the Regional Director, Region One" July 15, 1947, 4.
41. Newton B. Drury, Director, National Park Service, to Secretary of the Interior, December 2, 1948.

Fort Pickens State Park, 1948-1971

Florida, like many states, had an informal state park system until the Civilian Conservation Corps (CCC) and the NPS collaborated with the state to develop public recreational facilities in the 1930s. Florida created Olustee Battlefield in 1907, and a few other memorials thereafter, and in 1915, through the efforts of the Florida Federation of Women's Clubs, acquired Royal Palm State Park (later absorbed into Everglades). In 1933, with the encouragement of the NPS and the CCC, Florida began acquiring sites using the state's Internal Improvement Fund, land donations, and delayed payment purchases. As the land came into Florida's ownership, the CCC began development to make the parks accessible to the public. In 1935, the Florida legislature established a Florida Park Service under the Board of Forestry and gave it a small appropriation to continue acquiring and developing new parks. When the U.S. entered World War II, the CCC program ceased, leaving Florida parks with uncompleted projects. When the war ended in 1945, the Florida Legislature established a new Forestry and Parks Board to operate more independently of the Board of Forestry. It was this board that the NPS hoped might be interested in taking over the historic Pensacola forts.[42]

The Forestry and Parks Board did not immediately express interest in Fort Pickens, but the recreational potential of the island was obvious to the Pensacola community, who supported its development as a public park.[43] In mid-1949 the Florida Parks Board formally applied to the War Department for the transfer of the Fort Pickens Military Reserve to the state park system.[44] With War Department approval, the state purchased the 1,658.6-acre historic fort and grounds from the federal government for $6,830.[45] The property transferred to Florida on November 3, 1949.[46] In December 1949, the Florida Board of Parks and Historic Memorials (Florida Park Service) became its own independent state agency, under which the state consolidated the management, restoration, and development of all state parks and historic monuments. The board would be advised by local, unpaid advisory councils to assist with the development and care of each park. Although Fort Pickens had become property of this new state park system, it was not yet open to the public.[47]

Early Park Development Efforts

The greatest hurdle to making Fort Pickens a successful state park was providing access to the grounds. The Pensacola Bay Bridge and the Santa Rosa Sound Bridge opened in 1931, bringing automobiles to Santa Rosa Island, but the road on the island ended well east of the Fort Pickens grounds. The War Department had exclusively used boats to reach Fort Pickens and had constructed a narrow-gauge railroad (and later short roads to replace the tracks) to move supplies and people between the various fortifications on

42. Florida Board of Parks and Historic Memorials, *Biennial Report of the Florida Board of Parks and Historic Memorials for the Years July 1, 1952, through June 30, 1954* (Tallahassee, Florida: Florida Park Service, 1955), 51; William E. O'Brien, "State Parks and Jim Crow in the Decade before *Brown v. Board of Education*," *Geographical Review* 102, no. 2, April 2012, 168.
43. "Fort Property Future Viewed," *Pensacola (Florida) News Journal*, March 2, 1947, 9; "Ownership and Legal Control of Santa Rosa Island Defined," *Pensacola (Florida) News Journal*, April 20, 1947, 7; "Island's Progress to be Great Boon," *Pensacola (Florida) News Journal*, April 8, 1949, 4.
44. "Island District to Change Lands," *Pensacola (Florida) News Journal*, July 1, 1949, 7; "New Parks Board has Big Task," *Pensacola (Florida) News Journal*, July 10, 1949, 4.
45. Florida Park Service, *Annual Report, Florida Park Service, 1949–1950* (n.p.: Florida Board of Parks and Historic Memorials, June 30, 1950).
46. "Fort Pickens Seen as Obsolete," *Pensacola (Florida) News Journal*, September 17, 1950, 5.
47. Florida Board of Parks and Historic Memorials, *Biennial Report of the Florida Board of Parks and Historic Memorials for the Years July 1, 1952, through June 30, 1954* (Tallahassee: Florida Park Service, 1955), 52; "Title to Old Forts Is Recommended to Florida Board," *Pensacola (Florida) News Journal*, January 18, 1950, 1.

the island. The NPS had considered the inaccessibility of Fort Pickens to be one of the reasons it did not want to acquire the property as a national monument. Any roads across the narrow island would impact the beaches on the island, thereby decreasing their value. Docks for private boats and a potential ferry boat had seemed, in the 1930s, like the logical way of providing access to the site but would require people to seek the fort out as a destination.[48]

While the Florida Park Service considered how to bring visitors to the fort, a few more immediate concerns could be more easily addressed. Before the fort transferred to the state, the Army-Navy Surplus Store purchased and removed the "heavy equipment" at Fort Pickens including the installations on five batteries in the park (one of which was Battery Pensacola), as well as the narrow-gauge railroad tracks, Quonset huts, sheds, towers, and communication lines no longer necessary for site operation. The newspaper article on the removal did not specify the type of "installations" removed from Battery Pensacola.[49] The Florida Park Service installed a new water pumping system and purchased a used jeep in the 1950–1951 fiscal year, the first full year the site was under its management.[50] The Florida Park Service also began developing plans for the site—which it variously called Santa Rosa State Park (with other lands elsewhere in the area) and Fort Pickens Historic Memorial—before settling on Fort Pickens State Park. The site was so overgrown it was called "Jungle Town" by locals and had no visitor services.[51] In December 1950, the Florida Board of Parks and Monuments requested $295,000 from the Parks Board to develop the site for beach recreation over the next two years. This request nearly equaled the state's previous appropriation for the entire state park program and the request was not approved.[52]

The Parks Board and Florida legislature did approve some funding for the new site allowing the Florida Park Service to establish a small presence at Fort Pickens and continue to plan for its use. By 1951, the Park Board had a 10-year improvement plan for the park, costing $400,000, that called for interpreting the history of the region and developing beach recreation facilities. The Florida Park Service repurposed Army buildings to create a superintendent's office, residence, and site utilities. Walter Marion was named superintendent of the site and moved on to the grounds to serve as caretaker. He was the only employee on site, and by 1952 the site still had not seen any real development. The lack of a road and any serious park development funding (a problem most of Florida's state parks faced) meant that Fort Pickens was part of the state park system in name only.[53]

With the lack of state support for the park and concern over its deterioration, in March 1952 the Pensacola Junior Chamber of Commerce (also known as the Jaycees) and other local groups

48. Herbert E. Kahler and C. E. Vinten, *Preliminary Report on Historic Sites at Pensacola, Florida* (St. Augustine, FL: National Park Service, January 1938), 13–14; Albert Manucy, "Report on Historic Sites, Pensacola, Florida" (n.p., June 19, 1939), 56.
49. "Heavy Equipment in Fort Pickens Area Collected," *Pensacola (Florida) News Journal*, May 19, 1949, 7.
50. Florida Park Service, *Annual Report, Florida Park Service, 1950–1951* (n.p.: Florida Board of Parks and Historic Memorials, June 30, 1951).
51. "$400,000 Improvement Plan Outlined for Santa Rosa State Park Near City," *Pensacola (Florida) News Journal*, February 4, 1951; "Fort Pickens Seen as Obsolete," *Pensacola (Florida) News Journal*, September 17, 1950, 5; "State Park Needs," *Pensacola (Florida) News Journal*, June 21, 1950, 4.
52. "$295,000 Asked in Budget for Fort Pickens, Beach," *Pensacola (Florida) News Journal*, December 12, 1950, 1.
53. "$400,000 Improvement Plan Outlined for Santa Rosa State Park Near City," *Pensacola (Florida) News Journal*, February 4, 1951, 6; Florida Board of Parks and Historic Memorials, *Biennial Report of the Florida Board of Parks and Historic Memorials for the Years July 1, 1952, through June 30, 1954* (Tallahassee: Florida Park Service, 1955), 6; "May Close State Parks," *Pensacola (Florida) News Journal*, May 14, 1951, 4; "Island Road would Open Ft. Pickens to Visitors," *Pensacola (Florida) News Journal*, February 27, 1952, 4.

made an agreement with the Parks Board to help develop the park, including trying to provide overland beach buggy transportation and ferry service so that the public could get to Fort Pickens.[54]. The Jaycee-led group hoped to open Fort Pickens by the summer of 1952, including providing a museum and guide service at the fort and opening external buildings to accommodate visitors. The Jaycees successfully encouraged two locals to purchase a ferry boat, thereby solving the immediate access problem. Over the spring of 1952, the Jaycees and Jayceettes traveled out to the island on weekends and holidays for a total of twenty sessions of painting exteriors and interiors of buildings, cleaning/furnishing/repairing the interiors of buildings, repairing the holes and arches in the fort and removing debris from around them, cleaning vegetation off of structures, marking paths for tourists, repairing the docks, creating picnic areas near the fort, putting restrooms in working order, and placing electricity in the interior of the forts and along walkways. Much of the funding for this work came from Jaycee accounts or donations, and the Jaycees ran at least one fundraiser to support their work. The Jaycees marketed the park locally and even helped employ a guide to provide tours of the fortifications.[55]

On June 1, 1952, the Jaycees and Parks Board ran two boat tours to Forts Pickens and McRee, allowing visitors a little over an hour to explore each of the historic forts. In later years, the Florida Park Service considered this to be the official opening date of the park. Boat runs continued throughout the summer, with an average of 800 to 1,000 visitors touring Fort Pickens each week. As visitation dropped off in the cooler months, the ferry service ended. For their efforts, the Jaycees won the Florida Junior Chamber of Commerce's first prize for outstanding project of the year and the National Junior Chamber of Commerce's "second award" for outstanding project of the year. The Jaycees intended to continue working on the project, but also encouraged the Florida Parks Board (which had visited the island that summer) and the Florida Road Department to take up the helm of funding and staffing the park and building a road across Santa Rosa Island.[56]

The year 1953 was one of great promise at Fort Pickens State Park. Following the lobbying efforts of the Jaycees, Escambia County Commissioners, the Greater Pensacola Chamber of Commerce, and others, the Florida Legislature appropriated $100,000 for the State Road Department to build a road to the park. That same legislature provided funding for repairing and constructing new facilities in the entire park system (including an appropriation for Fort Pickens) and the Park Service determined to use prison labor (and further volunteer assistance from the Jaycees) to help get the new park ready for visitation (Figure 19). The preparation work included demolishing unsightly buildings after salvaging anything usable (the Florida Park Service reported that during this process, it put anything of historic value in storage), converting the old headquarters building into a canteen/exhibit room/office/storage space, restoring two gun

54. The State Parks Board had determined by 1952 that the Fort Pickens area was too inaccessible to develop until there was a road to it, according to a description of the Jaycee effort. Maurice Harling (*Pensacola News Journa*l) to Carl Liddle, July 13, 1953.
55. "Development of Pickens Gets Boost at Meeting," *Pensacola (Florida) News Journal*, March 23, 1952, 4; "Jaycees Invite Park Board Here," *Pensacola (Florida) News Journal*, March 25, 1952, 5; "Summer Season Growing with Market Unlimited," *Pensacola (Florida) News Journal*, April 15, 1952, 4; "Jaycees Praised for their Work at Ft. Pickens," *Pensacola (Florida) News Journal*, August 11, 1953, 10; "Opening to the Public—Tomorrow," *Pensacola (Florida) News Journal*, May 31, 1952, 5; Maurice Harling (*Pensacola News Journa*l) to Carl Liddle, July 13, 1953.
56. "[Advertisement] Elvie DeMarko Studio Presents 'What-Not Shelf,'" *Pensacola (Florida) News Journal*, June 1, 1952, 8; "West Pensacola Club Supports Increased Funds," *Pensacola (Florida) News Journal*, August 13, 1952, 1; "Pickens Braces for Record Tourist Influx," *Pensacola (Florida) News*, May 8, 1962, 5; "Jaycees Praised for their Work at Ft. Pickens," *Pensacola (Florida) News Journal*, August 11, 1953, 10; Maurice Harling (*Pensacola News Journa*l) to Carl Liddle, July 13, 1953.

platforms at the fort, making other minor repairs, and putting up a control fence and gates on the park. The Florida Road Department completed Fort Pickens Road in May 1954 and by the end of the season the park had the third highest visitation in the Florida state park system.[57] Views of Fort Pickens during the State Parks era are shown in Figure 20 through Figure 23.

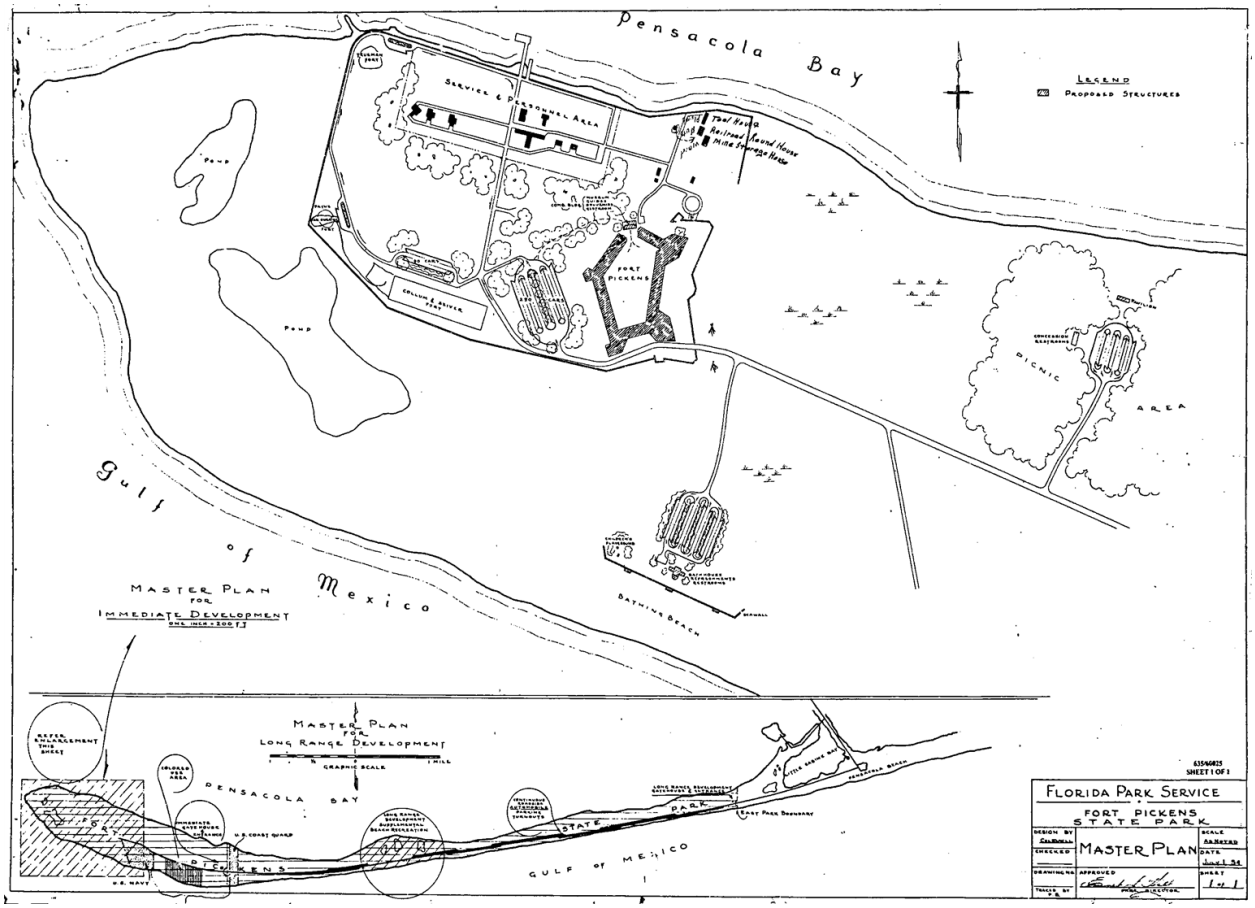


Figure 19. Master Plan for Fort Pickens State Park, Florida Department of Parks, 1954. (Source: NPS)

57. "Jaycees Praised for their Work at Ft. Pickens," *Pensacola (Florida) News Journal*, August 11, 1953, 10; *Biennial Report of the Florida Board of Parks and Historic Memorials for the Years July 1, 1952, through June 30, 1954* (Tallahassee, Florida: Florida Park Service, 1955), 7, 8, 12–13; "Beall, Douglas, Melvin Backed Gas Tax Refund," *Pensacola (Florida) News Journal*, April 11, 1953, 8; "County Board's Vote to Divide Precinct Canceled," *Pensacola (Florida) News Journal*, May6, 1953, 16; "Ft. Pickens Road Budget Affirmed," *Pensacola (Florida) News Journal*, June 27, 1953, 5; "Further Island Development," *Pensacola (Florida) News Journal*, September 27, 1953, 8; "[Road Construction Funds]," *Pensacola (Florida) News Journal*, May 15, 1957, 12.



Figure 20. View of Fort Pickens looking northeast, 1957. (Source: State Archives of Florida, Florida Memory, image no. rd0018, https://www.floridamemory.com/items/show/166551, accessed March 2023)



Figure 21. View of Fort Pickens, looking north, 1958. Note the cannon display to the right in this photograph. (Source: Don (Donald J.) Marks, photographer, State Archives of Florida, Florida Memory, image no. DGM0366, https://www.floridamemory.com/items/show/268200, accessed March 2023)



Figure 22. Historical marker at Fort Pickens, 1958. (Source: Don (Donald J.) Marks, photographer, State Archives of Florida, Florida Memory, image no. DGM0353, https://www.floridamemory.com/items/show/268213, accessed March 2023)



Figure 23. View of Fort Pickens from within the parade, looking southwest, 1958. Visitor cars were apparently permitted within the parade at this time. (Source: Don (Donald J.) Marks, photographer, State Archives of Florida, Florida Memory, image no. DGM0365, https://www.floridamemory.com/items/show/268201, accessed March 2023)

Segregated Development in the Park

In the biennial report recounting the opening of the Fort Pickens Road, the Florida Park Service put forward its wish list for future projects. This wish list called for the development of a "Colored" area at the park, and listed Fort Pickens as one of the few state parks having facilities for both White and Colored visitors.[58] The segregation of the

58. *Biennial Report of the Florida Board of Parks and Historic Memorials for the Years July 1, 1952, through June 30, 1954* (Tallahassee, Florida: Florida Park Service, 1955), 27.

Florida Park Service had been in place since its beginnings. Although the city of Pensacola had been more integrated than many other places in the South following the Civil War (and even had a Black mayor in 1874), the Jim Crow rules of segregation seeped into city and state policies across the South during the Reconstruction years. The U.S. Supreme Court's *Plessy v. Ferguson* decision in 1896 (which justified the legalization of segregation on the idea of "separate but equal" accommodations) provided support for Jim Crow policies, which were firmly established in Florida by the time the state started developing its parks in the 1930s. Florida's first state parks served only White visitors, with promises of parks for Black citizens generally not being fulfilled or being fulfilled in an unequal capacity.[59]

In 1954, the same year that the Fort Pickens Road opened, the U.S. Supreme Court, in *Brown v. The Board of Education*, ruled that *Plessy* was unconstitutional, and the National Association for the Advancement of Colored People (NAACP) used the decision to start challenging the lack of public recreation opportunities for non-Whites in court. In response, park systems in the South created separate Colored areas within White parks and began to invest more in "Negro only" parks as well. In the parks managed for both White and Black visitors, it was common for the parks to have entirely separate facilities (picnic shelters, bathrooms, campgrounds, swimming areas) and even visitor entrances for the two groups.[60]

Fort Pickens was on the Florida Park Service's list of parks that had facilities for both White and Black visitors, but it is unclear if the Park Service ever constructed the "Colored" area of the park. In the initial planning documents for the park, under the name Santa Rosa State Park which included units at Fort Pickens and in the nearby Naval Live Oaks Reservation, the park planned to accommodate both White and Colored visitors, with a Colored Beach at the Naval Live Oaks unit of the park. Because of litigation with landowners, the Naval Live Oaks unit did not become a part of Fort Pickens State Park, leaving only one unit in the park. Over the years of the park publishing its development plan, the Florida State Park Service continued to list "Colored" picnic areas, entrance road, and other facilities as priority construction projects for the park, but in 1957 and 1960 the *Pensacola News Journal* did not list the park as having Colored recreation areas, and in 1960 specifically noted that John C. Beasley was the state park for Colored people in the Pensacola region. It is therefore unclear if Black visitors were allowed access to historic Fort Pickens in the 1950s and early 1960s.[61]

Although *Brown v. The Board of Education* resulted in the Supreme Court's determination

59. Clavin, "Interracialism and Revolution on the Southern Frontier: Pensacola in the Civil War," 824–826; O'Brien, "State Parks and Jim Crow in the Decade before *Brown v. Board of Education*," 168–173; William E. O'Brien, "Landscapes of Exclusion: State Parks in the Jim Crow South," *Latin American Library of Landscape History*, no. 15 (Summer 2015): 3–4.
60. Clavin, "Interracialism and Revolution on the Southern Frontier: Pensacola in the Civil War," 824–826; O'Brien, "State Parks and Jim Crow in the Decade before *Brown v. Board of Education*," 168–173; O'Brien, "Landscapes of Exclusion: State Parks in the Jim Crow South," 3–7.
61. O'Brien, "State Parks and Jim Crow in the Decade before *Brown v. Board of Education*," 173; Marion T. Gaines, "Many Outing Spots Beckon Right at Home," *Pensacola (Florida) News Journal*, July 3, 1960, 8; *Biennial Report of the Florida Board of Parks and Historic Memorials for the Years July 1, 1952, through June 30, 1954* (Tallahassee, Florida: Florida Park Service, 1955), 27, 33, 46–47; *Biennial Report of the Florida Board of Parks and Historic Memorials for the Years July 1, 1955, through June 30, 1957* (Tallahassee, Florida: Florida Park Service, 1957), 53, 80–82; *Biennial Report of the Florida Board of Parks and Historic Memorials for the Years July 1, 1959, through June 30, 1961* (Tallahassee, Florida: Florida Park Service, 1961), 76; *Biennial Report of the Florida Board of Parks and Historic Memorials for the Years July 1, 1961, through June 30, 1963* (Tallahassee, Florida: Florida Park Service, 1957), 49, 68; "Budget Group Tags $3,363,000 For Area Projects," *Pensacola (Florida) News Journal,* July 17, 1957; "Myrtle Grove Residents Ask Board to Stop Trash Dumping," *Pensacola (Florida) News Journal*, July 23, 1947.

that public education could no longer be segregated, it took several years for the ruling to include public parks. In 1955, court cases based on unequal access to state parks in Maryland and Virginia were decided in favor of integration, both citing the *Brown* decision. In 1963, the Supreme Court's ruling in *Watson v. Memphis* clearly stated that states and municipalities had to integrate their public parks. The pressure of court decisions and acts of civil disobedience saw Florida, Texas, and Tennessee quietly integrate all public parks between 1960 and 1963. The 1961–1963 Florida State Park Biennial Report made no mention of segregated facilities.[62]

The Expansion of Tourism on Santa Rosa Island in the 1950s and 1960s

Through the mid-1950s and 1960s, once the park road was completed, Fort Pickens State Park visitation grew steadily, in tandem with visitation to the beaches of Santa Rosa Island. The increase in visitation and limited funding for the state parks strained the park's ability to provide enough parking, camping, and picnicking facilities. Although Fort Pickens and the nearby batteries appear to have been a draw for visitors, the park's budgetary focus was on expanding visitor services rather than rehabilitating or renovating the historic structures even as the park staff noted their deterioration. In fact, the Florida Park Service knew little of the site's history during this period, making even interpretation of the fort challenging.[63]

Changes to the structure of Fort Pickens and Battery Pensacola were minor during the first fifteen years of state park management, even as the evidence of structural deterioration became increasingly evident. Two state park biennial reports noted that the Florida Park Service made "minor repairs" to the fort and batteries, sometimes for the sake of visitor safety.[64] These repairs appear to have included painting and repairing the metal components on the batteries

62. O'Brien, "State Parks and Jim Crow in the Decade before *Brown v. Board of Education*," 175–177; O'Brien, "Landscapes of Exclusion: State Parks in the Jim Crow South," 7; *Biennial Report of the Florida Board of Parks and Historic Memorials for the Years July 1, 1963, through June 30, 1965* (Tallahassee, Florida: Florida Park Service, 1961), 11.
63. "Fort Pickens Park in Waiting Bill," *Pensacola (Florida) News Journal*, June 17, 1955, 27; "Full History of Fort Needed," *Pensacola (Florida) News Journal*, July 8, 1955, 4; "Fort Pickens Park Attracts 4,516," *Pensacola (Florida) News Journal*, April 12, 1956, 9; *Biennial Report of the Florida Board of Parks and Historic Memorials for the Years July 1, 1955, through June 30, 1957* (Tallahassee, Florida: Florida Park Service, 1957), 8, 16; "Pickens to Get Picnic Pavilion," *Pensacola (Florida) News Journal*, January 16, 1957, 1; Maurice Harling, "Political Patter, Calendar of House is Clogged; Senate Well Abreast of Work," *Pensacola (Florida) News Journal*, May 12, 1957, 8; Virginia Merritt, "Of and for Women," *Pensacola (Florida) News Journal*, August 31, 1958, 17; *Biennial Report of the Florida Board of Parks and Historic Memorials for the Years July 1, 1957, through June 30, 1959* (Tallahassee, Florida: Florida Park Service, 1959), 16, 66; George Baxley, "Record Business Seen for Island," *Pensacola (Florida) News*, June 17, 1960, 1; "Four-Lane Bridge will Boost Island Visitors More in '61," *Pensacola (Florida) News*, June 21, 1960, 4; "Parks Struggle Along," *Pensacola (Florida) News Journal*, October 7, 1960, 4; William Prime, "Pickens Braces for Record Tourist Influx," *Pensacola (Florida) News*, May 8, 1962, 5; *Biennial Report of the Florida Board of Parks and Historic Memorials for the Years July 1, 1961, through June 30, 1963* (Tallahassee, Florida: Florida Park Service, 1959), 8–11, 13, 23; "Cabinet Orders Enforcement of New Sporting Goods Tax," *Pensacola (Florida) News Journal*, July 8, 1964, 18; "Park is Popular," *Pensacola (Florida) News*, July 13, 1964, 4; Marion T. Gaines, "Private Enterprise Group Proposes Rustic-Style Cabins in Pickens Park," *Pensacola (Florida) News Journal*, June 18, 1967, 16; Marion Gaines, "Florida Parks Girding for Rush," *Pensacola (Florida) News Journal*, June 16, 1968, 20.
64. *Biennial Report of the Florida Board of Parks and Historic Memorials for the Years July 1, 1955, through June 30, 1957,* 16; *Biennial Report of the Florida Board of Parks and Historic Memorials for the Years July 1, 1961, through June 30, 1963* (Tallahassee, Florida: Florida Park Service, 1963), 23.

and painting the trim on some of the mortar.[65] The centennial of the Civil War brought more importance to Fort Pickens in 1961. The park had recently introduced a stronger interpretation program to recognize this anniversary. However more interpretation did not mean greater historic site access or renovation: “because of unsafe conditions of several of the Batteries in the Park it was necessary to close them to the public,” the 1959-1961 Biennial Report noted.[66]

In addition to minor repair work to the fort, the Florida Park Service used the fort as part of its visitor services and interpretation programming where it was safe to do so. In the mid-1950s, the Florida Park Service used some of the casemates in the fort as a picnic area, and by the 1960s it was offering tours of Geronimo’s cell.[67] The Florida Park Service and local park supporters also tried to re-arm the fort with historically accurate armaments. In April 1955, Pensacola-area historian T.T. Wentworth began a campaign to raise money to purchase four British cannons for installation at Fort Pickens. The cannons had once been mounted at Fort Barrancas but had found their way to a Gulfport junkyard after World War II. They dated from between 1763 and 1781 and had likely been used by the British, Spanish, U.S., and Confederate troops. Wentworth raised money to purchase the cannons by offering "notarized ownership certificates" to those who contributed to his campaign. The certificates stated that the cannons would be permanently displayed at the fort.[68] In August 1955, the Pensacola Historical Society celebrated the installation of the cannons at Fort Pickens with a picnic. The guns had been "cleaned, painted and mounted" at the time of the picnic.[69] The Florida Park Service wrote about the event in the biennial report, noting that the park had placed three old British cannons and one "of doubtful parentage" (later described as American) on display on the parade grounds of the fort. The Service stated that the guns would remain there until the Service could locate a place that an old Spanish fort might have stood on Santa Rosa Island.[70] As of 1970, the guns were still on the parade ground.[71]

By 1964, the park appears to have had a greater knowledge base of the history of the fort (having created a brochure on it for visitor use) and the deteriorating condition of the fort had become more obvious.[72] Several articles in the *Pensacola News Journal* in 1964 and 1965 noted the lack of work on historic structure upkeep at the park. In April 1964, the newspaper reported that the park had listed “reconstruction and control of deterioration in the fort” as a budgetary priority.[73] In March 1965, the State Legislature cut the Service's requested budget, prompting an editorial in the *News Journal* fearing that this would result in restoration work not taking place at the fort. The fort had “water seeping into the brick structure” that was gradually breaking it up through freeze/thaw processes. The structure also needed erosion control and safety fencing around

65. *Biennial Report of the Florida Board of Parks and Historic Memorials for the Years July 1, 1955, through June 30, 1957*, 16.
66. *Biennial Report of the Florida Board of Parks and Historic Memorials for the Years July 1, 1959, through June 30, 1961* (Tallahassee, Florida: Florida Park Service, 1961), 16.
67. *Biennial Report of the Florida Board of Parks and Historic Memorials for the Years July 1, 1955, through June 30, 1957*, 15; Carole Newcomer, “Pensacola Retains National Park Dream,” *Pensacola (Florida) News Journal*, June 19, 1966, 4.
68. “Do You Want to Own Cannon?” *Pensacola (Florida) News Journal*, April 22, 1955, 1; “Cannons Project,” *Pensacola (Florida) News Journal*, April 26, 1955, 8; “Less than $100 is Needed for Purchase of Cannons,” *Pensacola (Florida) News Journal*, May 4, 1955, 3.
69. “Historical Society to Meet Saturday,” *Pensacola (Florida) News Journal*, August 10, 1955, 2.
70. *Biennial Report of the Florida Board of Parks and Historic Memorials for the Years July 1, 1955, through June 30, 1957*, 15; “Pickens Given Modern Cannon,” *Pensacola (Florida) News Journal*, February 28, 1959.
71. “Brushing up on a Little History,” *Pensacola (Florida) News Journal*, March 20, 1970, 8.
72. “12-Page Booklet on Fort Pickens is Available,” *Pensacola (Florida) News Journal*, November 25, 1964, 23.
73. “Would Improve Park,” *Pensacola (Florida) News Journal*, December 2, 1964, 4.

deteriorating parts of the fort.[74] In 1966, the Florida Legislature approved a small amount of funding for structural repair on the fort and safety fences.[75] The Florida Park Service appears to have used this funding to stabilize walls on the western side of Fort Pickens.[76] By 1967, the Florida Park Service was using volunteer service groups to conduct the necessary upkeep of the building. A *Pensacola News Journal* editorial on the subject noted that youths of the Neighborhood Youth Corps "are working on erosion control, constructing picnic and camping areas for the public, renovating old buildings at Fort Pickens and performing odd jobs that need to be done for the benefit and enjoyment of the public."[77] The park also conducted some "fort reconstruction" activities that year, but it is unclear if this was separate from the Youth Corps work.[78] The repairs must have been only minor in nature, however, because in September 1968, two newspaper articles expressed concern over the condition of Fort Pickens, one noting that "Fort Pickens is suffering badly from water seepage and needs urgent repairs" and another stating that ". . . because of lack of funds, [the state] has not been able to care adequately for the fort itself, and it is therefore in a rapidly deteriorating condition."[79] The public visibility of the fort's crumbling condition became a motivating factor in transferring Fort Pickens to federal control.

Inclusion of Fort Pickens in Gulf Islands National Seashore

Although the NPS had passed on the option of including Fort Pickens and the other Pensacola area forts in a national monument in 1948, the NPS kept an eye on the recreation potential of the region. Public Law 878 (Act of July 2, 1948), requiring the Secretary of the Interior to investigate a potential Pensacola National Monument, permitted the NPS to continue to survey the area for potential inclusion in the national park system, an idea that became more appealing in the 1960s as undeveloped Gulf Coast property became increasingly rare, security protocols in the vicinity of the historic forts on Pensacola Naval Base property were no longer as stringent, and Santa Rosa Island was no longer as inaccessible as it had been in the past.[80] In March 1965 two NPS officials and Congressman Bob Sikes visited the historic areas around Pensacola, and locals began to hope that federal funding would be better able to protect and restore the crumbling Fort Pickens (and other historic forts) than the state park system could.[81] Local interest in federal management of the historic structures continued to drive support for a national monument or seashore, but the matter of taking a state park from Florida's control was a touchy one for NPS officials, who tried to honor the work that state officials were doing in historic preservation.[82]

74. Marion T. Gaines, "State Parks being Starved," *Pensacola (Florida) News*, March 11, 1965, 4.
75. "Booker Awarded Repair Contract at Ft. Pickens," *Pensacola (Florida) News Journal*, May 13, 1966, 5.
76. Resource Planning Office, Washington Planning and Service Center, "Reconnaissance Report for Pensacola-Santa Rosa (Florida)," August 1966, 33.
77. "Youth Corps Contributes Vital Service," *Pensacola (Florida) News Journal*, February 26, 1967, 19.
78. Marion T. Gaines, "Private Enterprise Group Proposes Rustic-Style Cabins in Pickens Park," *Pensacola (Florida) News Journal*, June 18, 1967, 16.
79. "Seashore would Preserve Outstanding Beach Areas," *Pensacola (Florida) News Journal*, September 8, 1968, 13; "A Grand Concept," *Pensacola (Florida) News Journal*, September 4, 1968, 4.
80. Resource Planning Office, Washington Planning and Service Center, "Reconnaissance Report for Pensacola-Santa Rosa (Florida)," 1, 28; "National Park Here?" *Pensacola (Florida) News Journal*, April 29, 1965, 4.
81. Carole Newcomer, "Pensacola Retains National Park Dream," *Pensacola (Florida) News Journal*, June 19, 1966, 4.
82. Dale Pullen, "Park Proposals Due by Year's End," *Pensacola (Florida) News Journal*, September 25, 1966, 24; Maurice Harling, "Gigantic Gulf Park Projected," *Pensacola (Florida) News Journal*, October 28, 1966, 1; Joel Gaston, "Proposed Seashore Features Recreation, Beauty, History," *Pensacola (Florida) News Journal*, November 12, 1967, 15.

Plans moved forward for a new seashore or monument in the Pensacola area following the NPS and congressman's visit, but the status of Fort Pickens State Park (including the historic fort) within the NPS system remained in question. In 1966, the NPS published a report of a survey of Santa Rosa Island identifying the parcels on the island that should be included in an eventual park unit. The report's authors concluded that even though Fort Pickens was repetitive of other forts in the NPS system, all of Santa Rosa Island excluding a few developed areas but including Fort Pickens State Park, should be included in a National Seashore proposal. The report clarified, however, that if the Florida Park Service wanted to retain Fort Pickens as a state park, it should be permitted to do so.[83] A subsequent NPS report on the entire seashore proposal, released in 1968, reiterated much of the Santa Rosa Report's findings. The report recommended establishing a Gulf Islands National Seashore that would encompass 20,000 acres of barrier islands spanning the shoreline from Louisiana to Destin, Florida, and including the already authorized Pensacola National Monument (the Pensacola Naval Base forts) and the Gulf Island National Wildlife Refuges on several barrier islands. The proposed seashore would meet the NPS system's need for more water-dependent recreational resources. The report did not specifically opine on the value of including Fort Pickens in the proposed seashore, other than to note that the fort was architecturally similar to other areas already in the NPS system and that its "chief claim to historical attention" was the fact that it had been held by Union soldiers through the entire Civil War.[84]

The Florida Board of Parks and Historic Memorials' opinion on the inclusion of Fort Pickens in a national seashore evolved rapidly between 1968 and 1969, in part due to the deteriorating state of Fort Pickens. In August 1968, the Florida State Parks endorsed the proposed national seashore project, "subject to the recognition of the State Parks Board's interests within the proposed area."[85] A newspaper report indicated that the Florida Park Service was considering offering just the fort to the NPS, while retaining the surrounding recreational lands in the Florida state park system. However, the NPS was not interested in the complexity of managing the fort within state park lands, and in the first bill introduced to Congress to create Gulf Islands National Seashore included the entirety of Fort Pickens State Park within the seashore's boundaries. An NPS planner clarified in a September 1968 newspaper article that the NPS wanted the entire Fort Pickens park unit, or it could all remain in state hands.[86] Following a December 1968 congressional hearing on the matter, in January 1969, the Florida Board of Parks and Historic Memorials approved the inclusion of the entire 1,650-acre Fort Pickens State Park in the proposed Gulf Island National Seashore, citing its importance in the seashore project and the need to restore the fort, which the state could not afford.[87] A last-ditch effort by a Florida congressman intent on keeping Fort Pickens State Park in the state system (and restoring it by retaining all entrance fees at the park) failed.[88]

83. Resource Planning Office, Washington Planning and Service Center, "Reconnaissance Report for Pensacola-Santa Rosa (Florida)," 9, 28, 41–43.
84. National Park Service, Bureau of Sport Fisheries and Wildlife, Bureau of Outdoor Recreation, *A Report for the Proposed Gulf Islands National Seashore* (Washington, D.C.: Department of the Interior, January 1968), 1–2, 6, 17, 24.
85. "98-Acre Play Site Leased in Gulf for Retarded," *Pensacola (Florida) News Journal*, August 12, 1968, 12.
86. "A Grand Concept," *Pensacola (Florida) News Journal*, September 4, 1968, 4; "Seashore would Preserve Outstanding Beach Areas," *Pensacola (Florida) News Journal*, September 8, 1968, 13.
87. R. C. Haraden, "4.5 Miles 'Offered' to Seashore," *Pensacola (Florida) News Journal*, January 17, 1969, 1; "Board Okays Fort Pickens in Gulf Bill," *Pensacola (Florida) News Journal*, January 21, 1969, 1.
88. "Historical Commission Wants Pickens to be in Seashore," *Pensacola (Florida) News Journal*, May 14, 1969, 1; Maurice Harling, "Transfer Keeps Income Locally," *Pensacola (Florida) News*, May 16, 1969, 1; "Historical Commission

As negotiations for the seashore continued into 1970, the fort itself deteriorated to the point where, in August 1970, the Florida Park Service fenced off most access to the fort for public safety reasons (Figure 24). Bricks were falling from the ceiling of the fort.[89] On January 8, 1971, Congress enacted Public Law 91-660, establishing Gulf Islands National Seashore (GUIS) and listing one of the reasons for doing so as to "recognize, preserve, and interpret" the history of the Pensacola area forts (including Fort Pickens).[90]

After Congress approved the national seashore in 1971, the Florida Park Service stopped funding Fort Pickens improvements.[91] The Florida Legislature officially voted to transfer the park to the new national seashore on January 11, 1972. At the transfer, Florida officials acknowledged that while tourists and campers had enjoyed the site, the state had not "been able to come up with the needed funds for restoration and preservation work."[92]



Figure 24. Aerial view of Fort Pickens looking northwest, toward the entrance to Pensacola Bay, 1970. (Source: National Register of Historic Places nomination, 1970)

Wants No Part of Park," *Pensacola (Florida) News*, May 16, 1969, 1.

89. Suzanne Stephens, "State Orders Fort Pickens Fencing for Safety Purposes," *Pensacola (Florida) News*, August 7, 1970, 1.
90. Bearss, *Historic Structure Report and Resource Study: Pensacola Harbor Defense Project, 1890–1947, Florida Unit,* 1.
91. Mike Albertson, "The Making of a Seashore," *Pensacola (Florida) News Journal*, July 18, 1971, 15.
92. "Fort Pickens Transferred: Seashore Grows," *Pensacola (Florida) News Journal*, January 12, 1972, 1.

Fort Pickens as a Gulf Islands National Seashore Unit, 1972 to Present

The NPS followed the dictates of the legislation establishing Gulf Islands by nearly immediately initiating the planning process to stabilize Fort Pickens and envelop it into comprehensive interpretive programming. The legislation also prompted the forts specifically named in it, including Fort Pickens, to be added to the National Register.[93] In the decades following acquisition of Gulf Islands National Seashore, the NPS conducted several focused efforts to stabilize Fort Pickens and Battery Pensacola, which the NPS recognized as significant to both the creation of the national seashore and the enhancement of the visitor experience at Gulf Islands. However, various constraints and storms and the effects of fluctuating weather patterns have directed NPS attention and funding to more pressing visitor access concerns rather than a full-scale preservation of Fort Pickens.

Treatment and Interpretation

Although Gulf Islands National Seashore was new to the NPS system at the time, a 1973 study on masonry forts under NPS management included an evaluation of the conditions at Fort Pickens. The study found the fort in poor repair, listing a number of problems. Some of the major structural issues included large cracks in the casemate and sally port ceilings, masonry at the interior wall faces peeling away (or already collapsed) in many of the casemates (which the Florida Park Service had attempted to arrest by placing stabilizing bars in the affected casemates), and accumulating sand on the terreplein and fort walls that appeared to be causing cracking on exterior surfaces. Water seepage through the fort's mortar was creating stalactites in interior rooms. Erosion in the terreplein exposed the brick ceilings of the casemate vaults, and bricks occasionally worked themselves loose from ceilings (constituting a visitor hazard). The dry moat had been damaged by the access road into the park and vegetation all over the fort was causing structural damage through root growth.[94] The authors concluded: "This fort is so badly deteriorated that to completely restore it would require an expenditure of huge proportions."[95] To keep costs from being prohibitive, the authors recommended only a partial restoration plan and a general stabilization of the fort through the use of stabilization rods, restoration of the sally port, the use of reinforced concrete to stabilize vaulting structures, and the repair of leaks. The authors further recommended that the NPS remove Battery Pensacola and its associated structures so that the fort could present its Civil War appearance, considered the appearance of greatest historical significance.[96]

At the time the authors of the masonry fort report visited Fort Pickens, the NPS was already removing vegetation from the fort, but the masonry fort report's evaluation of Fort Pickens (and archeological surveys of the building that revealed cracked foundations) showed that a greater investment in the fort was crucial. In December 1975, the NPS solicited bids for fort stabilization work, and within four months the NPS had contracted with the firm Zac Smith and Co. to stabilize the fort for $561,186. The plans for the Fort Pickens work called for stopping further deterioration of the fort while making the fort safe for visitors, or, as the NPS solicitation for bid put

93. Hammersten, *An Archeological Overview and Assessment of Gulf Islands National Seashore*, 91.
94. F. Ross Holland Jr. and Russell Jones, *Special History Study: Masonry Forts of the National Park Service* (Denver: Denver Service Center, Historic Preservation Team, National Park Service, August 1973), 110–111.
95. Holland Jr. and Jones, *Special History Study: Masonry Forts of the National Park Service*, 111. Note that at the time, the authors were recommending partial "restoration" of the fort, rather than preservation as later identified and implemented as the overarching treatment approach.
96. Holland Jr. and Jones, *Special History Study: Masonry Forts of the National Park Service*, 111–112.

it, "to preserve to the greatest degree possible, the fragile remains as they have survived through a century and a half."[97]

In pursuing these goals, the NPS outlined work in the following categories: new structural work at variance with original building methods; removal of existing original fabric; removal of existing non-historic fabric; repair of existing original fabric; and protective work.[98] Under its contract, Zac Smith and Co. reinforced the south front and north end of the concrete retaining walls along the northwest and southwest scarp; added a new brick retaining wall on the tower bastion and regularized the height of the elevations of the tower bastion, southwest bastion, and west scarp front south end walls; added a new parapet wall on the southwest bastion; removed earth fill, brick pavement, the breast-height wall, and the gun positions along the north wall; removed non-original masonry blocking in casemate walls, embrasure openings, and door openings along the north front, north and southeast bastions, tower bastion, and north end of the west channel front; removed casemate concrete floors on the north end of the west channel front; removed the steel ties and plates of the vaulting over the south end of the west channel front; removed the parade wall and some of the earth backfill cover of the terreplein of the north end west channel front; and placed tie beams in the southwest scarp vaults using reinforced concrete (Figure 25).[99] To repair the fort, the contractor removed damaged brick from the vaults, piers, and archways of the interior of the north front and replaced them, in Casemate 1, with a new brick lining that matched original construction. In Casemates 2 and 8, the contractor removed damaged brick and re-plastered the interior. The contractor also removed loose masonry and filled gaps and cracks throughout the interior and exterior of the fort with brick and grouting as needed. The sally port arches and door openings along the north front were rebuilt where needed, and damaged embrasure openings throughout the fort were reconstructed. The contractor replaced missing and damaged projecting granite units below the parapet on the scarp walls, repaired granite steps, and rebuilt damaged brick cordon. Where needed, the contractor repaired waterproofing, filled and graded over collapsed vaults, and repaired or replaced stair rails. The contractor installed grilles at embrasure openings, granite lintels, and granite sills where missing. Finally, the contractor protected the fort from further damage by removing sand fill and vegetation at the terreplein, treating the area with soil sterilant to protect against further growth of vegetation, and installing a sprinkler irrigation system. The contractor also installed fire protection measures. Zac Smith and Co. completed the work to the NPS's satisfaction in July 1977.[100]

97. George G. Demmy, "Stabilization of Fort Pickens, Santa Rosa Island" (n.p., August 8, 1977), 7; F .Holland Jr. and Jones, *Special History Study: Masonry Forts of the National Park Service*, 111–112; National Park Service, *Completion Report: Stabilization of Fort Pickens, Gulf Islands National Seashore, Gulf Breeze, Florida 32561, Contract No. CX 5000-6-0704* (Florida: National Park Service, 1982); Hammersten, ed., *An Archeological Overview and Assessment of Gulf Islands National Seashore*, 52–53.
98. National Park Service, *Completion Report: Stabilization of Fort Pickens.*
99. Demmy, "Stabilization of Fort Pickens, Santa Rosa Island," 1–6; National Park Service, *Completion Report: Stabilization of Fort Pickens*.
100. Demmy, "Stabilization of Fort Pickens, Santa Rosa Island," 1–6; National Park Service, *Completion Report: Stabilization of Fort Pickens*.

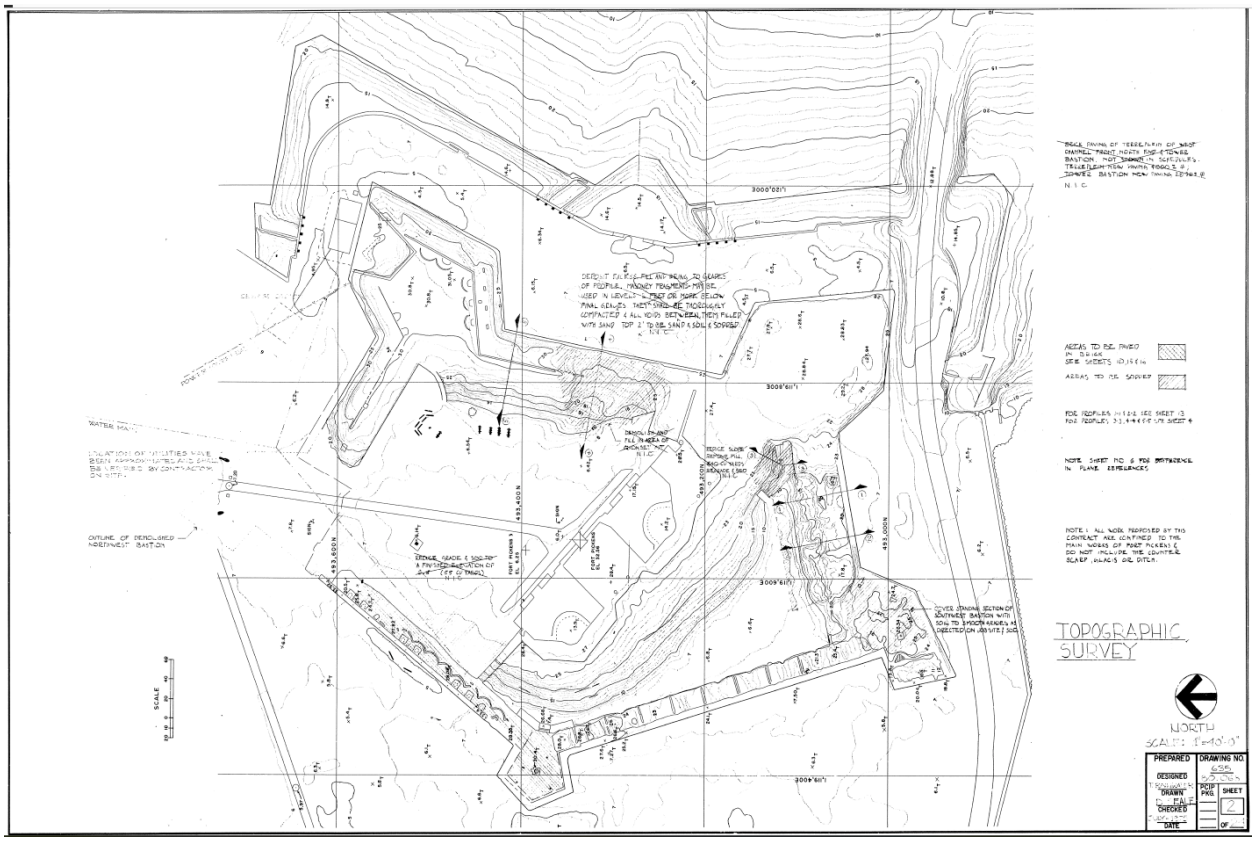


Figure 25. Rehabilitation drawing, Fort Pickens, 1977. (Source: NPS)

With the major stabilization work on Fort Pickens completed, the NPS's 1978 General Management Plan (GMP) for the park, published in 1978, did not call for any additional substantial work on the fort (which it placed in a "historic zone"). Instead, the GMP noted that the park would use the western end of the Fort Pickens unit and the historic structures within it for cultural history interpretation and, "Significant historic structures will be rehabilitated as money and manpower permit."[101] The major stabilization work on Fort Pickens had not included the removal of Battery Pensacola as called for in the masonry forts study, and the GMP did not mention plans to remove historic structures. In 1982 and 1983, NPS Historian Edwin Bearss completed Historic Structure Reports for the Pensacola Harbor Defense Project (including Battery Pensacola) and Fort Pickens, respectively. Like the GMP, these documents did not advocate removal of Battery Pensacola or any of its associated structures and did not promote the restoration of the fortifications to reflect any specific period of time. Instead, Bearss recommended that the structures be "preserved and protected, and their interiors, where feasible may be adapted to provide for a compatible usage."[102] In 1984, the NPS conducted some stabilization work on Battery Pensacola. Thereafter, the GUIS cultural management program completed preservation work regularly (using contractors), and annual work plans guided preservation maintenance activities. The NPS created an archeological monitoring program in June 1988 to track vandalism, destruction, erosion, plant build-up, and other threats to sites.[103]

101. National Park Service, Denver Service Center, *Final Environmental Statement, General Management Plan, Development Concept Plan* (Washington, D.C.: Department of Interior, 1978), 20.
102. Bearss, *Historic Structure Report and Resource Study: Pensacola Harbor Defense Project, 1890–1947, Florida Unit*, 1.
103. National Park Service, "Statement for Management: Gulf Islands National Seashore," Approved July 12, 1991, 2, 21.

While the NPS worked on stabilization and repair of the fort, it also began to consider the significance of the historic structures in the park and how to best interpret them for park visitors. In February 1979, L. Clifford Soubier of Harpers Ferry submitted an interpretive prospectus for GUIS in which he emphasized the themes of defense—both the islands presenting a form of protection for the coast and the forts built to control access to those ports—as well as of change, with the continual shifting of the islands changing their shape but not their overall function and technological developments making the island fortifications largely obsolete. With a twist, the interpretive plan urged visitors to learn to protect the barriers that have so long protected them. The prospectus noted that the primary use of the park was for seashore recreation, but that some visitors came specifically to see the forts, while others could be enticed with signage, exhibits, and brochures. The plan recommended using the exhibit space near Fort Pickens to focus on its natural defensive position—a position recognized by the Spanish and by those who followed.[104]

Park management continued to recognize the value of the historic structures as interpretive material through the 1980s and 1990s, particularly the structures mentioned in the enabling legislation (of which Fort Pickens was one). With the emphasis the park placed on interpretation of historic resources, visitation to the sites flourished. Although beach visitation remained the primary visitor use of the park, historic structure tours became increasingly popular at Fort Pickens and a few other locations in the 1990s, such that visitor use became a factor imperiling the structures themselves.[105]

By 1991, Fort Pickens had again deteriorated to a point where a focused effort on stabilization and repairs was necessary. The NPS recognized, however, that the fort could not be completely restored, as was previously imagined, due to the expense the park would incur to do so. Instead, the NPS determined to selectively stabilize the fort.[106] During Fiscal Years 1996 and 1997, the NPS partnered with the U.S. Bureau of Prisons for preservation work at Fort Pickens. The project included preserving the fort's counterscarp, reconstructing a piazza on the north front of the officer's quarters, constructing columns at the fort's entrance, and repairing the ceiling of the southwest bastion. The NPS created a masonry worker position in 1996 to direct repair and repointing work on the fort.[107]

The NPS began a new GMP planning effort in 2003, intending to create a plan to guide the national seashore for the next 20 years. The planning was delayed by tropical storm damage, but in 2014 the park published its second GMP. The primary focus of the report was not on preserving the historic forts in GUIS but in maintaining visitor access to the park in the face of increasingly frequent and destructive tropical storms.[108] Although the focus of the framework document was not historic structures, it made a

104. L. Clifford Soubier, *Interpretive Prospectus: Gulf Islands National Seashore* (Harpers Ferry Center: National Park Service, February 1979), 3–4, 8–10.
105. National Park Service, "Statement for Management: Gulf Islands National Seashore,"37; National Park Service, "Statement for Management: Gulf Islands National Seashore," Approved October 13, 1995, 24; National Park Service, *Gulf Islands National Seashore, Florida District, Long Range Interpretive Plan* (Gulf Islands National Seashore, Florida District: National Park Service, 1996), 6–7.
106. National Park Service, "Statement for Management: Gulf Islands National Seashore," 1995, 25; National Park Service, "Statement for Management: Gulf Islands National Seashore," 1995, 33.
107. Gulf Islands National Seashore, *Annual Narrative, October 1995, through September, 1996* (Gulf Islands National Seashore, Florida: National Park Service, 1996), 2, 8; Gulf Islands National Seashore, *Annual Narrative Report October 1, 1996 through September 30, 1997* (Gulf Islands National Seashore, Florida: National Park Service, 1997), 1.
108. National Park Service, *Final General Management Plan/Environmental Impact Statement, Gulf Islands National Seashore, Florida and Mississippi* (Washington D.C.: Department of the Interior, July 2014), ii.

few references to NPS plans for the historic structures. These plans remained largely unchanged from the first GMP in 1978. The NPS noted its interest in continuing to use the forts to "bring history to life" and remarked that, "The defense fortifications and other historic features play a highly visible and important role in overall visitor enjoyment and national significance of Gulf Islands National Seashore."[109] However, the NPS did not outline plans to conduct major preservation work other than "to provide appropriate conditions for tours."[110] The GMP noted that the NPS would also continue to monitor and stabilize historic structures as necessary, work with State Historic Preservation Offices and the NPS Advisory Council on historic preservation before modifying any historic building and monitor and constrain visitor use to protect the structures as needed.[111]

Climate Challenges

The primary concern of the 2014 GMP was how to address extreme weather-related challenges to visitor access, particularly in relation to Fort Pickens Road, which crosses a narrow stretch of Santa Rosa Island that is subject to overwash during tropical storms. The Fort Pickens Road, so critical for bringing visitors to historic Fort Pickens and Battery Pensacola as well as the other fortifications at the western end of the island, was completed in 1954 and paved in 1956. The road experienced its first incident of overwash in 1956 when Hurricane Flossy caused water to flow over the road, and then undercut it, closing access to Fort Pickens for nearly a month.[112]

Hurricane Flossy called attention to the vulnerability of the road, and as storms have become increasingly frequent and violent in the region, the road and visitor access has continued to draw the attention of NPS managers.[113] There appears to have been less NPS focus on the impacts of increasing storms on historic structures, perhaps because although storms have battered Fort Pickens and Battery Pensacola since their very construction, they have caused less damage to the buildings (with a few exceptions listed below) than the more persistent and regular impacts of visitor use, vandalism, and a humid, subtropical climate. In response to a 14-foot storm surge at Fort Pickens in 1906, the Corps of Engineers constructed a seawall to protect the fort area from future damage, but this action appears to have been more for the protection of external buildings rather than the fort and battery itself,

109. National Park Service, *Final General Management Plan/Environmental Impact Statement, Gulf Islands National Seashore, Florida and Mississippi*, v, 252.
110. National Park Service, *Final General Management Plan/Environmental Impact Statement, Gulf Islands National Seashore, Florida and Mississippi*, 280.
111. National Park Service, *Final General Management Plan/Environmental Impact Statement, Gulf Islands National Seashore, Florida and Mississippi*, 40, 280–281, 283, 286–291.
112. "Work to Start on Fort Pickens Road June 13," *Pensacola (Florida) News Journal*, June 7, 1956, 1; "Highway Damages Are High," *Pensacola (Florida) News Journal*, September 27, 1967, 1; "Ft. Pickens Road Will Be Closed to All Traffic," *Pensacola (Florida) News Journal*, September 28, 1956, 18; "Road to Pickens Open to Traffic," *Pensacola (Florida) News Journal*, October 24, 1956, 1; National Park Service, *Final General Management Plan/Environmental Impact Statement, Gulf Islands National Seashore, Florida and Mississippi*.
113. National Park Service, "Statement for Management: Gulf Islands National Seashore," Approved July 12, 1991; National Park Service, "Statement for Management: Gulf Islands National Seashore," Approved October 13, 1995; National Park Service, "DRAFT Environmental Assessment: Restore Visitor Access to Fort Pickens Area, Santa Rosa Island," (Washington, D.C.: Department of the Interior, October 2006), National Park Service, *Final General Management Plan/Environmental Impact Statement, Gulf Islands National Seashore, Florida and Mississippi*; National Park Service, *Gulf Islands National Seashore: Fort Pickens Ferry Support Facilities and Shuttle Service Environmental Assessment* (Washington, D.C.: Department of the Interior, June 2015).

which served as refuge during the storm.[114] Ironically, the seawall may have increased the damage to Fort Pickens the next time a storm surge hit the region (1926), because the storm water could not drain off the fortifications with the seawall acting as a reservoir.[115] Wind has also damaged the fortifications, such as in 1917 when a storm blew sections of roofing, shutters, and some doors off of Battery Pensacola. In general, though, the road has been much more vulnerable to hurricanes than the masonry and concrete fortifications.[116]



Figure 26. Storm surge after Hurricane Ivan in 2004 held in by Fort Pickens' seawall. (Source: NPS)

While storms and visitor access have drawn much of the attention at GUIS, the less visibly dramatic effects of sea-level rise and shoreline erosion have the potential to damage cultural resources at the park, including Fort Pickens and Battery Pensacola. Santa Rosa Island, as a barrier island, is naturally one of "the most rapidly changing landforms on earth," always moving due to "littoral drift, onshore bottom currents, wind, overwash, and inlet formation."[117] However, storm-driven coastal erosion and sea-level rise (not to mention harbor dredging which increases coastal erosion) have the potential to increasingly cause direct threats to historic structures in GUIS.[118] Although Fort Pickens and Battery Pensacola are currently near the western end of Santa Rosa Island, which has lengthened nearly 3,000 feet since 1834 (while the eastern end has eroded—see Figure 27), increased coastal erosion and rising seas are making even fairly stable barrier islands less predictable.[119] Scientists fear that increasing rates of coastal erosion combined with sea-level rise and hurricane damage to Santa Rosa east of Fort Pickens could cause a breach of Santa Rosa, dividing it into two islands. The breach would isolate Fort Pickens and Battery Pensacola on a new, less stable barrier island.[120]

Even without a full breach and division of Santa Rosa, a 2019 scientific report warned that barrier islands might have "tipping points" of stability, such that when thresholds of sea-level rise and storm activity exceed the island's ability to withstand them, even stable islands could become unstable and change in form and position with unknown results.[121] The unpredictability of

114. Bearss, *Historic Structure Report and Resource Study: Pensacola Harbor Defense Project, 1890–1947, Florida Unit*, 226–227, 231; "Mayor Bliss on Press Reports," *Pensacola (Florida) Journal*, October 2, 1906.
115. Ogden, "A Structural Timeline of Fort Pickens, 1829–2002," 8; Bearss, *Historic Structure Report and Resource Study: Pensacola Harbor Defense Project, 1890–1947, Florida Unit*, 251–252.
116. Bearss, *Historic Structure Report and Resource Study: Pensacola Harbor Defense Project, 1890–1947, Florida Unit*, 249–250.
117. Hammersten, ed., *An Archeological Overview and Assessment of Gulf Islands National Seashore*, 3.
118. Elizabeth A. Pendleton, Erika S. Hammar-Klose, E. Robert Thieler, and S. Jeffress Williams, *Coastal Vulnerability Assessment of Gulf Islands National Seashore (GUIS) to Sea-Level Rise*, Open-File Report 03-108 (Washington, D.C.: United States Geological Survey [USGS], 2004), 1–2; National Park Service, *Gulf Islands National Seashore: Geologic Resources Inventory Report* (Washington, D.C.: U.S. Department of the Interior, 2019), 43.
119. Pendleton, Hammar-Klose, Thieler, and Williams, *Coastal Vulnerability Assessment of Gulf Islands National Seashore (GUIS) to Sea-Level Rise*, Open-File Report 03-108, 7; National Park Service, *Final General Management Plan/Environmental Impact Statement, Gulf Islands National Seashore, Florida and Mississippi*, 199.
120. National Park Service, *Gulf Islands National Seashore: Geologic Resources Inventory Report*, 33.
121. National Park Service, *Gulf Islands National Seashore: Geologic Resources Inventory Report*, 33.

barrier island division or rapid shape shifting and lack of scientific understanding of storm-driven erosion in the Gulf makes planning for the possibility of these events extremely difficult.[122]

The future of preservation work at Fort Pickens may be as much about stabilizing the island as it is about stabilizing the historic structures.

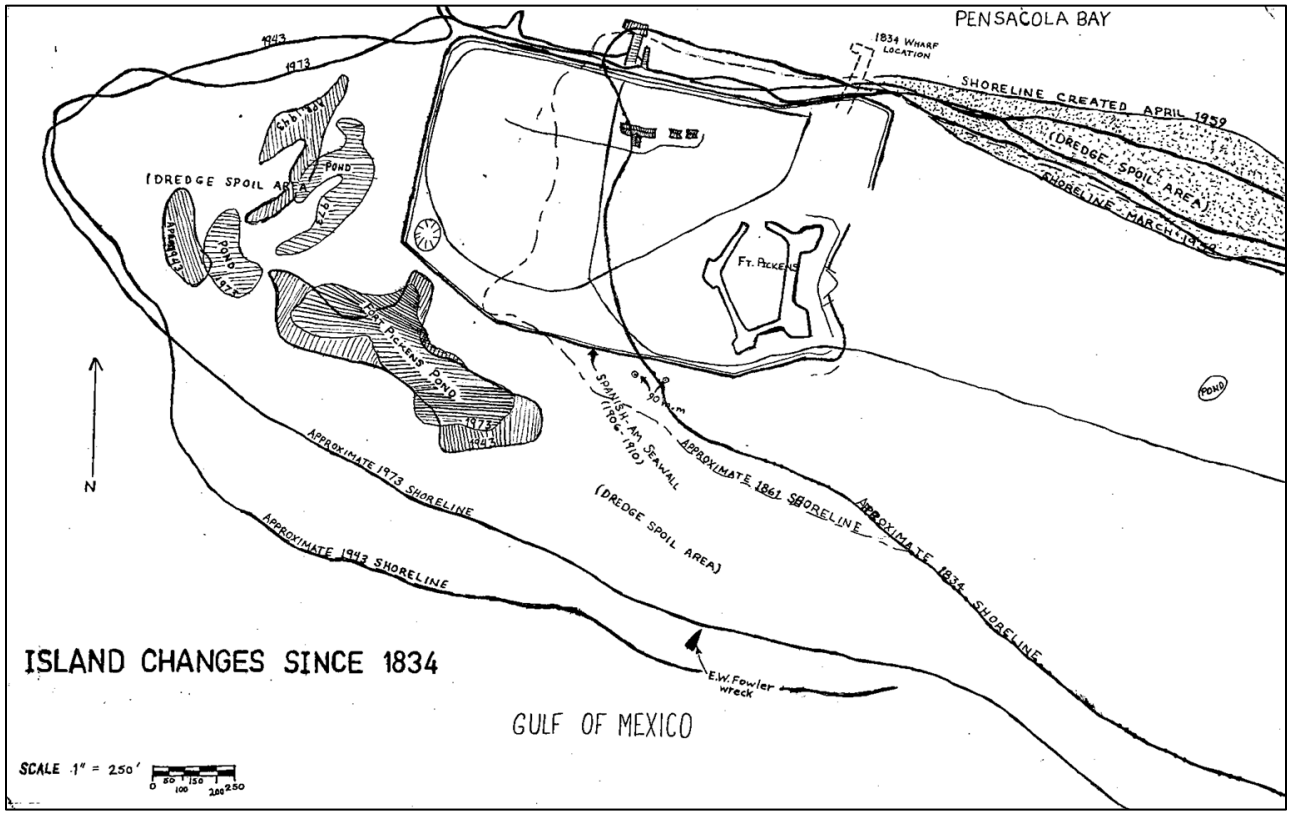


Figure 27. Changes in Santa Rosa Island coastline in vicinity of Fort Pickens since 1834. (Source: NPS)

122. National Park Service, *Gulf Islands National Seashore: Geologic Resources Inventory Report*, 31–33; National Park Service, *Final General Management Plan/Environmental Impact Statement, Gulf Islands National Seashore, Florida and Mississippi*, 276.

Fort Pickens and Battery Pensacola Chronology

1822–1828	Site survey, justification, and design of Fort Pickens.
1829–1834	Construction of Fort Pickens.
1834	The first garrison, Company H of the 2nd U.S. Artillery, arrived at Fort Pickens on October 21.
1835–1861	Work on fortification primarily dedicated to various repairs of walls and addressing leakage. Some additions such as piazza in front of south quarters.
1861–1865	Wartime alterations such as work on blindages and repairs to address effects of Confederate artillery. Pensacola abandoned by Confederates in May 1862.
1866–1898	Modifications for torpedo/mining defenses. In 1866, "torpedo" generally referred to static underwater explosive devices intended to damage or destroy surface vessels, later called "mines." Torpedo acquired current meaning as a self-propelled underwater explosive device capable of travelling substantial distances to the target later in the nineteenth century.
1876	Tower, northwest, and southwest bastions modified to mount 15-inch Rodman guns. Wood rail tramway with railcars pulled by mules built from wharf to support effort.
1886	Chiricahua and Warm Springs Apache prisoners arrived for incarceration at Fort Pickens. Work performed by the prisoners including removal of vegetation and debris around the fort.
	Endicott Board called for improving fortifications at twenty-six coastal locations, including Fort Pickens.
1889	Damp powder magazine in southeast bastion repaired; terreplein covered with a "coating of pure cement mortar, which stopped the greater part of the leakage."
1891	Capt. Philip Price, U.S. Army Corps of Engineers, recommended no further expenditure on maintenance and preservation of Fort Pickens due to advanced state of deterioration and low value of fort in defense of the harbor against modern warships.
1894	Conversion of casemate in northeast bastion to support mining defenses.
1898	Shelving installed in Fort Pickens casemate to store mines. Two casemates "fitted up" for storeroom and engine for searchlight.
1897–1899	Construction of Endicott program fortifications on Santa Rosa Island. Bulk of concrete and installation of electric light plant (15-kilowatt capacity installed by C&C Electric Company of New York, New York), ammunition conveyors, cranes, and hoists completed at Battery Pensacola in 1898. Breast-height wall fronting Battery Pensacola removed. Two 12-inch breech-loading rifles received April 24, 1899. Battery Pensacola turned over to artillery commander June 30, 1899.

	Narrow-gauge rail lines installed to serve the larger Fort Pickens defense complex at east end of Santa Rosa Island, including a line constructed from the Engineer's Wharf through the sally port to the interior of the fort.
1899	June 20: Fire and explosion of northwest bastion magazine at Fort Pickens. No attempt made to restore the bastion.
1900–1912	Further electrification efforts to support additional searchlights, post lights, and mine defenses. Three generators, engines, a switchboard, and three storage batteries installed in casemates 75 and 76 (1903). Platforms extended and battery commander's station constructed at Battery Pensacola (1907–1908).
	Parts of dry moat filled in to support construction of power station in Bastion E (1903) and for new exterior mining casemate (1904–1907). Remainder of dry moat filled in after completion of seawall between 1908 and 1909. Bids asked for additional filling in of dry moat to bring to elevation of 7 to 8 feet above mean low water in 1911.
1909	"Double primary" mine command station built on top of northeast bastion.
1915–1916	Walls in south curtain, southwest bastion, and part of southwest channel front removed to clear field of fire for Battery Pensacola.
1918	Photographs show several structures constructed on the former parade ground inside Fort Pickens, including a latrine, two mess halls, two kitchens, and two bath houses.
1922–1923	New detached powerhouse built near tunnel entrance to support Battery Pensacola.
1926	Mine defenses ended. Responsibility for underwater defense transferred to U.S. Navy.
	Major hurricane caused widespread damage in Pensacola area and submerged Fort Pickens under a storm surge. Seawalls, with drainage pipes blocked by sand, impounded the water.
1932	Conversion of mining casemate to fire control switchboard.
1934	12-inch guns declared obsolete and removed; carriages remained in place until 1942.
1941–1945	Searchlight, anti-aircraft, anti-motor torpedo boat, and 6-inch long-range gun batteries constructed in vicinity of Fort Pickens. Road constructed through counterscarp (1942). Igloo-type magazine built into earthen embankment fronting the north counterscarp (1943).
1946	Pensacola harbor defense command inactivated, and defenses placed in caretaker status.
1947	Fort Pickens transferred to State of Florida for use as a state park.
1949–1952	Pensacola Jaycees worked on fort clearing vegetation, adding lights, filling holes, and repairing "many dangerous arches." Plan developed to utilize state convict labor for preservation work at the fort. Ferry service initiated to Fort Pickens State Park.
1953–1954	Road constructed from Pensacola Beach to U.S. Coast Guard Station at Fort Pickens State Park.

1971	Fort Pickens State Park became part of Gulf Islands National Seashore under NPS management.
1976–1977	NPS initial stabilization work, a two-year project to stabilize fort in four phases. Work included removal of non-original brick blocking in casemates and other modern walls; removal of debris and fill; masonry replacement of missing and damaged brickwork on bastions, channel fronts, and parade walls; relining vaults and repair of arches; rebuilding scarp walls; and fabrication and installation of handrails and downspouts.
1985	Major rehabilitation effort on Battery Pensacola including repairs to concrete, stairs, and metal railings and doors.
1988–1989	Alterations to support National Park Service visitor center casemate.
1991	Concrete walkways and ramps added for accessibility.
1993	Reverse arch excavated in southwest front.
1994–1997	Prison crews provide labor for $1.5 million brick replacement project to stabilize parts of fort.
1995	Piazza rebuilt on north front; pillars built at road cut in counterscarp wall. Counterscarp extensively repaired by prison work crews.
2000	Work on casemate arches.
2004–2005	Hurricane Ivan (2004), Tropical Storm Arlene, and Hurricanes Cindy and Dennis (2005) destroyed road to Fort Pickens and flooded the area.
2009	Road re-opened to Fort Pickens.
2015	Road damaged and closed; re-opened in November.
2019	Using funding from the 2010 *Deepwater Horizon* spill settlement, ferry service established from Pensacola to Fort Pickens.
2010–2023	Various work on Fort Pickens includes replacing brick floors and handrails; repairs to casement arches, scuppers, and roofs; selective re-building parapets; blindage at northeast bastion (2018), and scarp walls (2017–2018); and recreation of sally port doors.

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Physical Description and Condition Assessment

Site

Fort Pickens is situated on the west end of Santa Rosa Island (Figure 28). Fort Pickens Road generally runs east–west through the west end of the island. The road cuts through the south end of the fort's counterscarp wall, where the dry moat was originally located, and continues south of the fort (Figure 29). The road leads to a loop road that provides vehicular access to sites at the west end of Santa Rosa Island. The loop road runs northeast from Fort Pickens Road past the fort, to a visitor parking area north of the fort (Figure 30 and Figure 31). Paved walks lead from the parking lot to the fort entrance at the sally port.



Figure 28. Fort Pickens, view from southwest. (Source: all photos taken by authors, 2023, unless otherwise noted)



Figure 29. Fort Pickens Road as it cuts through the counterscarp, view from east.



Figure 30. The area west of Fort Pickens. The loop road is visible at the far right (yellow arrow).



Figure 31. Parking area north of the fort with Fort Pickens in the background.

Several historic buildings and structures associated with the defense of Pensacola Bay, as well as several contemporary buildings and structures, are situated adjacent to the parking lot (Figure 32). The ferry pier is also located north of the fort on the bay. The Florida National Scenic Trail terminates just north of the fort and provides pedestrian access to the campgrounds to the east.



Figure 32. Historic and contemporary buildings adjacent to the parking lot, view from south.

Fort Pickens

Measured drawings of Fort Pickens are provided in Appendix A.

Fort Pickens is a brick masonry fortification, pentagonal in plan, that is approximately 780 feet north–south by 680 feet east–west in plan (Figure 33 and Figure 34). Two long casemated scarps face west, with the tower bastion at the center. Three scarps, shorter in length, face northeast, east, and southeast. Bastions are present at each corner of the fort, except for at the northwest corner, where an 1899 explosion destroyed Bastion D and portions of the northeast and northwest scarps. The northwest corner of the fort is open to the exterior because of the explosion. The tower bastion is at the center of the west elevation of the fort, facing the west end of the island and the entrance to Pensacola Bay beyond.



Figure 33. Fort Pickens, view from northwest. Tower bastion is visible at right.

The sally port is located at the center of the northeast elevation of the fort and provides visitor access to the fort from the exterior.

The parade at the center of the fort remains largely open, apart from Battery Pensacola, which is located at the southern end of the parade.

Open casemates line the parade at the northwest and southwest scarps. The former officers' quarters are located at the remaining portion of the northeast scarp, with a gift shop north of the sallyport. Earthen fill lines the east wall of the fort, between Bastion A and Bastion B.

The masonry counterscarp is located at the east side of the former dry moat. Constructed as part of the fort, the counterscarp and glacis to the east were designed to protect against ground attack.

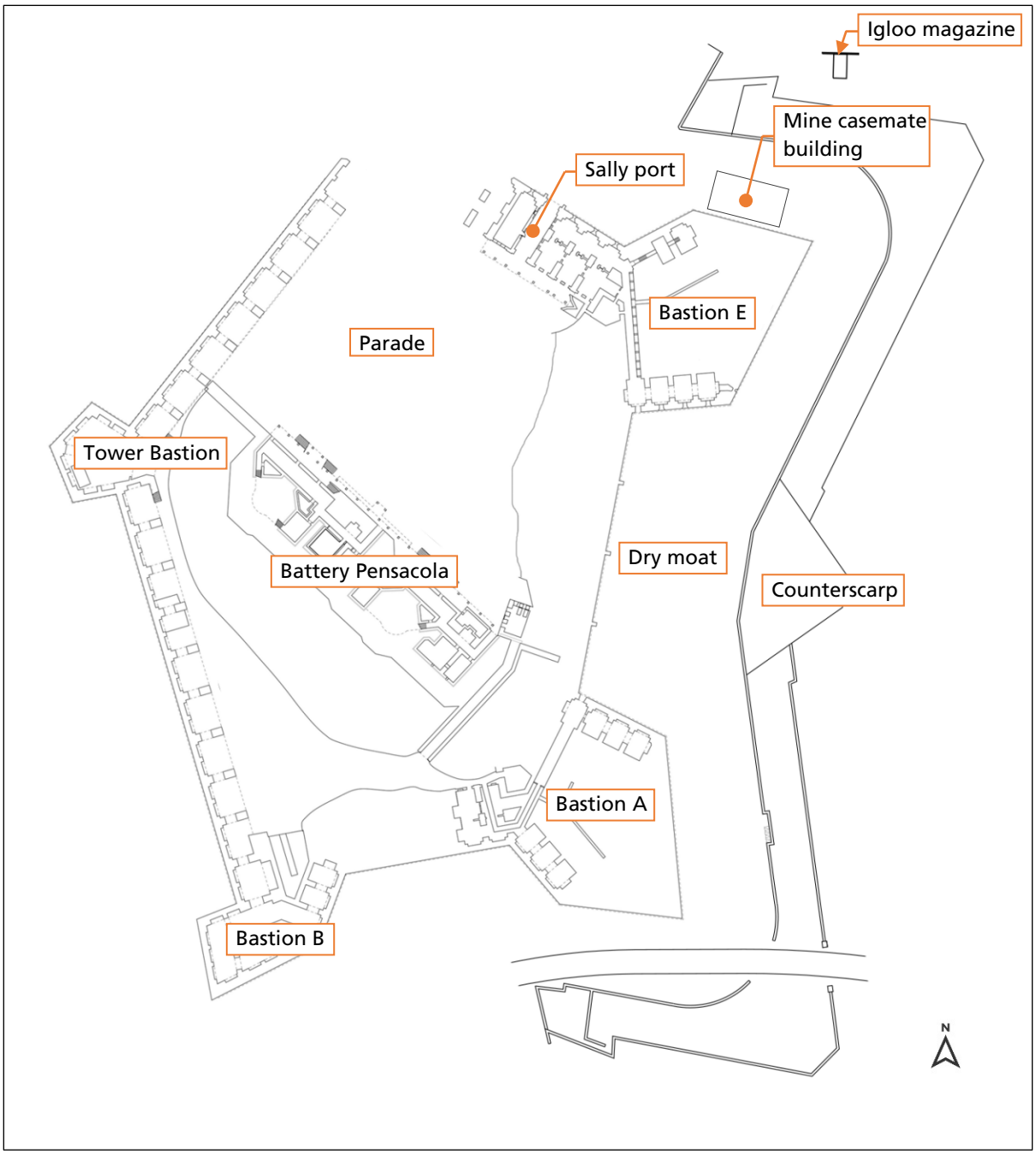


Figure 34. Diagram of Fort Pickens and surrounding areas showing major portions of the fort.

Counterscarp and Dry Moat

The former dry moat is defined by Fort Pickens at its interior and the counterscarp at the exterior. The dry moat is approximately 60 feet wide at Bastion A and Bastion E and extends to over 100 feet wide along the east scarp of the fort (Figure 35). The former dry moat is largely open, with the exception of the mine casemate building located just north of Bastion E. A concrete support, previously part of a stair from the moat to the top of Bastion E, is present east of the mine casemate building (Figure 36).

The counterscarp is generally located east of the main fort on the opposite side of the former dry moat, with portions of the counterscarp extending west, north of Bastion E and south of Bastion A (Figure 37 and Figure 38). The wall curves as it turns towards the west at its north and south ends (Figure 39 and refer to Figure 38).



Figure 35. The former dry moat. Fort Pickens is at left with the counterscarp to the right.



Figure 36. A concrete support for a former stair east of the mine casemate building, view from northeast.

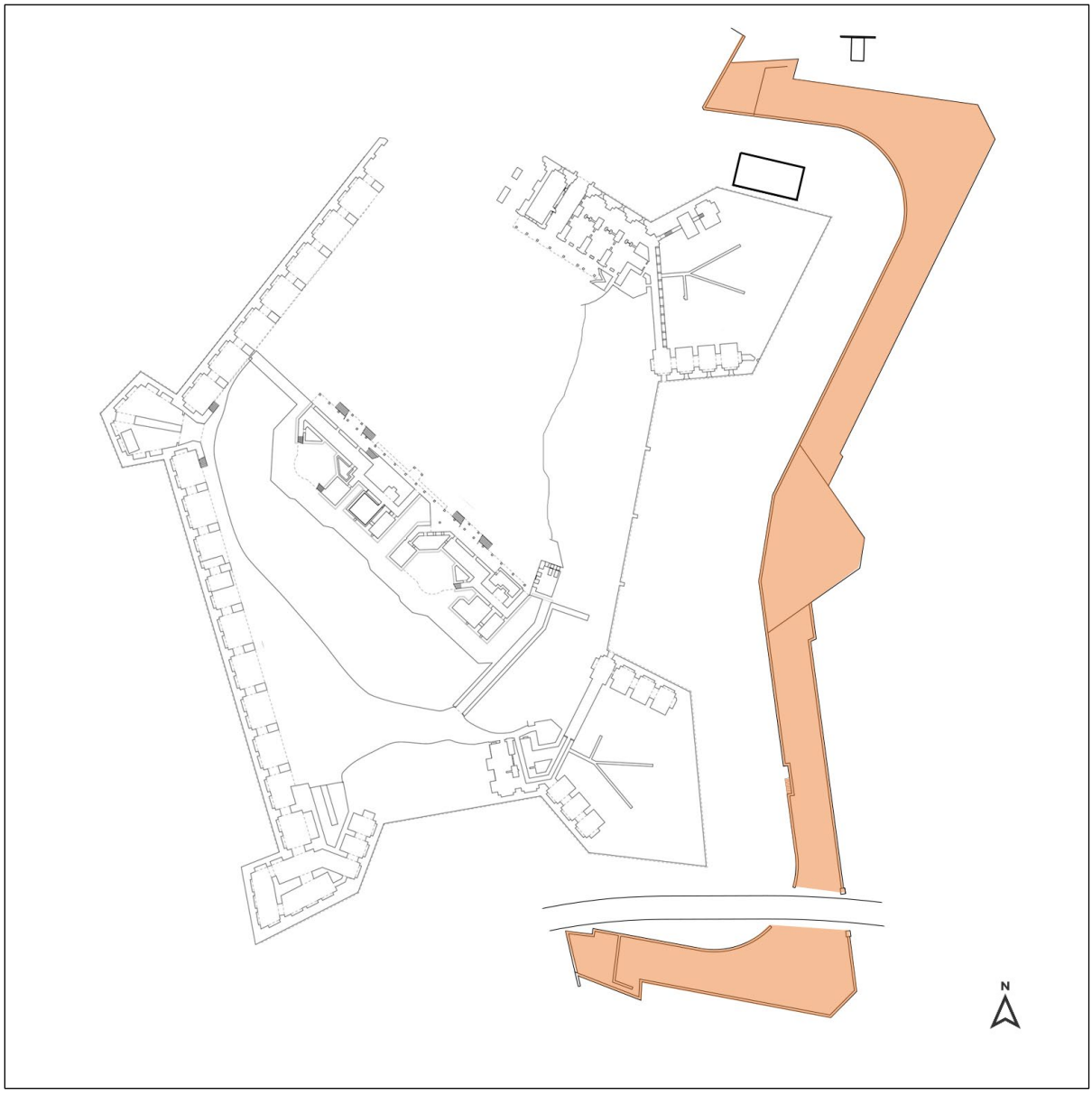


Figure 37. Plan of Fort Pickens showing the location of the counterscarp (orange shading).



Figure 38. The counterscarp as it curves around Bastion E, view from southwest.



Figure 39. The counterscarp as it curves around Bastion A, view from northeast. Fort Pickens Road cuts through the wall.

The counterscarp is comprised of brick masonry walls. The lower wall intersects with the infilled dry moat (Figure 40). The height of the wall varies, but is typically 9 feet 4 inches in height, and rises to approximately 20 feet near the center of the counterscarp and lowers to 12 inches in height at the south end at Fort Pickens Road (Figure 41 and Figure 42). The mass masonry walls are typically 4 feet deep. The brick units, which measure approximately 8-1/4 inches by 2-1/2 inches, are laid in a common bond pattern with a header row every fourth course. The walls are topped by a rowlock course of brick. Remnant limewash is present at locations throughout the counterscarp at the interior face of the wall, as well as at the top (refer to Figure 41).



Figure 40. The lower wall of the counterscarp, view from southwest.



Figure 41. The lower wall of the counterscarp, view from southwest. Note that the wall height is higher at left. Note the remnant limewash at the face of the higher portion of the wall (yellow arrow).



Figure 42. The lower wall where it intersects Fort Pickens Road, view from west.

The upper portion of the lower counterscarp wall appears to have been rebuilt in several locations

(Figure 43). The brick appears different in color to the brick at the lower portion of the wall.



Figure 43. Rebuilt portion of the lower wall (above yellow line).

There are four sets of stairs at the counterscarp (Figure 44 through Figure 47). One is located at the south end opposite Bastion A, just north of Fort Pickens Road; two are located near the center of the counterscarp; and the fourth stair is situated at the north end of the counterscarp opposite Bastion E. The stairs are composed of granite treads, each measuring 4 feet wide, 8-1/4 inches tall, and 14 inches deep.



Figure 44. Southernmost stair at counterscarp.



Figure 45. South stair near the center of the counterscarp.



Figure 46. North stair near the center of the counterscarp.



Figure 47. Far northern stair at counterscarp.

The lower counterscarp wall steps back to accommodate the northernmost and southernmost stairs (Figure 48). The offset portion of the wall in these locations is only 2 feet 10 inches wide.



Figure 48. The lower counterscarp wall where it steps back to accommodate a stair.

Near the center of the counterscarp, the wall slopes upward to account for the sloping grade to the east (Figure 49). The wall features a series of brick buttresses along the lower portion of the masonry (Figure 50). The wall steps down approximately 4 feet 5 inches before sloping downward to its typical height (Figure 51).



Figure 49. Near the center of the counterscarp, the wall slopes upwards to account for the sloping grade to the east.



Figure 50. Brick buttresses lining the base of the wall.



Figure 51. The taller section of the wall steps down before it continues to slope.

The wall also slopes upward at the north and south ends of the counterscarp, again to accommodate a change in grade beyond (Figure 52 and Figure 53). Both walls feature a series of brick buttresses at the base (Figure 54). Where the wall steps down on the west side, the highest portion of the wall turns toward the outside of the counterscarp (Figure 55).



Figure 52. The wall where it slopes upward at the south end of the counterscarp adjacent to Fort Pickens Road.



Figure 53. The wall where it slopes upward at the north end of the counterscarp.



Figure 54. Brick buttresses along the south end of the counterscarp.



Figure 55. The wall turns outward toward the outside edge of the counterscarp, view from west.

At the far west end of the north portion of the wall is an arched opening just below grade that provides access to a space within the counterscarp (Figure 56). The interior of this space extends the depth of the counterscarp and measures approximately 7 feet 7 inches wide by 63 feet (Figure 57). The space has brick walls with a brick barrel-vaulted ceiling. A series of 16 arches, 2 feet 11 inches wide, line the west wall (Figure 58). Small embrasure openings are present at each arch. A cast-in-place concrete enclosure, measuring 4 feet tall, 3 feet 8 inches wide, and 8 feet long, is situated at the south end of the space. The historic use for the enclosure is not known (Figure 59).



Figure 56. Arched opening at the northwest portion of the counterscarp.



Figure 57. Space under counterscarp wall.



Figure 58. Typical arch along the west wall of the space under the counterscarp wall. Note the narrow embrasure openings.



Figure 59. Concrete enclosure.

At the south end of the counterscarp, adjacent to the buttressed wall, is a set of brick stairs (Figure 60). The stairs are approximately 4 feet wide, with 11-1/2-inch-deep treads and 8-1/2-inch-tall risers. West of the brick stair is an arched opening that sits just below grade (Figure 61). Remnant limewash is visible at the arch above the opening (refer to Figure 61). The vaulted space continues south under the counterscarp (Figure 62). A pipe extends through the vaulted space from under Fort Pickens Road to the north (Figure 63).

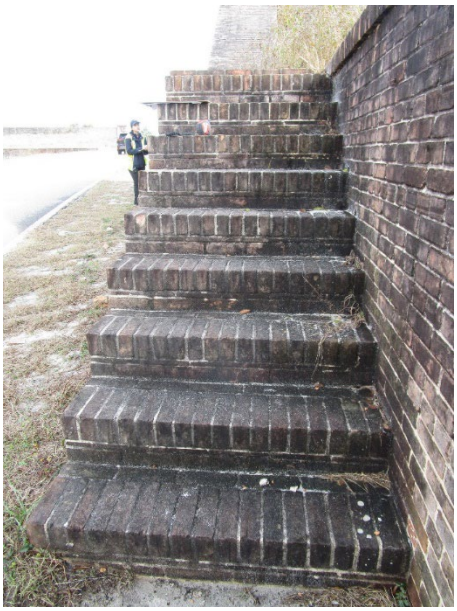


Figure 60. Brick stair at south end of counterscarp adjacent to Fort Pickens Road.



Figure 61. An arched opening west of the stair along Fort Pickens Road. Note the remnant limewash at the face of the arch above the opening.



Figure 62. The interior of the arched opening.



Figure 63. A pipe extending through the vaulted space.

The west end of the south portion of the wall slopes upward toward the south, with two brick buttresses projecting west (Figure 64). The circa 1910 concrete seawall that encircles the west end of Santa Rosa Island terminates at the west-facing wall at the south end of the counterscarp (Figure 65).

The upper walls of the counterscarp are set back from the lower wall approximately 35 to 85 feet (Figure 66). The upper walls are typically 2 feet 6 inches wide and consist of brick laid in a common bond pattern with a header row every fourth course. The walls are topped by a rowlock course of brick. The walls typically serve as retaining walls, with grade nearly flush with the top of the wall at the exterior side (Figure 67). Remnant limewash is present at the topside of the walls (Figure 68). Stone coping units are typically present at corners of the upper wall (Figure 69).



Figure 64. The west end of the south portion of the counterscarp wall.



Figure 65. The concrete seawall meets the south end of the counterscarp.



Figure 66. The upper walls of the counterscarp, view from south.



Figure 67. The top of the upper wall of the counterscarp. Note that the adjacent grade is nearly level with the top of the wall.



Figure 68. A remnant limewash at the topside of the walls.



Figure 69. Stone coping units at a corner of the upper wall.

Near the center of the counterscarp are two additional walls that are constructed inboard of the main outer wall (Figure 70). The walls are approximately 3 feet 4 inches apart and connect to the taller buttressed portions of the lower wall on either side of the central stairs (Figure 71). The main outer wall extends east, forming a nearly triangular area between the lower and upper walls (Figure 72 and Figure 73).



Figure 70. Two additional walls that are constructed inboard of the main outer wall at the upper portion of the counterscarp.



Figure 71. The upper wall as it turns west toward the buttressed wall near the center of the counterscarp.



Figure 72. The top of the upper wall where it extends east.



Figure 74. Fort Pickens Road where it cuts through the counterscarp.



Figure 73. The open space between upper and lower walls of the counterscarp.



Figure 75. A stone plaque added in 1991 where Fort Pickens Road cuts though the counterscarp.

In 1942, the U.S. Army Corps of Engineers constructed a road through the southern end of the upper wall of the counterscarp. The road was later connected to Fort Pickens Road, which leads to Pensacola Beach (Figure 74). The upper wall of the counterscarp was rebuilt around the road in 1991. At this time, a stone plaque was included at the new section of the wall that reads "Fort Pickens 1834" (Figure 75). The counterscarp continues south of the road (Figure 76).



Figure 76. The counterscarp as it continues south of Fort Pickens Road.

Scarp

The scarp or exterior walls of Fort Pickens are mass masonry walls approximately 5 feet thick

(Figure 77 through Figure 87). The walls rise approximately 20 feet above current grade, and were originally a greater height above grade before the dry moat was filled in. The brick units used to construct the walls are typically 2-3/8 inch tall by 8-3/8 inch long and are laid in a variety of patterns. At the lower portion of the bastion walls, the brick is laid in an English bond pattern with alternating stretcher and header courses (Figure 88). In other locations, brick is laid in a common bond pattern with a header row every fourth course (Figure 89).

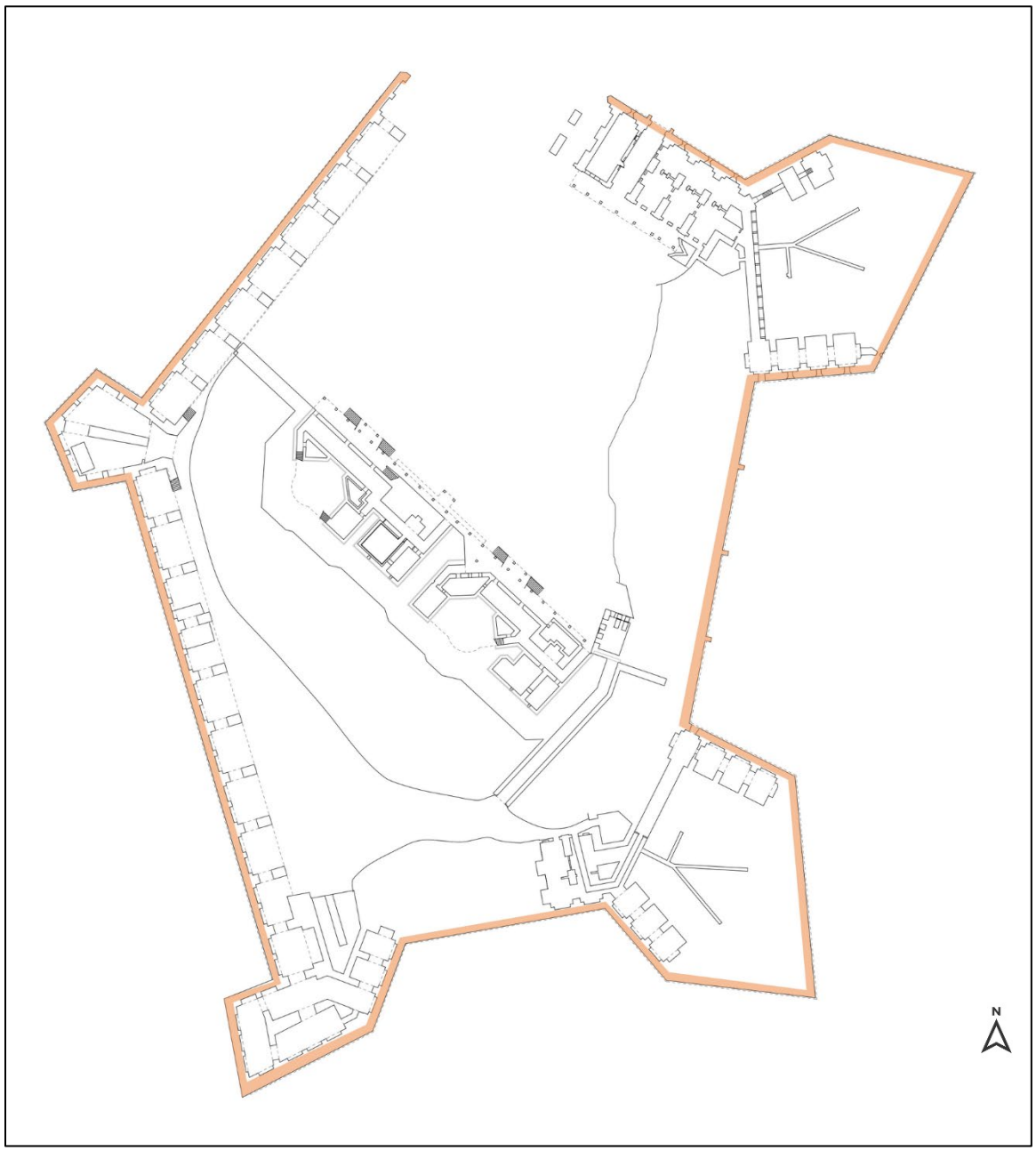


Figure 77. Plan of Fort Pickens showing the location of the scarp at the perimeter of the fort (orange shading).



Figure 78. The northeast scarp and sally port, view from northeast.



Figure 79. The northwest scarp with tower bastion at right, view from northwest.



Figure 80. Fort Pickens, with tower bastion at center, view from west.



Figure 81. The southwest scarp, view from southwest.



Figure 82. The south scarp with Fort Pickens Road in the foreground, view from south.



Figure 83. Bastion A, view from southeast.



Figure 84. The south end of the east scarp, with Bastion A at the far left, view from east.



Figure 85. The north end of the east scarp, with Bastion E at the far right, view from east.



Figure 86. Bastion E, view from southeast.



Figure 87. Bastion E, with mine casemate building at left, view from northwest.



Figure 88. Brick laid in an English bond pattern at the base of the bastion walls.

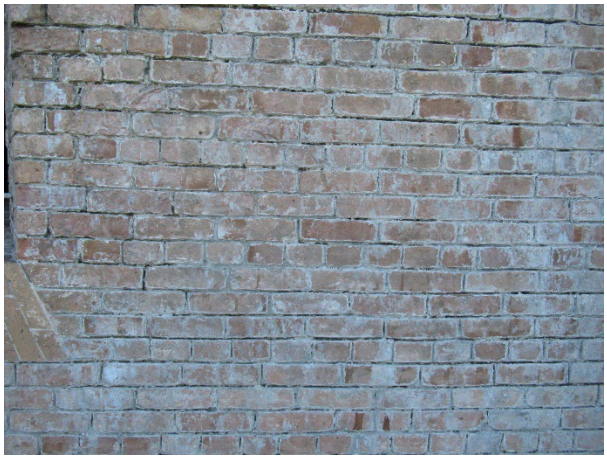


Figure 89. Brick laid in a common bond pattern, with a header row every fourth course, at the scarp walls.

Much of the scarp is topped with granite units that overhang the wall below (Figure 90). The stone at the top of Bastion B has been replaced recently (Figure 91). At portions of the bastions and other isolated locations, the walls are topped with a stepped brick cornice (Figure 92).



Figure 90. Overhanging granite coping units.



Figure 91. Newer stone coping installed at the top of Bastion B.



Figure 92. A stepped brick cornice at the top of Bastion E.

While the scarp is fairly regular in appearance, alterations were made to the southwest scarp and Bastion B to accommodate Battery Pensacola (Figure 93). As a result, the west walls at Bastion B are typically 13 feet tall, and only 10 feet tall at the

north edge of the bastion (Figure 94). At the northwest scarp the wall extends up above the projecting granite approximately 9 feet (Figure 95).



Figure 93. View of Bastion B showing the portions of the upper wall that have been removed (yellow arrow).



Figure 94. The north end of the west wall at Bastion B, where it is only 10 feet tall at the north edge of the bastion.



Figure 95. At the northwest scarp, the wall extends up above the projecting granite course.

The north end of the northwest scarp, Bastion D, and the west end of the northeast scarp were destroyed by an explosion in Bastion D in 1899. The end of the northwest scarp is open, with portions of the interior wythes of the exterior wall visible (Figure 96). A vent that extends from the casemate above the embrasure to an opening at the top of the wall is visible (refer to Figure 96). These vents are present in all the casemates and are typically connected to chimneys that are visible at the top of the scarp wall (Figure 97).



Figure 96. The end of the northwest scarp.



Figure 97. Chimneys are located at intervals along the scarp walls and serve as vents for the casemates below.

The historic entrance into the fort was through the sally port, which was located at the center of the northeast scarp (Figure 98). The sally port opening is arched, with the brick arch projecting slightly from the fort wall (Figure 99). Two buttresses flank the arched opening (Figure 100). The buttresses are 2 feet 1 inch wide and are comprised of brick set in an English bond pattern. The bricks are typically 2-1/4 inches tall and 8-3/4 inches long.



Figure 98. The sally port, which was originally centered on the northeast scarp.



Figure 99. The arched sally port opening.

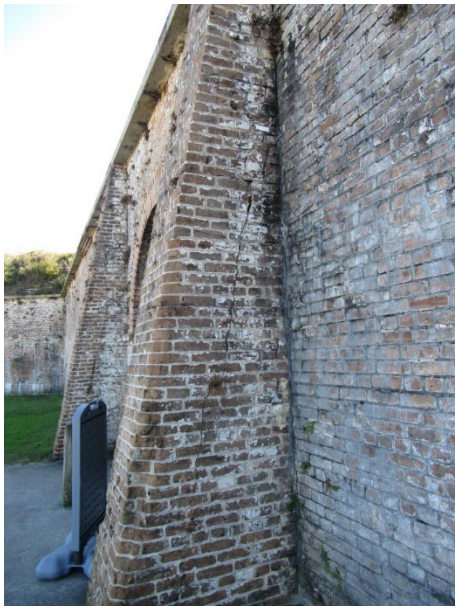


Figure 100. Side view of one of the two buttresses that flank the arched sally port opening.

A series of embrasures lines the scarp as well as portions of the bastions (Figure 101 and Figure 102). The embrasures are arched openings with a flat arch at the sill. At the casemated scarp walls, the openings are typically 3 feet 6 inches tall from sill to the keystone of the arch, 2 feet 8 inches tall from the sill to the spring point of the arch, and 4 feet 1 inch wide at the exterior wall. Each opening becomes smaller toward the interior of the fort, with the openings typically 2 feet wide at their narrowest point. The embrasures at the bastions line the walls that intersect the scarp and differ in size (Figure 103). While the openings at the bastions are typically 3 feet high to 3 feet 3 inches high (sill to keystone), the widths at the exterior bastion walls range from 5 feet 4 inches

wide at Bastion E to 5 feet 7 inches wide at Bastion B. Narrow openings, only 6-1/2 inches wide, are also present at the walls of Bastion B. Despite the differences in size, the embrasures are all arched openings with a flat arch at the sill.

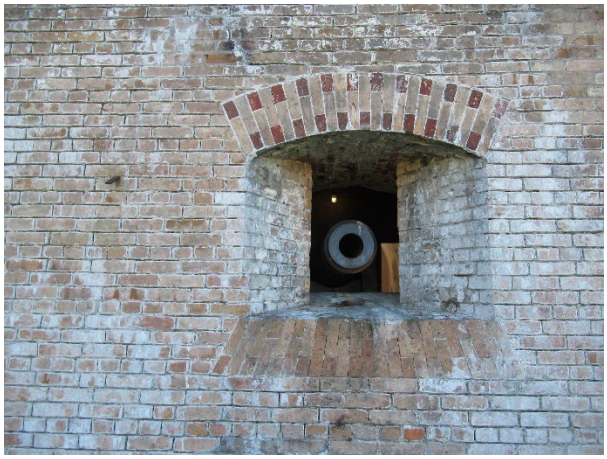


Figure 101. A typical embrasure at a bastion wall. Note the arch at the head of the opening and the flat-arch sill.



Figure 102. A typical embrasure along the scarp. Note the arch at the head of the opening and the flat-arch sill.



Figure 103. The embrasures at Bastion E, view from south. The embrasures differ in size.

A rectangular piece of brownstone is typically present in the embrasure sill near the center of the wall thickness, where the opening narrows (Figure 104). The brownstone is typically 1 foot 11 inches wide by 1 foot deep, with a 7-inch-diameter circular indentation in the center.



Figure 104. Typical brownstone unit at an embrasure sill near the center of the wall, where the embrasure opening narrows.

Metal grilles are typically present at the embrasure openings. Some of the grilles appear to be historic and consist of flattened steel bars (Figure 105). Others are more contemporary and are composed of steel reinforcing bars (Figure 106). The steel reinforcing bars were likely added as part of work undertaken by the National Park Service in the 1970s.



Figure 105. Historic grille at an embrasure opening.



Figure 106. Contemporary grille constructed of steel reinforcing bars at an embrasure opening.

The embrasures along the southeast scarp have been filled in with brick (Figure 107). This was likely completed when Battery Pensacola was constructed.



Figure 107. A filled-in embrasure along southeast scarp.

At the south wall of Bastion B, the embrasures are narrow openings measuring 3 feet 1 inch tall and 6-1/2 inches wide (Figure 108). These openings are likely original, as the adjacent brickwork does not appear to have been altered.



Figure 108. Narrow openings at the south wall of Bastion B.

There are no embrasures present in the east scarp of the fort (Figure 109). Three brick buttresses extend from the east scarp (Figure 110). The buttresses extend the full height of the wall. The buttresses are thought to have been added to the exterior of the scarp wall following original fort construction. A continuous vertical joint is present between each side of the buttresses and the adjacent scarp wall (Figure 111). The buttresses are constructed of a similar-sized brick to that on the adjacent scarp wall.



Figure 109. Three brick buttresses line the east scarp. Note that there are no embrasures present in the wall.



Figure 110. One of three brick buttresses that extend from the east scarp.



Figure 111. A continuous vertical joint extends the height of the buttresses, where the buttresses meet the wall (dashed line).

Arched openings are present at the north side of Bastion A and the south side of Bastion E, providing visitor access from the interior of the fort to the east portion of the former dry moat (Figure 112).



Figure 112. An arched opening at the north side of Bastion A.

At tower bastion (Bastion C), a series of copper-lined scuppers is present near the top of the wall (Figure 113). Each scupper consists of an arched brick opening, with the copper scupper fitting extending past the brick wall.



Figure 113. A copper-lined scupper near the top of the wall at tower bastion.

Portions of the scarp wall at Bastion A and portions of the southeast scarp wall were cleaned by power washing in 2023. It is not known if any chemical cleaners were also used (Figure 114).



Figure 114. Recently cleaned portion of the scarp wall at Bastion A.

Bastions

Historically, there were five bastions, located one at each corner of the pentagonal fort structure, identified on archival drawings as Bastions A through E (Figure 115). An explosion in 1899 destroyed Bastion D, previously located at the north corner of the site. Each bastion projects from the main fort structure approximately 40 feet. Bastion A is located at the southeast corner of the fort, Bastion B is located at the south corner, Bastion C is located at the west corner, and Bastion E is located at the northeast corner.

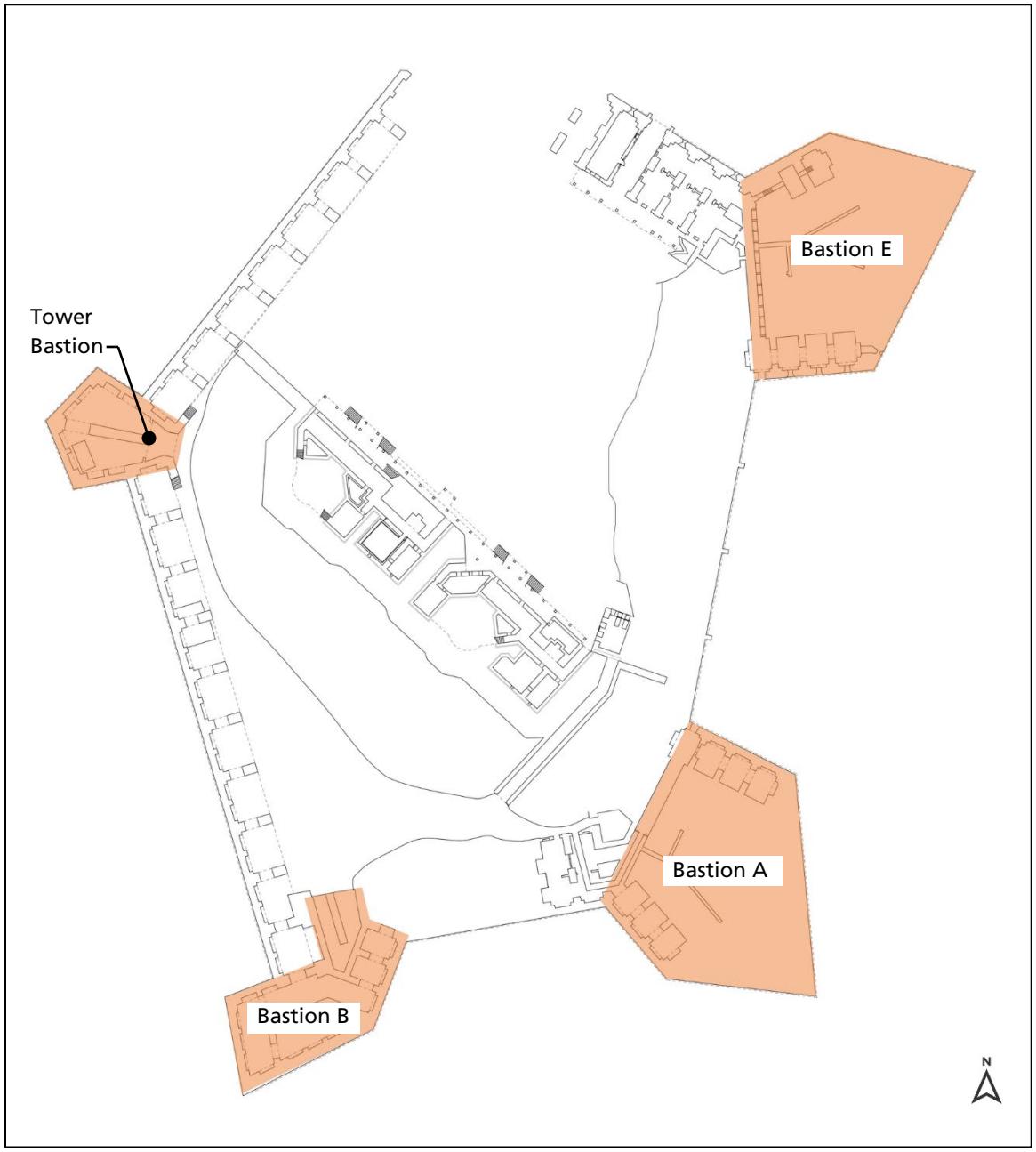


Figure 115. Plan of Fort Pickens showing the location of the bastions at the corners of the fort (orange shading).

Arched embrasures are present throughout the outer walls (Figure 116 and Figure 117). The arched openings generally measure 4 feet wide and are 3 feet tall at the center of the arch, and 2 feet and 5/8 inches tall at either side of the arch. A brownstone unit, measuring approximately 2 feet in length by 1 foot in width, is set within each brick embrasure. The embrasure opening is 5 feet deep. These dimensions vary slightly between embrasures. Above the embrasure is a semicircular arch composed of a two-piece soldier course. The arch opening is 1 foot 1/2 inch tall with very thin masonry joints. Below the embrasure is a trapezoidal-shaped sill composed of angled brick. The sill is 11 inches tall and 5 feet wide at the bottom. The masonry joints above and below the embrasure are very thin (Figure 118).



Figure 116. A typical arched embrasure at the outer walls of a bastion. Note the arch at the head of the opening and the flat-arch sill.



Figure 117. A typical arched embrasure at the outer walls of a bastion. No grille is present at this opening.



Figure 118. Thin masonry joints at the flat arch below the embrasure opening.



Figure 119. Embrasures infilled with brick masonry along the northwest wall of Bastion E.

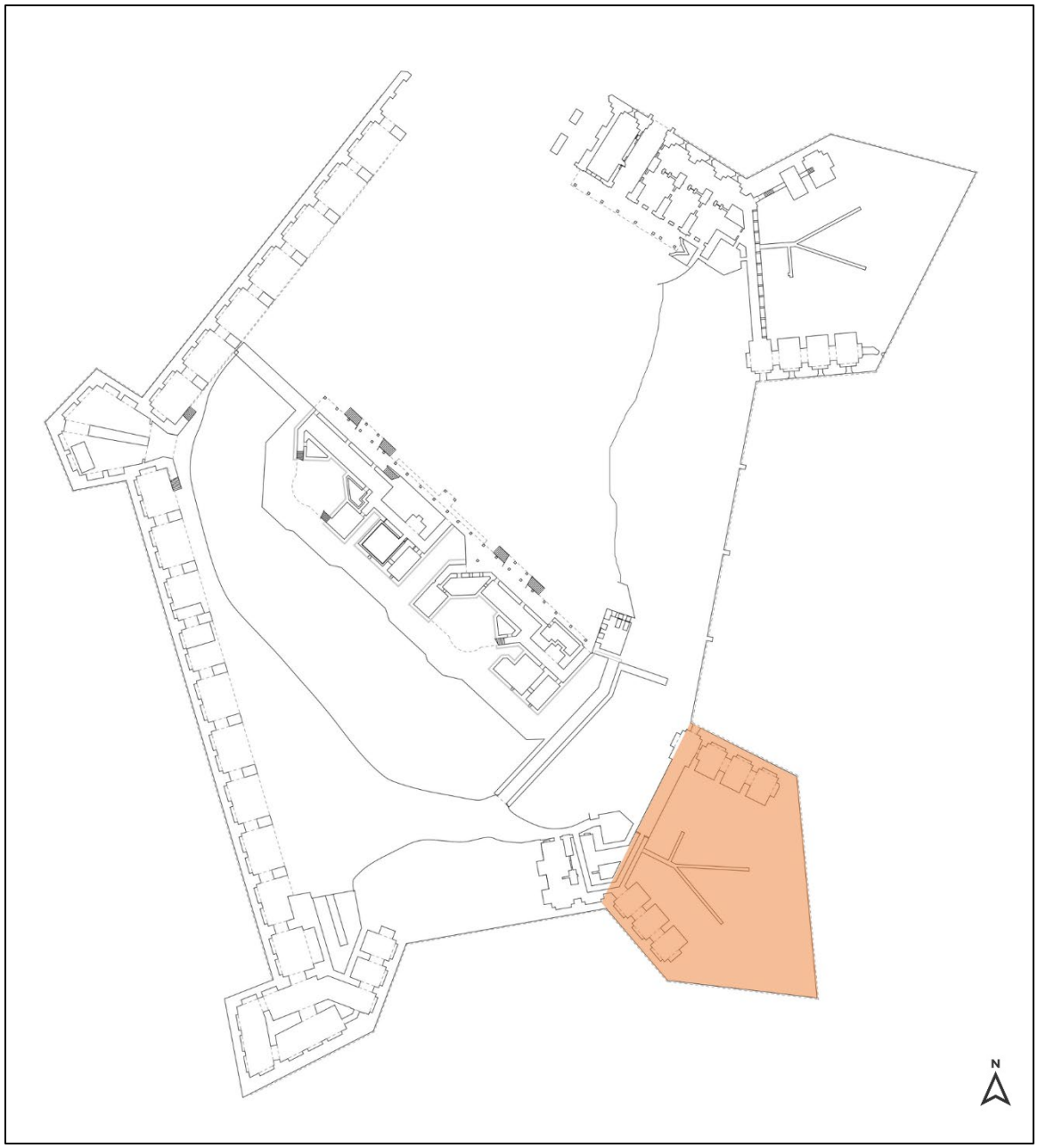


Figure 120. Plan of Fort Pickens showing the location of Bastion A (orange shading).

Bastion A

Bastion A is located at the southeast corner of the fort, to the south of the counterscarp wall and the dry moat, which was later infilled (Figure 120). Within Bastion A are the mine chambers, a powder magazine, and two sets of casemate galleries, located on either side of the bastion outer walls. A brick vaulted corridor, located on the west end of Bastion A, leads to a tunnel opening, known as the countermine, that further leads to three narrow vaulted chambers (Figure 121 through Figure 123). The vaulted chambers were constructed to store powder. Two brick walls perpendicular to the corridor were subsequently added, outside of the powder magazine entrance (Figure 124).



Figure 121. A brick vaulted corridor at the west end of Bastion A.



Figure 122. A tunnel opening, or countermine, that leads to three narrow vaulted chambers.



Figure 123. The interior of the countermine, which leads to three narrow vaulted chambers.



Figure 124. Masonry walls at the corridor outside of the powder magazine entrance.

The upper portion of the exposed brick corridor and tunnel walls and ceilings are partially coated with limewash (Figure 125 through Figure 127). The brick flooring steps up a few feet after entering the tunnel. The tunnel walls and ceilings in the brick corridor along the west side of Bastion A were recoated with limewash in 2023 (Figure 125).

Unlike the mine chambers at Bastion E, no light fixtures or conduit lines have been installed at the Bastion A mine chambers.



Figure 125. The upper portion of the brick vaulted corridor is partially coated with limewash. The walls were recoated in 2023.



Figure 126. The brick vaulted ceiling in the corridor is partially coated with limewash.



Figure 127. The upper portions of the tunnel walls and ceilings are partially coated with limewash.



Figure 128. New limewash at the brick corridor along the west side of Bastion A.

On the west side of the corridor are a set of board-formed, cast-in-place concrete knee walls (Figure 129). The trapezoidal walls are approximately 2 feet 10 inches in height, 3 feet 3 inches in width, 1 foot in length at the top, and 1 foot 5-1/2 inches in length at the base. The corners of the walls are chamfered approximately 1 inch in width. The date of construction and purpose of the knee walls and curb are unknown, though they are not believed to be original features.



Figure 129. A set of board-formed cast-in-place concrete knee walls along the west side of the corridor.

At the west end of Bastion A, adjacent to the mine chambers, is the powder magazine. Historically, the black powder could easily be transferred from the powder magazine to the mine chamber, and from there to the three narrow-vaulted chambers.

The powder magazine is entered through an arched entryway and leads to a pentagon-shaped brick masonry room with a raised roof (Figure 130 and Figure 131). There is another opening leading to the parade on the west wall of the powder magazine (Figure 132). The brick flooring is covered with the sand that fills the retaining wall outside.



Figure 130. The arched entryway into the powder magazine.



Figure 131. The brick vaulted ceiling of the powder magazine.



Figure 132. An arched opening leading to the parade on the west wall of the powder magazine.

Two wall openings are located on the southeast and west walls, and two smaller rectangular openings are located on the west and south walls (Figure 133). The smaller openings, known as vent channels, extend through the full depth of the wall and lead to air shafts that ventilate the powder magazines located inside the fort. The larger wall openings outside of the powder magazine walls are approximately 4 feet wide and 3 feet 6 inches in height. The vent channel openings are approximately 6 inches wide and 2 feet in height (Figure 134). The interior and exterior openings of the vent channel align in plan (Figure 135).



Figure 133. The west wall of the powder magazine.



Figure 134. A vent channel opening at the Bastion A powder magazine.



Figure 135. An interior view of a vent channel.

The casemate galleries are located on either end of the mine chamber corridor of Bastion A. The casemate gallery to the north of Bastion A is entered through a door opening along the scarp, following the concrete walkway provided for visitors in the dry moat (Figure 136). To the right of the opening is a casemate gallery (Figure 137).

The arched opening to the casemate gallery was partially infilled with brick masonry, and a steel I-beam, approximately 6 feet in length and 10 inches in height, was installed above the opening (Figure 138). It is not known when the brick infill was installed. Common brick of a different size and vintage was used for the infill. The web of the I-beam is etched on the side facing the interior of the casemate gallery and reads "ALIVE GERONIMO" (Figure 139). In 1886, Geronimo and fifteen Chiricahua Apache were imprisoned at Fort Pickens.



Figure 136. An opening leading into Bastion A from the dry moat.



Figure 137. The arched opening into the casemate gallery.



Figure 138. The arched opening into the casemate gallery.



Figure 139. Etching on the web of the steel beam is visible on the inside face of the casemate gallery and reads "ALIVE GERONIMO."

The flooring is composed of brick (Figure 140). Centered in the barrel-vaulted ceilings are rectangular and diamond-shaped openings

(Figure 141). The ceilings and walls are partially coated with limewash (Figure 142). An embrasure opening is present at the north walls centered on each casemate opening (Figure 143). Typically, there is an approximately 1-inch-wide gap between abutting arched walls (Figure 144). This gap is thought to be an original feature intended to allow the arches to remain intact if the adjacent walls were damaged. A brownstone unit is set within the sole of each embrasure. Embedded into the sole of the embrasure is an iron pivot, approximately 7 inches in diameter, that historically received the cannon carriage. The iron pivots remain intact at some locations throughout Bastion A and are significantly corroded or missing at others (Figure 145 and Figure 146). There are holes in the brownstone at the locations where the iron pivot embedments are no longer intact (Figure 147).



Figure 140. Brick flooring in the casemate gallery.



Figure 141. A diamond-shaped opening in the barrel-vaulted ceiling.



Figure 142. Limewash at the brick walls and ceilings.



Figure 143. An embrasure opening along the north wall of the bastion.



Figure 144. A gap approximately 1 inch wide between abutting arched walls.



Figure 145. An iron pivot at the sill of an embrasure opening.



Figure 146. A damaged iron pivot at the sill of an embrasure opening.



Figure 147. A hole in a brownstone sill where the iron pivot embedment is missing.

The iron grilles installed inboard of the embrasure opening are fabricated from steel reinforcing bars.

An open vent is present above the embrasure, which allowed smoke from cannon fire to be vented from the space. Semicircular granite stone units facing the embrasure openings and soles were used to allow cannon carriages to be easily rotated (Figure 148). The brick flooring within the granite steps upward in the vicinity of the embrasure opening (Figure 149).



Figure 148. Semicircular granite stone units.



Figure 149. The brick flooring within the granite steps upward in the vicinity of the embrasure opening.

The casemate gallery to the south of Bastion A is accessed through the mine chamber corridor and through the southwest corner of the parade, close to the tunnel that leads to Battery Pensacola (Figure 150). The casemate gallery is similar in description to the casemate gallery located on the north of Bastion A. An embrasure opening is present at the south walls centered on each casemate opening (Figure 151).



Figure 150. The mine casemate corridor.



Figure 151. An embrasure opening at a casemate.

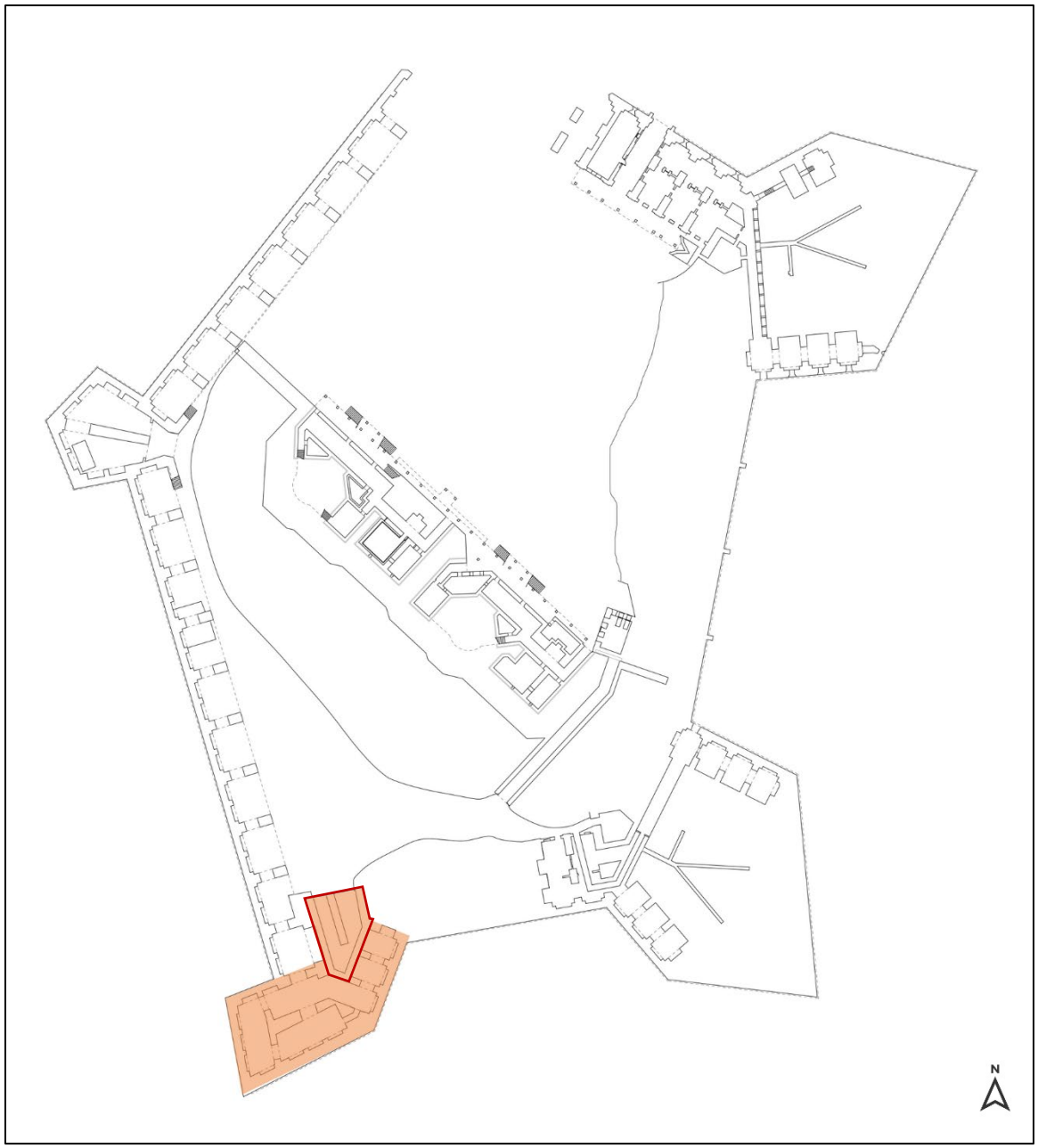


Figure 152. Plan of Fort Pickens showing the location of Bastion B (orange shading). The location of the cisterns is outlined in red.

Bastion B

Bastion B, located at the south corner of the fort, is the earliest bastion constructed on site (Figure 152). The footprint of the bastion is more rectangular in shape and has a smaller area than Bastions A and E. Bastion D, no longer present, was similar in plan to Bastion B.

Following construction of Battery Pensacola, the Bastion B walls were lowered by demolishing the top half of the walls to prevent the height of the walls from interfering with the firing of the guns from the battery. The roof of the southwest casemate gallery of Bastion B was also removed at this time, exposing the arches that comprise the casemate galleries and the openings between (Figure 153 and Figure 154).



Figure 153. The lower walls at Bastion B. Note the larger arches over the casemates visible in the back.



Figure 154. There is no roof present over the southwest casemate gallery. Note the exposed arched opening and casemate beyond.

The embrasures on the southwest wall of Bastion B are long and narrow to accommodate rifled cannons (Figure 155 through Figure 157). At the exterior, these narrower embrasures measure approximately 6 inches wide by 3 feet in height. Typically, an opening is present below the brownstone unit that is located below the sole of the embrasure. Bastion B was eventually used as a storage space once rifled cannons were replaced by modern artillery.



Figure 155. A typical narrow embrasure at Bastion B.



Figure 156. A narrow embrasure at Bastion B. Note the opening is larger at the interior.



Figure 157. A view inside a typical narrow embrasure at Bastion B.

The interior of Bastion B has a set of interconnected, vaulted rooms (Figure 158 through Figure 161). The flooring is composed of brick. The vents centered in the barrel-vaulted ceilings range from diamond-shaped to circular openings (Figure 162). The ceilings and walls are partially coated with limewash.



Figure 158. Vaulted, interconnecting rooms at the interior of Bastion B.



Figure 159. Vaulted rooms at the interior of Bastion B, view from west.



Figure 160. Vaulted rooms at east end of Bastion B.



Figure 161. Detail of masonry vaulting at ceiling and walls of interior of Bastion B.



Figure 162. Two vents centered in the barrel-vaulted ceilings.

The arched openings facing the southeast end of Bastion B are partially blocked by cast-in-place concrete retention walls (Figure 163). The walls likely date to the period when Battery Pensacola was constructed. An open vent is present above

each embrasure, allowing smoke from cannon fire to be vented from the space (Figure 164). Unlike the southwest end of the bastion, there are semicircular granite stone units facing the embrasure openings and soles on the southeast portion of the bastion (Figure 165). The flooring within the granite stone units in the vicinity of the embrasure opening is brick (Figure 166).



Figure 163. An arched opening facing the southeast end of Bastion B is partially blocked by a concrete retention wall.



Figure 164. An open vent above an embrasure.



Figure 165. Semicircular granite stone units in the floor adjacent to embrasure openings.



Figure 166. Brick flooring adjacent to the embedded granite stone units.

Sections of the brick vault and embrasures on the southwest and southeast ends of the bastion have been reconstructed, as evidenced by the newer brick present (Figure 167 through Figure 170).The brick flooring at the southwest end of Bastion B, where no roof is present, is partially covered with vegetation (Figure 171).

Bastion B connects to the casemates, located between Bastion B and Bastion C, from the north end of the bastion.



Figure 167. A reconstructed portion of a brick vault.



Figure 168. A reconstructed embrasure at Bastion B.



Figure 169. Rebuilt brick wall above an embrasure at Bastion B.



Figure 170. Example of reconstructed brickwork along the south wall of Bastion B.



Figure 171. The brick flooring at the southwest end of Bastion B is partially covered with vegetation.

Cisterns

Two cisterns, original to Bastion B construction, remain at the south of the fort (Figure 172). Together with the cisterns outside of Bastion D, which were destroyed in 1899, these cisterns served as the main water supply for the fort until 1916. The interiors of the cisterns are constructed of brick masonry covered with a parge coat (Figure 173). There is a concrete curb at the bottom of the cistern walls (Figure 174). The cistern closest to the west end abuts the first casemate gallery opening located between Bastion B and Bastion C. The west cistern is partially blocked by a brick wall (Figure 175). Remains of brick flooring are found outside of the cistern entrance (Figure 176). The floors of the cisterns are obscured, but remnant brick is visible in some locations (refer to Figure 174).



Figure 172. The two cisterns, as viewed from the parade.



Figure 175. A brick wall at the western cistern opening.



Figure 173. An interior view of the cisterns.



Figure 176. Remains of brick floor outside of the cistern entrance.



Figure 174. A concrete curb is present at the bottom of the cistern walls.

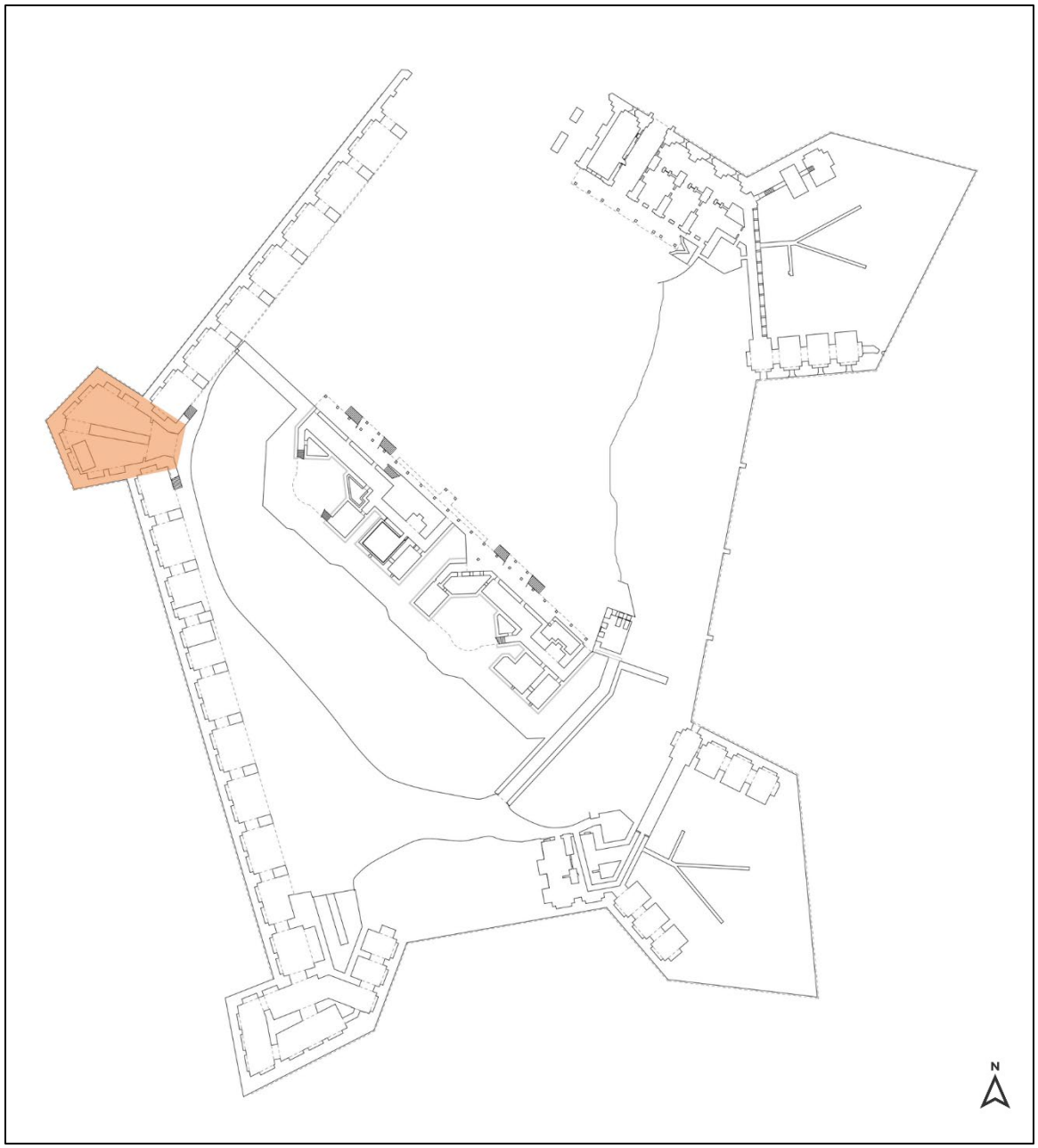


Figure 177. Plan of Fort Pickens showing the location of tower bastion (orange shading).

Tower Bastion (Bastion C)

Bastion C, known as the tower bastion, is located at the west corner of the fort (Figure 177). The footprint of Bastion C is smaller in size than the other bastions at the fort. The terreplein at the top of the bastion is accessed through granite stairs located on either side of the east wall (Figure 178).The bastion is enclosed by masonry parapet walls, approximately 2 feet 6 inches in height and 1 foot 10 inches in width (Figure 179). A large 15-inch cannon is mounted on a concrete curb in the center of the bastion (Figure 180). Four circular iron tracks are offset from the center of the cannon, on top of the concrete curb. Outside of the concrete stoop is deck flooring composed of composite boards outlined with wood framing following a trapezoidal shape (Figure 181 and Figure 182). Several wooden benches have been installed on the deck flooring for visitor use (Figure 183).



Figure 178. Stairs leading to the terreplein at tower bastion.



Figure 181. Composite decking at the terreplein at tower bastion.



Figure 179. Masonry parapet walls at the perimeter of the terreplein.



Figure 182. Composite decking at the terreplein.



Figure 180. The 15-inch cannon mounted on a concrete curb in the center of the terreplein at Bastion C.



Figure 183. Wood benches at the terreplein.

The area between the deck flooring and the outer parapet walls consists of sand with low vegetation (Figure 184). The parapet wall facing the parade is lower in height than the wall at the north end of the bastion (Figure 185). Expansion joints with

sealant and backer rod are present at the parapet walls approximately every 12 feet 6 inches (Figure 186).



Figure 184. Sand and vegetation at the terreplein at tower bastion.



Figure 185. The brick parapet wall at tower bastion.

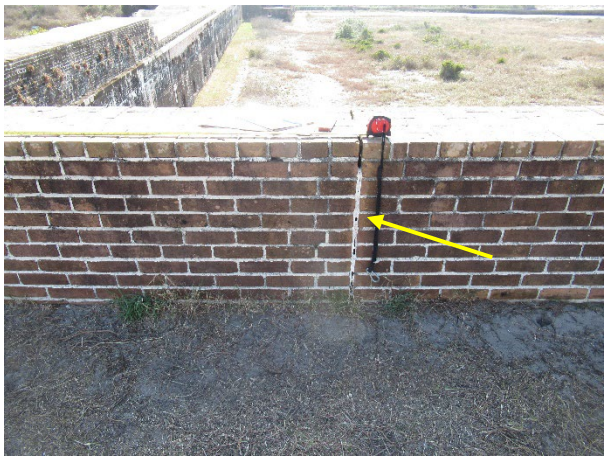


Figure 186. Sealant expansion joint at the parapet walls (yellow arrow).

Brick ventilation flues extend past the roof level and are located outside of the deck flooring perimeter (Figure 187 and Figure 188). One ventilation flue is located within the area of composite decking on the north half of the bastion (Figure 189). The flues typically measure approximately 1 foot 6 inches long, 1 foot 10 inches wide, and 1 foot 4 inches in height. The tops of the ventilation flues are capped with a cementitious coating (Figure 190).



Figure 187. Brick ventilation flues extend above the roof level.



Figure 188. Interior of brick ventilation flue.



Figure 189. One ventilation flue is located inside the area of composite decking.



Figure 191. The entrance to the ground level of Bastion C. Note the stairs above.



Figure 190. Cementitious parge coating at the top of the ventilation flue.



Figure 192. The arched opening at tower bastion.

The entrance to the ground level of Bastion C is through a vaulted opening that bridges between the two stairs (Figure 191 and Figure 192). The concrete walkway provided for visitors extends parallel to the bastion entrance.

The south-facing vaulted opening has been partially infilled with a brick wall, approximately 6 feet 2 inches in width, with a steel lintel installed at either side of the wall above the two rectangular openings (Figure 193). There is concrete infill set within the gaps between the lintels above the two openings (Figure 194). The outer 1-foot-6-inch section of the outer wall was reconstructed (Figure 195). The brick at the reconstructed portion of the wall does not appear to be keyed into the inner portion of the wall. It is not known when the infill wall was added, or when the outer portion was reconstructed. The ceilings and walls at the vaulted opening are partially coated with limewash.



Figure 193. The south-facing vaulted opening in tower bastion.



Figure 194. Concrete infill between the steel lintels at a partially infilled opening.



Figure 195. Reconstructed outer portion of the wall.

The tower bastion houses a wood frame structure that may have been constructed in 1900 as a refrigeration room (Figure 196 through Figure 198).[123] The flooring in the bastion is composed of concrete with control joints. It is not known when the concrete was installed.



Figure 196. Wood-framed structure at the interior of Bastion C.



Figure 197. Wood structure at the interior of Bastion C. Note that the outer cladding is missing at the end of the structure.

123. Deborah Slaton, Liz Sargent, Tim Penich, and Andi Mele, *Pensacola Harbor Defense Project National Register Nomination,* August 26, 2016, entered into the National Register, May 15, 2017.

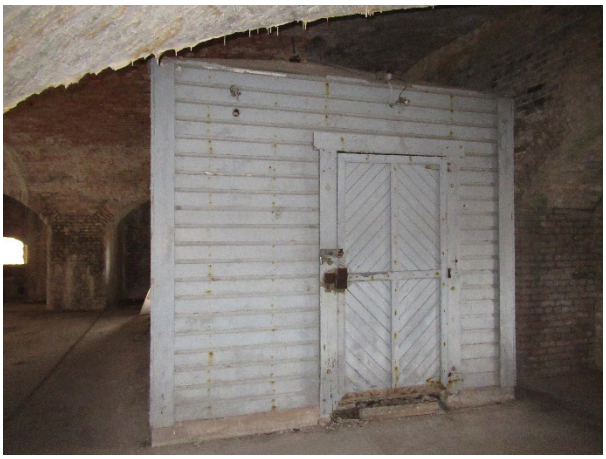


Figure 198. Wooden structure at the interior of Bastion C. Note the wood door.

An approximately 1/2-inch-wide gap runs uniformly through the walls and vaulted ceiling, approximately 7 feet from the outer edge of the wall (Figure 199 and Figure 200). The gap is not visible above the center wall that divides the two interior spaces of the bastion (Figure 201). While the gap between the arches and adjacent exterior wall appears to have been included to allow the arches to remain if the walls were damaged, the purpose of the gap through the walls and vaulted ceiling is not known.

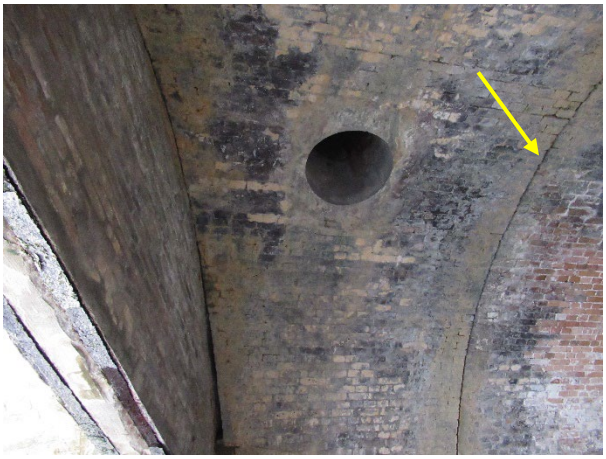


Figure 199. The gap that runs through the walls and vaulted ceiling (yellow arrow).



Figure 200. A gap in the walls and vaulted ceiling.



Figure 201. The gap is not visible above the center wall between the two spaces in Bastion C.

An embrasure opening is present at the west wall, centered on each casemate opening (Figure 202). A cementitious parge coat is installed over the sole of the embrasure (Figure 203).



Figure 202. An embrasure opening along the west wall of Bastion C.



Figure 203. A cementitious parge coat is installed over the sole of the embrasure.

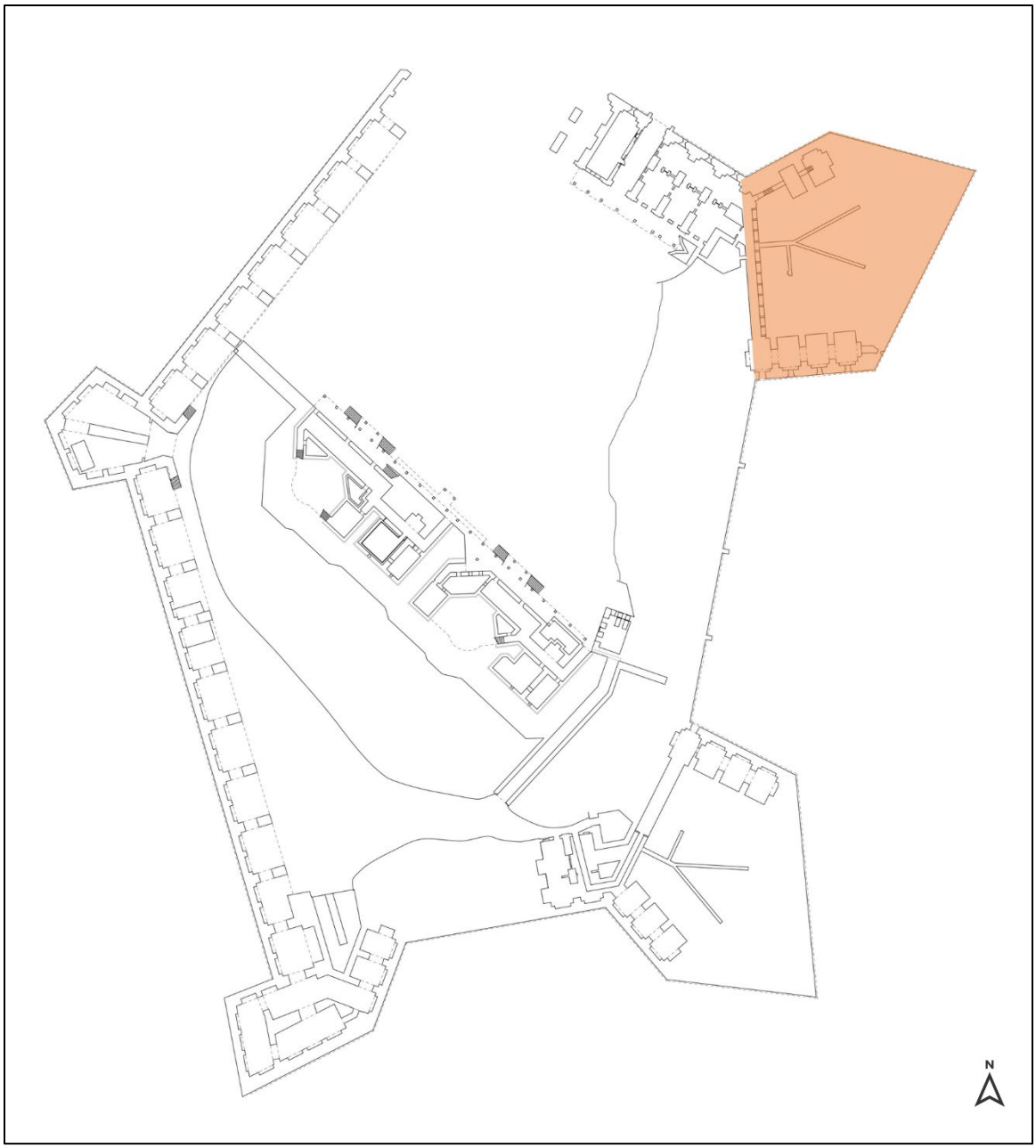


Figure 204. Plan of Fort Pickens showing the location of Bastion E (orange shading).

Bastion E

Bastion E is located at the northeast corner of the fort, to the east of the sallyport entrance (Figure 204). Within Bastion E are mine chambers, a powder magazine, and a casemate gallery that was later converted to a generator room or central power station.

A vaulted brick corridor, located at the west end of Bastion E, leads to a tunnel opening, known as the countermine, that further leads to three narrow vaulted chambers (Figure 205 and Figure 206). The upper portion of the exposed brick corridor walls and ceilings are partially coated with limewash (Figure 207). Near the east end of the corridor, the brick walls have been coated with a thicker cementitious material. Centered on the ceiling of the vaulted corridor is a wood plank that runs the entire length of the tunnel, leading to the power station (Figure 208). Near the east end of the corridor, a layer of concrete has been poured over the brick flooring. Light fixtures and conduit lines are installed throughout the corridor (Figure 209).



Figure 205. The vaulted brick corridor at the west end of Bastion E.

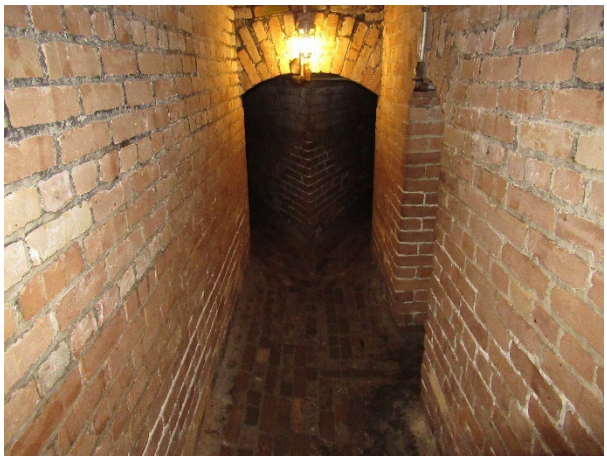


Figure 206. The vaulted brick corridor (countermine) at the west end of Bastion E.



Figure 207. Limewash at the upper portion of the exposed brick corridor walls.



Figure 208. A wood plank is centered on the ceiling of the vaulted corridor that runs the entire length of the tunnel.

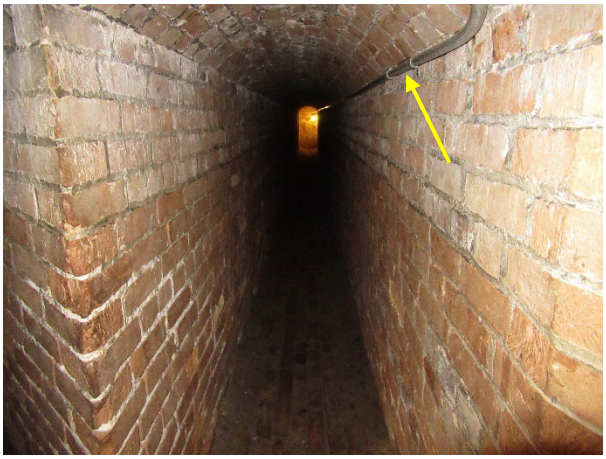


Figure 209. A conduit line at the wall of the corridor (yellow arrow).

The three vaulted mine chambers are approximately 2 feet wide and 4 feet 9 inches in height at the center of the arch.

On the north side of the corridor is a series of board-formed, cast-in-place concrete knee walls constructed atop a concrete curb (Figure 210 and Figure 211). The trapezoidal walls on either side of the stoops are approximately 3 feet in height, 3 feet 4 inches in width, 1 foot in length at the top, and 1 foot 6 inches in length at the base. The corners of the walls are chamfered approximately 1 inch in width (Figure 212). The stoop is approximately 4 inches in height and is constructed of a combination of concrete and brick masonry (Figure 213). The overall length of the stoop and two waist-high walls is 8 feet. The date of construction and purpose of the knee walls and

curb is unknown, though they are not believed to be original features.



Figure 210. Cast-in-place concrete knee walls that line the corridor at right.



Figure 211. A set of cast-in-place concrete knee walls atop a concrete curb.



Figure 212. The corners of the walls are chamfered approximately 1 inch in width.



Figure 213. Each stoop is approximately 4 inches in height and is a combination of concrete and brick masonry.

At the west end of Bastion E, adjacent to the mine chambers, is the powder magazine. Historically, the black powder could easily be transferred from the powder magazine to the mine chamber and from there to the three chambers.

The powder magazine is entered through a wood-framed arched entryway and leads to a pentagon-shaped brick masonry room with a raised roof (Figure 214 through Figure 216). The brick flooring is uneven in height (Figure 217).



Figure 214. The entryway to the powder magazine.



Figure 215. The interior of the powder magazine.



Figure 216. The brick vaulted ceiling in the powder magazine.



Figure 217. The uneven brick floor at the powder magazine.

Two openings are located on the north and west walls, and two smaller rectangular openings are located on the west and south walls (Figure 218 and Figure 219). The smaller openings, which are vent channels, extend through the full depth of the wall and lead to air shafts that ventilate the powder magazines located inside the fort. The larger wall openings outside of the powder magazine walls that face the mine chambers are approximately 4 feet wide and 3 feet 6 inches in height (Figure 220). The vent channel openings are approximately 6 inches wide and 2 feet high (Figure 221). The interior and exterior openings of the vent channel appear to align in plan. At each side of the wall, the vent extends through the outer wythe of the wall, approximately 2-1/4 inches, into a trapezoidal channel.



Figure 218. Openings at the north (right) and west (left) walls of the powder magazine.



Figure 219. An opening near the center of the west wall of the powder magazine (yellow arrow).



Figure 220. The north wall of the powder magazine. Note the opening at right.



Figure 222. A rectangular opening in the vaulted ceiling.



Figure 221. A typical vent channel opening in the powder magazine.



Figure 223. A diamond-shaped opening in the vaulted ceiling.

The flooring includes exposed brick at the west end of the room and concrete cast-in-place over the brick flooring near the east end of the corridor. Centered in the barrel-vaulted ceilings are rectangular and diamond-shaped openings (Figure 222 and Figure 223). The ceilings and walls are partially coated with limewash (Figure 224). Embrasure openings are present at the east walls, centered on each casemate opening (Figure 225 and Figure 226). An open vent is present above each embrasure, which allowed smoke from cannon fire to be vented from the space (Figure 227). Semicircular granite stone units facing the embrasure openings and soles were used to allow cannon carriages to be easily rotated (Figure 228). Brownstone units are located below the sole of the embrasure (Figure 229). The brownstone is not coated.



Figure 224. Limewash coating at the walls and ceiling.



Figure 225. A typical embrasure opening at the east wall of the bastion.



Figure 226. A typical embrasure opening at the east wall of the bastion.



Figure 227. An open vent above an embrasure, which allowed smoke from cannon fire to be vented from the space.



Figure 228. Semicircular granite stone units facing the embrasure openings and soles were used to allow cannon carriages to be easily rotated.



Figure 229. Brownstone units are located below the sole of the embrasure.

A hole in the brick wall, approximately 4 feet 6 inches in height by 4 feet in length, is located at the east wall of the bastion (Figure 230). The hole was apparently made as an exploratory opening in the early twentieth century. Its purpose is not known.

A brick unit with a handprint believed to date to early construction is located at the center casemate flooring (Figure 231).

The mine casemate, or mine battery room, is located at the north end of Bastion E, in what was originally a casemate gallery. This area was altered to its current configuration in 1903 as part of the Endicott-era modifications to the fort, which is also when a generator and boiler house (no longer present) were introduced. The original space housed three casemates.



Figure 230. The exploratory opening in the east wall of Bastion E.



Figure 232. The entryway is outlined by wood framing that is approximately 6 inches in width.



Figure 231. A brick unit with a handprint dating to initial construction of the fort at the center of the casemate flooring.



Figure 233. The walls of the tunnel consist of board-formed concrete.

The mine casemate is accessed down a set of stairs through a vaulted entryway. The entryway is outlined by wood framing, and the framing is approximately 6 inches in width (Figure 232). The walls and ceiling of the tunnel leading to the mine casemate are board-formed finished concrete partially coated with white paint (Figure 233). The form markings indicate that the boards used were approximately 3-1/2 inches wide (Figure 234). The walls are composed of a masonry rubble substrate (Figure 235). The concrete steps lead to an underground room composed of paved brick flooring and vaulted concrete walls (Figure 236). There is an opening at the bottom end of the west wall. Sand is present at the opening.



Figure 234. The form boards were approximately 3-1/2 inches wide.



Figure 235. Masonry rubble visible at the side of a tunnel wall (yellow arrow).



Figure 236. The underground room at the end of the tunnel. Note the opening in the center of the wall.

Further north is a rough opening through the wall, approximately 7 feet deep, followed by a set of brick masonry stairs that lead to an adjacent space (Figure 237 and Figure 238). It is unknown if the rough opening dates to the Endicott era, or if it was added at a later date. This room is a barrel-vaulted space built of brick with an embrasure opening facing west. Centered in the ceiling are diamond-shaped ventilation openings, and chimney openings are located at the side walls (Figure 239 and Figure 240). The entry walls are partially parged with concrete and the remainder of the walls are coated with what appears to be a limewash (Figure 241 and Figure 242).

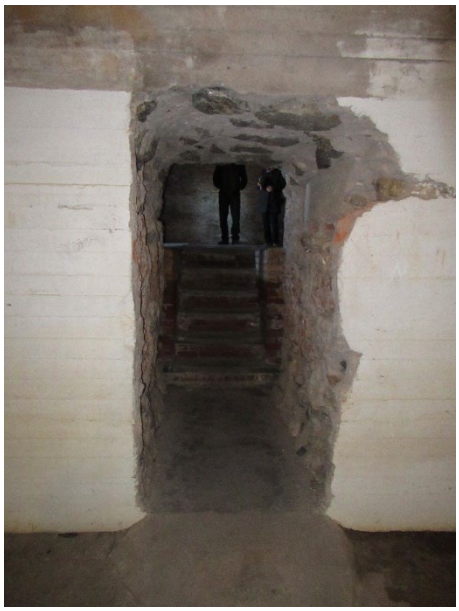


Figure 237. A rough opening through the wall. Note the set of brick masonry stairs in the background.



Figure 238. The stairs beyond the rough opening.



Figure 239. A diamond-shaped ventilation opening at the center of the ceiling.



Figure 240. A chimney opening along a side wall.



Figure 241. The walls are partially parged with concrete.



Figure 242. The walls and ceilings are coated with limewash.

Casemates

A typical casemate has exposed brick masonry walls with a vaulted masonry ceiling. Arched openings connecting adjacent casemates are present on the long sides of the casemates. An embrasure is present at the center of the exterior wall of a typical casemate. An open vent is present above the embrasure, which allowed smoke from cannon fire to be vented from the space.

The interior corners of the walls are notched to accommodate the swing of the cannon in any direction (Figure 243).



Figure 243. The notched interior corners of walls to accommodate the swing of the cannon.

The interior finishes vary throughout the casemates (Figure 244). The brick vaulted ceilings typically have a plaster finish keyed into metal lath. The embrasure walls are typically exposed brick masonry. At some locations, the brick has a limewash coating applied. Replacement brick is found at isolated locations, primarily at reconstructed brick arches, or reconstructed embrasure soles or sills.



Figure 244. Typical casemate showing brick walls and plaster ceiling.

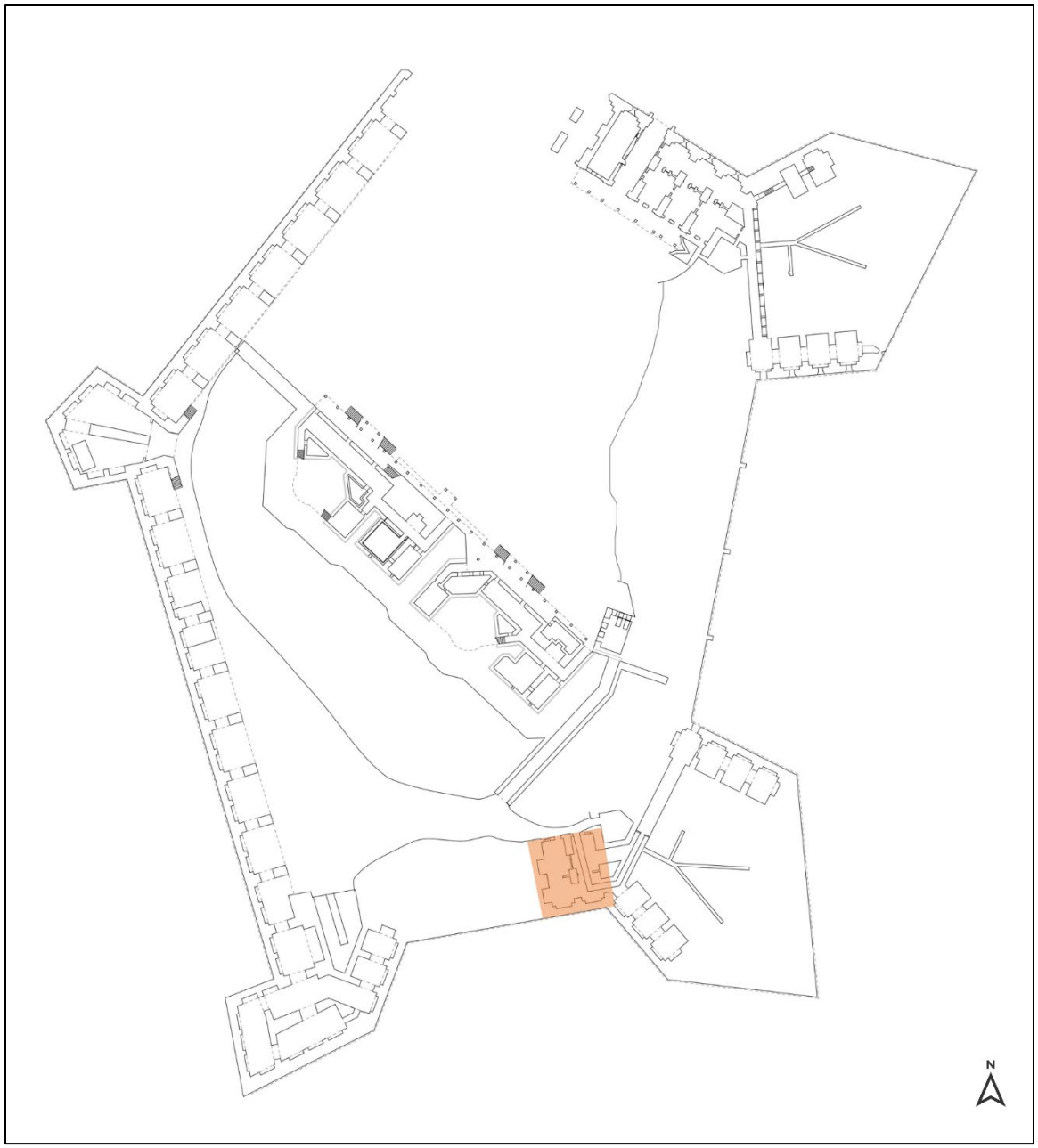


Figure 245. Plan of Fort Pickens showing the location of the casemates at the southeast scarp (orange shading).

Casemates at Southeast Scarp

Two casemates remain along the southeast scarp between Bastion A and Bastion B, facing the tunnel that leads to Battery Pensacola (Figure 245). Two openings lead from the parade south of Battery Pensacola into the casemates (Figure 246). The spaces are accessed by the concrete walkway for visitors that extends through Bastion A (Figure 247). The remaining five casemate galleries that originally lined the southeast scarp were removed in conjunction with the addition of Battery Pensacola.



Figure 246. The remaining casemates at the southeast scarp at the end of the concrete walk.



Figure 247. The concrete walkway that extends through Bastion A.

The exterior walls facing north have been infilled with brick and parged over except for two rectangular openings, one for a door and the other for a window (Figure 248). The arched opening between the two remaining rooms was partially infilled with brick masonry (Figure 249). At some locations, large areas of brick have been removed from the walls leaving a hole in the wall (Figure 250). The arched openings facing west are partially blocked by cast-in-place concrete walls (Figure 251). These openings would have connected to the casemates to the west (no longer extant). These alterations likely date to the removal of the other casemates along the southeast scarp. Remnants of plaster coating are present on the vaulted brick ceilings (Figure 252). Replacement brick is present at isolated locations, primarily at reconstructed brick arches, or reconstructed embrasure soles or sills.



Figure 248. The exterior-facing walls at the north end of the casemate have been infilled with brick and parged over, except for one door opening and one window opening.



Figure 249. The arched opening between the two remaining rooms was partially infilled. Note the embrasure opening beyond the arched opening.



Figure 250. At some locations, large areas of brick have been removed from the walls.



Figure 251. The arched openings facing west are partially blocked by cast-in-place concrete walls.



Figure 253. A historic etching along the south wall at the sill of an embrasure opening.



Figure 252. Remnants of plaster coating on the vaulted brick ceilings.



Figure 254. Two rectangular flues are located at the center of the vaulted ceiling.

Two embrasure openings, one at each casemate, are located along the south wall (refer to Figure 249). A historic etching at the brick sill of an embrasure opening along the south wall reads "John Campbell" (Figure 253).

The interior corners of the walls are notched, and the flooring is composed of brick masonry. Two rectangular flues are located at the center of the vaulted ceiling (Figure 254). The flues have been capped with concrete at the roof level (Figure 255). There are remnants of a fireplace.



Figure 255. The flues have been capped with concrete at the roof level.

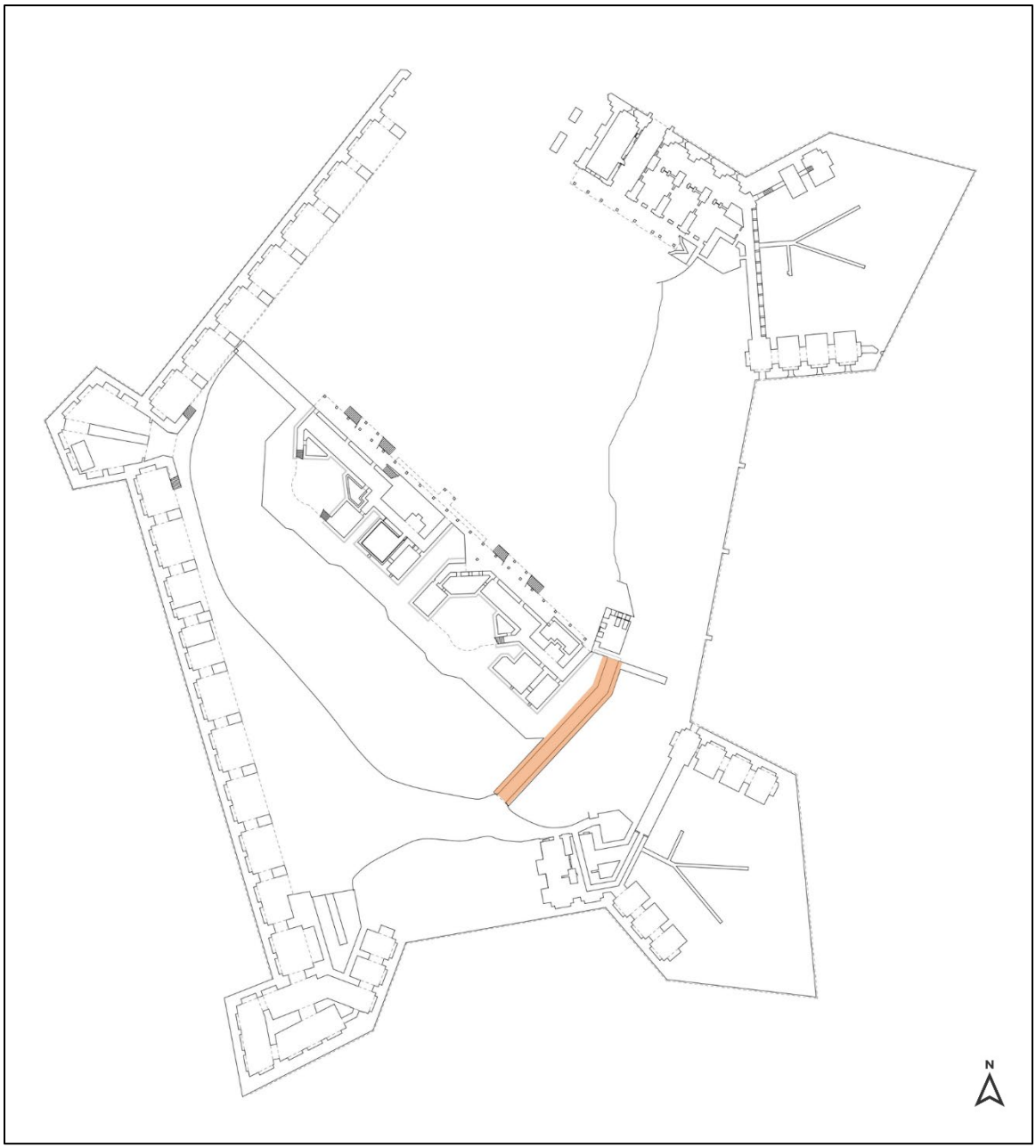


Figure 256. Plan of Fort Pickens showing the location of the Battery Pensacola tunnel (orange shading).

Battery Pensacola Tunnel

A tunnel built between 1898 and 1899 to access Battery Pensacola is located outside of Bastion A (Figure 256). The tunnel extends from the south of the battery to the north end of the battery (Figure 257). The outside of the tunnel is formed by wide concrete walls. The concrete lifts from construction are visible on the tunnel walls (Figure 258). The height of the lifts varies from 6 inches to 12 inches.



Figure 257. The entrance to the Battery Pensacola tunnel south of the battery.



Figure 258. The interior of the Battery Pensacola tunnel. Note the concrete lifts from construction are visible on the tunnel walls.

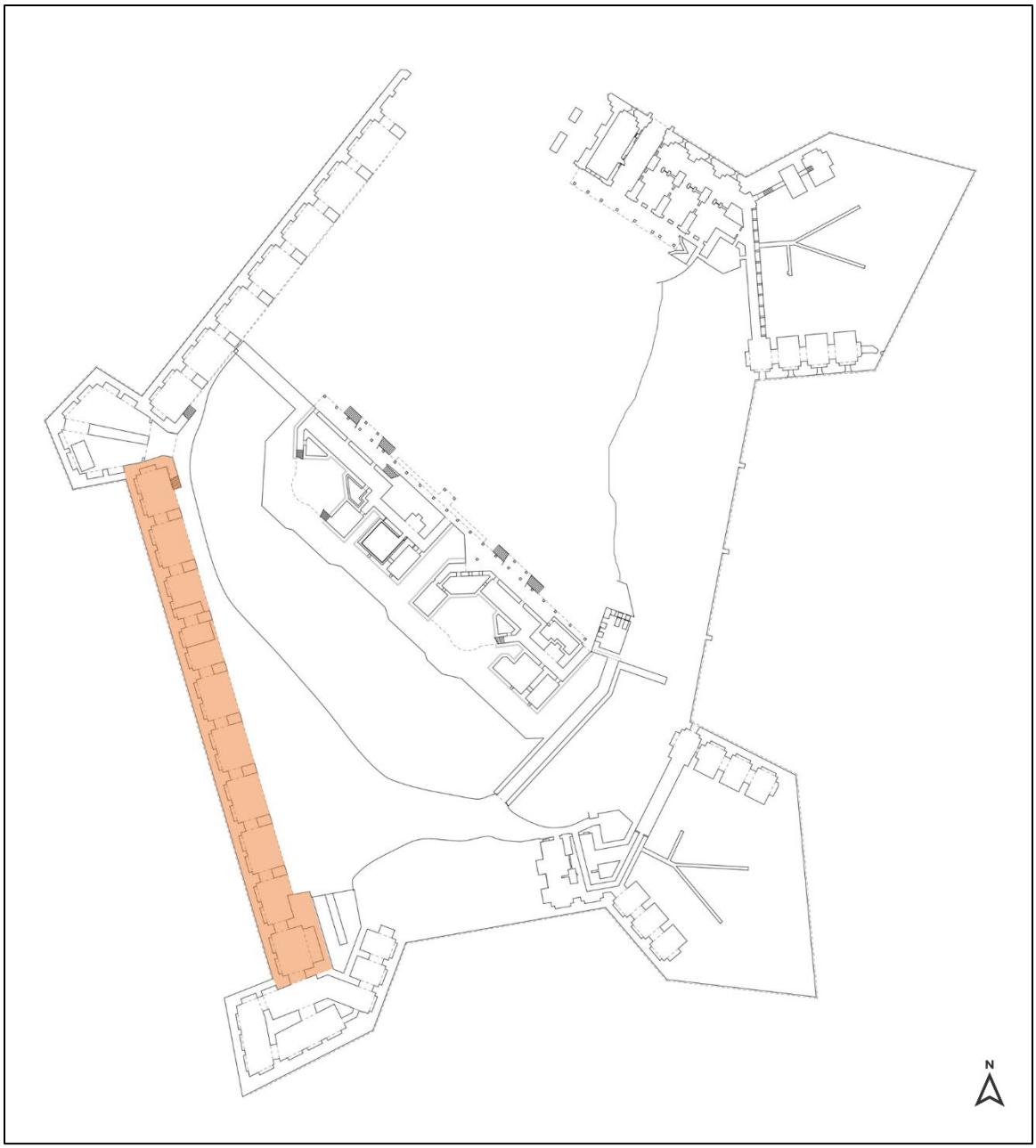


Figure 259. Plan of Fort Pickens showing the location of the casemates at the southwest scarp (orange shading).

Casemates at Southwest Scarp

There are ten vaulted casemate openings connected by intersecting vaults at the casemate gallery located between Bastions B and C (Figure 259). The interior of the casemate gallery is open to the parade (Figure 260 and Figure 261). The concrete walkway for visitors is located outside of the casemate gallery and runs parallel to the casemate openings.

Following Hurricane Ivan in 2004, areas of sediment were washed away, exposing the foundation and substructure of the casemate gallery, which consists of a double arch. A double arch, comprised of an upper arch above ground, and a reverse arch below ground, is currently exposed at the third casemate from the northwest end (Figure 262). The exposed double arch is one of the tour stops for the park visitors; therefore, the concrete walkway for visitors extends through the inside of the casemate opening at this location (Figure 263).

The stair that leads to the tower bastion (Bastion C) abuts the first casemate opening on the northwest section of the fort (Figure 264 and Figure 265). The sides of the arches on the east-facing walls of the casemate gallery have notches, added in 1841, to allow for movement of the cannon. Replacement brick is present throughout the vaulted ceiling and at reconstructed embrasure soles or sills (Figure 266 and Figure 267).



Figure 260. The interior of the casemate gallery is open to the parade.



Figure 261. View of casemates at southwest scarp at the parade behind Battery Pensacola, view from east.



Figure 262. A double arch is currently exposed at the third casemate from the northwest end at the southwest scarp.



Figure 263. The exposed double arch is interpreted for park visitors. Note the fence and wayside exhibit sign at right.



Figure 264. The stair that leads to the tower bastion terreplein where it abuts the first casemate opening (at right).



Figure 265. The stair where it obscures the casemate opening.



Figure 266. Replacement brick installed above an arched opening.



Figure 267. Replacement brick at the sole of an embrasure opening.

The floors in the casemates are typically sand infill, except for the third casemate from the northwest end where the foundation is exposed, and at the two casemates at the southwest end, where the floors are brick (Figure 268 through Figure 271). The original flooring in many of the casemates was brick, with wood flooring installed at casemates used as barracks. At the second casemate from the northwest end, the notches on the walls have been parged over (Figure 272).



Figure 268. Typical sand infill floors within the casemate gallery.



Figure 269. Exposed foundation at the third casemate from the northwest.



Figure 270. Brick floors at two casemates at the southwest end.



Figure 271. Brick floors at two casemates at the southwest end.



Figure 272. At the second casemate from the northwest end, the notches on the walls have been parged over.

An embrasure opening is present at the northwest wall, centered on each casemate opening (Figure 273). Brownstone units are set below the sole of the embrasure. Similar to the casemate gallery at Bastion B, there is an opening below the brownstone unit (Figure 274). The opening is partially infilled with brick at some locations (Figure 275). It is unknown why the opening was partially infilled. Typically, there is a gap, approximately 1 inch wide, between abutting arched walls (Figure 276). This gap is thought to be an original feature intended to allow the arches to remain intact if the adjacent walls were damaged.



Figure 273. An embrasure opening is present at the northwest walls, centered on each casemate opening.



Figure 274. An opening below the brownstone unit at the exterior wall of a casemate.



Figure 275. The opening is partially infilled with brick at some locations.



Figure 276. Typically, there is a gap, approximately 1 inch wide, between abutting arched walls.

An iron pivot, approximately 7 inches in diameter, was previously embedded into the sole of the embrasure to receive the cannon carriage (Figure 277). The iron pivot is missing in many locations, and there are holes in the brownstone at locations where the iron pivot embedment was removed (Figure 278). One relatively intact iron pivot remains at the sixth casemate from the northwest end (Figure 279).



Figure 277. Remnants of the previous iron pivot embedded into the sole of the embrasure.



Figure 278. The iron pivot is missing at many locations, and there are holes in the brownstone at locations where the iron pivot embedment was removed.



Figure 279. One relatively intact iron pivot remains at the sixth casemate from the northwest end.

An open vent is present above the embrasure, which allowed smoke from cannon fire to be

vented from the space (Figure 280). Staining from smoke that occurred during the period of significance is visible at the vent openings. At some of the casemate galleries, what appears to be a makeshift vent opening was created above the embrasure (Figure 281). Semicircular granite stone units facing the embrasure openings and soles are concealed by the sand infill, except for the third casemate from the northwest end, where the foundation is exposed, and remnants of the granite stone units remain (Figure 282). Remnants of granite stone units also remain on the casemates located on the southwest end (Figure 283 and Figure 284).



Figure 280. An open vent is present above the embrasure, allowing smoke from cannon fire to be vented from the space.



Figure 281. A makeshift vent opening above an embrasure.



Figure 282. Semicircular granite stone units facing the embrasure openings and soles are concealed by the sand infill, except for the third casemate from the northwest end, where the foundation is exposed and remnants of the granite stone units remain.



Figure 283. Remnant granite stone units also remain in a casemate at the southwest end.



Figure 284. Remnants of a granite stone unit at casemates at the southwest end.

Centered in the barrel-vaulted ceilings are rectangular and diamond-shaped openings (Figure 285). At the first casemate closest to the northwest end, the diamond-shaped opening has been squared off (Figure 286). The flues have been capped with concrete at the roof level at most locations, except for the southwest end of the casemate gallery.



Figure 285. Centered in the barrel-vaulted ceilings are rectangular and diamond-shaped openings.



Figure 286. At the first casemate closest to the northwest end, the diamond-shaped opening has been squared off.

The northwest wall of Bastion B abuts the last casemate opening at the southwest section of the fort (Figure 287). The last casemate opening also shares a wall with the Bastion B cistern (Figure 288).



Figure 287. The northwest wall of Bastion B abuts the last casemate opening at the southwest section of the fort.



Figure 288. The last casemate opening also shares a wall with the Bastion B cistern.

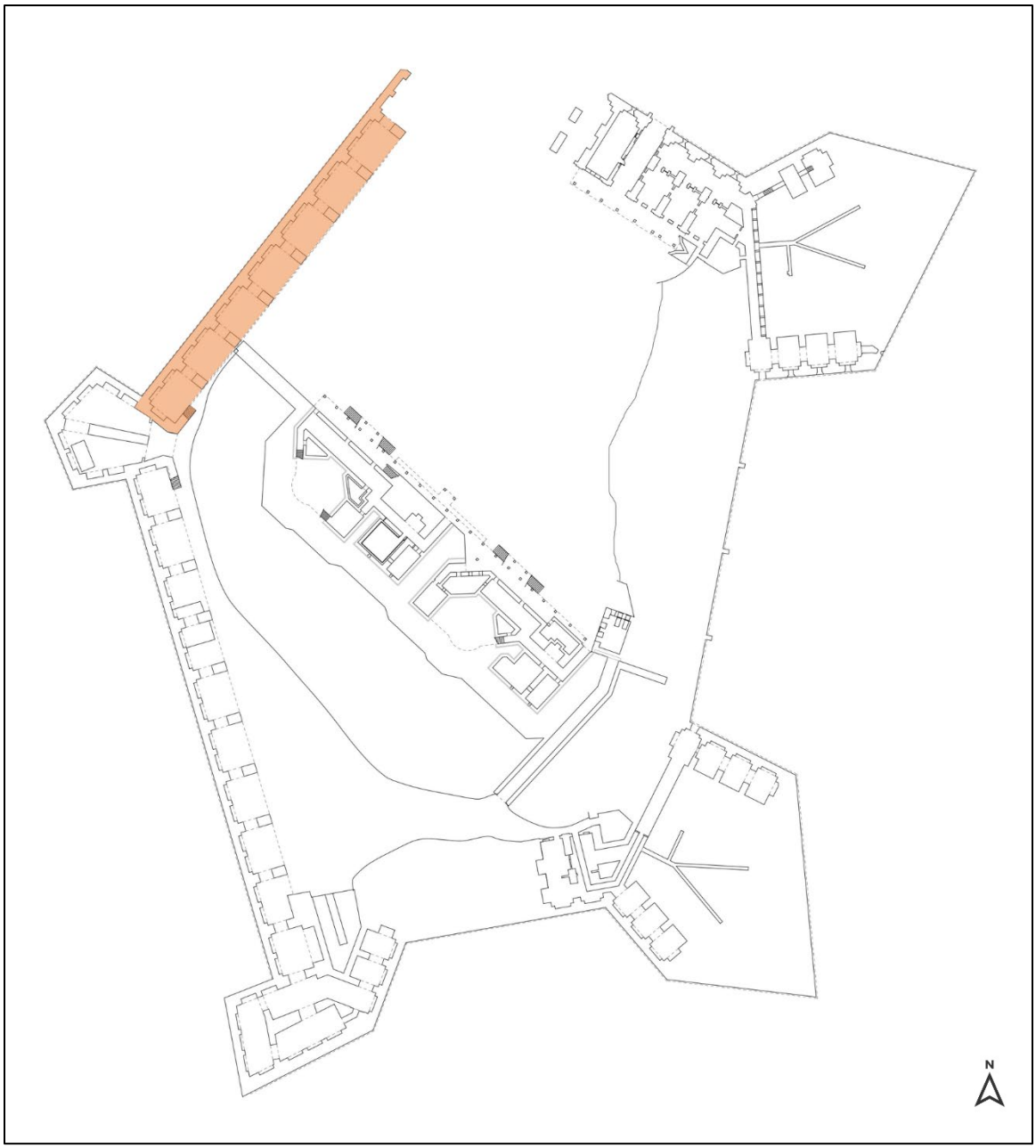


Figure 289. Plan of Fort Pickens showing the location of the casemates at the northwest scarp (orange shading).

Casemates at Northwest Scarp

Seven of the ten casemate vaulted openings remain at the casemate gallery between Bastion C and the location of Bastion D prior to the explosion that destroyed the latter bastion (Figure 289 and Figure 290). The three casemate openings on the north end of the fort were destroyed during the explosion. The vaulted openings are connected by intersecting vaults. The interior of the casemate gallery is open to the parade.

There are notches on the side of the arches located on the east facing wall of the casemate gallery. An embrasure opening is present at the northwest wall, centered on each casemate opening (Figure 291). Brownstone units are set below the sole of the embrasure.



Figure 290. View of casemates at northwest scarp at the parade, view from southeast.



Figure 291. Embrasure openings are present at the northwest walls centered on each casemate opening.



Figure 292. Replacement brick at the vaulted ceiling.

Similar to the casemate gallery between Bastion B and C, replacement brick is found throughout the vaulted ceiling soffits and at reconstructed embrasure soles or sills (Figure 292 through Figure 294).

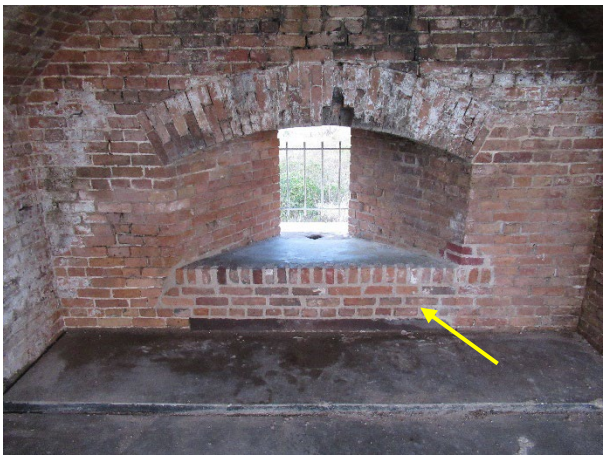


Figure 293. Replacement brick adjacent to an embrasure opening (yellow arrow).



Figure 294. Replacement brick between embrasure openings (yellow arrow).

The height of the concrete flooring at the first, second, fourth, and fifth casemate openings closest to the north end is raised (Figure 295). Due to the raised height of the concrete flooring, there is an approximately 3 inch distance between the bottom of the notch and the height of the flooring. Similarly, the concrete flooring partially covers the brownstone unit embedded below the sole of the embrasure (Figure 296). It is unknown when the concrete was added to these casemates. The outline of a partition wall is present in the center of the casemate openings (Figure 297). The floor level at the third casemate opening is slightly lower than that of the first two casemate openings closest to the north end but still higher than the original floor height (Figure 298).



Figure 295. The concrete flooring where it is raised, shortening the height of the casemates.



Figure 296. The raised concrete flooring partially covers the brownstone unit embedded below the sole of the embrasure and the opening below (yellow arrow).



Figure 297. The outline of a removed partition wall remains.



Figure 298. The floor level at the third casemate opening is slightly lower than that of the first two casemate openings closest to the north end.

The concrete walkway extends through the interior of the three casemate openings closest to Bastion C (Figure 299). At this location, the flooring transitions from concrete to sand infill and matches the original height of the flooring (Figure 300). The east-facing section of the sixth casemate floor is partially concealed by the fill at the west end of Battery Pensacola (Figure 301). Handrails have been installed along the concrete walkway closest to Bastion C (Figure 302).



Figure 299. The concrete walkway where it extends through the interior of the three casemate openings closest to Bastion C.



Figure 300. The flooring transitions from concrete to sand infill and matches the original height of the flooring. Note the higher concrete floor at right (yellow arrow).



Figure 301. The east-facing section of the sixth casemate floor is partially concealed by the fill at the west end of Battery Pensacola.



Figure 302. Handrails along the concrete walkway closest to Bastion C.

An open vent is present above each embrasure, which allowed smoke from cannon fire to be vented from the space (Figure 303 and Figure 304). On the east side of the arches at the second and third casemate opening closest to the north end, there are multiple square pockets in the brickwork (Figure 305 and Figure 306). Although their function is unknown, the pockets may have engaged wood framing associated with a wall covering the inside face of the casement. Centered in the barrel-vaulted ceilings are rectangular and diamond-shaped openings (Figure 307). Typically, there is a gap approximately 1 inch wide between abutting arched walls (Figure 308).



Figure 303. An open vent is present above an embrasure.



Figure 304. An open vent is present above an embrasure.



Figure 305. Example of square pockets in the brickwork at the second and third casemate opening from the north end.



Figure 306. Close-up view of square pocket in brickwork at the second and third casemate opening from the north end.



Figure 307. A diamond-shaped opening centered in the barrel-vaulted ceiling.



Figure 308. A typical gap between abutting arched walls.

There is an opening below the brownstone unit at the casemate openings closest to Bastion C, where the height of the flooring has not been altered (Figure 309). The opening is partially infilled with brick at some locations.



Figure 309. An opening below an embrasure at the casemate closest to Bastion C, where the floor level has not been altered.

Embedded into the sole of the embrasure, on the casemate openings closest to Bastion C, are remnants of 7-inch-diameter iron pivots previously present to receive the cannon carriage (Figure 310 and Figure 311). The iron pivot is missing at many locations, and there are holes in the brownstone where the iron pivot embedment was removed.

A historic etching is present at the sole of the embrasure opening, at the third casemate from the northwest end of the scarp (Figure 312).



Figure 310. Remnant of iron pivot previously present to receive the cannon carriage.



Figure 311. A filled-in opening where an iron pivot was previously present.



Figure 312. Historic etching at the sole of an embrasure along the northwest scarp.

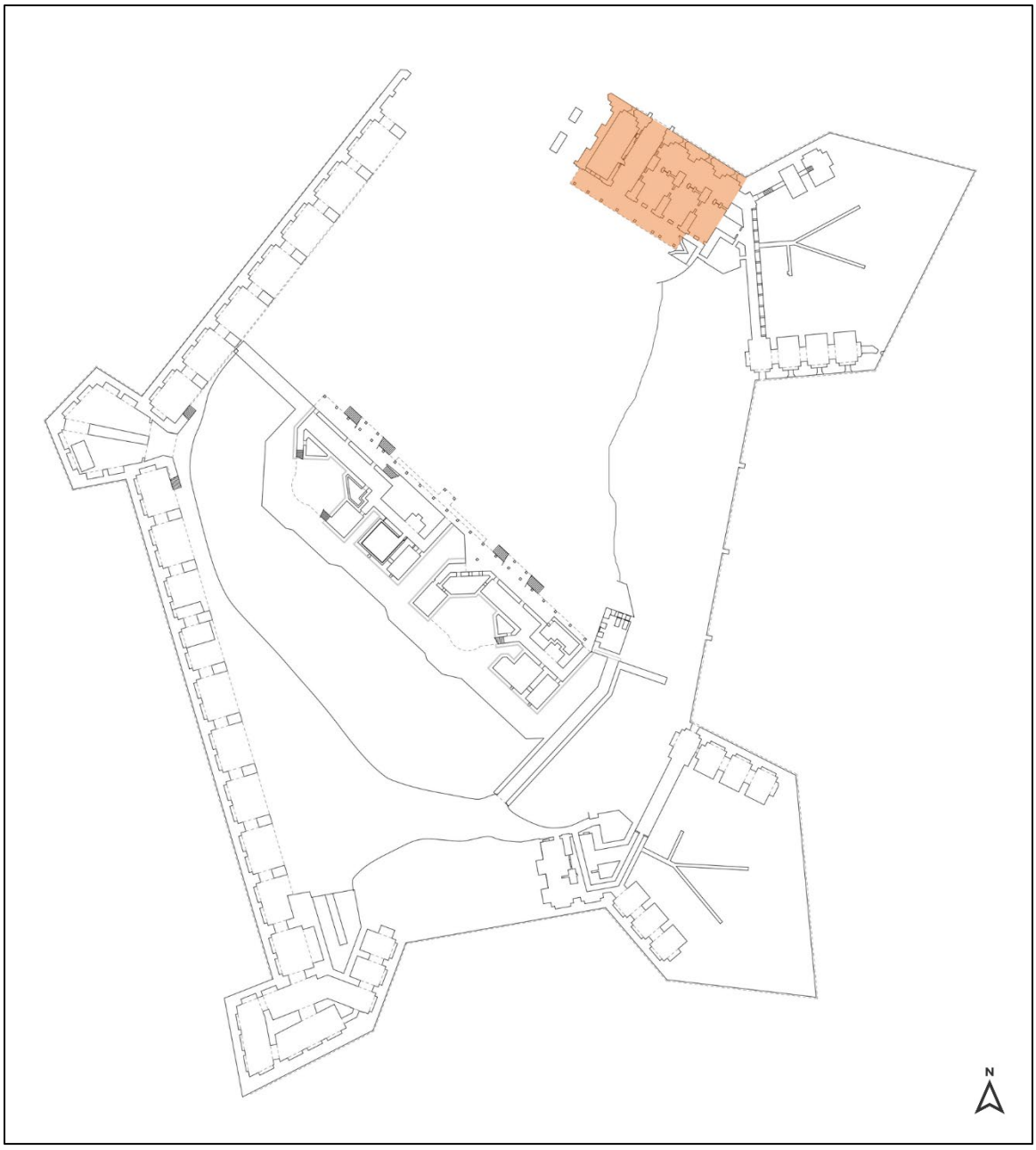


Figure 313. Plan of Fort Pickens showing the location of the sally port and officers' quarters (orange shading).

Sally Port and Officers' Quarters

The northeast portion of the casemates between Bastion E and the former Bastion D remains (Figure 313 and Figure 314). The intact portions of the interior include the sally port, as well as three former officers' quarters and associated casemates to the east and the present-day gift shop to the west.

The sally port, which served as the historic entrance to the fort, was originally centered on the northeast scarp between Bastion D and Bastion E. The sally port extends from the exterior walls to the parade at the center of the fort (Figure 315). The finishes at the interior of the sally port include granite paving adjacent to the exterior arched opening (Figure 316). Remnants of the rail line that ran from the fort to the buildings to the north are present at the center of the stone paving. The floor throughout the remaining portion of the sally port consists of brick pavers laid in a herringbone pattern (Figure 317). The brick pavers do not appear to be original, as the tracks of the rail line do not continue where brick is present.



Figure 314. The sally port and officers' quarters from the parade, view from the southwest.



Figure 315. The sally port, view from northeast.



Figure 316. Granite paving adjacent to the exterior arched opening at the north end of the sally port.



Figure 317. Brick pavers laid in a herringbone pattern at the sallyport floor. The pavers are likely a contemporary addition.

The walls and arched ceiling of the sally port are constructed of brick (Figure 318). Two cross arches are present at the east and west walls of the sally port (Figure 319 and Figure 320). At the west arches are a window and a doorway into the gift shop (Figure 321). Door openings at the east arches lead from the sally port to the officers' quarters and casemates to the east (Figure 322).



Figure 318. The walls and arched ceiling of the sally port are brick. Note that the historic rail line ends at the brick paving.



Figure 319. A cross arch at the east wall of the sally port.



Figure 320. A cross arch at the west wall of the sally port. A window has been placed in the historic opening.



Figure 321. Door to gift shop at west wall of sally port.



Figure 322. Door opening from sally port to officers' quarters to the east.

At either side of the exterior arched opening is a granite unit set in the brick masonry (Figure 323). The granite is approximately 1 foot 10 inches wide and 1 foot tall. Embedded iron elements likely associated with the former doors are present at the edge of the arched opening (Figure 324). Inboard of the arched opening are pockets in the brick wall (Figure 325). The pockets are approximately 5 inches by 5 inches square and 1 foot deep.



Figure 323. At either side of the exterior arched opening is an embedded granite unit.



Figure 324. Embedded iron elements likely associated with the former doors are present at the edge of the arched opening.



Figure 325. Inboard of the arched opening are pockets in the brick wall.

A gift shop is located in the casemate west of the sally port (Figure 326). The finishes in the gift shop are not historic and consist of brick pavers set in a herringbone pattern at the floor, vertical wood paneling at the walls, and painted gypsum board ceilings with a popcorn finish (Figure 327 through Figure 329). Non-original double-hung windows are present at the exterior walls of the gift shop (Figure 330).



Figure 326. A gift shop is located in the casemate west of the sally port.



Figure 329. Typical finishes in the gift shop include painted gypsum board ceilings.



Figure 327. The finishes in the gift shop are not historic and include brick pavers set in a herringbone pattern at the floor.



Figure 330. Non-original double-hung windows at the exterior walls of the gift shop.



Figure 328. Typical finishes in the gift shop include painted wood-paneled walls.

East of the sally port are three casemates that historically included officers' quarters. Each casemate is divided into two spaces, with the officers' quarters at the south. Finishes in the officers' quarters in the westernmost casemate consist of plaster walls and ceilings and concrete floors (Figure 331). A fireplace is centered on the north wall of the room (Figure 332). The fireplace contains a brick firebox (Figure 333). The historic finishes in the finished portions of the rooms included plaster walls, wood floors, doors, and windows. The fireplaces had marble mantles. It is not known when the existing plaster finishes and concrete floors were added.

Two door openings lead from the officers' quarters to the parade to the south (Figure 334). The door opening on the west wall leads to the sally port, while openings in the north and east

walls lead to adjacent spaces (Figure 335 and Figure 336).



Figure 331. Finishes in the officers' quarters in the westernmost casemate consist of plaster walls and ceilings and concrete floors.



Figure 332. A fireplace is centered on the north wall of the room.



Figure 333. The fireplace contains a brick firebox.



Figure 334. Two door openings lead from the officers' quarters to the parade to the south.



Figure 335. The door opening on the west wall leads to the sally port.



Figure 336. The door opening on the east wall leads to additional officers' quarters.

A casemate is located to the north. Typical finishes in the space include brick walls and ceiling with a cementitious parge coat applied over the brick arched ceiling (Figure 337). The walls have

chamfered corners at the crossed-arch openings that connect the casemates (Figure 338). A brick fireplace is centered on the south wall of the casemate (Figure 339). The embrasure is centered on the north wall (Figure 340). Embedded brownstone is present below the embrasure over an opening at the base of the wall (Figure 341). The floor is brick with multiple layers of a cementitious parge coat applied (Figure 342).



Figure 337. Westernmost casemate. Note brick walls and fireplace, and ceiling with cementitious parge coating.



Figure 338. The walls have chamfered corners at the cross-arched openings that connect the casemates.



Figure 339. A brick fireplace is centered on the south wall of the casemate.



Figure 340. The embrasure is centered on the north wall.



Figure 341. Embedded brownstone is present below the embrasure over an opening at the base of the wall.



Figure 342. The floor is brick with multiple layers of a cementitious parge coat applied.

The casemate to the east has similar finishes, including brick walls (Figure 343). The walls have chamfered corners at the crossed-arch openings that connect the casemates (Figure 344). A brick fireplace is centered on the south wall of the casemate (Figure 345). The embrasure is centered on the north wall (Figure 346). A cannon is displayed at the embrasure opening. The arched ceiling is finished with painted plaster (Figure 347). The floor is brick with semicircular granite stone units to allow for movement of the cannon (Figure 348).



Figure 343. The casemate to the east has similar finishes, including brick walls.



Figure 344. The walls have chamfered corners at the cross-arched openings that connect the casemates.



Figure 345. A brick fireplace is centered on the south wall of the casemate.



Figure 346. The embrasure is centered on the north wall.



Figure 347. The arched ceiling is finished with painted plaster.



Figure 349. The second officers' quarters. Note door opening to casemate to the north at left.



Figure 348. The floor is brick with semicircular granite stone units.



Figure 350. The room has plaster-finished walls and ceilings and concrete floors.

The second officers' quarters features similar finishes to the officer's quarters to the west (Figure 349). The room has plaster-finished walls and ceilings and concrete floors (Figure 350). A fireplace is centered on the north wall of the room. The fireplace contains a brick firebox (Figure 351). Conduit is present in the firebox and runs to the room to the north (Figure 352). Two door openings lead from the space to the parade to the south (Figure 353). The door opening on the west wall leads to the quarters to the west, while openings in the north and east walls lead to adjacent spaces (Figure 354, and refer to Figure 349).



Figure 351. The fireplace contains a brick firebox.



Figure 352. Conduit is present in the firebox and runs to the room to the north.



Figure 353. Two door openings lead from the officers' quarters to the parade to the south.



Figure 354. The door opening on the west wall leads to the quarters to the west.

The easternmost officers' quarters has brick walls and ceiling that are partially plastered (Figure 355 and Figure 356). The floors are concrete (Figure 357). A fireplace is centered on the north wall of the room (Figure 358). The fireplace contains a brick firebox. Two door openings lead from the space to the parade to the south (Figure 359). The door opening on the west wall leads to the former quarters to the west. A hall with an arched ceiling leads to Bastion E (Figure 360). A doorway at the north wall provides access to the casemate to the north.



Figure 355. The easternmost officers' quarters has brick walls and ceiling that are partially plastered.



Figure 356. The easternmost officers' quarters has brick ceiling that is partially plastered.



Figure 357. The floors in the easternmost officer's quarters are concrete.



Figure 358. A fireplace is centered on the north wall of the easternmost room.



Figure 359. Two door openings lead from the officers' quarters to the parade to the south. Note brick stair which obscures view to parade.



Figure 360. A hall with an arched ceiling leads to Bastion E.

The casemate west of Bastion E contains partially plastered brick walls (Figure 361). The walls have chamfered corners at the cross-arched openings that connect the casemates to the west (Figure 362). A brick fireplace is centered on the south wall of the casemate (Figure 363). The embrasure is centered on the north wall (Figure 364). The opening has been partially filled in with brick. It is not known when this alteration was made. Embedded brownstone is present below the embrasure over a pocket at the base of the wall (Figure 365). The arched ceiling is partially painted (Figure 366). The floor is brick with semicircular granite stone units (Figure 367). The brick floor slopes upward towards Bastion E to the east (Figure 368).



Figure 361. The casemate west of Bastion E contains partially plastered brick walls. Note the smaller opening at the embrasure.



Figure 362. Chamfered corners at the cross-arched opening that connects the casemates to Bastion E.



Figure 363. A brick fireplace is centered on the south wall of the westernmost casemate.



Figure 364. The embrasure is centered on the north wall. Note the opening has been partially filled in.



Figure 365. Embedded brownstone is present below the embrasure and over an opening at the base of the wall.



Figure 366. The arched ceiling is partially coated.



Figure 367. The floor is brick with semicircular granite stone units.



Figure 368. The brick floor slopes upward towards Bastion E to the east.

A covered breezeway extends across the southern face of the former officers' quarters and sally port at the north end of the parade (Figure 369). The breezeway has a shed roof clad with clay tiles (Figure 370). The roof is supported by brick columns that line the south edge of the breezeway. The ceiling is exposed wood roof rafters (Figure 371). The floor at the breezeway is composed of brick pavers (Figure 372). The floor slopes upward near the center officers' quarters toward the east (Figure 373). Large granite pavers are present east of the ramp (refer to Figure 373). Granite sills are present at the sills of the door openings to the officers' quarters (Figure 374). The door openings are typically raised above the brick pavers at the breezeway.



Figure 369. A covered breezeway extends across the southern face of the officers' quarters and sally port at the north end of the parade.



Figure 370. The breezeway has a shed roof clad with clay tiles.



Figure 371. The ceiling is exposed wood roof rafters.



Figure 372. The floor at the breezeway is composed of brick pavers.



Figure 373. The brick paving slopes upward toward the east outside the center officers' quarters room.



Figure 374. Granite sills at the door openings to the officers' quarters.

The opening to the sally port consists of a brick arch (Figure 375). The brick pavers are set in a herringbone pattern that is seen in the sally port and extends into the breezeway (refer to Figure 375).



Figure 375. The opening to the sally port consists of a brick arch.

The openings associated with the gift shop south of the sally port are filled in with wood clapboard siding and double-hung windows (Figure 376).



Figure 376. The openings associated with the gift shop south of the sally port are filled in with wood clapboard siding and double-hung windows.

Metal downspouts are present at the walls between door openings (Figure 377).



Figure 377. Metal downspouts are present at the walls between door openings (yellow arrow).

Terreplein and Roof

The terreplein and roof over the casemates and bastions at Fort Pickens have been altered from their original appearance following modifications to the fort over time, including the construction of Battery Pensacola and associated changes such as lowering of the walls at southwest portion of the fort and removal of the casemates at the southeast scarp.

The brick vaults that comprise the ceiling of the casemates throughout the fort are visible at the northeast scarp above the former officers' quarters and at the casemates at the southwest scarp (Figure 378 and Figure 379). At the vaults above the former officers' quarters, the upper portion of the masonry vault assembly is exposed, with Acrymax AF-130, an elastomeric acrylic roof coating, applied over the top of the brick (Figure 380 and Figure 381). The coating continues over the gift shop, west of the sally port (Figure 382). In 2023, the sloped brickwork at the terreplein where Bastion E meets the northeast scarp was rebuilt (Figure 383).



Figure 378. The topside of the brick vaults over the officers' quarters. Note the liquid-applied waterproofing.



Figure 381. Contemporary liquid-applied waterproofing is installed over the top of the brick vaults over the casemates.



Figure 379. The topside of the brick vaults over the casemates at the northwest scarp.



Figure 382. The elastomeric coating continues over the gift shop, west of the sally port.



Figure 380. A contemporary elastomeric coating is installed over the top of the brick vaults at the officers' quarters.



Figure 383. Rebuilt sloped brickwork where Bastion E meets the northeast scarp (yellow arrow).

The wall that divides the casemates from the officers' quarters extends up past the top of the exposed brick vaults (Figure 384). Openings at the

top of chimneys that correspond to the fireplaces below are visible at the top of the projecting wall (refer to Figure 384).



Figure 384. The wall that divides the casemates from the officers' quarters extends upward past the top of the exposed brick vaults. Note the openings at the top of the wall that correspond to the fireplaces below.

At the casemates along the southwest scarp, the brick vaulting as well as the associated waterproofing system is visible (Figure 385). Above the brick are slate tiles set in mortar and covered with a cementitious parge coating (Figure 386). Between the vaulted casemates are additional brick vaults which served as gutters to direct water toward scuppers at the interior face of the casemates (Figure 387). The parge-coated slate at the vaulted casemates extends into the gutters (Figure 388). Coated metal waterproofing is present at the southernmost casemates (Figure 389). Stone coping units and brick pavers are present at the top of the southwest scarp (Figure 390).



Figure 385. The brick vaulting as well as the associated waterproofing system is visible above casemates along the southwest scarp.



Figure 386. Above the brick vaults are slate tiles set in mortar and covered with a cementitious parge coating.



Figure 387. An additional brick vault between the larger vaults which served as gutters to direct water toward scuppers at the interior face of the casemates.



Figure 388. The parge-coated slate at the vaulted casemates extends into the gutters. Note historically there would have been a brick vault over the gutter.



Figure 389. Coated metal waterproofing above the southernmost casemates.



Figure 390. Stone coping units and brick at the top of the southwest scarp.

Above Bastion E, the terreplein is largely open with brick walls near the perimeter and vegetation throughout (Figure 391 and Figure 392). The grade above the bastion slopes upward from the edge (Figure 393). Gun emplacements are situated along the edge adjacent to the brick walls (Figure 394). The emplacements are typically brick with remnant iron pivots at the center and a semicircular rail set on semi-circular granite stone units beyond (Figure 395). A flagpole is situated along the east side (Figure 396). Chimneys are visible at the edge of the roof above embrasures (Figure 397).



Figure 391. The terreplein above Bastion E is largely open with brick walls near the perimeter and vegetation throughout.



Figure 392. Brick parapet walls along the perimeter of the terreplein above Bastion E.



Figure 393. Bastion E, view from south. Note the grade above the bastion slopes upward from the edge.



Figure 394. Gun emplacements along the edge of the terreplein adjacent to the brick parapet wall.



Figure 395. A typical gun emplacement. Note the semicircular rail set atop granite stone units.



Figure 396. The flagpole is situated along the east side of the terreplein.

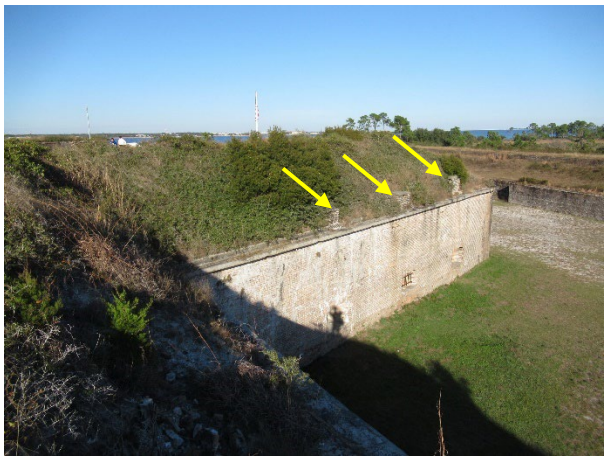


Figure 397. Chimneys along the edge of the roof above the embrasures (yellow arrows).

A concrete wall is present at the north end of the Bastion E roof where a mine battery commander's station was constructed in 1909 (Figure 398). A steel railing lines the north side of the former mine battery commander's station (Figure 399).



Figure 398. A concrete wall along the north end of the Bastion E roof where a mine battery commander's station was previously located.



Figure 399. A steel railing lines the north side of the former mine battery commander's station.

South of Bastion E is the top of the glacis which extends along the rear of the east scarp (Figure 400). The grade slopes downward from Bastion E to the glacis (Figure 401). A brick wall extends from Bastion E onto the top of the glacis (Figure 402).



Figure 400. The glacis extends along the rear of the east scarp south of Bastion E.



Figure 401. The glacis, view from north. Note the grade slopes downward from Bastion E along the glacis.



Figure 402. A brick wall extends from Bastion E onto the top of the glacis.

The roof over Bastion A is generally level with the glacis to the north. Brick chimneys extend upward above embrasures at the perimeter of the bastion

and at areas where fireplaces are present below (Figure 403). Several of the chimneys have been filled in with a cementitious material (Figure 404). The chimneys at the center of the bastion are typically brick with a parge coating (Figure 405).



Figure 403. Brick chimneys extend upward above embrasures at the perimeter of Bastion A.



Figure 404. A chimney that has been filled in atop Bastion A.



Figure 405. The chimneys at the center of Bastion A are typically brick with a parge coating.

It appears that brick walls, similar to those present at Bastion E, were once present at Bastion A, as remnants of brick walls were noted (Figure 406). It is not known when these alterations were made, although they may have been made in conjunction with the construction of Battery Pensacola.



Figure 406. Remnants of brick walls were noted atop Bastion A.

The casemates along the southeast scarp were removed in conjunction with the construction of Battery Pensacola. As a result, the scarp remains, with remnants of the former casemates visible below (Figure 407). The top of the scarp is topped with stone coping units and brick pavers (Figure 408). The brick pavers and coping units appear to be a contemporary addition to the fort.



Figure 407. The top of the southeast scarp at left with remnants of the former casemates below at right.



Figure 408. The top of the southeast scarp is topped with stone coping units and brick pavers.

At Bastion B, a short brick wall with chimneys extends along the perimeter of the roof (Figure 409). The brick wall slopes downward away from the perimeter, with a cementitious parge coating and liquid-applied waterproofing along the inside edge of the wall (Figure 410).



Figure 409. A short brick parapet wall with chimneys lines the perimeter of the roof at Bastion B.



Figure 410. The top of the brick wall slopes downward away from the perimeter with a cementitious parge and liquid-applied waterproofing.

Sand and vegetation cover Bastion B, with a single-ply waterproofing membrane present under the sand (Figure 411). The membrane does not appear to be mechanically attached to the substrate below (Figure 412).

There is no roof over the easternmost portion of Bastion B (Figure 413).



Figure 411. A single-ply waterproofing membrane is present under the sand.



Figure 412. The waterproofing membrane does not appear to be mechanically attached.



Figure 413. There is no roof over the easternmost portion of Bastion B.

The terreplein at tower bastion features a composite deck walk that leads from the stairs to the west end of the bastion (Figure 414). A small plaza is located around a gun emplacement near the center of the bastion (Figure 415). Wayside exhibit signs and benches line the plaza.



Figure 414. The terreplein at tower bastion features a composite deck walk that leads from the stairs to the west end of the bastion.



Figure 415. A composite deck plaza is located around a gun emplacement near the center of the bastion.

A brick wall lines the perimeter of the bastion (Figure 416). Brick chimneys with cementitious parge coating are present near the perimeter of the bastion inboard of the perimeter brick walls (Figure 417).



Figure 416. A brick parapet wall lines the perimeter of the bastion.



Figure 417. Brick chimney with a cementitious parge coating near the perimeter of the bastion inboard of the perimeter brick walls.

The terreplein above the northwest scarp consists of six gun emplacements near its northern end with vegetation present throughout (Figure 418). The gun emplacements consist of steel rails set atop stone in a semi-circular shape with brick pavers inboard of the stone (Figure 419). The guns were placed on a stone platform above the brick (Figure 420). A 6-foot-wide wall with integrated chimneys lines the west edge of the terreplein (Figure 421). The wall extends 5 feet above the gun emplacements. A barrier comprised of wood posts and rope lines the east side of the terreplein (Figure 422).

The brick vault over the northernmost casemate is partially exposed (Figure 423). Bastion D was located to the north of this area prior to its destruction in 1899. The scarp extends past the casemate (Figure 424).



Figure 418. The terreplein above the northwest scarp consists of six gun emplacements.



Figure 419. A typical gun emplacement along the northwest scarp.



Figure 420. A stone platform where guns were placed above the brick.



Figure 421. A 6-foot-wide wall with integrated chimneys lines the west edge of the terreplein along the northwest scarp.



Figure 422. A barrier composed of wood posts and rope lines the east side of the terreplein.



Figure 423. The brick vault over the northernmost casemate is partially exposed.



Figure 424. Bastion D was located to the north of this area prior to its destruction in 1899. Note the scarp extends past the northernmost casemate.

Parade

The parade sits at the center of Fort Pickens and is characterized by grass and a series of paved walks that help direct visitors around the fort (Figure 425). The walks lead from the sally port at the northeast end to Battery Pensacola, which comprises much of the southern portion of the parade (Figure 426). Upon completion of the fort, the parade would have been largely open between the casemates at the south, west, and north. A glacis is present at the east end of the parade along the inside of the east scarp (Figure 427). The glacis would have helped strengthen the east scarp of the fort against attack.



Figure 425. Parade, view from south.



Figure 426. Battery Pensacola with portion of the parade in the foreground, view from northeast.



Figure 428. Paved walks through center of parade, view from southeast.



Figure 427. Glacis with parade in foreground, view from west.



Figure 429. Paved walk leading to Fort Pickens, view from northwest.

A second paved walk leads from the parking area through the former location of Bastion D (Figure 428). A split rail fence that extends from the northwest scarp east to the northeast scarp restricts access to the fort via the paved walk (Figure 429). Additional paved walks extend along the north face of Battery Pensacola and along the interior face of the casemates at the southwest scarp (Figure 430). These walks connect to a paved walk along the southern edge of Battery Pensacola, which provides access between the parade and Bastion A.



Figure 430. Paved walks along casemates, view from southeast.

Condition Assessment

Counterscarp and Dry Moat

The following notable conditions were observed at the counterscarp and dry moat:

- Cracked brick and mortar joints were noted at the top of the counterscarp walls in isolated locations (Figure 431).
- Cracked, deteriorated, and missing mortar was observed at joints between brick throughout the counterscarp walls (Figure 432 and Figure 433).
- Vegetation was noted growing out of joints at areas where cracked and missing mortar is present at vertical portions of the walls (Figure 434). Vegetation was also growing out of portions of the top of the wall (Figure 435).
- Biological growth was noted at several locations throughout the counterscarp walls (Figure 436).
- Eroded mortar joints were noted at what appears to be replacement brick at the upper wall directly north of Fort Pickens Road (Figure 437).
- Eroded mortar joints were noted at locations along the base of the counterscarp wall (Figure 438). This condition was also noted at areas of the upper wall (Figure 439 and Figure 440).
- Vertical cracking was observed at mortar joints and through brick at isolated locations along the counterscarp (Figure 441 through Figure 443). Horizontal and step cracking was also noted at mortar joints in isolated locations (Figure 444 and Figure 445).
- Missing brick units were noted in isolated areas along the counterscarp (Figure 446 and Figure 447).
- Signs of previous movement and displacement were noted near a corner at the upper wall (Figure 448). Cracked mortar was noted at this location.
- Bowing of the southern buttressed wall along the east portion of the counterscarp was noted at mid-height of the wall (Figure 449).
- Outward displacement of the lower wall of the counterscarp south of the northern buttressed wall was noted (Figure 450). The displacement was as great as 1 inch in some locations.
- Displacement was also noted at the buttressed wall immediately south of Fort Pickens Road (Figure 451). It appears the west portion of the wall that projects outward from the east portion of the wall may have been rebuilt, as the bricks appear different in color.



Figure 431. Cracked brick at the top of the counterscarp walls.



Figure 432. Cracked mortar at the counterscarp walls.



Figure 433. Cracked mortar at the counterscarp walls.



Figure 436. Biological growth at the face of the counterscarp wall.



Figure 434. Vegetation growing from the counterscarp wall.



Figure 437. Eroded mortar joints adjacent to the Fort Pickens Road opening in the counterscarp.



Figure 435. Vegetation at the top of the counterscarp wall.



Figure 438. Eroded joints at the base of the counterscarp.



Figure 439. Eroded joints at the upper wall.



Figure 440. Eroded joints at the upper wall.



Figure 441. Vertical cracking through brick at the counterscarp.



Figure 442. Vertical cracking through brick at the counterscarp.



Figure 443. Vertical cracking through brick at the counterscarp.



Figure 444. Horizontal and step cracking at mortar joints.



Figure 445. Horizontal and step cracking at mortar joints.



Figure 448. Outward displacement at the counterscarp.



Figure 446. Missing brick units at the counterscarp.



Figure 449. Bowing of a buttressed wall.



Figure 447. Missing brick units at the top of the counterscarp.

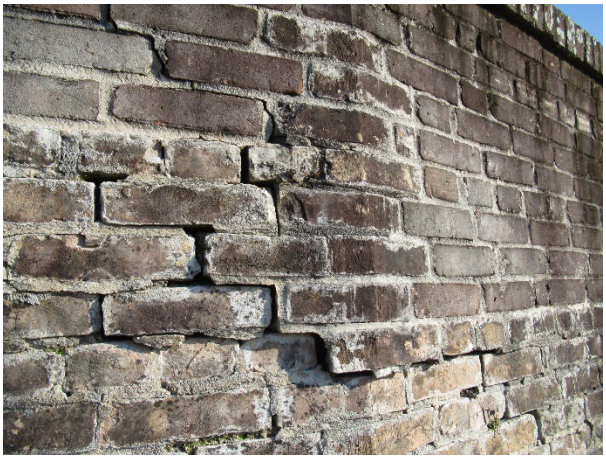


Figure 450. Outward displacement of the lower wall at the counterscarp.



Figure 451. Displacement at the buttressed wall immediately south of Fort Pickens Road.

Scarp

The following notable conditions were observed at the scarp:

- Vertical cracking and outward displacement were noted on the sides of the buttresses flanking the sally port (Figure 452 and Figure 453). Crack gauges were previously installed at cracks on the east side of the east buttress (Figure 454). It is not known when the crack gauges were installed or if they were regularly monitored in the past.
- Deteriorated mortar joints were noted throughout the brick masonry (Figure 455). Biological growth was observed at the open joints (Figure 456).
- Eroded mortar joints were noted along the base of the scarp walls (Figure 457 and Figure 458).
- Cracked and missing mortar was noted in locations throughout scarp walls (Figure 459). In some locations, new mortar appears to have been applied over existing mortar without sufficient removal of the existing mortar (Figure 460). The mortar in these locations was loose and easily removed (Figure 461).
- Vertical cracking was noted throughout the scarp (Figure 462 through Figure 464). This condition was particularly prevalent near corners (Figure 465 through Figure 468).
- Staining was noted adjacent to joints at the underside of the granite coping units (Figure 469).
- Staining was noted throughout the fort at the top of the scarp walls as well as at locations where cracks are present (Figure 470 through Figure 472).
- Biological growth that was damp to the touch was noted on the west wall of Bastion E (Figure 473).
- Abandoned steel, including some anchors, remains at isolated locations along the exterior scarp walls (Figure 474 through Figure 476).
- Vegetation is present at cracking throughout the scarp walls (Figure 477).
- Remnant concrete was noted at the top of the north wall of Bastion E (Figure 478). The concrete was associated with a stair, previously removed, that provided access from the former dry moat to the battery commander's station at the top of Bastion E.
- A depression is present at the south end of the east wall of Bastion E (Figure 479). A cementitious parge coating is present over some of the exposed brick. The depression is approximately 19 inches deep. It is believed this may have been made in conjunction with the exploratory opening at the interior of Bastion E.
- Heavy efflorescence and water staining were noted at the underside of the arched opening at the south wall of Bastion E (Figure 480).
- Vertical cracking was noted at the buttresses along the east scarp (Figure 481). Cracking was observed at the face of the buttress as well as the sides (Figure 482).
- Cracked and spalled stone coping and projecting water table units were noted in isolated locations (Figure 483). This condition, which presents a potential safety hazard, was most prevalent along the top of the northwest scarp (Figure 484). Visitor access should be limited below the cracked and spalled stone units at the northwest scarp.
- Missing and displaced brick were noted at the underside of the arch at embrasure openings along the south scarp wall (Figure 485).
- Steel grilles at the embrasures along the west side of the fort are corroded, with section loss

noted in several locations (Figure 486 and Figure 489).

- Steel grilles that are incompatible with the historic grilles have been installed at embrasure openings throughout the fort (Figure 487). The grilles are constructed of steel reinforcing bars.
- A historic steel grille was observed to be detached from the adjacent brick wall at an embrasure opening along the northwest scarp (Figure 488). This grille was removed by park personnel during the site visit and placed in storage.
- Brick units at the keystone of an embrasure at the south wall of the tower bastion are displaced (Figure 490). Brick units are displaced throughout the arch (Figure 491).
- Missing and damaged brick were noted at the top of the arch at an embrasure at the southwest wall of the tower bastion (Figure 492). A vertical crack extends upward from the top of the embrasure (Figure 493).



Figure 452. Vertical cracking and outward displacement at the sides of the buttresses flanking the sally port.



Figure 453. Vertical cracking at the side of a buttress flanking the sally port.



Figure 454. Crack gauges previously installed on the east side of the east buttress.



Figure 455. Deteriorated mortar joints at the scarp.



Figure 456. Biological growth at open joints.



Figure 457. Eroded mortar joints at the base of the scarp walls.



Figure 458. Eroded mortar joints at the base of the scarp walls.



Figure 459. Cracked and missing mortar along the scarp walls.



Figure 460. New mortar appears to have been applied over existing mortar (yellow arrow).



Figure 461. Loose mortar that was easily removed at areas where new mortar was installed directly over existing mortar.



Figure 462. Vertical cracking near a corner at the scarp wall.



Figure 463. Vertical cracking at the scarp wall.



Figure 464. Vertical cracking at the top of the scarp wall.

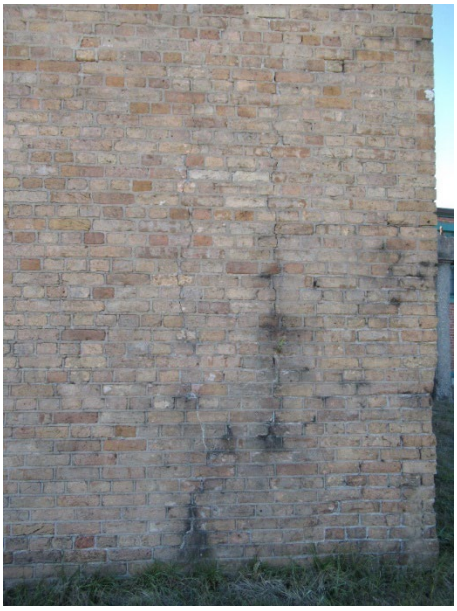


Figure 465. Vertical cracking near a corner of the scarp wall.



Figure 466. Vertical cracking near a corner of the scarp wall.



Figure 467. Vertical cracking near a corner of the scarp wall.



Figure 468. Vertical cracking near a corner of the scarp wall.



Figure 469. Staining near joints at the underside of the granite coping units.



Figure 470. Staining at the top of the scarp walls.



Figure 471. Staining at the interior side of the scarp wall.



Figure 472. Staining along the east wall of Bastion A.



Figure 473. Biological growth at the west wall of Bastion E.



Figure 474. Abandoned steel at the scarp wall.



Figure 475. Abandoned steel at the scarp wall.



Figure 476. Abandoned steel at the scarp wall.



Figure 477. Vegetation at cracking in the scarp wall.



Figure 478. Remnant concrete associated with the stair that provided access to the battery commander's station at the top of Bastion E.



Figure 479. A depression at the south end of the east wall of Bastion E.



Figure 480. Heavy efflorescence and water staining at the underside of the arched opening at the south wall of Bastion E.



Figure 481. Vertical cracking at a buttress along the east scarp.



Figure 482. Cracking at the side of a buttress at the east scarp.



Figure 483. Cracked stone coping unit at top of scarp wall.



Figure 484. Cracked and spalled stone units along the northwest scarp.



Figure 485. Missing and displaced brick at the underside of the arch at embrasure openings along the south scarp wall.



Figure 486. Corroded steel grille at embrasure opening.



Figure 487. Incompatible grille at embrasure opening at tower bastion. Note the grille is constructed of steel reinforcing bars.



Figure 488. Detached steel grille at the northwest scarp.



Figure 489. Corroded steel grille with section loss at an embrasure opening.



Figure 490. Displaced brick at an embrasure opening on the south wall of tower bastion.



Figure 491. Bricks displaced through the full depth of the arched opening at the south wall of the tower bastion.



Figure 492. Missing and damaged brick at the top of the arch at an embrasure at the southwest wall of the tower bastion.



Figure 493. A vertical crack extends upward from the top of an embrasure at the southwest wall of the tower bastion.

Bastions

Bastion A

The following notable conditions were observed at Bastion A:

- Eroded mortar joints and brick masonry were observed throughout the interiors of the bastion, including the vaulted corridor, powder magazine, and casemate gallery.
- Missing brick was observed near the embrasure openings of the casemate gallery.
- Cracking of the brick masonry was observed radiating from the diamond-shaped ceiling openings on the casemate gallery, facing north.
- Vertical cracking through the mortar joints and brick, radiating from the intrados of the arch and reentrant corners of the masonry, were observed on the casemate gallery, facing north (Figure 494).
- Signs of water infiltration are visible on the ceiling of and sides of the vaulted tunnels, casemate gallery, and powder magazine, as evidenced by efflorescence, stalactites, and biological growth staining (Figure 495 through Figure 500). Areas with standing water as well as active dripping were found on the casemate gallery, facing north (Figure 501). The lower portions of the powder magazine walls are significantly stained with efflorescence and biological growth (Figure 502).

- The limewash coating installed in 2023 at the brick in the west corridor is deteriorated near the base of the wall, and the walls where the coating was installed were damp to the touch (Figure 503).



Figure 494. Vertical cracking through the mortar joints and brick at the interior of Bastion A.



Figure 495. Water infiltration staining on the ceiling of the vaulted tunnels at casemate gallery.



Figure 496. Water infiltration staining at the wall of the vaulted tunnels at casemate gallery.



Figure 497. Signs of water infiltration at the wall of the vaulted tunnels at casemate gallery. Note the biological growth at right.



Figure 498. Signs of water infiltration at the wall of the vaulted tunnels at casemate gallery.



Figure 499. Signs of water infiltration are visible on the ceiling and sides of the vaulted tunnels at casemate gallery.



Figure 500. Signs of water infiltration at the base of the wall of the vaulted tunnels at casemate gallery.



Figure 501. An area with standing water and active dripping was observed at the casemate gallery.



Figure 502. The lower portion of the powder magazine walls are stained with efflorescence and biological growth.



Figure 503. Deteriorated limewash at the base of the wall in the brick corridor along the west side of Bastion A.

Bastion B

The following notable conditions were observed at Bastion B:

- Cracking was observed through the underside of the brick arches, perpendicular to the crown of the arched opening (Figure 504 through Figure 506).
- Vertical step cracking was observed on the back wall of the southeast section of the bastion.
- Loose brick units were observed at the top corners of the embrasure openings (Figure 507). A loose brick with mortar was noted to be stuck within the vent opening (Figure 508).

- Multiple spalled and cracked brownstone units were observed at the sole of the embrasure on the southeast end of the bastion (Figure 509 and Figure 510).
- Missing and spalled brick were observed below the sole of the embrasure (Figure 511).
- Signs of water infiltration are visible on the vaulted ceilings, walls, and flooring, as evidenced by efflorescence, stalactites, and biological growth staining (Figure 512 and Figure 513). The walls were found to be wet to the touch, and there is biological growth staining within the mortar joints (Figure 514 through Figure 517).
- Eroded mortar joints and brick masonry were observed throughout the interiors of the cisterns (Figure 508 and Figure 519).
- The insides of the cistern walls were found to be wet to the touch and have efflorescence and biological growth staining (Figure 520).
- Graffiti in the form of etching over the parge coat is visible throughout the interior of the cistern walls (Figure 521 and Figure 522).



Figure 504. Cracking at the underside of the brick arches perpendicular to the crown of the arched opening.



Figure 505. Cracking at the underside of the brick arches perpendicular to the crown of the arched opening.



Figure 506. Cracking at the underside of the brick arches perpendicular to the crown of the arched opening.



Figure 507. Loose bricks at the top corners of the embrasure openings.



Figure 508. Loose brick with mortar within a vent opening.



Figure 511. Missing and spalled brick below the sole of an embrasure.



Figure 509. Spalled and cracked brownstone units at the sole of the embrasure on the southeast end of the bastion.



Figure 512. Signs of water infiltration on the vaulted ceilings of the bastion.



Figure 510. Spalled and cracked brownstone units at the sole of the embrasure on the southeast end of the bastion.



Figure 513. Signs of water infiltration on the walls and vaulted ceilings of the bastion.



Figure 514. Biological growth and staining at the walls of the bastion.



Figure 517. Biological growth and staining at the walls of the bastion.



Figure 515. Biological growth and staining at the walls of the bastion.



Figure 518. Eroded mortar joints and brick masonry at the interior of a cistern.



Figure 516. Biological growth and staining at the walls of the bastion.



Figure 519. Eroded mortar joints and brick masonry at the interior of a cistern.



Figure 520. Biological growth and staining at the walls of the cistern.



Figure 521. Etching at the parge coat at the interior of the cistern.



Figure 522. Etching at the parge coat at the interior of the cistern.

Tower Bastion (Bastion C)

The following notable conditions were observed at the tower bastion (Bastion C):

- Cohesive and adhesive failure of sealant expansion joints on the parapet walls is visible (Figure 523).
- Step cracking was observed at the interior walls of the bastion (Figure 524)
- Corrosion of the steel lintel located above door opening between spaces was observed (Figure 525).
- Signs of water infiltration are visible on the vaulted ceilings and walls, as evidenced by efflorescence, stalactites, and biological growth staining (Figure 526 through Figure 529). The walls were found to be wet to the touch, and there is biological growth staining within the mortar joints, particularly on the perimeter of the stair walls and the lower-level entrance (Figure 530 and Figure 531). The walls, ceilings, and floor behind the wood refrigeration room were also visibly wet (Figure 532 through Figure 534).



Figure 523. Cohesive and adhesive failure of sealant expansion joints on the parapet walls.



Figure 524. Step cracking at a wall in Bastion C.



Figure 525. Corrosion of the steel lintel at a door opening.



Figure 526. Signs of water infiltration on the vaulted ceilings and walls.



Figure 527. Signs of water infiltration on the vaulted ceilings and walls.



Figure 528. Signs of water infiltration on the vaulted ceilings and walls, including standing water at the floor.



Figure 529. Signs of water infiltration on the vaulted ceilings and walls.



Figure 530. Biological growth and staining within mortar joints.



Figure 531. Biological growth and staining within mortar joints.



Figure 532. Standing water at the interior of Bastion C adjacent to the wooden refrigeration room.



Figure 533. Visible water infiltration at the inside face of the scarp at Bastion C.



Figure 534. Visible water infiltration at the inside face of the scarp at Bastion C.

Bastion E

The following notable conditions were observed at Bastion E:

- Erosion of brick faces was observed, primarily at the ends of the brick arches and inside the powder magazine walls.
- Eroded mortar joints within the brick masonry were observed inside the powder magazine walls and ceiling.
- Corrosion staining was observed on the brick masonry walls of the powder magazine at locations where there are embedded conduits (Figure 535).
- Remnants of a whitewash layer are visible throughout the mine chamber tunnel surfaces (Figure 536).

- An exploratory opening measuring approximately 20 square feet, in the back of the central power station wall facing west, remains open (Figure 537). The masonry in the opening appears generally intact. It is believed this may have been made in conjunction with the depression present at the east elevation of Bastion E.
- Horizontal cracking was observed through the brick joints near the haunches of the arch at the central power station (Figure 538). Vertical cracking through the brick, radiating from the intrados of the arch, was also observed (Figure 539).
- The brownstone units below the sole of the embrasures at the central power station have been coated over with cementitious parge coating.
- Signs of water infiltration are visible on the ceiling and sides of the vaulted tunnels, powder magazine, and the central power station, as evidenced by efflorescence, stalactites, and biological growth staining (Figure 540 through Figure 547). The powder magazine walls were found to be wet to the touch, and there is biological growth staining within the mortar joints (Figure 548). In the central power plant, previously a casemate gallery, visible water drips were observed emerging from the vaulted ceiling (Figure 549 and Figure 550).



Figure 535. Corrosion staining at the brick walls inside the powder magazine.



Figure 536. Remnants of a whitewash layer at the mine chamber tunnel surfaces.



Figure 537. Exploratory opening in the back of the central power station wall facing west.



Figure 538. Horizontal cracking through the brick joints near the haunches of the arch at the central power station.



Figure 539. Vertical cracking through the brick at an arch in the central power station.



Figure 540. Water infiltration staining on the ceiling and sides of a vaulted tunnel.



Figure 541. Signs of water infiltration on the ceiling and walls of a vaulted tunnel.



Figure 542 Signs of water infiltration on the ceiling and walls of the powder magazine. Note the efflorescence on the walls.



Figure 543. Signs of water infiltration on the walls in Bastion E.



Figure 544. Signs of water infiltration on the ceiling and sides of the powder magazine.



Figure 545. Signs of water infiltration on the walls of the central power station. Note the organic growth on the walls.



Figure 546. Signs of water infiltration on the walls of the central power station. Note the organic growth.



Figure 547. Signs of water infiltration on the ceiling and sides of the central power station.

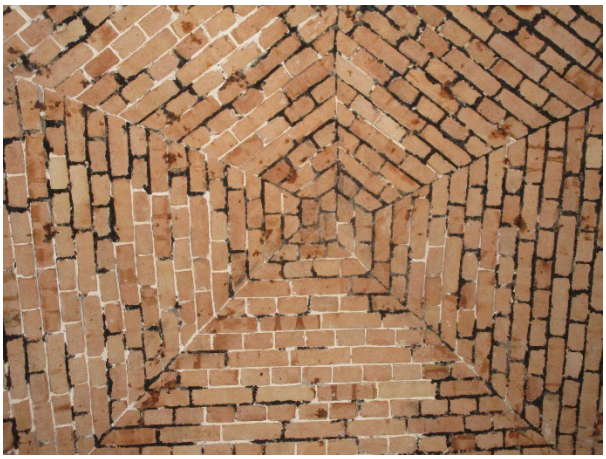


Figure 548. Biological growth staining within the mortar joints at the ceiling of the powder magazine.



Figure 549. Signs of active water infiltration on the ceiling of the central power station.



Figure 550. Signs of active water infiltration on the ceiling and sides of the central power station (yellow arrow).

Casemates

The following notable conditions were observed at the casemate interiors:

- A significant amount of water infiltration was observed throughout the ceiling of several casemates, as evidenced by efflorescence, formation of stalactites, drip marks, and biological growth staining (Figure 551). At the east end of the casemate connecting Bastions D and E, the vaulted ceiling bricks in close proximity to areas with heavy water infiltration are eroded and spalled (Figure 552 and Figure 553).
- Following heavy rain events, flooding has been reported at the mine casemate closest to Bastion E.
- Missing brick was observed at the mine casemate flooring, at the east end of the casemate along the northeast scarp, and up a set of stairs (Figure 554).
- The paint finish installed over the masonry walls at the mine casemates is debonded at isolated locations, including where spalls in the concrete have been noted (Figure 555).



Figure 551. Water infiltration at the ceiling of a casemate.



Figure 552. Bricks at the vaulted ceiling are eroded and spalled (yellow arrow).



Figure 553. Bricks at the vaulted ceiling are eroded and spalled.



Figure 554. Missing brick at the floor of the mine casemate between Bastions C and D.



Figure 555. Delaminated paint over masonry at the mine casemate.



Figure 556. Cracking through the underside of a brick arch.

Casemates at Southeast Scarp

The following notable conditions were observed at the casemates along the southeast scarp:

- Missing brick was observed near the embrasure openings of the casemate gallery.
- Cracking is present through the underside of a brick arch, perpendicular to the crown of the arched opening (Figure 556).
- Signs of water infiltration are visible on the ceiling, walls, and flooring, as evidenced by efflorescence, stalactites, heavy biological growth staining, and visibly wet areas of the masonry (Figure 557 through Figure 560).
- The inside of the Battery Pensacola tunnel walls and flooring was found to be wet to the touch, and there is biological growth staining present (Figure 561 and Figure 562).
- Graffiti in the form of etching on the plaster walls is visible throughout the interior (Figure 563).



Figure 557. Signs of water infiltration at the remaining casemates at the southeast scarp.



Figure 558. Water infiltration staining and organic growth at the remaining casemates at the southeast scarp.



Figure 559. Signs of water infiltration at the walls and floor of the remaining casemates at the southeast scarp.



Figure 560. Signs of water infiltration at the brick vault at the remaining casemates at the southeast scarp.



Figure 561. The walls and floor of the Battery Pensacola tunnel are wet to the touch.



Figure 562. Biological growth at the walls and floor of the Battery Pensacola tunnel.



Figure 563. Etching on the plaster walls at the interior of the casemates at the southeast scarp.

Casemates at Southwest Scarp

The following notable conditions were observed at the casemates along the southwest scarp:

- Cracking parallel to the span of the vaulted ceiling was observed throughout the casemates. At multiple locations, the cracking at the vaulted ceilings has been pointed with mortar (Figure 564 and Figure 565).
- Eroded mortar joints, as well as eroded, spalled, and partially missing brick masonry units, were observed within the embrasure and below the sole of the embrasures (Figure 566). Eroded brick masonry was also observed at the soffit of the vaults (Figure 567).
- Missing and cracked brick were observed at locations corresponding to the wall notches

and at the embrasures (Figure 568 and Figure 569).

- Loose brick units were observed at the top corners of the embrasure openings, near the southwest end of the casemate gallery (Figure 570).
- Localized repointing of the mortar joints was observed throughout the vaulted ceiling (Figure 571).
- Signs of water infiltration are visible on the vaulted ceilings, walls, and flooring, as evidenced by efflorescence, stalactites, and biological growth staining, particularly at the wall that abuts Bastion C and at the intersecting vault between the sixth and seventh casemates from the northwest end (Figure 572 through Figure 575). There is biological growth staining within the mortar joint and at the gap between abutting walls (Figure 576).
- Displaced remnants of the semicircular granite stone units were observed at the seventh casemate from the northwest end (Figure 577).
- Graffiti, in the form of spray paint, is present on the fourth casemate from the northwest end (Figure 578).

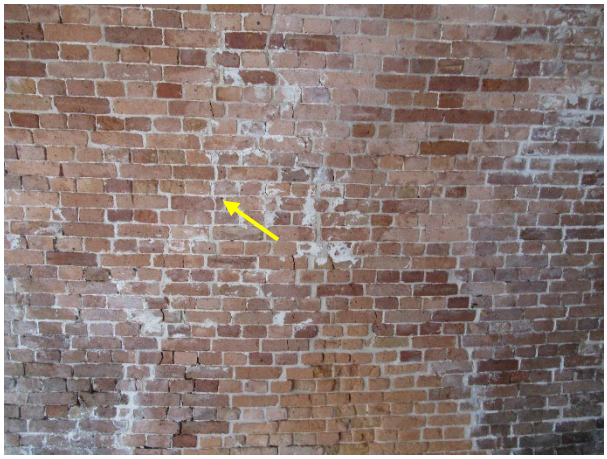


Figure 564. Mortar installed at cracks at the vaulted ceilings (yellow arrow).

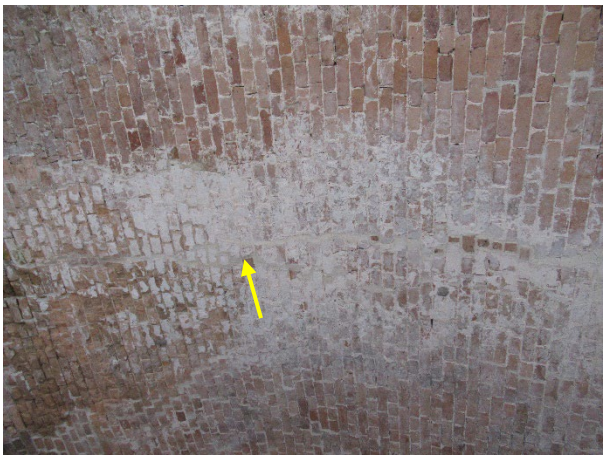


Figure 565. Mortar installed at cracks at the vaulted ceilings (yellow arrow).



Figure 566. Eroded mortar joints and spalled and partially missing brick masonry at an embrasure opening.



Figure 567. Eroded brick masonry at the vaulted ceiling.



Figure 568. Missing and cracked brick at a wall notch at casemate no. 4.



Figure 571. Localized repointing of the mortar joints at the vaulted ceiling.



Figure 569. Missing and cracked brick at an embrasure in casemate no. 5.



Figure 572. Water infiltration staining is visible on the vaulted ceilings and walls.



Figure 570. Loose bricks at the top corners of an embrasure opening near the southwest end of the casemate gallery.



Figure 573. Signs of water infiltration are visible on the vaulted ceilings and walls. Note the staining at left.



Figure 574. Signs of water infiltration are visible on the vaulted ceilings. Note the efflorescence.



Figure 575. Signs of water infiltration are visible on the vaulted ceilings and walls. Note the efflorescence.



Figure 576. Biological growth and staining at the gap between abutting walls.



Figure 577. Displaced remnants of a semicircular granite stone unit.



Figure 578. Graffiti on a wall in the fourth casemate from the northwest end.

Casemates at Northwest Scarp

The following notable conditions were observed at the casemates along the northwest scarp:

- Ongoing maintenance work was being carried out by a NPS Historic Preservation Training Center crew during the week of January 9, 2023 (Figure 579 and Figure 580). The maintenance work included repointing of open joints on the vaulted ceiling and routing and installing mortar at cracks.
- Cracking parallel to the span of the vaulted ceiling was observed throughout the casemates (Figure 581). Wider cracking

parallel to the span of the vaulted ceiling was observed at the second casemate closest to the north end (Figure 582). At multiple locations, the cracking at the soffit of the vault ceilings has been pointed with mortar (Figure 583).

- Separation and cracking of the outer wythe of brick was observed at the intrados of the arch, parallel to the span of the vaulted ceiling (Figure 584).
- Signs of water infiltration are visible on the vaulted ceilings walls, and flooring, as evidenced by efflorescence and biological growth staining (Figure 585 and Figure 586). The walls were found to be wet to the touch at the fourth and fifth casemate openings from the north end of the fort (Figure 587 and Figure 588).
- Heavy dark staining of the brick masonry at the northwest facing walls was noted (Figure 589).



Figure 579. Ongoing maintenance work carried out by a NPS Historic Preservation Training Center crew at the northwest scarp.



Figure 580. Ongoing maintenance work carried out by a NPS Historic Preservation Training Center crew at the northwest scarp.



Figure 581. Cracking parallel to the span of a vaulted ceiling.



Figure 582. Wider cracking parallel to the span of a vaulted ceiling.



Figure 583. Cracking at vaulted ceilings that has been pointed with mortar.



Figure 584. Separation and cracking of the outer wythe of brick parallel to the span of the vaulted ceiling.



Figure 585. Signs of water infiltration at floor of northwest scarp. Note the standing water.



Figure 586. Signs of water infiltration at the walls of northwest scarp. Note the organic growth at the corner of the room.



Figure 587. The walls were found to be wet to the touch at the fourth and fifth casemates from the north end of the fort.



Figure 588. The walls were found to be wet to the touch at the fourth and fifth casemates from the north end of the fort.



Figure 589. Heavy dark staining of the brick masonry at the northwest-facing walls.



Figure 590. Efflorescence and staining at the sally port walls.

Sally Port and Officers' Quarters

The following notable conditions were observed at the sally port and officers' quarters:

- Efflorescence and staining were noted at the east and west walls of the sally port (Figure 590 and Figure 591).
- Water staining and biological growth were noted at the plaster walls and ceilings of the officers' quarters (Figure 592 and Figure 593). This condition was most widespread in the easternmost quarters (Figure 594 and Figure 595).
- Metal lath is exposed at the door openings (Figure 596). The lath is typically corroded with section loss noted.
- Graffiti is present on the plaster walls in the former officers' quarters (Figure 597 and Figure 598).
- Efflorescence and staining were noted at the brick walls of the casemates north of the officers' quarters (Figure 599 through Figure 601).
- Eroded mortar joints were observed at the base of the exposed brick walls in casemates (Figure 602).
- Cracked plaster was noted at the center room of the former officers' quarters (Figure 603).
- Biological growth and vegetation were noted at the brick walls below the covered breezeway (Figure 604). The condition was typically present behind downspouts.



Figure 591. Efflorescence and staining at the sally port walls.



Figure 592. Water staining and biological growth at the ceilings of the officers' quarters.



Figure 593. Water staining and biological growth at the ceilings of the westernmost officers' quarters.



Figure 596. Exposed metal lath at the door openings to the officers' quarters.



Figure 594. Water staining and biological growth at the ceilings of the easternmost officers' quarters.



Figure 597. Graffiti at the plaster walls in the officers' quarters.



Figure 595. Water staining and biological growth at the ceilings of the easternmost officers' quarters.



Figure 598. Etched graffiti at the plaster walls in the officers' quarters.



Figure 599. Efflorescence and staining at the brick walls of the casemates.



Figure 602. Eroded mortar joints at the base of the casemate walls.



Figure 600. Efflorescence and staining at the brick walls of the casemates. Note the organic growth at the walls.



Figure 603. Cracked and missing plaster at the door in the east wall of the center room of the officers' quarters.



Figure 601. Efflorescence and staining at the brick walls of the casemates.



Figure 604. Biological growth and vegetation at the brick walls of the breezeway.

Terreplein and Roof

The following notable conditions were observed at the terreplein and roof:

- Cracked and missing mortar was noted at the joints in the brick walls at the perimeter of the terreplein over Bastion E (Figure 605).
- Signs of water infiltration are prevalent in the casemates and former officers' quarters south of the northeast scarp.
- Sealant installed between the stone coping units at the southeast and southwest scarps has failed (Figure 606). Sealant was also noted to have been installed between brick units adjacent to the joints at the stone (Figure 607).
- The single-ply waterproofing membrane at Bastion B is loose and wrinkled (Figure 608).
- The coated metal waterproofing at the south end of the southwest scarp is wrinkled and displaced (Figure 609).
- The brick vaults over the gutters between casemates have failed along the southwest scarp with damaged and missing brick (Figure 610 and Figure 611).
- Vegetation was noted growing along the base of the topside of the vaults over a casemate adjacent to the gutter (Figure 612).
- Sealant at expansion joints along the brick wall at the perimeter of tower bastion has failed (Figure 613).



Figure 605. Cracked and missing mortar at joints between brick units.



Figure 606. Failed sealant between stone coping units.



Figure 607. Sealant at brick pavers adjacent to joint in stone coping units.



Figure 608. Loose and wrinkled waterproofing membrane at Bastion B.



Figure 609. Wrinkled and displaced coated metal roofing at the south end of the southwest scarp.



Figure 612. Vegetation at the base of the top side of the vaults.



Figure 610. Failed brick vault at the gutters along the southwest scarp. Note the missing brick at the right side of the vault.



Figure 613. Missing sealant at expansion joint at the perimeter of tower bastion.



Figure 611. Failed brick vault at the gutters along the southwest scarp. Note the top of the vault is no longer extant with brick visible in the gutter.

Battery Pensacola

Exterior Description

Measured drawings of the battery are provided in Appendix A.

Battery Pensacola is a two-level concrete structure measuring approximately 282 feet in length (Figure 614 and Figure 615). It is covered by earthen berms on all elevations, except at the north elevation, which is open (Figure 616). The battery has a generally symmetrical plan oriented on a northwest–southeast axis, with two round gun emplacements situated on the upper level. The upper level of the battery is largely open to the elements, with the exception of the battery commander's station, which rises above the rest of the battery and is partially enclosed (Figure 617). This structure is accessed from the battery by two sets of concrete stairs that lead to the upper level. The battery's one-story power station sits directly east of the main battery.

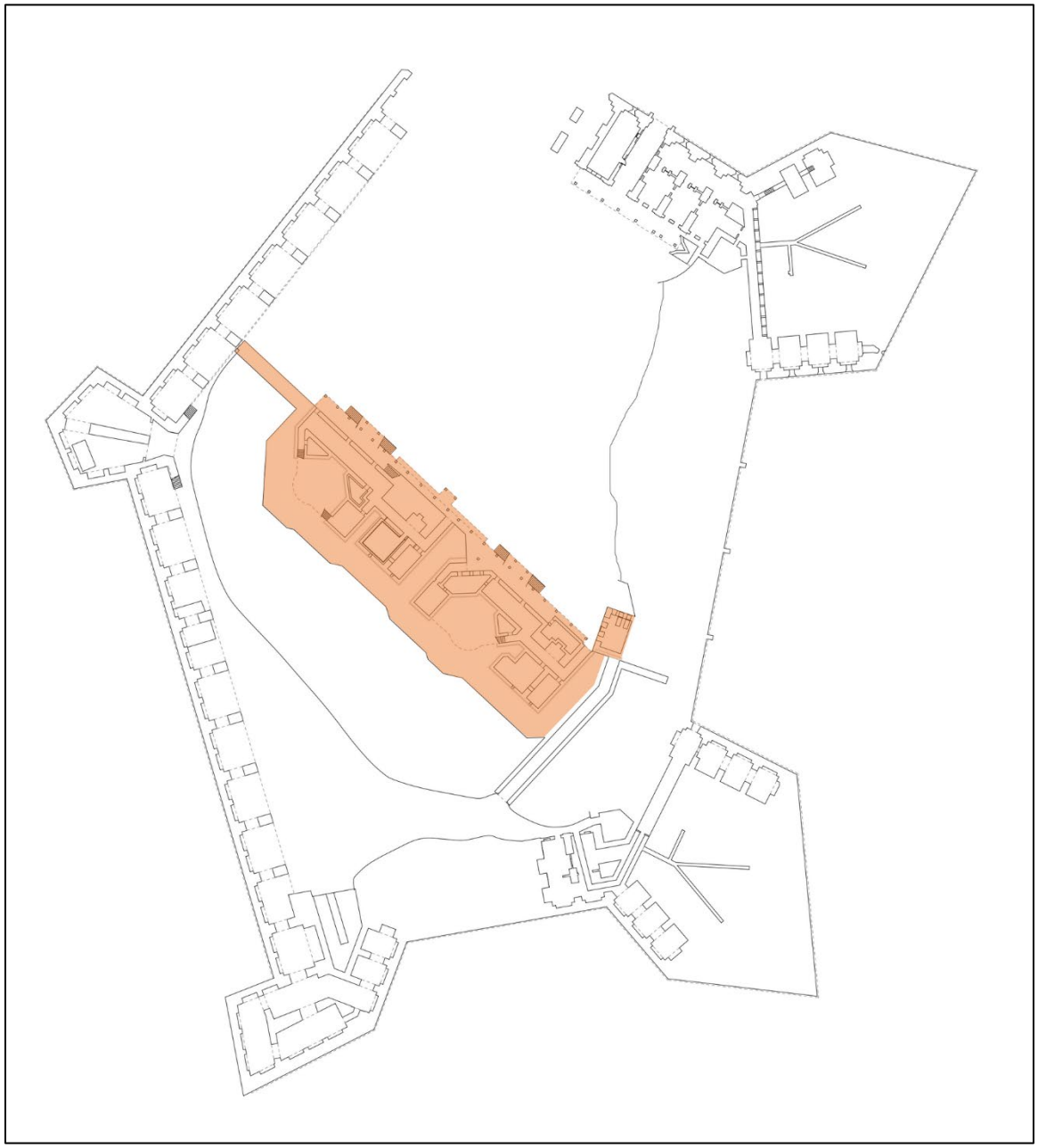


Figure 614. Plan of Fort Pickens showing the location of Battery Pensacola (orange shading).



Figure 615. Battery Pensacola, view from north.



Figure 616. North elevation of Battery Pensacola.



Figure 617. Partial view of the north elevation showing the battery commander's station, view from northwest.

Structure

Battery Pensacola's original structure was constructed in the late nineteenth century. An addition on the north end of the battery was completed circa 1909. The original structure included multiple rooms on the first level and two gun emplacement pads on the roof level. The addition included the battery commander's station and an upper-level walkway supported by columns on the north end of the battery.

The cast-in-place concrete structure of the original portions of Battery Pensacola was designed to be a mass concrete structure. The walls were shown on archival drawings to range in thickness from 2 feet up to 20 feet thick in some locations. Two gun emplacement pads were constructed as part of the original battery. The concrete walls at the emplacements are typically 10 to 20 feet thick. At the ceilings of the interior spaces at the lower level adjacent to gun emplacements, steel I-beams are embedded in the concrete (Figure 618).



Figure 618. Steel I-beams are embedded in the concrete at the ceilings of the interior of the battery.

The concrete power station, constructed circa 1920, is cast-in-place concrete with embedded steel bar reinforcement (Figure 619). The concrete walkways that line the north edge of the battery are supported by steel bar reinforced concrete beams and columns (Figure 620). Concrete foundations are indicated by the exposed top surface of concrete footings visible below the concrete columns at isolated locations.



Figure 619. Cast-in-place concrete with embedded steel bar reinforcement at the power station and walkways, constructed in circa 1909.



Figure 620. Steel bar reinforced beams and columns at the north edge of the battery.

Exterior Concrete

Board-formed, cast-in-place concrete is the primary exterior material of the structure. The upper-level walls are board-formed concrete with 9-inch-wide boards (Figure 621), while the lower-level walls used 5-inch-wide boards (Figure 622). All vertical exterior concrete is covered with a black, paint-like coating. A series of entrances to the interior portions of the structure line the north elevation of Battery Pensacola, with two cast-in-place concrete double staircases leading to the upper level of the battery from grade.



Figure 621. Board-formed concrete at the upper-level walls.



Figure 622. Board-formed concrete at the lower-level walls.

At both the east and west ends of the north elevation of Battery Pensacola is a concrete retaining wall (Figure 623 and Figure 624). The retaining wall on the west tapers upward from grade to the top of the battery, where it is approximately 20 feet tall. The retaining wall at the east end of the battery tapers downward to the north from the corner of the power station.



Figure 623. Concrete retaining wall at west end of the battery.



Figure 624. Concrete retaining wall at east end of the battery.

The power station, a one-story concrete structure, is located on grade at the east end of the main battery structure (Figure 625). The west elevation of the building contains two door openings flanking a central window opening (Figure 626). No doors are present, but the window opening on the east elevation is covered with vertical steel bars. The north elevation has three openings; two doors to the east and a window at the northwest corner (Figure 627). The building has a flat concrete roof covered in a layer of overburden.



Figure 625. The power station at the east end of the battery.



Figure 626. The west elevation of the power station.



Figure 627. The north elevation has three openings: two doors to the east and a window to the west.

Upper Level and Roof

The upper level of Battery Pensacola is largely exposed to the elements. The upper level generally consists of an upper-level walkway, which extends along the north side of the battery, as well as the gun emplacements, which sit below the upper-level walkway. The upper-level walkway consists of an outer walk that was added as part of an expansion in 1909 (Figure 628). The horizontal concrete surfaces are coated with a liquid-applied waterproofing membrane. Two gun emplacements separate the structure. The gun emplacements are semicircular in plan and step down from the upper level (Figure 629). The gun emplacements sit approximately 4 feet below the upper level of the battery. A series of stairs also leads from the gun emplacements down into their associated magazines. The concrete walls around the gun emplacements typically rise 13 feet from the floor

level with a chamfered edge at the top. The east and west gun emplacements are symmetrical.



Figure 628. The upper-level walkway.



Figure 629. The east gun emplacement.

The upper level of Battery Pensacola can be accessed from two double concrete stairs located on the north elevation. The stairs, which each consist of fifteen concrete treads, end at the upper level across from the gun emplacements (Figure 630). Prior to construction of the 1909 addition, access to the upper levels was provided by stairs located at the center of the north facade of the battery. The stair remains, but the opening at the upper level was covered with the new walkway slab, preventing access (Figure 631). On the far east and west ends of the upper level are steel ladders leading to observation rooms (Figure 632). The ladders have been covered by sheets of sheet metal to prevent public access (Figure 633). A steel ladder, also with restricted access, leading to the roof is anchored to the concrete wall on either side of the west gun emplacement (Figure 634). Steel rings are anchored intermittently into the upper-level walls (Figure 635). The concrete area in the center of the battery on the upper level, between the gun emplacements, is a solid mass concrete construction. As part of the 1909 addition, a roof constructed of concrete reinforced with steel bars was erected above the walkway at the east end and at the center of the upper walkway (Figure 636). The roofs correspond with openings for the ammunition hoists (Figure 637). Concrete overhangs previously used to shelter equipment are located throughout the upper level (Figure 638).



Figure 630. The double concrete stair at the east side of the battery.



Figure 631. The stair at the center of the north elevation. Note that there is currently no opening at the top of the stair.



Figure 632. The top of a ladder leading to the observation rooms.

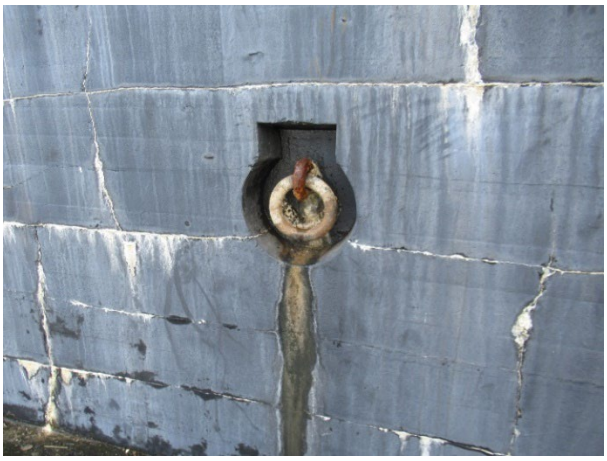


Figure 635. Steel ring anchored into the upper-level walls.



Figure 633. A ladder leading to the observation rooms. Note the metal panel installed to prevent public access.



Figure 636. The roof constructed above the walkway at the east end of the battery.



Figure 634. A steel ladder leading to the roof. Note the metal panel installed to prevent public access.



Figure 637. Ammunition hoist below the roof constructed above in 1909.



Figure 638. A concrete overhang previously used to protect equipment at the upper level.

The battery commander's station is located at the center of the north facade of Battery Pensacola. This structure is connected to the main battery structure by two staircases leading from the upper-level walkway up to the battery commander's station (Figure 639). Each staircase consists of nine concrete risers. Steel nosing pieces are present at the front edge of the treads, with some nosing pieces missing. The station is a single room with openings on all four sides. The east and west elevations have door openings, but no doors are present. A window opening extends the length of the south elevation (Figure 640). A window opening is also present on the north elevation (Figure 641).



Figure 639. A concrete stair leading to the battery commander's station from the upper-level walkway.



Figure 640. A window opening along the south side of the battery commander's station.



Figure 641. The north elevation of the battery commander's station.

The roof of Battery Pensacola is constructed of concrete and is generally flat and continuous across the length of the battery (Figure 642). The concrete is covered with the same black, paint-like coating that is visible at the battery walls and slab. Metal hatches cover ventilation shaft openings at four locations on the roof (Figure 643).



Figure 642. The roof of the battery.



Figure 643. Metal hatch at a ventilation shaft opening.

Interior Description

The interior of Battery Pensacola is divided into two main sections, with each interior section associated with an adjacent gun emplacement. The interior spaces include a single level and consist of passages, magazines, and storerooms (Figure 644).

The interior spaces are typically accessed from grade. However, two staircases lead from the west gun emplacement into the lower interior spaces and one staircase leads from the east gun emplacement to the lower interior spaces.

Typical finishes throughout the interior include concrete floors and board-formed concrete walls and ceilings with a white parge coat. Steel I-beams are present in the ceiling of the main battery interior rooms. Rectangular wood members are embedded in the concrete ceiling spanning transverse to the embedded steel beams.

The interior spaces associated with the east gun emplacement at Battery Pensacola consist of a shot room, powder magazine, shell room, multiple storerooms, and an ammunition lift. The shot room is along the north wall of the battery and is connected to the exterior with two door openings. The room has typical finishes, including steel I-beams visible at the ceiling (Figure 645). Two steel I-beam rails used for ammunition transport are anchored to the ceiling I-beams (Figure 646).

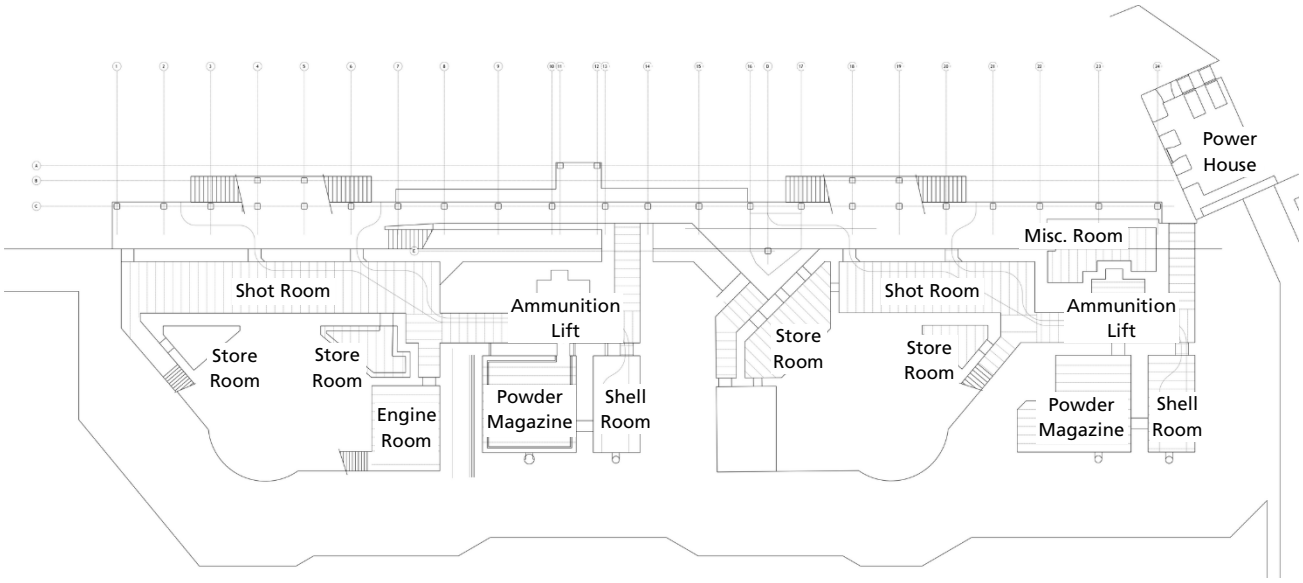


Figure 644. First-floor plan of Battery Pensacola showing locations of interior rooms.



Figure 645. The shot room at the north side of the battery.



Figure 646. Steel I-beam rails used for ammunition transport, anchored to the ceiling I-beams.

East of the shot room is the ammunition lift with a steel hoist, which is set in an alcove directly north of the powder magazine. An opening above the steel hoist leads to the upper level of the battery (Figure 647). A steel railing blocks public access to the steel hoist (Figure 648). The alcove has finishes similar to the other interior spaces (Figure 649).



Figure 647. An opening above the steel hoist.



Figure 648. A steel railing blocks public access to the steel hoist.



Figure 649. The alcove at the steel hoist.

A steel-framed door, which is comprised of metal plates and angles, leads from the adjacent hallway to the shell room (Figure 650). A more robust steel-framed door, composed of sheet metal and steel plates, leads to the powder magazine

(Figure 651). At the south end of the powder magazine is a vent shaft with vertical steel bars and wire mesh covering the opening (Figure 652). A square opening located in the partition wall separating the powder magazine and shell room is covered with horizontal steel bars (Figure 653). Visible from the powder magazine room, brick and concrete masonry units fill the opening beyond the steel bars. The powder magazine has typical finishes, including concrete floors and board-formed concrete walls and ceilings with a white parge coat. Embedded steel I-beams are located in the concrete at the ceiling.



Figure 650. A steel-framed door at the shell room.



Figure 651. The steel-framed door at the powder magazine.



Figure 652. A vent with vertical steel bars and wire mesh covering at the south end of the powder magazine.



Figure 653. A square opening in the partition wall between the powder magazine and shell room.

Directly east of the powder magazine is the shell room. The shell room has typical interior finishes, including concrete floors and board-formed concrete walls and ceilings with a white parge coat. Embedded steel I-beams are located in the concrete at the ceiling (Figure 654). At the south end of the shell room is a ventilation shaft with vertical steel bars and welded wire fabric covering the opening (Figure 655). At the west wall, a square patch of uncoated concrete repair material covers the opening leading to the powder magazine (Figure 656). Two steel I-beam rails run the length of the shell room in the north-south direction below the embedded steel I-beams at the ceiling.



Figure 654. The shell room.



Figure 655. A vent opening at the south end of the shell room.



Figure 656. An infilled opening at the west wall of the shell room.

Below the east gun emplacement but accessed from a separate exterior door is a storeroom and the relocating room. The storeroom is irregular in shape and has two window openings on the exterior wall that are covered with vertical and horizontal steel bars (Figure 657). A steel-framed door composed of steel plates and angles is located at the entrance to the storeroom (Figure 658). A square opening on the east wall of the room is covered with horizontal steel bars (Figure 659). The concrete slab at the perimeter of the storeroom is recessed. Both rooms have typical finishes, including concrete floors and board-formed concrete walls and ceilings with a white parge coat. Embedded steel I-beams are located in the concrete at the ceiling (Figure 660 and Figure 661).



Figure 657. An opening at the exterior wall of the storeroom.



Figure 658. A steel-framed door at the storeroom.



Figure 659. A square opening on the east wall of the storeroom.



Figure 660. The storeroom.



Figure 661. The relocating room.

An additional room, labeled "Misc. Room" on the archival drawings, is located north of the ammunition lift and accessed from the exterior through a steel-framed door on the northwest corner of the room. This room has different construction and interior finishes from other spaces in the battery. The floor is exposed concrete and the walls are board-formed concrete covered with a white cementitious parge coat (Figure 662). Similar to adjacent hallway and room construction, steel I-beams are cast into the concrete ceiling slab with the bottom flange exposed (Figure 663). The concrete cast between the beams is convex in shape (Figure 664). At the southwest corner of the room, an additional steel I-beam was installed below the cast-in steel beams (Figure 665). At this location, the cast-in I-beams terminate approximately 1 foot inboard of the wall (Figure 666).



Figure 662. The interior of the Misc. Room.



Figure 663. Steel I-beams are cast into the concrete ceiling slab with the bottom flange exposed at the ceiling of the room.



Figure 664. The concrete between the I-beams is convex in shape.



Figure 665. An additional steel I-beam below the cast-in steel beams at the southwest corner of the room.



Figure 666. The cast-in I-beams terminate approximately 1 foot inboard of the perimeter wall, where they are supported by the I-beam below.

The main passage associated with the east gun emplacement is accessed from grade at the east end of the battery (Figure 667). The hallway leads to the shell room at the south and extends west leading to the powder magazine, ammunition lift, and shot room. Before reaching the east end of the shot room, the hallway turns southwest and leads to a storeroom as well as a concrete staircase up to the gun emplacement on the upper level of the battery. The storeroom is inaccessible due to an inoperable steel-framed door (Figure 668). Steel I-beam rails for ammunition transport are connected to the ceiling in the portion of the hallway that connects the shell room to the shot room (Figure 669).

The interior spaces associated with the west gun emplacement are laid out similar to those of the east gun emplacement, with a shot room that is directly north of the gun emplacement, an ammunition lift, and a passage that leads to a shell room and powder magazine. These areas are all accessible from grade.

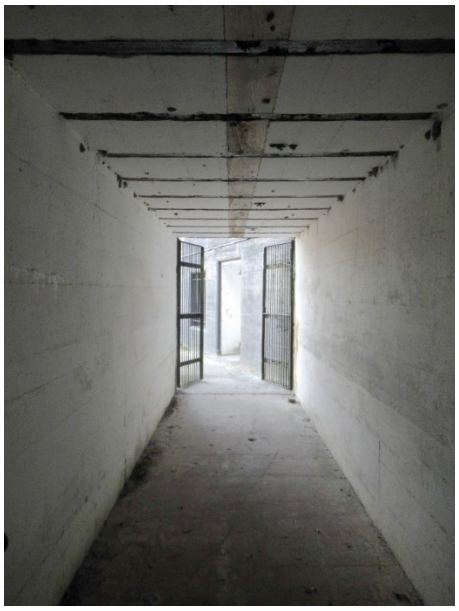


Figure 667. The passage associated with the east gun emplacement.

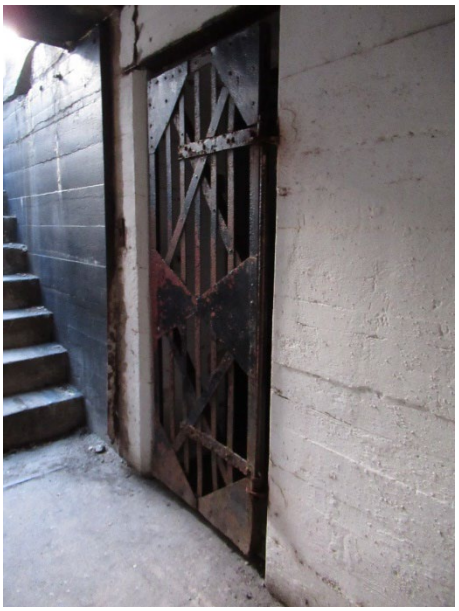


Figure 668. The inoperable steel-framed door to a storeroom.



Figure 669. Steel I-beam rails at the ceiling of the hallway that connects the shell room to the shot room.

The shot room is connected to the exterior by two door openings in the north wall and has typical finishes (Figure 670). The remnants of two steel I-beams for ammunition transport are anchored to the ceiling I-beams. Three door openings along the north wall allow access to the shot room from grade. The westernmost opening is inaccessible due to installed steel bars across the opening. The two east openings each house a metal-framed door consisting of steel bars and plates.



Figure 670. The shot room.

The east end of the shot room leads to a storeroom and the engine room. A 13-inch-deep concrete bench is constructed along the perimeter of the storeroom (Figure 671). A square wall opening in the south wall shows the adjacent engine room. A steel-framed door with vertical steel plates covers the opening to a staircase in the southwest corner that leads to the upper level of the battery

(Figure 672). An embedded steel member is visible at the top of the east wall (Figure 673). The steel member extends from the southeast corner to the midpoint of the east wall. Both rooms have typical finishes, including concrete floors and board-formed concrete walls and ceilings with a white parge coat. Embedded steel I-beams are located in the concrete at the ceiling (Figure 674 and Figure 675).



Figure 671. A concrete bench at the perimeter of the storeroom.

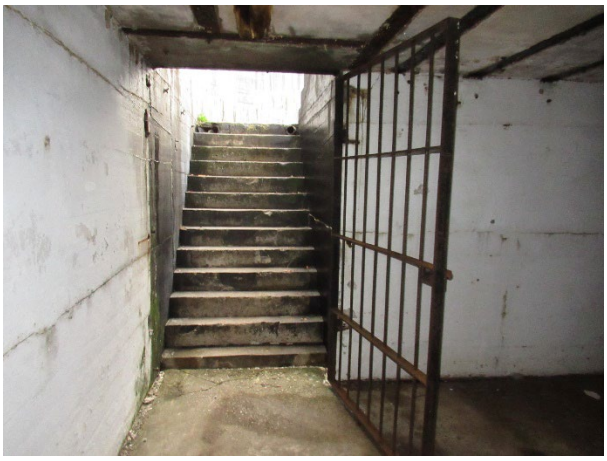


Figure 672. A steel-framed door at the stair to the upper level of the battery.



Figure 673. An embedded steel member at the top of the east wall of the storeroom.



Figure 674. The storeroom.



Figure 675. The engine room.

An additional storeroom is located on the west end of the shot room, as well as a concrete stair leading to the upper level of the battery. The staircase opening is covered with a steel-framed door (Figure 676). The storeroom has typical

finishes, including concrete floors and board-formed concrete walls and ceilings with a white parge coat. Embedded steel I-beams are located in the concrete at the ceiling (Figure 677).

The ammunition lift is located to the east of the shot room. The alcove houses the remnants of a steel hoist set below an opening in the ceiling leading to the upper level of the battery (Figure 678 and Figure 679). A steel railing blocks public access to the steel hoist. The ammunition lift area has typical finishes, including concrete floors and board-formed concrete walls and ceilings with a white parge coat. Embedded steel I-beams are located in the concrete at the ceiling.



Figure 676. The steel-framed door at the staircase opening to the upper level.



Figure 677. The storeroom.



Figure 678. Remnants of a steel hoist in the shot room.



Figure 679. Remnants of a steel hoist in the shot room.

The powder magazine is directly south of the ammunition lift. A steel-framed door with vertical steel plates is present at the entrance (Figure 680). The room has typical finishes and construction including concrete floors and board-formed concrete walls and ceilings with a white parge coat. Embedded steel I-beams are located in the concrete at the ceiling; however, a brick masonry veneer was constructed 9 inches inboard of the original concrete wall (Figure 681). The wall is two brick wythes thick, with ties connecting the masonry to the original concrete wall (Figure 682). An opening on the east wall is obscured by the brick masonry wall (Figure 683). A ventilation shaft in the south wall extends to the battery roof (Figure 684).



Figure 680. A steel-framed door at the entrance to the powder magazine.



Figure 681. The powder magazine.



Figure 682. A masonry tie between the brick and concrete structure.



Figure 683. Brick masonry partially obscures an opening.



Figure 684. A vent in the south wall of the powder magazine extends to the battery roof.

Directly east of the powder magazine is the shell room. Construction includes a concrete floor and board-formed concrete walls with a white parge coat (Figure 685), but the ceiling has been modified with wood tongue-and-groove decking and sawn lumber construction (Figure 686). Steel plate connectors are installed between adjacent members of sawn lumber beams. The wood decking covers most of the shell room ceiling, but a portion near the door opening is covered in exposed metal panels (Figure 687). Two steel I-beams for ammunition transport extend the length of the shell room. They are connected to the ceiling at the outer quarter points of the room. The wood panels are sloped to have high points at the steel rails and low points at the outer edges and center of the room. A vent in the south wall extends to the battery roof (Figure 688). Through-wall metal flashing is present at a height of

approximately 74 inches above the concrete floor (Figure 689).



Figure 685. The shell room east of the powder magazine.



Figure 686. The ceiling of the shell room. Note the tongue-and-groove decking.



Figure 687. Exposed metal panels at the shell room ceiling.



Figure 688. A vent at the south wall of the shell room.



Figure 689. The shell room. Metal through-wall flashing is present near the top of the wall (yellow arrow).

A hallway leads from the exterior of the battery to the shell room and powder magazine (Figure 690). The room has typical finishes, including concrete floors and board-formed concrete walls and ceilings with a white parge coat. Embedded steel I-beams are located in the concrete at the ceiling. The hallway turns west at the shell room and continues to the shot room. The remnants of the steel I-beam rails run the length of this portion of the passage (Figure 691).



Figure 690. A hallway between the exterior of the battery and the shell room and powder magazine.



Figure 691. Remnants of steel I-beam rails at the ceiling (yellow arrows).

The one-story power station is accessible from grade at the east end of the battery. The interior of the building is a single room, with exposed concrete floors and board-formed concrete walls and ceilings with a white parge coat (Figure 692). Two 6-inch-thick concrete equipment pads are present directly in front of the large wall openings on the north wall (Figure 693). Steel anchors and sleeves are cast into the concrete walls and ceiling throughout the room (Figure 694 and Figure 695).



Figure 692. The interior of the power station.



Figure 693. Two concrete equipment pads at the power station.



Figure 694. The ceiling of the power station.



Figure 695. Steel anchors and sleeves at the walls of the power station.

The battery commander's station is the tallest point on Battery Pensacola and is situated at the center of the battery on the north end. The interior space is a single room with openings on all sides. A built-in concrete table, partially supported by steel posts, extends across the full length of the south end (Figure 696). The footprint of the table decreases from top to bottom. A wood panel is attached to the concrete wall in the northeast corner (Figure 697). The interior concrete walls, ceiling, and floor are all covered with a black coating.



Figure 696. A built-in table at the south end of the battery commander's station.



Figure 697. Wood at the wall near the northeast corner of the battery commander's station.

Condition Assessment

Exterior

Concrete

- Horizontal cracks with efflorescence at the concrete walls were observed throughout the exterior of the structure (Figure 698). The cracking typically aligned with apparent concrete pour joints.
- Cracking at the top side of the upper-level floor slab was observed. In some locations, cracks had been routed and sealed and previous concrete repairs were evident (Figure 699). Isolated failed concrete patches were observed (Figure 700).
- Map cracking was observed on the top side of the upper-level floor slab (Figure 701).
- Cracks oriented in the north-south direction were observed on the underside of the upper-level walkway (Figure 702). Efflorescence staining was typical at these cracks.
- Concrete cracks and spalls with exposed steel reinforcement were observed in the concrete supports below the battery commander's station and associated walkway (Figure 703). Corrosion in the exposed steel reinforcement ranged from mild to severe surface corrosion with section loss (Figure 704). Isolated

locations of spalled concrete had been re-coated (Figure 705).

- Cracking at the top surface of the roof level was observed (Figure 706). Isolated cracks had been routed and sealed.
- Diagonal cracks in the edge beams supporting the upper-level walkway were noted typically at column-bearing locations (Figure 707).
- Spalled concrete at stair risers was observed at multiple locations. (Figure 708 and Figure 709).
- Spalled concrete at the concrete beams, columns, and slabs was prevalent in the 1909 reinforced concrete construction, with exposed steel reinforcement (Figure 710 through Figure 712).
- Spalled concrete along the length of the north perimeter wall was observed where the original and 1909 construction interface (Figure 713). Concrete patch repairs were previously completed at most locations.
- The exposed reinforcement at spalled concrete generally exhibits varying levels of corrosion.
- Exposed reinforcement with severe corrosion is located at the corbel elements supporting the walkway leading to the commander's station, as well as the walkway itself. Exposed reinforcement exhibited section loss and flaking corrosion product (Figure 714 and Figure 715). At the corbels, cracks were observed along the length of embedded reinforcing steel (Figure 716).
- Areas of delaminated concrete in the top side of the 1890s-era concrete slab were discovered through hammer sounding and the use of nondestructive evaluation. See Appendix B.
- The gun emplacements were partially filled with sand and vegetation (Figure 717). Cracks were noted in the stairs leading into the gun emplacements, and multiple stair treads had previously been repaired with concrete (Figure 718).
- Faded and deteriorated coating was observed throughout the concrete surfaces of the battery (Figure 719 through Figure 721).
- One isolated shallow spall was observed at the top surface of the roof, adjacent to the west gun emplacement (Figure 722).
- Failed sealant at sawcut joints in the roof was typically observed (Figure 723).
- Failed bituminous material was observed at isolated locations on the roof (Figure 724). This condition was typically seen at previously repaired cracks.
- Vegetation is present throughout the structure, particularly at the roof level, in the gun emplacements, and at cracks in the concrete walls (Figure 725 and Figure 726). Biological growth was observed at cracks and lift lines in the concrete walls throughout the structure (Figure 727).
- Isolated vertical cracks at the top of the wall were noted at the power station on the east facade (Figure 728).



Figure 698. Horizontal cracks with efflorescence at the concrete walls.



Figure 699. Cracks at the top side of the upper-level slab have been routed with sealant installed.



Figure 702. Cracks on the underside of the upper-level walkway.



Figure 700. Failed concrete patches at the top side of the battery.



Figure 703. Concrete cracks and spalls in the concrete supports below the battery commander's station and associated walkway.



Figure 701. Map cracking on the top side of the upper-level floor slab.



Figure 704. Corrosion at exposed steel reinforcement (yellow arrow).



Figure 705. Spalled concrete that was re-coated (yellow arrow).



Figure 706. Cracking at the top surface of the roof.



Figure 707. Diagonal cracks in the edge beams supporting the upper-level walkway.



Figure 708. Spalled concrete at stair risers.



Figure 709. Spalled concrete at stair risers.



Figure 710. Spalled concrete at the concrete beams in the 1909 reinforced concrete construction, with exposed steel reinforcement.



Figure 711. Spalled concrete at the concrete columns in the 1909 reinforced concrete construction, with exposed steel reinforcement.



Figure 712. Spalled concrete at the concrete slabs in the 1909 reinforced concrete construction, with exposed steel reinforcement.



Figure 713. Spalled concrete along the length of the north perimeter wall, where the original and 1909 construction interface.



Figure 714. Exposed corroded reinforcing steel on underside of slab of walkway leading to battery commander's station.



Figure 715. Exposed corroded reinforcing steel at corbel supporting walkway leading to battery commander's station.



Figure 716. Crack along embedded steel reinforcement.



Figure 717. The gun emplacements are partially filled with sand and vegetation.



Figure 718. Previous concrete repairs at multiple stair treads.



Figure 719. Faded and deteriorated coating.



Figure 720. Faded and deteriorated coating.



Figure 721. Faded and deteriorated coating.



Figure 722. A shallow spall at the top surface of the roof, adjacent to the west gun emplacement.



Figure 723. Failed sealant at sawcut joints in the roof.



Figure 724. Failed bituminous material on the roof.



Figure 725. Vegetation at cracks at the roof level.



Figure 726. Vegetation at cracks in the concrete walls.



Figure 727. Biological growth at cracks in the concrete walls.



Figure 728. Biological growth at a concrete wall.

Steel

- Remnants of metal awnings are anchored to the north side of the power station (Figure 729). The remaining portion of the

awning exhibits severe corrosion with areas of full section loss.

- Corrosion with section loss of the steel lintels above door openings was typically observed (Figure 730).
- Corrosion with areas of full section loss was noted at the steel surrounding the ammunition exits on the upper level of the battery (Figure 731).
- Mild surface corrosion at embedded anchors in the concrete walls was typically observed near the gun emplacements (refer to Figure 635).
- Railings throughout the battery exhibited full and partial section loss, primarily at the base of the guardrail posts (Figure 732).
- Chipped and deteriorated paint was noted at railings throughout the battery (Figure 733).
- Isolated railing baseplates and horizontal members had been previously replaced.
- Corrosion with partial to full section loss was present at the remnants of the steel I-beams used as ammunition transport that extend from the shot rooms below both the east and west gun emplacements (Figure 734).
- Remaining steel bars or doors throughout the battery exhibited corrosion or deformation (Figure 735 and Figure 736).
- Corrosion with section loss was observed at steel nosing pieces of concrete stairs, where present (Figure 737). Corrosion staining of the concrete was typically observed at these locations. The steel nosing is missing in some locations.



Figure 729. Remnants of metal awnings at the north side of the power station.



Figure 730. Corrosion with section loss of the steel lintels above a door opening (yellow arrow).



Figure 731. Corrosion with areas of full section loss at the steel surrounding the ammunition exits on the upper level of the battery.



Figure 732. Full and partial section loss at the base of a guardrail post.



Figure 733. Chipped and deteriorated paint as observed at railings throughout the battery.



Figure 734. Corrosion with section loss at the remnants of the steel I-beams extending from the shot rooms below both the east and west gun emplacements.



Figure 735. Corrosion at steel bars.



Figure 736. Deformation of steel bars at the power station.



Figure 737. Corrosion with section loss at steel nosing pieces of concrete stairs.

Interior

- Severe corrosion at ammunition hoists with areas of full section loss was observed (Figure 738). More extensive deterioration

was present at the hoist associated with the west gun emplacement.

- Surface corrosion with partial or full section loss at exposed portions of the steel I-beams at the underside of concrete slabs was observed (Figure 739). Deterioration is more extensive at rooms associated with the west gun emplacement.
- Surface corrosion with partial or full section loss at the steel I-beam rails was observed (Figure 740). Deterioration is more extensive at rooms associated with the west gun emplacement.
- Graffiti was observed throughout the interior walls of the structure (Figure 741 and Figure 742).
- Staining and biological growth were observed throughout the interior spaces (Figure 743 and Figure 744). The staining includes efflorescence at the walls and ceiling.
- Ponding water was noted at the south end of the powder magazine associated with the west gun emplacement (Figure 745).
- Cracks in the concrete walls and floors were observed throughout the structure, including the concrete patch in the east shell room (Figure 746); the west shot room (Figure 747); and outside the center storeroom (Figure 748).
- Faded and peeling wall coating was typical throughout the interior spaces (Figure 749 and Figure 750).
- Deteriorated wood members were observed throughout the ceiling structure (Figure 751).
- Corrosion with areas of full section loss was noted at the bottom of the steel-framed door leading from the shell room to the west gun emplacement (Figure 752).
- Spalls and delaminated concrete were observed at isolated locations. This includes the easternmost hallway leading to the east shell room and the window opening in the central storeroom (Figure 753 and Figure 754).
- Delaminated concrete and an overhead incipient spall were observed at the shell room associated with the west gun emplacement (Figure 755 and Figure 756). The overhead incipient spall is located above the easternmost doorway on the north wall. The project team informed NPS on site that overhead incipient spalls could be a potential safety hazard.



Figure 738. Severe corrosion at ammunition hoist, with areas of full section loss.



Figure 739. Surface corrosion with section loss at exposed portions of a steel I-beam.



Figure 740. Surface corrosion with section loss at the steel I-beam rails. Note the center rail appears cut off.



Figure 741. Graffiti at an interior wall of the battery.



Figure 742. Graffiti at an interior wall of the battery.



Figure 743. Staining and biological growth.



Figure 744. Staining and biological growth.



Figure 745. Ponding water at the south end of the powder magazine associated with the west gun emplacement.



Figure 746. A crack in the concrete patch in the east shell room.



Figure 747. A crack at the west shot room. Note the water staining and biological growth.



Figure 748. Cracked concrete outside the center storeroom.



Figure 749. Faded and peeling wall coating. Note the water staining at the walls.



Figure 750. Faded and peeling wall coating.



Figure 751. Deteriorated wood members at the ceiling.



Figure 752. Corrosion with areas of full section loss at the bottom of the steel-framed door leading from the shell room to the west gun emplacement.



Figure 753. Spalled and delaminated concrete.



Figure 754. Spalled and delaminated concrete at a window opening.



Figure 755. Delaminated concrete and an overhead incipient spall at the shell room associated with the west gun emplacement.



Figure 756. Delaminated concrete at the shell room associated with the west gun emplacement.

Mine Casemate Building

The mine casemate building was constructed in 1905–1907 directly north of Bastion E, in the former dry moat (Figure 757). The building is approximately 35 feet by 24 feet in plan. The west portion of the building is approximately 10 feet 6 inches tall, while the east portion is approximately 14 feet 6 inches tall.



Figure 757. The mine casemate building, view from northwest.

The one-story building sits on a concrete foundation and has brick masonry walls. The concrete foundation projects slightly from the masonry walls above. Typical windows on the east end of the building are eight-over-eight wood double-hung windows with painted stone lintels and projecting sills (Figure 758). The windows on the east end of the building were moved vertically upward when this portion of the building was raised in the 1920s. Although alterations have been made to windows throughout the building, including the addition of louvers, it is not known when these modifications were made or if the present windows are original.

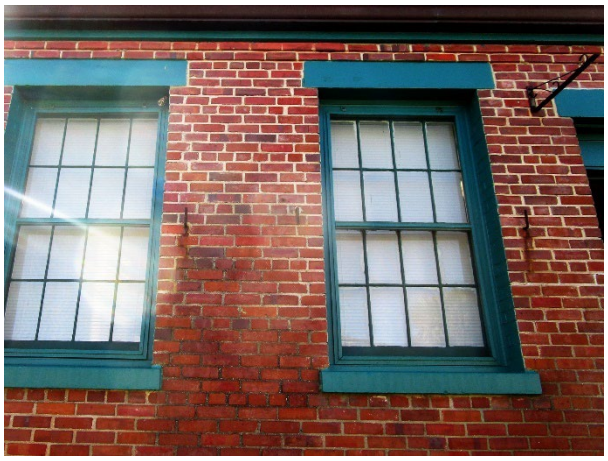


Figure 758. Typical windows at the east end of the mine casemate building.

The roof at the west end is a shallow hipped standing-seam metal roof (Figure 759). The east end has a shallow gable standing-seam metal roof. Metal gutters and downspouts line the perimeter of the roof. A chimney extends above the roof along the south edge of the building.



Figure 759. The roof of the mine casemate building.

The west elevation of the building features two fixed windows evenly spaced across the elevation (Figure 760). Each window features a twelve-light upper sash with louvers at the lower sash. A circular hole in the brick facade is present at the center of the elevation, exposing concrete masonry units beyond.



Figure 760. The west elevation of the mine casemate building.

The east end of the north elevation is raised above grade approximately 4 feet and consists of two typical windows and a double door (Figure 761). When the east end of the building was raised in the 1920s, the windows and doors were raised as well, with the original openings filled in. (Figure 762) The doors are contemporary units that mimic the appearance of a six-panel door. A double brick stair leads from grade up to the doors at the east end of the north elevation (Figure 763). The stairs consist of a header course at the treads atop a running bond course. A concrete slab is present at the landing atop the stair. A metal railing lines the north side of the stair.



Figure 761. The north elevation of the mine casemate building.



Figure 762. The windows were raised at the east end of the building. Note the different brick below the windows.



Figure 763. The double stair at the east end of the north elevation.

The west end of the north elevation contains a door opening at the far west, with another door near the center of the elevation and a window centered in between (Figure 764). A second window is located adjacent to the brick stair (Figure 765). The window is a six-over-six double-hung wood window. The center door is a wood six-panel unit. The door opening at the west end is accessible by a wood ramp. The window to the east of the door opening features a twelve-light upper sash with louvers at the lower sash (Figure 766).

The east elevation consists of two typical windows, equally spaced (Figure 767).



Figure 764. The west end of the north elevation.



Figure 765. A window and door near the center of the north elevation.



Figure 766. The window at the west end of the north elevation.



Figure 767. The east elevation of the mine casemate building.

The south elevation of the mine casemate building is approximately 4 feet away from the north wall of Bastion E of Fort Pickens. Five window openings line the south elevation.

The interior of the mine casemate building contains restrooms at the west end, with the remainder of the building used for storage. The restrooms were added between 1949 and 1971, when the property was a state park. The restrooms are accessed through the doorway at the west end of the north elevation. The doorway leads to a small vestibule that provides access to the men's and women's restrooms as well as to a small janitor's closet (Figure 768). Finishes in the two restrooms and vestibule are similar, with 12-inch-square tile flooring and matching tile at the bottom half of the walls (Figure 769). Painted gypsum board is present at the upper portion of the walls and ceiling (Figure 770). Doors are flat panel metal doors. Contemporary lighting and plumbing fixtures are present in both restrooms. The janitor's closet, accessed from the vestibule, is an unfinished space, with exposed concrete masonry unit walls and concrete floor (refer to Figure 768).



Figure 768. The small vestibule that leads to the restrooms. Note the janitor's closet at center.



Figure 769. The women's restroom.



Figure 770. The men's restroom.

East of the restrooms is a two-room storage area. Finishes in the room include exposed concrete masonry unit wall at the west and exposed brick walls at the north, south, and east (Figure 771 and Figure 772). The ceiling is exposed wood framing with plywood and gypsum board in some locations. The underside of the wood plank roof deck is visible beyond the wood framing (Figure 773). A plywood-clad wall divides the storage area (refer to Figure 772). Centered on the wall between the two rooms of the storage areas is a six-panel wood door (Figure 774). A brick chimney projects from the south wall of the storage area (Figure 775).



Figure 771. The storage room at the center of the building.



Figure 772. The storage room at the center of the building.



Figure 773. The underside of the wood plank roof deck.



Figure 774. The door between the two storage rooms.

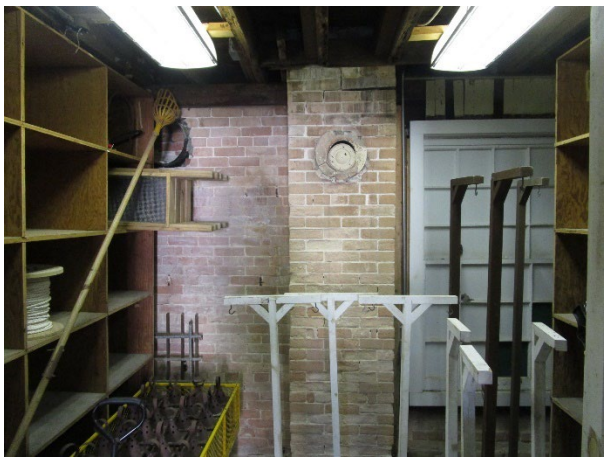


Figure 775. The brick chimney at the south wall of the storage area.

At the east wall of the storage area is an infilled door opening (Figure 776). The door likely led to the east portion of the building before it was raised. A stone lintel is present atop the wood-framed opening.



Figure 776. The infilled former door opening at the east wall of the storage area.

A second storage area is located at the east end of the building and is accessed through the double door at the top of the stair. Typical finishes in the room include horizontal wood tongue-and-groove siding, carpet flooring, paneled ceiling, and wood trim at doors and windows (Figure 777 through Figure 779).These finishes likely date to the state park era, when the restrooms were added.



Figure 777. The east storage room.



Figure 778. The east storage room.



Figure 779. The east storage room.

A small mechanical closet is located in the southwest corner of the space (Figure 780). A louvered wood door leads into the closet, which contains a mechanical unit.



Figure 780. The small mechanical closet at the southwest corner of the east storage room.

Condition Assessment

- The inner concrete masonry unit wall at the west elevation is visible through a circular opening in the masonry at the top of the wall (Figure 781). It is not known if the concrete masonry units date to the mid-twentieth century when the restrooms were added to the building, or if they are a more recent addition. Given the regular appearance of the opening at the brick masonry, a vent may have been present at this location previously.
- Cracking and deteriorated mortar was noted at the brick masonry walls. This condition was most prevalent at the base of the walls (Figure 782).
- Cracked brick masonry units were noted in isolated locations. This condition was observed adjacent to window and door openings (Figure 783).
- Cracked mortar joints and displaced brick masonry units were noted at the top of the brick chimney at the interior of the building (Figure 784).



Figure 781. The inner concrete masonry unit wall at the west elevation is visible at an opening in the masonry at the top of the west facade.



Figure 782. Cracking and deteriorated mortar at the base of the brick masonry walls.

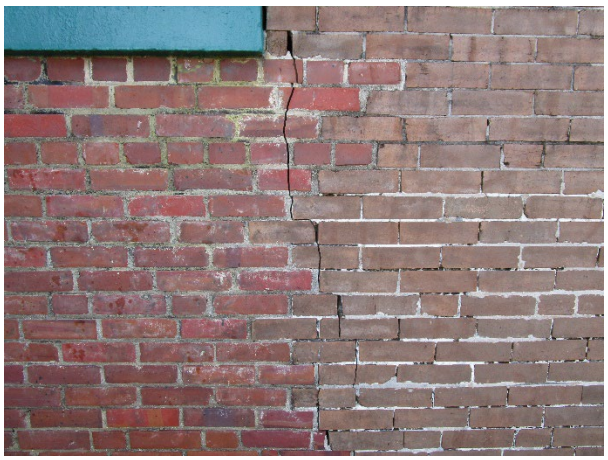


Figure 783. Cracked brick masonry below a window sill.



Figure 784. Cracked mortar joints and displaced brick masonry units at the top of the brick chimney in the storage area near the center of the room.

Igloo Magazine

The igloo magazine, constructed in 1943, sits north of the Fort Pickens counterscarp. Built to support munitions storage associated with Battery Payne to the west, the building is set within the glacis at the exterior side of the counterscarp (Figure 785).

The exterior of the igloo magazine consists of a concrete facade, trapezoidal in shape, approximately 30 feet wide and 9 feet 6 inches tall (Figure 786). The north elevation is board-formed concrete with beveled edges. A concrete and steel-framed door set within a concrete frame is present at the center of the north elevation. The rear of the magazine is covered by earthen fill and consists of corrugated metal walls on a concrete slab. A concrete chimney is present at the south end of the structure.



Figure 785. The igloo magazine, view from northwest.



Figure 786. The north elevation of the igloo magazine.

The interior of the magazine is cylindrical in section with a flat floor. The east and west walls and ceiling are composed of corrugated metal panels with screws at joints between panels (Figure 787). The metal panels rest on a concrete curb at the concrete floor. The north and south walls of the magazine are concrete (Figure 788). A gutter is present in the concrete floor at the base of both the east and west walls (refer to Figure 788).

The igloo magazine is currently used to store black powder used for demonstrations by park staff.



Figure 787. The interior of the igloo magazine.



Figure 788. The interior of the igloo magazine. Note that the metal panels rest on a concrete curb at the concrete floor.

Condition Assessment

- Corrosion was noted at screws along the top of the interior of the igloo magazine (Figure 789). Corrosion was also noted at the interior walls of the structure, typically where

the corrugated metal panels meet (refer to Figure 787).

- Minor spalling was noted at the concrete floor and curbs at the interior of the structure (Figure 790).



Figure 789. Corrosion at screws along the top of the interior of the igloo magazine.



Figure 790. Minor spalling at the concrete floor and curbs at the interior of the structure.

Structural Analysis

As part of this study, WJE collected field measurements, conducted limited non-destructive evaluation, and completed inspection openings, with assistance from NPS personnel, to review the condition of selected structural components in support of a structural analysis. The findings of the analysis are included in Appendix B.

Methodology

Section strength was evaluated for minimum loadings and load combinations per the requirements of the current governing code, the 2023 Florida Building Code, which references the following standards: American Society of Civil Engineers "Minimum Design Loads for Buildings and Other Structures" dated 2016 (ASCE 7-16), and The Masonry Society "Building Code for Masonry Structures" dated 2016 (TMS 402-16). The Florida Building Code references the same standards as the International Building Code, with more stringent requirements for wind load design. Due to the limitations of the assessment, the effective strength has been evaluated with the observed as-built reinforcement.

Assumed material properties and reinforcement detailing were used for portions of the analysis due to the limited scope of the assessment. Assumptions are both inferred from observed conditions and based on available information for commonly available construction materials contemporary with the building's construction.

Findings

Fort Pickens

The section strength of a masonry arch spanning over a typical casemate was evaluated for gravity loading. The typical masonry arch was evaluated, on a per foot basis, using RISA 3D, a commercially available software for structural analysis and design. The structural model was used to determine the resulting stresses along the span of the arch, as well as reactions at the load-bearing masonry walls between casemates. The combined applied axial and flexural stresses were subsequently compared to maximum allowable stresses of the historic masonry. The analysis results demonstrated that the typical masonry arch has adequate strength to meet the gravity load demand, based on the assumptions summarized in Appendix B.

The section strength of an exterior masonry wall at the tower bastion was evaluated for gravity and lateral loading. The exterior masonry walls are

cantilevered and independent of the perpendicular masonry walls and masonry arches. Also, the infill soil above some arches is laterally restrained by a short masonry wall built above the arches, independent of the exterior masonry walls. Hence, the gravity and lateral loading that the exterior masonry walls experience is limited to its self-weight and wind pressure. The combined applied axial and flexural stresses were compared to the code-permitted allowable stresses of the masonry. The as-built construction of the exterior masonry wall is adequate to meet the gravity and lateral load demand, based on the above assumptions.

Battery Pensacola

At six representative locations, individual components of the battery were evaluated for minimum loading per the requirement of the current governing code.

The typical upper-level floor slab was evaluated for gravity loading. The 36-inch-thick upper-level floor slab is composed of an unreinforced concrete slab with 9-inch-deep hot rolled I-shape steel beams embedded at the base of the slab at 2 feet on center. The floor slab was analyzed as a one-way slab spanning in the direction parallel to the steel beams. The steel and concrete elements were analyzed as a composite section (i.e., the concrete and the steel beams that reinforce it work together to resist the full gravity loading). With the assumed material properties and loading, the floor slab was found to meet current code requirements for flexural and shear strengths.

The upper-level floor edge beam of the north addition was evaluated for gravity loading. The reinforced concrete beam was evaluated as simply supported, spanning between edge columns. Due to the lack of conventional stirrups in the member, only concrete capacity was considered in the shear capacity of the member. With the assumed material properties and loading, the edge beam was found to meet current code requirements for flexural and shear strengths.

A first-floor column, second-floor column, and battery commander's station column were evaluated for gravity loading. As these members are not part of the lateral-load-resisting system of the battery, lateral wind loading was not applicable for this analysis. Structure Point Column (SPC), a commercially available column modeling and design software package, was utilized for the column analysis. The analysis demonstrated that the columns have adequate strength to meet the demand, based on the assumptions above.

The battery commander's station north wall was assessed for general wind loading (including hurricanes). Location, terrain, size of structure, and developed wind speeds are among the factors used in determining the wind loads. The north concrete wall is found to have adequate flexural strength to resist lateral wind loads (imposed by hurricane), based on the assumptions above.

Conclusions

Fort Pickens

Mass masonry walls and arches are typical of fortification construction during this era. This system relies on net compressive stresses in load-bearing elements to transfer lateral and gravity load to foundations. Generally, tensile stresses in mass masonry structures would be expected to be minimal because masonry has a low tensile capacity without steel reinforcement. Cracked mortar joints and bricks are a sign of tensile strain developing in masonry. It is particularly critical that masonry arches remain in compression across their span to prevent an unstable overhead condition. Cracks perpendicular to and on the underside of the span of the arch are indicative of tensile strain in the arch. This type of cracking was seen in limited locations at the east end of the southeast scarp and at an arch at Bastion B. A typical masonry arch at the fort was analyzed for its observed gravity loading conditions, which includes self-weight and, conservatively, a full overburden load. With conservative assumptions made regarding material property, the analysis demonstrated that the masonry arch was in net compression and adequate to meet load demand. Only symmetrical loading of the masonry arch was considered, which is traditionally the optimal way to load an arch because it produces the lowest

tensile stresses. Non-symmetrical loading, such as infill installed above partial span of the arch, may lead to larger stresses in the masonry arch and is not recommended. The presence, if any, of this condition should be confirmed.

A combined gravity and lateral load analysis on a typical exterior masonry wall was completed. Components and cladding wind forces were used to assess this component of the structure. Based on commentary in ASCE7-16, a basic wind speed of 152 miles per hour for a Risk Category II structure corresponds to a 700-year return period and a Saffir-Simpson Hurricane Category 4. In areas adjacent to Fort Pickens, new structures are designed in accordance with this standard to resist wind loads from a Category 4 hurricane with minimal structural damage due to wind pressures. The representative exterior masonry wall of the fort was evaluated using the same new design standard, which exceeds any wind speed historically recorded from previous hurricanes at this location. The exterior masonry wall was found to be sufficient to resist such loads.

Given the height, geometry, and stiffness of the main structural components comprising Fort Pickens, which include historic masonry walls and arches, structural analysis of these components suggests that significant damage is unlikely to occur to the main structural elements in a high wind event, based on the assumptions made above and the as-built conditions observed. However, any brick masonry distress and deterioration should be repaired.

Based on the findings of the analysis, further material study and additional analysis is not necessary.

Battery Pensacola

Numerous individual components of the battery, including beams, columns, slabs, and walls, were evaluated and found to be structurally adequate to meet current code requirements. The unreinforced mass concrete walls of the original battery construction are inherently sufficient to resist structural loading demands due to their thickness, geometry, and stiffness. Findings of the visual assessment also show no significant structural deficiencies in the unreinforced mass concrete components of the battery. It is reasonable to suggest that significant damage is unlikely to occur to the battery in an extreme weather event. However, consideration should be given further evaluating and addressing isolated areas of distress, including corroded embedded steel. Corrosion of embedded steel may reduce the strength of the concrete elements. If left unaddressed, corrosion typically reduces the durability of a concrete element by producing additional cracking and spalling, and may compromise the capacity of the element.

The portions of the battery with embedded steel bars exhibited areas of distress in the form of cracks, spalls, and corroded embedded steel. Areas constructed of concrete with embedded steel reinforcing bars are limited to the 1900s addition to the north side of the battery. Corrosion of varying severity was observed in the exposed reinforcing bars, with the most severe corrosion observed at the corbels supporting the walkway leading to the battery commander's station, and the underside of the walkway. During the site visit, the walkway was closed due to distress at the stairs. The walkway should be kept closed until a detailed evaluation is performed to understand the corbel and walkway construction and the condition of the corroded reinforcing. Additionally, concrete deterioration and distress should be repaired.

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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 Park Service's 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.[124]

The significance evaluation identifies the important historical associations of the property, and comments on its architectural, archeological, and social value as they relate to 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:

> The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:
>
> A. That are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> B. That are associated with the lives of persons significant in our past; or
>
> C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> D. That has yielded, or may be likely to yield, information important in prehistory or history.[125]

In addition, the Criteria for Evaluation identify Criteria Considerations that address 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—but which will qualify for the National Register if they fall within certain categories. The Criteria Considerations do not pertain to this property, thus are not further discussed here.[126]

124. National Park Service, "National Register of Historic Places," accessed April 12, 2022, https://www.nps.gov/subjects/nationalregister/index.htm.
125. *Code of Federal Regulations*, Title 36, Part 60, "The National Register Criteria for Evaluation."
126. National Park Service, "National Register of Historic Places."

National Register Significance Evaluation

National Register Status

Fort Pickens—the masonry fortification constructed in 1829–1834—was listed in the National Register on May 31, 1972 (NRIS no. 72000096). The nomination indicates that Fort Pickens is significant in the area of Military History and cites its role as a federal fort during the Civil War, as well as its post-Civil War use as a prison.[127]

Other resources in the vicinity of the fort that postdate the circa 1830 masonry fortifications, including Battery Pensacola, were not addressed in the 1972 nomination. A draft nomination was prepared in 1977 for a Fort Pickens historic district to address the collection of coastal defense structures on western Santa Rosa Island, including structures developed as part of the Endicott System and later engineered features. However, the 1977 draft nomination was never completed.[128]

A National Register nomination for a historic district comprising the Pensacola Harbor Defense Project on Santa Rosa Island was completed in 2016. The Pensacola Harbor Defense Project was listed in the National Register of Historic Places on May 15, 2017 (NRIS no. 100000992). The historic district is nationally significant for its association with a large and complex system of surviving coastal defense structures that illustrates decades of evolving military engineering designed and constructed to protect American shores from enemy attack and invasion. The property possesses one of the most extensive collections and greatest concentrations of coastal defense structures in the United States. The nomination listed sixty-nine contributing resources, including the previously listed Fort Pickens, and thirty-one non-contributing resources. The historic district is significant under National Register Criteria A and C, and in the areas of significance of Architecture, Engineering, and Military History.[129] The Pensacola Harbor Defense Project nomination addresses Fort Pickens, Battery Pensacola (including battery commander's station), mine casemate building, and igloo magazine, as further discussed below.

Related coastal defense features located on Perdido Key, including three Endicott-era batteries and associated structures, were listed in the National Register of Historic Places in 1980 (Perdido Key Historic District, NRIS No. 80000404).[130] The Naval Live Oaks Reservation in Gulf Breeze, Florida, was listed in the National Register in 1998 (NRIS No. 64500092).[131]

National Register Significance of Fort Pickens

The following assessment of significance of Fort Pickens pertains to the study area of this HSR, within which are five structures assessed to be contributing to the Pensacola Harbor Defense Project historic district: Fort Pickens (the nineteenth-century masonry fortifications);

127. Randy F. Nimnicht, Historic Preservationist, Division of Archives, History and Records Management, Florida Department of State, *Fort Pickens National Register of Historic Places Nomination Form*, March 10, 1971. Entered into the National Register, May 31, 1972.
128. Anne Castellina-Dudley, Historian, Gulf Islands National Seashore, *Fort Pickens Historic District National Register of Historic Places Nomination Form*, draft, May 27, 1977.
129. Deborah Slaton, Liz Sargent, Tim Penich, and Andi Mele, *Pensacola Harbor Defense Project National Register Nomination,* August 26, 2016, entered into the National Register, May 15, 2017. (Assessment of archeological resources for significance under Criterion D was not a part of this nomination.)
130. Anne Castellina-Dudley, *National Register Nomination: Perdido Key Historic District* (Gulf Breeze, Florida: National Park Service, 1979), entered in the National Register, March 10, 1980.
131. Norma Harris, Research Associate, reviewed by Judith A. Bense, University of West Florida Archeology Institute, Pensacola, *National Register Nomination: Naval Live Oaks Reservation* (Gulf Breeze, Florida: National Park Service, 1998), entered in the National Register, September 28, 1998.

Battery Pensacola; the battery commander's station erected on the platform of Battery Pensacola; the mine casemate building (Building 9), and the igloo magazine.[132] Other resources associated with Fort Pickens and Battery Pensacola were assessed in the Pensacola Harbor Defense Project nomination to be non-contributing as they postdate the period of significance established for the historic district. These include the concrete walks leading to and within the fort; wood post-and-rail fencing; wayside exhibits; the flagpole; and artillery exhibits. (See further discussion of the period of significance, below.)

Fort Pickens and Battery Pensacola are nationally significant under Criterion A in the area of Military History, and under Criterion C in the area of Engineering, as further discussed below.[133]

Criterion A Significance

Military History

Following the War of 1812, which revealed the weakness of American shoreline defenses as represented by the Second System of fortifications, the U.S. Army began to develop a new defensive network known as the Third System. The new fortifications associated with the system would house advanced armaments within a comprehensive collection of fortifications placed strategically along the United States coastline.

In 1816, Congress appropriated more than $800,000 for construction of Third System defenses. President James Madison appointed a Board of Engineers for Seacoast Fortifications, which visited potential sites and prepared plans for the new works. After Florida was transferred to the United States, the federal Board of Engineers in 1821 included the newly acquired stretch of coastline in its planning. The board's first report, published in the same year, suggested a chain of forts to stretch from Maine to Texas.

Pensacola Bay was selected as the principal naval depot along the Gulf Coast due to its deep-water harbor. The western end of Santa Rosa Island was chosen as the site for the first of these fortifications, Fort Pickens, named in honor of Revolutionary War hero Maj. Gen. Andrew Pickens (1739–1817). Additional forts were planned for other strategic locations, including Fort Barrancas, constructed 1839–1844, overlooking the entrance to Pensacola Bay north of Fort Pickens, and Fort McRee, constructed 1834–1839, west of Santa Rosa Island, on the eastern edge of Perdido Key.

Construction of Fort Pickens began in late May 1829 and was completed by early October 1834. The new Third System fortification remained in federal control throughout the Civil War, despite repeated threats from Confederate attack. During the war, however, changes in ordnance—particularly new rifled artillery—made masonry fortifications vulnerable to destruction. In the April 10, 1862, attack on Fort Pulaski near Savannah, Georgia, rifled cannon repeatedly breached the masonry walls and caused extensive damage, leading to Confederate surrender. Fort Pickens, however, was not attacked by the Confederates in this way, and remained operational throughout the war.

Following the Civil War, work continued on Fort Pickens until 1869. The forts protecting Pensacola Harbor continued to be at least minimally maintained for many years, with guns mounted at

132. The Pensacola Harbor Defense Project National Register nomination addresses Battery Pensacola and the battery commander's station as two separate resources, while the scope of this HSR treats the battery commander's station as part of Battery Pensacola.

133. The Pensacola Harbor Defense Project National Register nomination also cites the area of significance, Architecture, for the surviving collection of early twentieth-century U.S. Army post architecture that supported the housing, storage, maintenance, and administration needs of those stationed on Santa Rosa Island, which represent the range of building types used to manage a post community. The area of significance, Architecture, does not pertain to the masonry fortification and Battery Pensacola and is therefore not addressed here.

several forts during the *Virginius* incident, a diplomatic dispute between the United States, Great Britain, and Spain, in 1874. Repairs and modifications continued to be made at Fort Pickens into the 1890s, when the fort was adapted for new purposes in support of the Endicott plan.

The Endicott System of coastal defenses was envisioned by the Endicott Board, a federal body authorized by the U.S. Congress and appointed by President Grover S. Cleveland in 1885 to consider comprehensive coastal defense needs. The board was named for its head, Secretary of War William Crowninshield Endicott (1826–1900). The system was designed to ensure that coastal areas of the United States were not vulnerable to attack, particularly from European powers that had significantly advanced their military weaponry capabilities during the 1870s and 1880s.

The report of the Endicott Board recommended an extensive program of coastal defense improvements that included construction of permanent fortifications in association with twenty-seven ports, all with modern armaments, and also entailed strengthening existing fortifications. Although the board's plans were never fully implemented, twenty-six Endicott installations were constructed or modified between 1890 and 1910 based on the board's recommendations, including six constructed specifically as a result of the war with Spain in 1898. The Endicott period defenses at Pensacola Bay, including those at Fort Pickens, are significant as one of the only coastal fortification systems in the United States to survive intact from the Spanish-American War era, and reflect the vision of the Endicott Board as partially implemented during the 1890s.

In addition to the Endicott batteries constructed on western Santa Rosa Island, harbor defenses were updated at the request of Secretary of War William Howard Taft during the administration of President Theodore Roosevelt, specifically to address the emerging threat of torpedo boats. Other additions included plotting rooms to improve precision firing, as well as electrical systems. As attack by aircraft emerged as a threat during World War I, the Army retrofitted existing batteries with anti-aircraft guns and installed searchlights for night lighting. Batteries with longer range guns were also constructed to defend against naval armament advances. During World War II, additional batteries and battery commander stations/coincidence range finder towers were constructed, and existing Battery Langdon was casemated in response to the threat of attacks by air. At the end of World War II, atomic weapons made the defense systems at Santa Rosa Island obsolete, and the military post was deaccessioned.

Criterion C Significance

Engineering

Fort Pickens is an example of a Third System fortification constructed with pre-Civil War military engineering capabilities. Many Third System forts were massive brick and stone structures designed to be part of a permanent, integrated, and organized coastal defense system. At the time, they were considered by American military engineers to be state of the art and capable of repelling most enemy attacks.[134]

Construction of Fort Pickens began in late May 1829 and was completed by early October 1834. Access to the site and delivery of construction materials occurred via boats that docked at the so-called Engineers' Wharf, a structure completed on the north side of the island by 1828. The new fortification was constructed of brick masonry in a pentagonal shape, with walls 40 feet high and 12 feet thick. Fort features included protected passageways, a ditch, and flanking outerworks. Built to accommodate the emplacement of more than 200 artillery pieces, the fort was designed to fire on all potential enemy avenues of approach. The lower walls were punctuated with openings in bomb-proof casemates for artillery, while positions were established *en barbette* on top of the walls. Corner bastions projected forward from the fort walls to allow for crossfire.

134. Lewis, 42.

During the Civil War, changes in ordnance—particularly new rifled artillery—resulted in the vulnerability of masonry fortifications to destruction. This was made clear in the April 10, 1862, attack on Fort Pulaski near Savannah, Georgia, where the rifled cannon repeatedly breached the masonry walls and did extensive damage, leading to Confederate surrender. Fort Pickens, however, was not attacked by the Confederates in this way, and remained operational throughout the war.

Following the Civil War, work continued on Fort Pickens until 1869. The forts protecting Pensacola Harbor continued to be at least minimally maintained for many years, with gun-mounting at several forts during the *Virginius* incident, a diplomatic dispute between the United States, Great Britain, and Spain, in 1874. Repairs and modifications continued to be made at Fort Pickens into the 1890s when the fort was adapted for new purposes in support of the Endicott plan.

Endicott System structures were designed to be capable of surviving attack by rifled artillery, as well as other emerging threats.[135] The Endicott plan involved large-scale modernization of harbor and coastal defenses in the United States through the engineering of strategically placed, relatively small concrete batteries of breech-loading guns located along the coastline. Many were sited at earlier Third System sites, such as Fort Pickens, due to the continued strategic importance of these locations.[136] The system involved construction of well-dispersed, open top, reinforced concrete gun emplacements, protected by sloped earthworks. Unlike Third System defenses, which were typically traditional masonry forts concealing massed batteries of cannon, these smaller batteries of up to four large-caliber rifled guns were emplaced in reinforced concrete structures hidden behind earth-covered concrete parapets. These defenses also involved plans for the placement of mines near the mouth of the harbor, and within the harbor, to protect against torpedo boats. The Endicott Battery System became the primary system for coastal defenses between 1886 and 1917.

Four Endicott batteries were constructed on western Santa Rosa Island—Batteries Cullum, Van Swearingen, Pensacola, and Worth. Updates to the system were designed at the request of Secretary of War William Howard Taft during the presidential administration of Theodore Roosevelt. Additions to the harbor defenses at Pensacola Bay based on the Taft plan, which addressed the emerging threat of torpedo boats, included Battery Trueman, Battery Payne, and Battery Cooper. As attack by aircraft emerged as a threat during World War I, the Army retrofitted existing batteries with anti-aircraft guns and installed searchlights for night lighting. Battery Langdon and Battery GPF (Grand Puissance Filloux) were constructed in the 1920s and 1930s to further augment the system in response to advances in military engineering involving aircraft. Finally, during World War II, Battery 234 and several battery commander stations/coincidence range finder towers were constructed, and Battery Langdon was casemated in response to the threat of attacks by air. The igloo magazine north of Fort Pickens which was historically associated with operations at Battery Payne, was added during this time.

Assessment of Resources

Fort Pickens

Fort Pickens was constructed between 1829 and 1834 by the U.S. Army Corps of Engineers as a Third System coastal defense military fortification designed to protect the U.S. Navy Yard and deepwater harbor at Pensacola Bay. Fort Pickens was the largest, and first completed, of four fortifications built on the two low-lying islands that formed the opening into the bay, and on either side of the peninsula where the navy yard

135. Weaver, John R., II, *A Legacy in Brick and Stone: American Coastal Defense Forts of the Third System, 1816–1867* (Missoula, Montana: Pictorial Histories Publishing Co., July 2001), 15.

136. Weaver, *A Legacy in Brick and Stone: American Coastal Defense Forts of the Third System, 1816–1867*, 16–17.

was to be built, during the early to mid-nineteenth century.

A dry moat originally surrounded the fort, beyond which the land was graded to form a glacis, or downward sloped plain that facilitated viewing and firing from the fort. The masonry structure also included quarters for the officers, fronted with piazzas.

The exterior walls formed an interior open space, the parade, which measures approximately 3 acres. The parade was used for drilling and quartering troops. The main gate, or sally port, is in the center of the northeast front and was connected to a causeway that led to a wharf on the bay.

Cisterns near Bastion B and Bastion D originally provided the water supply for the fort. Rainwater from the arches above was channeled to the cisterns. The ruin of the remaining cistern is near Bastion B.

Since its original construction, several modifications have been made to Fort Pickens. Between 1893 and 1895, the U.S. Army Corps of Engineers converted casemates 86 and 87 in the northeast bastion of Fort Pickens into a bombproof shelter for electric batteries used to power a minefield in the harbor. Shelving was built in the gallery of Bastion E, and casemate floors next to the sally port were cemented for storing searchlights and cables for the mines. In 1894, several additional casemates were converted to shelter electric batteries. Dampness forced relocation of the batteries to a new brick building constructed as a mine casemate adjacent to the fort in 1905–1907.

Battery Pensacola, an Endicott battery, was constructed over a portion of the interior parade ground circa 1898–1899. Interior spaces and casemates of Fort Pickens were adapted for use to support the battery, including munitions storage, and a power plant built in 1903. The casemate that served as the power plant has a concrete floor today, used to support gas-powered generators that provided electricity for searchlights and other equipment. Concrete shelf supports located within some of the casemates held mine equipment and later extra ammunition for the guns of Battery Pensacola. A narrow-gauge rail line was built to pass through the sally port to convey building materials to the site for Battery Pensacola. In 1915, engineers removed the sand from the parapet of two of the Fort Pickens walls and then blasted away the upper 3 or 4 feet of portions of the masonry to enhance the field of fire associated with Battery Pensacola's 12-inch guns. The casemates and quarters associated with the south wall of the fort collapsed during the blasting. Only the southeast scarp wall of the fort remains.

On June 20, 1899, the northwest corner bastion (Bastion D) was destroyed when the 8,000 pounds of black powder stored in the magazine exploded following spread of a fire in a nearby warehouse.

A refrigeration room was added beneath the tower bastion circa 1900.

The fort was further modified prior to 1942, when the U.S. Army Corps of Engineers constructed a road through the southeast corner of the counterscarp. This road was later connected to the road to Pensacola Beach, completed in 1954. The counterscarp wall was reworked around the road in 1991 to enhance its appearance, including the addition of a plaque mounted in the new section of the wall that reads "Fort Pickens 1834."

Today, most of the scarp wall system, four of the original bastions, the counterscarp, and dry moat, which was filled in, survive from the original construction of Fort Pickens. During the late nineteenth and early twentieth centuries, several changes were made to Fort Pickens to accommodate the Pensacola Harbor Defense Project. Smoothbore cannon were replaced, recycled, or converted to rifled cannon, while sections of the breast-height masonry walls were lowered. As noted, the sand parapet wall was removed to enhance the field of fire associated with Battery Pensacola. Modifications to the Third System structure to accommodate the engineering technology associated with the Endicott System also survive with integrity. As such, Fort Pickens survives with sufficient integrity to contribute to the significance of the Pensacola Harbor Defense Project Historic District.

Battery Pensacola

Battery Pensacola is located within and covers a portion of the parade of Fort Pickens. The reinforced concrete battery was built in 1898–1899 in anticipation of Pensacola's involvement in the Spanish-American War. Battery Pensacola was designed by the U.S. Army Corps of Engineers to emplace two 12-inch rifles mounted on disappearing carriages.

The battery was constructed from concrete mixed on the island in a temporary concrete plant. Materials for the concrete, including cement, sand, and stone aggregate, were purchased and not obtained at the site. The two-level battery has an open arcade with square columns on the north face, and double stairways on the east and west that lead to the second level. The south side is earth covered. The first level consists of various rooms used to store projectiles, powder charges, and tools. The upper level, reached by metal and concrete stairways from both inside and outside, contains two 25-foot-diameter pits for mounting the 12-inch disappearing rifles. A spotting tower can be reached by stairs between and to the rear of the pits.

To obtain proper command of the area fronting Fort Pickens, it was necessary to raise the interior crest of the proposed battery above the breast-height wall of Fort Pickens.[137] Because the battery divided Fort Pickens into two and cut off the ability to pass between the south and north parades while blocking access to casemates on the south and southwest fronts, the U.S. Army Corps of Engineers constructed a tunnel in 1898, 8 feet wide and 9 feet high, that extended around the left flank of the battery. The tunnel afforded access to warehouse areas on the south side of Fort Pickens.

In 1933, Battery Pensacola was listed as surplus. Its guns were shipped to the U.S. Army arsenal in Watervliet, New York, in 1934 and the carriages sold for scrap in 1942. The battery was used for storage during World War II. The National Park Service performed restoration work on Battery Pensacola in 1985.

Although it no longer contains artillery pieces and has been modified to a degree since 1947 to address visitor access needs, Battery Pensacola retains sufficient integrity to convey its historic associations and contributes to the historic district.

Battery Commander's Station

In 1907–1908, a splinter-proof battery commander's station was erected on the platform of Battery Pensacola, oriented to view south towards the ocean. In order to avoid siting the structure so that it would become a target for enemy fire while also ensuring a clear view from the station, portions of the Fort Pickens wall were lowered. The three-story structure is little changed from its original construction and retains sufficient integrity to convey its historic associations. The structure contributes to the significance of the historic district.

Mine Casemate Building (Building 9)

Constructed in 1905–1907, the mine casemate building, later the fire control switchboard room, was used to store harbor mine batteries, mine equipment, and instruments following removal from the Fort Pickens casemates due to humidity and dampness problems that were detrimental to the sensitive electrical instruments. The brick building was constructed by the U.S. Army Corps of Engineers in the former dry moat between the counterscarp and the scarp walls of Bastion E of Fort Pickens, which was subsequently filled in circa 1907–1912. A mine battery commander's station added to Fort Pickens above Bastion E in 1909 was heavily damaged during a hurricane in 1926. The hurricane also destroyed elements of the mine system. In response, the program was discontinued, and mine defense responsibilities were transferred to the Navy.

After the submarine mine defense system was eliminated from the Pensacola Harbor Defense Project in 1926, the mine casemate building was

137. Bearss, *Historic Structure Report and Resource Study*, 95.

converted into the fire control switchboard room. The building was likely converted from a single-level structure into its present-day split-level design at this time, given that the current level is exactly 4 feet higher than the original, which was the level of the water inside the seawall resulting from the 1926 hurricane. Also, fire control switchboard rooms were typically divided into two or more sections.

The building was later adapted for use as a restroom during the State Park period (1949–1971).[138]

Despite the interior changes to accommodate evolving uses, the exterior of the building remains relatively intact. The mine casemate structure retains sufficient integrity to convey its historic associations, and thus contributes to the significance of the historic district.

Igloo Magazine

An igloo magazine associated with the operation of Battery Payne was constructed in 1943 to the north of Fort Pickens. The magazine is a cylindrically shaped reinforced concrete structure, upright in form, with a concrete foundation, poured tar roof, and corrugated metal walls. The magazine is set into the backside of the counterscarp, so that only the front elevation is visible on the exterior.

The igloo magazine has been little altered since 1947. As such, it retains sufficient integrity to convey its historic associations and contributes to the historic district.

National Park Service National Underground Railroad Network to Freedom

In September 2020, Fort Pickens was selected as one of twelve new listings in the Underground Railroad Network to Freedom. The mission of the Network to Freedom is ". . . to honor, preserve and promote the history of resistance to enslavement through escape and flight, which continues to inspire people worldwide."[139] On March 12, 1861, a month before the start of the Civil War, eight enslaved people sought protection and hoped they would be granted freedom by the Union garrison at Fort Pickens. Although they were returned to slavery, ". . . these unidentified people became the first documented enslaved people to make their way to what would become Union lines during the Civil War."[140]

Two related applications have been completed for the Network to Freedom, for Pensacola Pass, and for the Marianna Expedition on Santa Rosa Island. In the 1840s and 1850s, Pensacola Pass at the western end of Santa Rosa Island served as a corridor for enslaved people seeking freedom via the Underground Railroad.[141] In the fall of 1864, approximately 600 enslaved people joined U.S. soldiers led by Brig. Gen. Alexander S. Asboth on their march back to Fort Pickens, following fighting at Marianna, Florida. From September 18 to October 4, the freedom seekers walked the length of Santa Rosa Island in their effort to reach freedom.[142]

The NPS may wish to consider developing a Special History Study or National Register

138. Personal communication by the authors with David Ogden, December 2015.
139. National Park Service, "National Underground Railroad Network to Freedom," accessed September 2022, https://www.nps.gov/orgs/1205/index.htm.
140. Daniel R. Brown, Superintendent, and Casimer J. Rosiecki III, Park Ranger and Interpreter, National Park Service, Gulf Islands National Seashore, *National Park Service, National Underground Railroad Network to Freedom Application, Fort Pickens,* July 17, 2020.
141. Darrell L. Echols, Superintendent, and Casimer J. Rosiecki III, Park Ranger and Interpreter, National Park Service, Gulf Islands National Seashore, *National Park Service, National Underground Railroad Network to Freedom Application, Pensacola Pass,* July 11, 2021.
142. Darrell L. Echols, Superintendent, and Casimer J. Rosiecki III, Park Ranger and Interpreter, National Park Service, Gulf Islands National Seashore, *National Park Service, National Underground Railroad Network to Freedom Application, The Marianna Expedition – Santa Rosa Island,* January 14, 2022.

Additional Documentation to explore the significance of Fort Pickens as "gateway to freedom" for enslaved persons, beginning with the arrival of the freedom seekers at the fort in March 1861. This study could build on the research and narratives the park has prepared for several Underground Railroad Network to Freedom applications for Fort Pickens and nearby sites. These studies would inform an understanding of whether Fort Pickens might be considered for National Historic Landmark designation in this historic context.

State Parks-Era Resources

Based on research and site work conducted for this study, resources present from the period of Florida State Parks ownership of Fort Pickens do not contribute to the overall significance of Fort Pickens. In addition, State Parks-era resources that remain would not be significant in a state parks context, in the areas of entertainment and recreation, at the local level. Two Florida state parks are significant in the state parks context because they are the earliest Florida State Parks: Highlands Hammock in Sebring, Florida, established in 1931, and Gold Head Branch in Keystone Heights, Florida, established in 1935. The Civilian Conservation Corps (CCC) was extensively involved in development of these state parks, which contributes to their significance. Fort Pickens does not reflect CCC involvement in its development.[143]

Several Florida state parks include fortifications, offering comparison with Fort Pickens. These include Fort Clinch on Amelia Island, which includes mid-nineteenth-century masonry fortifications and is listed in the National Register, and San Marcos de Apalachee in Wakulla County, Florida, which includes the site of a Spanish Colonial fort and is a National Historic Landmark. However, neither of these parks has been determined significant in the state parks context.[144]

Consideration could be given to conducting further research on additional changes made during the State Parks era, specifically, to review materials in the collections of the Florida Park Service and Florida State Archives in Tallahassee that are not yet digitized. This additional research would provide an opportunity to document the State Parks era at Fort Pickens in greater detail and potentially to evaluate its significance further, should additional documentation be discovered.

Period of Significance

Based on the findings of this HSR, the recommended period of significance for Fort Pickens is 1829–1947. This period starts with the beginning of construction of Fort Pickens and concludes with deaccessioning of the military features on Santa Rosa Island in 1947. This period of significance encompasses the evolution of coastal defenses in response to several periods of military engagement and conflict, including the Civil War, Spanish-American War, World War I, and World War II. The period of significance also encompasses periods identified in the National Register nomination for the Pensacola Harbor Defense Project, 1893–1947, and the period recognized by the National Underground Railroad Network to Freedom. (The 1972 National Register nomination for Fort Pickens lists the period of significance as nineteenth century, a more general period typical of the nomination form used at the time.)

The recommended period of significance does not include the period of State Park ownership or National Park Service ownership, as resources present from these periods do not appear to contribute to the overall significance of Fort Pickens.

Character-Defining Features

The historic nature of significant buildings and structures is defined by their character, which is

143. Correspondence by the authors with Ruben Acosta, Bureau Chief at the Florida SHPO, March 2023.

144. Correspondence by the authors with Ruben Acosta, Bureau Chief at the Florida SHPO, March 2023.

embodied in their identifying physical features. Character-defining features can include the shape of a building; its materials, craftsmanship, interior spaces, and features; and the different components of its surroundings.[145]

The following list identifies existing character-defining features of Fort Pickens:

- Fort Pickens as part of the entire Pensacola Harbor Defense System.
- Setting of the fort, including the relationship of the fort and the surrounding buildings and landscape.
- The specific relationship between Fort Pickens and Battery Pensacola.
- General layout, plan, and orientation of the fort, including projecting embrasures and two-tier design (ground level where casemates are present, and terreplein above).
- Masonry structure (interior and exterior) including mass masonry walls and arches, and brick and stone used in construction of walls, ceilings, and paving.
- Area of the fort lost to the explosion, including the configuration of remaining portions of the structure adjacent to gap.
- Terreplein and parapet, including reduced height where lowered to accommodate firing.
- Configuration of the window and door openings.
- Counterscarp east of the fort and associated glacis.
- Open space where dry moat was filled in, particularly between the fort and counterscarp.
- Partially open parade.
- Interior configuration of spaces, including quarters along the northeast scarp, sally port, and remaining casemates at the east and south scarps.
- Historic interior features, including iron pivots and tracks for guns.
- Historic etchings and graffiti present throughout the fort.

The following list identifies existing character-defining features of Battery Pensacola (including battery commander's station):

- Battery Pensacola as part of the entire Pensacola Harbor Defense System.
- Setting of the battery on the parade within Fort Pickens.
- The specific relationship between Battery Pensacola and Fort Pickens.
- General layout, plan, and orientation of the battery.
- Concrete structure (exterior and interior), including walls, structural members, stairs, and landings.
- Gun emplacements and associated historic features, including iron tracks for guns.
- Configuration of window and door openings.
- Extant steel doors.
- Extant steel railings.
- Surviving machinery remnants, e.g., hoists.
- Surviving electrical components.

The following list identifies existing character-defining features of the mine casemate building:

- Setting of the building in the former dry moat adjacent to Fort Pickens.
- General layout and orientation of the building.
- Masonry walls.
- Low-slope gable and hipped roofs.
- Configuration of window and door openings.

The following list identifies existing character-defining features of the igloo magazine:

- Setting of the structure outside the counterscarp of Fort Pickens.

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

- General layout and orientation of the structure.
- Concrete facade.
- Door on north facade.
- Corrugated metal walls.

Assessment of Integrity

Assessment of integrity is based on an evaluation of the existence and condition of the physical features which 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 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.[146]

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."[147]

Fort Pickens

Integrity of Location. Fort Pickens retains integrity of location. The location of the structure has remained unchanged since original construction.

Integrity of Design. Fort Pickens retains integrity of design. Although the structure has been altered both intentionally, for example to accommodate Battery Pensacola and Fort Pickens Road, and unintentionally due to the explosion at Bastion D, the general plan and configuration of the fort remain.

Integrity of Setting. Fort Pickens retains integrity of setting. The relationship of the structure to the surrounding site and buildings, and to Pensacola Bay and the adjacent gulf waters, remains intact.

Integrity of Materials and Workmanship. Despite deterioration and alterations, including the removal of portions of the counterscarp to accommodate Fort Pickens Road, Fort Pickens retains integrity of materials and workmanship, as the majority of the fort remains intact.

Integrity of Feeling. Fort Pickens retains integrity of feeling. Despite alterations and the addition of Battery Pensacola, the fort continues to convey its historic character.

Integrity of Association. Fort Pickens retains integrity of association with the Third System defenses, the defense of Pensacola Harbor, and the other features of the site that form a part of the defense system.

146. *National Register Bulletin: How to Apply the National Register Criteria for Evaluation* (Washington, D.C.: U.S. Department of the Interior, National Park Service, National Register, History and Education, 1990, rev. 1995), 44–45.
147. *National Register Bulletin: How to Apply the National Register Criteria for Evaluation*.

Battery Pensacola

Integrity of Location. Battery Pensacola retains integrity of location. The location of the structure has remained unchanged since original construction.

Integrity of Design. Battery Pensacola retains integrity of design. While changes to the original battery have been made, including the addition of the battery commander's station, which was completed during the period of significance, the general design and configuration of the battery remains.

Integrity of Setting. Battery Pensacola retains integrity of setting. The setting of the structure within the walls of Fort Pickens and the relationship between the battery, the fort, and the surrounding site, including Pensacola Bay and the adjacent gulf waters, remains intact.

Integrity of Materials and Workmanship. Despite deterioration present, Battery Pensacola retains integrity of materials and workmanship. The battery is largely intact.

Integrity of Feeling. Battery Pensacola retains integrity of feeling and continues to convey its historic character. The battery continues to be representative of Endicott-era batteries.

Integrity of Association. Battery Pensacola retains integrity of association with the Endicott System and the defense of Pensacola Harbor.

Mine Casemate Building

Integrity of Location. The mine casemate building retains integrity of location. The location of the building has remained unchanged since original construction.

Integrity of Design. The mine casemate building retains integrity of design. Although the structure has been altered, with the east portion of the building raised approximately 4 feet, the building still largely reflects its original design.

Integrity of Setting. The mine casemate building retains integrity of setting. The relationship of the structure to Fort Pickens and the surrounding site remains intact.

Integrity of Materials and Workmanship. Despite alterations made to the building, the mine casemate building retains integrity of materials and workmanship.

Integrity of Feeling. The mine casemate building retains integrity of feeling and continues to convey its historic character as an early twentieth-century military structure.

Integrity of Association. The mine casemate building retains integrity of association with Fort Pickens, Battery Pensacola, and the defense of Pensacola Harbor.

Igloo Magazine

Integrity of Location. The igloo magazine retains integrity of location. The location of the structure north of Fort Pickens has remained unchanged since original construction.

Integrity of Design. The igloo magazine retains integrity of design. The structure has been little altered since original construction.

Integrity of Setting. The igloo magazine retains integrity of setting. The relationship of the structure to the surrounding site remains intact.

Integrity of Materials and Workmanship. The igloo magazine retains integrity of materials and workmanship. The concrete facade, door, and corrugated metal walls are still intact.

Integrity of Feeling. The igloo magazine retains integrity of feeling and continues to convey its historic character as a World War II-era military structure.

Integrity of Association. The igloo magazine retains integrity of association with Battery Payne and the defense of Pensacola Harbor.

Treatment and Use

Requirements for Treatment and Use

The following discussion of treatment and use for Fort Pickens and Battery Pensacola has been prepared based on historical research, condition assessment, and discussion with the National Park Service. Fort Pickens and Battery Pensacola as well as the battery commander's station at Battery Pensacola and the mine casemate building and igloo magazine, both north of Fort Pickens, are listed in the National Register of Historic Places, and are managed as cultural resources by the National Park Service.

As such, treatment and use of the structures should be considered within the context of the legal mandates and policy directives established by the National Park Service *Cultural Resources Management Guideline* (Director's Order 28) for the protection of cultural resources. The structures are expected to be preserved while continuing to be used for interpretation.

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, 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 the structures and site are also to be guided by the following:

- The Secretary of the Interior's Standards for the Treatment of Historic Properties
- Architectural Barriers Act Accessibility Standards (ABAAS)
- International Building Code (IBC), 2024
- International Existing Building Code (IEBC), 2024
- NPS Guiding Principles of Sustainable Design

The State of Florida has adopted the Florida Building Code, eighth edition, and the Florida Building Code, Existing Building, eighth edition, both of which went into effect on December 31, 2023. The National Park Service is self-regulating in terms of enacting and enforcing building code standards. Gulf Islands National Seashore is, therefore, not legally subject to local or state building code requirements. When undertaking repairs to buildings and structures, the National Park Service endeavors to have the work comply with model building code standards. At this time, the 2024 IBC is the model building code used by the National Park Service for design and construction. The NPS Denver Service Center also references the 2024 IEBC, with appendices.

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.

Alternatives to full prescriptive legislative and code compliance should be considered where such compliance would compromise the integrity of the structure.

The 2024 IEBC includes the following statements in Section 507, Historic Buildings:

> 507.1 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.
>
> 507.2 Life safety hazards. The provisions of this code shall apply to *historic buildings* judged by the building code official to constitute a distinct life safety hazard.
>
> 507.3 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* meeting any of the following criteria need not be brought into compliance:
>
> 1. Listed or preliminarily determined to be eligible for listing in the National Register of Historic Places.
>
> 2. Determined by the Secretary of the U.S. Department of Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined to qualify as an historic district.
>
> 3. Designated as historic under a state or local historic preservation program that is approved by the Department of Interior.
>
> 507.4 Structural. Historic buildings shall comply with the applicable structural provisions in this chapter.
>
> Exceptions:
>
> 1. The *code official* shall be authorized to accept existing floors and existing live loads and to approve operational controls that limit the live load on any floor.
>
> 2. Repair of *substantial structural damage* is not required to comply with Sections 405.2.3, and 405.2.4. *Substantial structural damage* shall be repaired in accordance with Section 405.2.1.[148]

The IEBC exceptions noted above pertain to Fort Pickens and Battery Pensacola and associated buildings as structures listed in the National Register of Historic Places and managed as a cultural resource.

In addition, the National Park Service provides guidance on sustainability in work on historic structures, in terms of energy efficiency, technology, and sustainable preservation in practice, as described in *The Secretary of the Interior's Standards for Rehabilitation & Illustrated Guidelines on Sustainability for Rehabilitating Historic Buildings*.[149]

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:

148. International Code Council, Inc., International Existing Building Code 2024 (Country Club Hills, Illinois: International Code Council, 2023).
149. Anne E. Grimmer, *The Secretary of the Interior's Standards for Rehabilitation & Illustrated Guidelines on Sustainability for Rehabilitating Historic Buildings* (Washington, D.C.: U.S. Department of the Interior, National Park Service, Technical Preservation Services, 2017).

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. 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. However, new exterior additions are not within the scope of this treatment. The Standards for Preservation require retention of the greatest amount of historic fabric along with the building's historic form.

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. The Rehabilitation Standards acknowledge the need to alter or add to a historic building to meet continuing or new uses while retaining the building's historic character.

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. The Restoration Standards allow for the depiction of a building at a particular time in its history by preserving materials, features, finishes, and spaces from its period of significance and removing those from other periods.

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. The Reconstruction Standards establish a limited framework for recreating a vanished or non-surviving building with new materials, primarily for interpretive purposes.[150]

Of the four treatment approaches, *preservation*, which involves sustaining the building or structure in its existing form, is most appropriate for Fort Pickens and Battery Pensacola. Preservation is to some extent in progress as a result of ongoing repair and cyclical maintenance implemented by the Park, including ongoing masonry repair work. Alterations and repairs to the fort since the period of significance have in many cases retained historic features and materials. A limited number of non-original features have previously been added to the fort to assist public visitation and prevent deterioration. These features include paved concrete paths at the parade and composite decking at the terreplein over the tower bastion. Overall, these added features are not intrusive and do not detract from the historic character of the fort.

Within the overarching preservation approach for Fort Pickens and Battery Pensacola, this study recommends continuing to make the repairs necessary to maintain and preserve the structures in their existing state for continued use by the Park. The treatment *preservation* permits selective restoration of character-defining elements where missing or altered, if appropriate archival documentation is available. While selective restoration of character-defining elements where missing is permitted, the reconstruction of Bastion D, which was destroyed in an explosion in 1899, is not recommended. The damage resulting from the explosion that destroyed Bastion D is part of the historic character of the fort and occurred within the period of significance.

(Refer to the Developmental History and the Significance and Integrity chapters for further discussion of character-defining features.)

Future use of Fort Pickens and Battery Pensacola is anticipated to be similar to its current function—

150. Grimmer, *The Secretary of the Interior's Standards*.

historic military structures interpreted for visitor use. Any minor changes in this use should be formulated so as to not require significant alterations to the historic exterior or primary interior spaces and features. Where future modifications are considered to provide universal access and meet code requirements, these modifications should be designed to retain original historic materials, features, and character wherever possible. Where incorporation of new amenities would require significant alterations to the fort that could diminish its integrity as a historic resource, consideration should be given to limiting or avoiding these modifications.

Ultimate Treatment and Use: Standards and 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 Fort Pickens and Battery Pensacola at Gulf Islands National Seashore. 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* were referenced in development of treatment guidelines and recommendations for any 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.[151]

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*.
- Retain the character of Fort Pickens, Battery Pensacola, the mine casemate building, igloo

151. Grimmer, *The Secretary of the Interior's Standards*. The guidelines that accompany the Standards also note that new materials should be distinguishable from old.

magazine, and environs by protecting the structures and surrounding site.

- Protect adjacent natural resources during any construction activities.
- Document through detailed as-built drawings, photographs, and written narrative all changes and treatments to the structures and the immediate site. Maintain records of treatments and preserve documentation according to professional archival standards. Maintain a copy of records in the park archives.
- Retain features and materials that survive from the period of significance to the greatest extent possible.
- Incorporate sustainable design principles that respect the preservation principles listed above in all future projects.

Recommendations

The following specific recommendations for treatment of Fort Pickens, Battery Pensacola, the mine casemate building, and igloo magazine follow the overarching treatment approach of *preservation*.

Site

- Retain Fort Pickens and Battery Pensacola in their current location and avoid constructing new features within or around the site that would interfere with views of the structures.
- Continue to maintain the site around the structures. Continue to conduct regular clearing so that the site around the structures is free of heavy ground vegetation.
- Consider slope stability measures including regrading, addition of groundcover, turf grass, and/or specialized matting in combination with vegetation to prevent gullies and slides. Identify areas where the topography of the landscape is susceptible to erosion and currently exhibits loss of soil and turf grass. Monitor the turf slopes associated with Fort Pickens and Battery Pensacola.
- Evaluate the extent of vegetation coverage on the berms and environs surrounding Fort Pickens and Battery Pensacola. Identify plant species and potential hazards due to vegetative growth.
- Remove any vegetation growing on the structures, such as at mortar joints or at cracks in the masonry walls of Fort Pickens and the concrete walls of Battery Pensacola.
- Protect and preserve nearby features associated with Fort Pickens and Battery Pensacola, such as the small buildings and structures north of the fort, and consider strengthening the visual connection between the structures and the fort.
- Evaluate the need for the diagonal walkway through the interior of the fort. The split-rail fence indicates no access to Battery Pensacola via the walkway.
- Consider preparation of a parkwide accessibility plan. This approach would aid in the development of comprehensive programmatic interpretation for Fort Pickens, including areas with limitations to physical access. An accessibility plan would help guide the park in making improvements to accommodate the public in accordance with federal accessibility requirements for both programmatic and physical access. The plan would ensure that the Fort Pickens is as accessible and inclusive as possible to all visitors. A comprehensive accessibility plan for Fort Pickens and Battery Pensacola would coordinate and align with recommendations in the Fort Pickens Unit Cultural Landscape Report, currently underway.
- Consider providing partial ABAAS accessibility to Battery Pensacola. Explore alternative options that meet ABAAS requirements during the planning process and clarify the potential impacts to the structure that would diminish its significance. Explore alternatives with virtual reality and digital interpretation if impacts incurred by construction diminish the significance of the battery structure.

Fort Pickens

Brick Masonry

- Ongoing repairs are required to address the effects of weathering on the brick masonry at the fort. Crews with the Historic Preservation Training Center (HPTC) have been undertaking cyclical masonry repairs at Fort Pickens including brick repair, pointing work, and cleaning. The repointing and other repairs, including the application of an elastomeric coating to selected areas of the exterior masonry, currently being undertaken by HPTC, should be reviewed, monitored, and documented over an extended period to evaluate durability and seasonal effects of climate conditions. Establish and record best practices to guide ongoing repair and maintenance.

- Brick masonry deterioration and distress should be repaired using repair techniques and procedures that include the following steps:

  Where present, unsound mortar should be removed to a depth of 2-1/2 times the width of the joint, or to sound mortar, whichever is greater. Work should be performed using handheld, non-power tools. A skilled mason can sometimes accomplish joint preparation without damaging the adjacent substrate by using a small power tool to cut along the center of the joint, followed by use of a hand tool (chisel) to remove mortar adjacent to the center cut. This process, if properly implemented, can sometimes result in less potential damage to the masonry adjacent to the joint than preparation using hand tools only, particularly for existing hard mortar adjacent to eroded or spalled brick. A trial sample is required to evaluate the skill of the mason and effectiveness of the repair.

  Joints should be repointed using appropriate mortars that match existing historic mortars. The use of hard portland cement-based mortars should be avoided. Commercially available portland cement mortars should be avoided because they can contain unnecessary, and undisclosed, additives and fillers.

  The work currently in progress by the HPTC uses Rosendale 12M, a natural cement-based mortar manufactured by Edison Coatings, Inc., for pointing work. While a natural cement-based mortar appears to be appropriate for use on the fort, laboratory studies of existing and new mortar should be undertaken to assess current conditions and confirm information for replacement mortar mixes.

  Pointing work should match historic mortar joints in color, texture, joint size, profile, and tooling.

  Since the repointing work is expected to continue over an extended period of time and at varying locations on the fort each year, a detailed protocol for tracking the extent of work and materials installed each year should be established. The protocol should include photographic documentation of the work before, during, and after repointing; annotated plan and elevation drawings to indicate the extent of work performed; written records of mortar mixes; and physical mortar cubes prepared at the same time mortar is installed on the fort to be cured, labeled, and stored in the park archive for future comparison.

- Sealant installed at skyward facing joints along the top of the parapet walls at Bastion C, between stone coping units at the southeast and southwest scarp, and at expansion joints along the brick wall at the perimeter of tower bastion, has failed. The failed sealant should be removed and replaced with new non-staining silicone sealant.

- Where severely spalled or deeply eroded brick and individual displaced or loose brick are present throughout the masonry walls, reset loose brick and replace missing or damaged brick with new brick to match the original. Consideration could also be given to removing the brick and resetting it with the previously concealed face oriented to the exterior. If individual brick units are too severely damaged to be reused, it is recommended that

a small area be dismantled and the original brick salvaged for use on the exposed surfaces, with new compatible brick provided for the concealed back-up construction. In some cases, given the thickness of the wall construction, individual eroded brick units do not require repair.

- At areas where the topside of a brick wall or vault is exposed, such as at the cisterns, Bastion B, or extant portions of the fort near the former location of Bastion D, repairs should be made to cracked, deteriorated, or eroded brick and mortar joints as described above. This includes the failed brick vaults over the gutters along the southwest scarp, where loose brick should be removed and reinstalled, and existing brick and mortar joints repaired as needed. (See also discussion of Waterproofing, below.)
- While the origin of the depression and associated exploratory opening at the interior of Bastion E is unknown, consideration should be given to maintaining the openings as is, with repairs made as needed to the masonry. The cementitious parge coating at the exterior depression should be removed and replaced with matching brick and repointed as described above.
- A portion of a wall at the tower bastion was partially rebuilt in the past and the reconstructed part of the wall does not appear to be keyed into the original wall. The park should monitor the rebuilt portion of the wall and the joint between the two parts of the wall for movement. If movement is occurring, consideration should be given to pinning or rebuilding portions of the new wall to ensure that both portions of the wall are connected.
- Where continuous cracks are observed through brick masonry, repair the masonry by rebuilding along the cracks. Consideration should be given to adding horizontal stainless-steel reinforcement within masonry bed joints across cracks. Due to the coastal environment, Type 316 stainless steel or coated stainless steel reinforcement should be used. In some locations, cracks that are known to have been present for many years could be monitored and, if found to be stable, repaired by repointing in lieu of rebuilding the wall at the crack.

  Cracks at the buttresses along the east scarp and at those flanking the sally port, as well as the vertical cracking at the corners of the scarp walls, should be monitored to determine if there is active movement. If active movement is not observed, these cracks should be repaired as described above. Localized rebuilding of the corners and buttresses may be necessary. Cracked or damaged masonry should be removed to sound masonry and rebuilt using compatible materials. Existing brick, if not damaged, should be cleaned and reused as possible. New brick should match the historic brick in size, color, and composition. New mortar should match the historic mortar joints in color, texture, joint size, profile, and tooling. Laboratory studies of existing and new mortar should be undertaken to assess current conditions and confirm information for replacement mortar mixes.

  If cracks are found to be active, further investigation would be required to help determine the cause of the movement.
- Investigate further the outward displacement and bowing of the counterscarp walls prior to implementing repairs to determine if movement is active and what the potential causes of the displacement may be, and to confirm appropriate repairs.
- Existing abandoned metal embedments are present at the exterior scarp walls. Although corroded in some locations, the existing metal embedments do not appear to be causing damage to the adjacent masonry. The abandoned anchors and adjacent masonry should be monitored periodically to ensure that no damage is occurring at the masonry.
- Contemporary steel reinforcing bars at embrasure openings, while incompatible with the historic grilles, can remain in place unless they are causing damage to the adjacent masonry. If replacement is required, new

grilles should match the historic grilles in appearance.

- Remove any vegetation growth observed through cracks or mortar joints at the counterscarp or scarp walls as well as any vegetation present at interior masonry walls. Vegetation should be removed with care to avoid dislodging any masonry. If vegetation is too large to remove without dislodging masonry, consideration should be given to cutting back the vegetation but leaving the roots in place. Care should be given to not damaging the brick or mortar when cutting back any vegetation. Cutting back may be required over time as part of cyclical maintenance if vegetation roots are left in place.
- Investigate possible causes of potential rising damp noted throughout the fort. This may include isolated excavation adjacent to the base of masonry walls. If possible, isolated excavation should be done in the least intrusive location possible where the most significant instances of potential rising damp were noted. If rising damp is confirmed, improved drainage at the base of the wall can be considered. Repair to the below-grade masonry, including repointing and replacement of cracked or damaged brick, and the installation of a below-grade waterproofing, can also be considered. Any replacement masonry materials should match the existing as described above.
- Clean brick masonry where affected by biological growth and efflorescence, including localized areas of counterscarp walls, exterior scarp walls, interior walls of Bastions A, B, and E, and the tower bastion, as well as at the interior of the casemates. Also, clean brick masonry if staining is occurring due to storm water passage through the scuppers. Cleaning is not necessary where staining that occurred during the period of significance appears at vent openings from smoke, unless damage of the brick masonry was observed. Cleaning of interior surfaces where signs of active water infiltration is noted should not be undertaken until the cause of the water infiltration is understood and addressed.

Prior to cleaning, conduct trial cleaning studies to address soiling and biological growth on masonry. Cleaning treatments fall into three general categories: water-based, chemical, and mechanical methods. Water-based methods include pressurized water spray, heated water or steam treatments, and misting. Chemical methods involve the use of products ranging from non-ionic detergents to acidic or alkaline cleaners, as well as biocidal treatments, in a variety of gels, liquids, pastes, and poultices. Mechanical cleaning methods include very low pressure (less than 75 psi) micro-abrasive systems and specialized laser-based cleaning equipment; these techniques are likely not appropriate for the masonry at Fort Pickens.

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.

Low-pressure water washing can be effective, at no greater than 100 to 200 pounds per square inch (psi), or less as indicated by trial samples. Any cleaning method using water should not occur when the temperature will remain above 50 degrees Fahrenheit for at least 72 hours after cleaning.

If chemicals are used, test samples should be performed and carefully evaluated to avoid over-cleaning. Chemical cleaners must be chosen by a conservator who understands the type and condition of the masonry material to be cleaned. Cleaners containing strong acids or which are highly alkaline can damage historic materials and should be avoided. Some chemical cleaners may also result in staining of porous masonry in the near term and long term.

Biological staining can be removed using an approved masonry cleaner containing a quaternary ammonium compound, if shown by trials to be appropriate for the masonry at the fort.

Appropriate water pressure, nozzle, distance, and fan tip should be used based on cleaning trials and a conservator's microscopic examination of trial samples and uncleaned masonry. Use only stainless-steel nozzles with fan tip spray, typically 40 degrees, held a minimum of 12 to 18 inches from the surface being cleaned. Prewetting and thorough rinsing are necessary in any cleaning process involving water or chemical cleaning. Finally, it should be understood that some soiling may remain and the masonry should not be expected to appear new after cleaning.

Cleaning should be repeated only as needed to remove heavy soiling or staining. Rinsing with clean water to remove bird drippings and other accretions can occur more frequently.

A treatment record should be maintained of cleaning work, including date of cleaning, materials used, notation of any change in condition since the previous cleaning, and field notes with photographs.

Stone Masonry

- Cracked and spalled stone coping and water table units along the northwest scarp wall should be examined close-up to ensure that the stone is intact and not at risk of falling. Any loose pieces should be removed. Dutchman units could be installed, if desired, to replace a portion of the original unit with compatible material to re-create the original profile. Visitor access to this area should be limited until the stone units can be inspected up close and any loose pieces removed.
- Remove cementitious parge coating previously applied to brownstone units at the power station at Bastion E. The cementitious parge coat is not an appropriate treatment because it is harder and less vapor permeable than the underlying sandstone. Perform trial parge coat removal in selected areas to evaluate the effectiveness of removal and confirm best practices to avoid damage to the substrate stone. Inspect the condition of the stone units following parge coat removal to understand condition. Stone units with smooth spalls or erosion may not require repair. For units where the remaining stone is irregular or unstable following parge coating removal, implement repairs as discussed below.
- Consider repairing brownstone units with large spalls or cracks. Where stone repair is considered, various options are available. For severely eroded or cracked stone units where much of the original material is already lost, consideration can be given to replacement in kind with an entirely new brownstone unit. Replacement units should be photographically documented before, during, and after the work, and drawings should be annotated to show the location of the units. The new unit should be permanently embossed or engraved on a concealed surface with a notation such as "NPS, 2023." For stones with localized damage, dutchman units can be installed that replace a portion of the original unit with compatible brownstone material, cut square and installed to re-create the original profile.
- Clean stone where affected by biological growth or soiling. Refer to Brick Masonry (above) for a discussion of masonry cleaning issues. Note that cleaners should be selected for the specific substrate and soiling; certain chemical cleaners suitable for brick may not be appropriate for stone. Perform trial samples with selected cleaners for evaluation before proceeding.
- Holes exist at the top of the brownstone sills due to missing iron pivots. The holes should be periodically monitored to determine if any standing water is present in the holes following rain. If standing water is observed, consideration could be given to repairing the holes to prevent further deterioration. For example, the holes could be filled with a matching mortar or a stone dutchman.

- In support of developing appropriate repairs and for documentation purposes, conduct selected laboratory studies of existing stone.

Waterproofing

- Investigate and document sources of active water leakage through the terreplein roofing into the interior of the fort, particularly at the vaulted tunnels, casemate galleries, and powder magazine of Bastion A; the interiors of Bastion B, tower bastion, and Bastion E; and at the casemates throughout the fort. Prior to beginning investigations, the extent of leaking should be monitored, with any active leakage noted. Testing should be planned at representative areas to determine potential sources of the leakage. Investigations could include water infiltration testing (e.g., introducing water in a controlled manner and monitoring leakage during testing) at areas where signs of water infiltration were observed. A testing protocol should be developed that outlines potential areas to be tested and the types of tests to be administered. If water infiltration testing is performed from the top of the structure, the temporary removal of fill from the terreplein may be required to expose the concealed waterproofing systems.

  At specific locations of active water leakage, further investigation is needed to determine the condition of the existing waterproofing above and the source of the leakage. For investigative purposes, consideration should be given to excavating small portions of the terreplein fill to expose the existing concealed waterproofing systems. Additional investigation should also be conducted below the composite decking at the top of tower bastion. Investigation procedures and findings should be carefully documented with annotated drawings, notes, and photographs, and retained in park archives.

- The single-ply roofing membrane over Bastion B should be removed. Consideration could be given to excavating the terreplein fill to expose the historic roofing below, with repairs made to the coated metal roofing (if present) as described above. If investigation is performed, procedures and findings should be carefully documented with annotated drawings, notes, and photographs, and retained in park archives.

- Repairs should be made to the exposed wrinkled and displaced coated metal roofing at the south end of the southwest scarp. Based on close-up examination of the metal roofing, tears or punctures in the membrane may be repaired by soldering sheet metal patches. If the existing roofing cannot be repaired, the existing roofing should be removed and new coated metal roofing should be installed, integrated with the existing roofing and waterproofing system.

- At the topside of the exposed brick vaults above the former officers' quarters, the HPTC crew recently applied Acrymax AF-130, an elastomeric acrylic coating. While the coating will likely reduce water infiltration into the interior spaces below, it may not fully prevent water from entering the masonry vaults. Additionally, the brick vault assembly is less breathable with the application of this coating, potentially resulting in water being trapped within the brick masonry. Given that the coating was applied somewhat recently, the park should monitor the interior areas below for water infiltration and also the topside of the brick vaults to ensure that the coating and brick are not deteriorating.

  Depending on the performance of the coating, consideration could be given to applying it to other locations where horizontal brick surfaces are exposed, such as at portions of Bastion B or the cisterns. This coating is not recommended for use on vertical masonry surfaces, particularly those that are visible.

  If the application of the coating has not reduced the level of water infiltration sufficiently to meet the park's needs or is found to be damaging the brick vaulting below, consideration should be given to investigating other waterproofing systems that could be more watertight and integrated into the historic waterproofing system believed to

be extant to the northeast. Further investigation of the concealed waterproofing systems should occur if a new system is desired to be integrated with the historic waterproofing systems.

Interior Finishes

- No plaster repairs should be undertaken if ongoing water infiltration is occurring. Determine the source of water infiltration and address the leakage prior to commencement of repairs.
- Minor cracks and deterioration in plaster finishes should be repaired in place by filling cracks or damaged areas with compatible new material, then sanding and re-painting.
- Moderate deterioration of the plaster should be repaired in place by applying a compatible new plaster finish coat, then sanding and re-painting.
- Severely deteriorated plaster should be removed and replaced with a multi-coat plaster system that matches the original plaster texture and finish.
- Organic growth on sound but water-stained plaster walls and ceilings should be treated with a biocide before applying a stain-hiding, alkaline-resistant primer and finish coats of compatible paint.

Battery Pensacola

Concrete

- The walkway and stairs to the commander's station should be kept closed until a detailed evaluation of the corbel and walkway's construction and the condition of the corroded reinforcing is performed. Following the evaluation, any necessary repairs to the concrete walkway and stairs should follow the recommended concrete repair protocol outlined below. Any required repairs to the stair and walkway railings and associated anchorage should follow the recommended steel repair protocol outlined below.
- Recommended concrete repairs are described below and include proper preparation of exposed steel and coating with a protective system appropriate to existing conditions; the use of formed concrete repairs rather than trowel-applied patches at spalls; and other measures to provide durable repairs that are appropriate to the historic character of the structure. In addition, the following repair recommendations take into consideration future maintainability of the repairs and the overall structure. Vegetation growth should be removed where present on concrete surfaces, as existing vegetation can hold moisture against the concrete. Additionally, sand present at the gun emplacements should be removed.
- Prior to undertaking repairs, areas with evidence of moisture movement through cracks or moisture staining should be further investigated to determine sources of moisture and required repairs.
- Overhead areas where cracked and spalled concrete is present should be examined close-up and any loose pieces of concrete removed. Concrete should then be repaired as described below.
- The concrete should be cleaned with a biocide/detergent at affected areas to remove organic growth. Prior to implementation, cleaning mock-ups should be performed to evaluate cleaning systems to be used and to determine the concrete appearance for matching of any 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.

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. 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, such as corrosion 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 (rust) staining, such as that present at areas of the concrete stairs, 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 pressure washing. These methods can be effective on light soiling.

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.

- Concrete repair mixes should be developed to match the color, finish, and texture of the original concrete. This includes the architectural formboard finish. Form and pour techniques should be used for repairs rather than trowel-applied patches.
- Trial repairs and mock-ups should be performed to determine the exact concrete mix designs and repair techniques. Multiple samples of various mixes are typically required. Initial small samples should be prepared off-structure and in unobtrusive locations on-structure, followed by mock-ups of selected repair mixes and techniques as needed to achieve a match to original surface finishing, texture, and color.
- Concrete at areas of spalling 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 to retain as much sound concrete beyond the spalled area as possible. The sawcut may align with edges of the formboard profile where present and as appropriate or the repair location.

  Chipping hammers should be used to remove concrete within the spalled area to a depth of at least 3/4 inch 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. Small, shallow spalls not associated with embedded steel do not require repair.

Note that formed concrete repairs are not required at very shallow spalls where reinforcement is not exposed. At the few localized areas where corroded reinforcement is exposed at deeper spall locations, the above process should be followed.

- 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; generally smaller non-moving cracks may be repairable by cementitious grout. Hairline cracks do not require repair.
- Examples of cracks to be repaired as described above include cracks at the topside of the battery, including previously repaired cracks. Although a cementitious patch material would need to be renewed periodically if the crack reappears, this approach is preferable to routing and sealing cracks, which is not necessary to address observed conditions and which would be visually very intrusive.
- At sawcut joints on the roof level, failed sealant should be removed with new sealant installed. Careful color matching and proper installation will help conceal these sealant joints. If desired, techniques such as broadcasting sand into the sealant before curing can be considered to make the sealant less visible. These techniques should be evaluated through trial repairs.
- Consideration could be given to removal of deteriorated bituminous waterproofing at roof areas and replacement in-kind with new bituminous waterproofing to protect the concrete below. The bituminous membrane should be covered with gravel, which will protect the waterproofing from ultraviolet (UV) exposure. (Installation of a cementitious parge coat would not be expected to provide long-term waterproofing on the horizontal roof surfaces due to anticipated cracking over time. Other modern waterproofing membrane types are not considered suitable for use on the historic structure, as they would be visually intrusive through color, texture, additional thickness, or termination details required for performance reasons.)
- Prior to recoating the exterior concrete of Battery Pensacola, an analysis of the existing coating should be undertaken to determine its composition. This will inform specification of a coating for application of the exterior vertical surfaces. Concrete repairs should be made prior to recoating work.

Steel

- The steel elements of Battery Pensacola include steel I-beams embedded in concrete ceilings, doors and door frames, steel reinforcement in concrete (discussed above), and other steel accessories and fixtures. Steel elements of the battery are vulnerable to corrosion due to the coastal marine

environment. As such, the battery 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.

- Steel repairs should be designed and implemented in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. Recommended steel repairs include the following:

  The existing surface coating and rust scale should be removed to bare steel using abrasive blasting in preparation for a new coating system. (Note that abrasive blasting, while not appropriate for use on historic masonry, is considered appropriate for preparation of steel in historic structures prior to priming and coating. This preparation is needed to provide for removal of corrosion product and proper adhesion of the prime coat.) 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.

  The steel surfaces should be pressure washed to remove chloride contamination.

  Where previously coated, exposed steel surfaces should be prepared and 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.

  Where severely deteriorated, steel structural elements will likely require replacement. The replacement elements should be able to withstand exposure conditions with respect to corrosion. This should be achieved by material selection and/or corrosion mitigation measures. Replacement materials could include stainless steel. Existing elements should be coated with protective coating systems suitable for marine exposure.

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

Other Recommendations

Documentation of Repairs

- Prior to commencement of any repair work, prepare documentation of repairs for compliance and record purposes. Documentation should include photographs, drawings or sketches, and specifications or protocols, recording distress conditions and repairs. Ensure work is completed in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. Maintain records of treatments and preserve documentation according to professional archival standards. Maintain a copy of all records in the park archives.

Graffiti Mitigation

- 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. For removal of painted graffiti, the sooner a cleaning product can be applied, the more likely it is to be successful. 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. Poultices are generally effective in removing graffiti and can be applied to specific locations and remain active in place for a period of 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, as is seen through much of Battery Pensacola. However, this treatment is not an appropriate means to address graffiti on any surfaces where the concrete 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. These coatings 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 should be reversible. Long-lasting film-forming clear protective coatings may not be reversible and typically affect the appearance and reflectivity of the surfaces to which they are applied. Therefore, these 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.
- Prompt removal of graffiti will improve the effectiveness of removal efforts and may also tend to discourage repetition of this vandalism.
- The addition of lights to discourage vandalism is not recommended as they can be intrusive and may draw attention to resources at periods when park staff is not present.

Steel Hoist

- The steel hoist located in the shot room is severely corroded with areas of full section loss. Given the poor condition of the hoist, the park is considering moving a similar hoist from nearby Battery Cullum-Sevier to Battery Pensacola. The hoist is in better condition than the hoist at Battery Pensacola and is in an area of Battery Cullum-Sevier that the park does not intend to open to the public for interpretation (Figure 791).

  Conservation was performed in 2015 on a similar hoist at Battery Jasper at Fort Moultrie, which appears to be in better condition than the hoist at Battery Pensacola, including the use of a pressurized water blasting system and pressure washing using the ThermaTech system.[152]

  Given the severe corrosion and areas of full section loss present on the Battery Pensacola hoist, restoration of the existing hoist would be difficult and would likely involve extensive use of replacement material, which could result in a loss of integrity.

  Although there are integrity issues involved with moving the hoist from Battery Cullum-Sevier, this approach should be considered,

152. *Preserve Historic Metal Architectural Elements of Battery Jasper – Task Order Agreement P13AC00443*. Piedmont South Atlantic Coast Cooperative Ecosystems Studies Unit 2014-2015, October 31, 2015.

particularly given the deteriorated condition of the existing hoist at Battery Pensacola. If the Battery Cullum-Sevier hoist is moved to Battery Pensacola, the existing hoist at Battery Pensacola should be documented as part of the process and salvaged for archival purposes. Interpretation should note the provenance of the hoist.

With preservation work currently in progress at Battery Cullum-Sevier, the existing hoist at that structure should be protected, particularly if relocation of the hoist to Battery Pensacola is planned.



Figure 791. A steel hoist at Battery Cullum-Sevier, 2017.

Mine Casemate

- Brick masonry deterioration and distress should be repaired using repair techniques and procedures that include the following steps:

  Where present, unsound mortar should be removed to a depth of 2-1/2 times the width of the joint, or to sound mortar, whichever is greater. Work should be performed using handheld, non-power tools. A skilled mason can sometimes accomplish joint preparation without damaging the adjacent substrate by using a small power tool to cut along the center of the joint, followed by use of a hand tool (chisel) to remove mortar adjacent to the center cut. This process, if properly implemented, can sometimes result in less potential damage to the masonry adjacent to the joint than preparation using hand tools only, particularly for existing hard mortar adjacent to eroded or spalled brick. A trial sample is required to evaluate the skill of the mason and effectiveness of the repair.

  Joints should be repointed using appropriate mortars that match existing historic mortars. The use of hard portland cement-based mortars should be avoided. Commercially available portland cement mortars should be avoided because they can contain unnecessary, and undisclosed, additives and fillers.

  Laboratory studies of existing and new mortar should be undertaken to assess current conditions and develop information for replacement mortar mixes.

  Pointing work should match historic mortar joints in color, texture, joint size, profile, and tooling.

  Since the repointing work may be performed over an extended period of time, a detailed protocol for tracking the extent of work and materials installed each year should be established. The protocol should include photographic documentation of the work before, during, and after repointing; marked plan and elevation drawings to indicate the extent of work; written records of mortar mixes; and physical mortar cubes prepared at the same time mortar is installed to be cured, labeled, and stored in the park archive for future comparison.

- At the circular opening on the west elevation, new brick should be installed to fill in the opening. The new brick should match the original.

Igloo Magazine

- The isolated corrosion on the interior of the magazine should be monitored and the steel cleaned as needed.

- The minor spalling is at the edge of the concrete floor and does not appear to present a tripping hazard. No treatment is required at this time. Monitor to confirm the condition does not worsen.

Current and Forthcoming Work

Masonry repair work performed by HPTC is ongoing. Additionally, a Cultural Landscape Report for the west end of Santa Rosa Island, including Fort Pickens and Battery Pensacola, is currently being drafted.

Recommendations for Further Research

1. Excavate portions of the terreplein to determine the condition of the underlying waterproofing to assist in developing potential repairs to mitigate ongoing water infiltration.
2. Perform analysis of the existing coating at Battery Pensacola to assist in determining a new coating for the exterior of the structure.
3. Perform analysis of existing mortars from representative locations around the fort to understand condition of existing original and repair mortars, and to confirm the repair mortar mix currently being used.
4. Consider conducting further research to determine whether the site is significant under National Register Criterion B for its association with specific individuals, including persons associated with designs and construction of the fortifications. Further research and archeological studies could be undertaken to explore the role of enslaved persons in construction of the fort[153]
5. Conduct further research to determine the date at which various alterations were made to Fort Pickens for which archival documentation has not yet been discovered, including the addition of the concrete floors at casemates along the northwest scarp, the construction of the concrete knee walls and curbs at Bastion A and Bastion E, and the exploratory opening at the exterior wall of Bastion E.

Resilience to Natural Hazards

Emerging trends in the severity of weather events, rising temperatures, and increasing rainfall totals are currently affecting ecosystem processes along the eastern seaboard of the United States. Increased temperatures, pollution, non-native insect pests, disease, and invasive plants are all contributing to the altered ecosystem process observed by scientists and others. An analysis of environmental conditions and ecological processes at Gulf Island National Seashore conducted during the 2010s indicated that climatic conditions are shifting faster than formerly anticipated.[154]

Expected impacts to the Gulf region include warmer sea surface temperatures, hotter summer temperatures, fewer winter freezes, higher sea level, higher storm surges, and altered rainfall patterns. Prolonged drought conditions, storm surges, and rising sea levels may reduce availability of freshwater resources, alter river and wetland hydrology, increase erosion, and induce changes in the distribution of coastal plant and animal species.

The National Park Service has identified extreme weather as one of the major threats to national park system units and has developed a response strategy that focuses on science, adaptation, mitigation, and communication.[155] Impacts of increasing severe weather are already occurring in Gulf Islands National Seashore. Specific extreme weather effects on the Gulf Islands National Seashore include the following:

153. Further discussion of the Underground Railroad Network to Freedom listings is provided in the Cultural Landscape Report. Panamerican Consultants with Wiss, Janney, Elstner Associates, Inc., and Liz Sargent HLA, *Fort Pickens Unit Cultural Landscape Report* (in progress, September 2024).
154. William B. Monahan and Nicholas A. Fisichelli, "Climate Exposure of U.S. National Parks in a New Era of Change," (PLOS ONE 9 7, July 2014), U.S. Department of the Interior, accessed October 20, 2022, http://dx.plos.org/10.137/journal.pone.
155. National Park Service. *National Park Service Climate Change Response Strategy 2023 Update*. (Washington, D.C.: National Park Service, 2023).

- **Hotter average days and more very hot days.** Extreme temperatures can increase weathering of structures, threaten park staff and visitor safety, and increase stresses for HVAC (heating, ventilation, and air conditioning) systems. If not addressed through building design or more efficient temperature control systems, the increased demand for complex air conditioning systems can add stress to building envelopes and can require significant alterations to a structure. It is possible that heat, combined with humidity, can make the park inhospitable to individuals seeking outdoor experiences, and more climate-controlled indoor environments may be needed to provide an escape from the elements for park staff and visitors.
- **Altered precipitation patterns, increased extreme precipitation, and changing humidity.** Changing precipitation and humidity conditions can result in local flooding, encourage mold growth and wood decay, increase fire risk, and intensify drought conditions, depending on the pattern of change. Extreme precipitation events present a variety of threats to infrastructure and operations including flooding of sites, sewage backup, accelerated decay of masonry, overcoming drainage systems, road wash out, cracks in building infrastructure, destabilization of buildings and pipes and erosion of support ground around structures.
- **Sea level rise and coastal storm surge.** Global sea level is rising and will continue, with local variability. Gulf Islands National Seashore includes multiple barrier islands composed of unconsolidated sediments that are easily mobilized by moving water, especially in areas that are not vegetated or otherwise stabilized. Sea level rise poses considerable risks to lighthouses, forts, and other historic structures. Campgrounds, roads, parking lots, comfort stations, utilities, and other ground-level infrastructure are at increased risk with higher levels of groundwater and storm surge. The challenge of maintaining access to Fort Pickens and other low-lying areas will only become more problematic with increasing sea level and impacts of storm surge (Figure 792 and Figure 793).



Figure 792. The management of Fort Pickens Road



Figure 793. Cultural landscape features throughout

- **Hurricane risk.** Hurricane wind speed is predicted to increase along with rainfall intensity and storm-surge height and strength. Future storm surge and wave runup will be superimposed on rising mean sea level, which increases the impact of storm events.
- **Tornado risk**. The potential for severe thunderstorms that provide conditions for tornadoes may increase substantially across the central and eastern United States. Tornadoes can result in catastrophic damage

to infrastructure from high winds and associated debris, hail, and flash flooding.

- **Invasive species.** Increased temperatures, changes in precipitation, and disturbance due to extreme climate events can increase the survival, spread, growth, and establishment of invasive species. Weeds and aquatic mussels have the potential to cause direct damage to power, water, transportation, and building facilities. Non-native species that may not currently impact facilities may become harmful due to changes in local climates.[156]

The ever-changing and dynamic environment within Gulf Islands National Seashore is expected to have effects on the natural and cultural resources as well as visitor use patterns. Planning and treatment recommendations for Fort Pickens and Battery Pensacola need to address two different issues related to increased extreme weather. One issue is whether the recommended treatments would contribute to increases in greenhouse gas emission and carbon footprints. The second issue is how the treatment recommendations can provide innovative management options for Fort Pickens and Battery Pensacola.

156. William B. Monahan and Nicholas A. Fisichelli, "Climate Exposure of U.S. National Parks in a New Era of Change."

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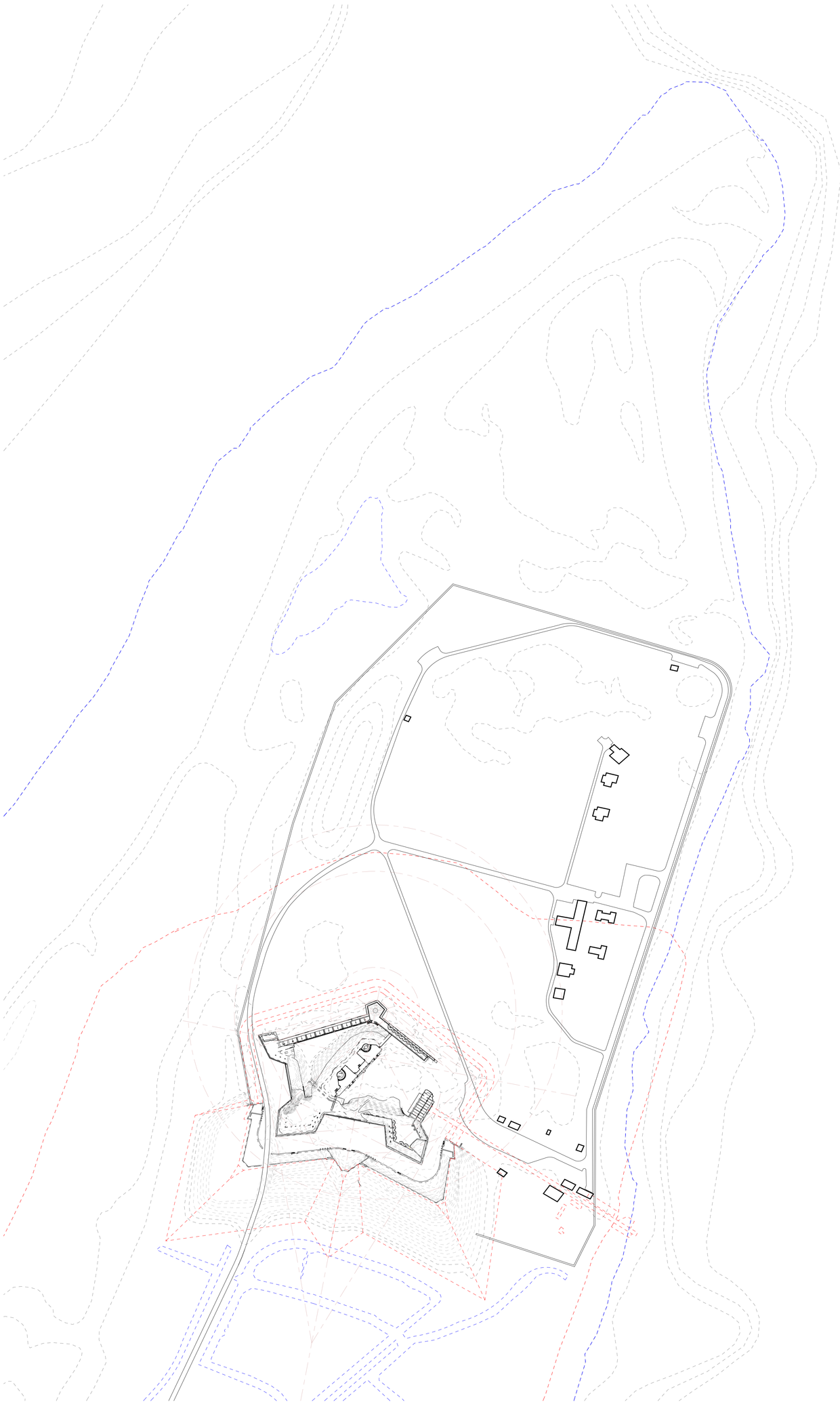
Appendix A: Measured Drawings

OVERALL SITE PLAN
1"=200'-0"

LEGEND

- 2023 TOPOGRAPHY
- 2023 WATER LINE
- 1834 SITE PLAN
- GEOMETRIC CONSTRUCTION LINES

N



DRAWN BY: WFT ARCHITECTS 3/2025

NATIONAL PARK SERVICE U.S. DEPARTMENT OF THE INTERIOR SOUTHEAST REGIONAL OFFICE	FORT PICKENS AND BATTERY PENSACOLA SANTA ROSA ISLAND GULF ISLANDS NATIONAL SEASHORE ESCAMBIA COUNTY, FLORIDA	HISTORIC STRUCTURE REPORT	SHEET 1

ROOF LEVEL PLAN

1"=50'-0"

LEGEND

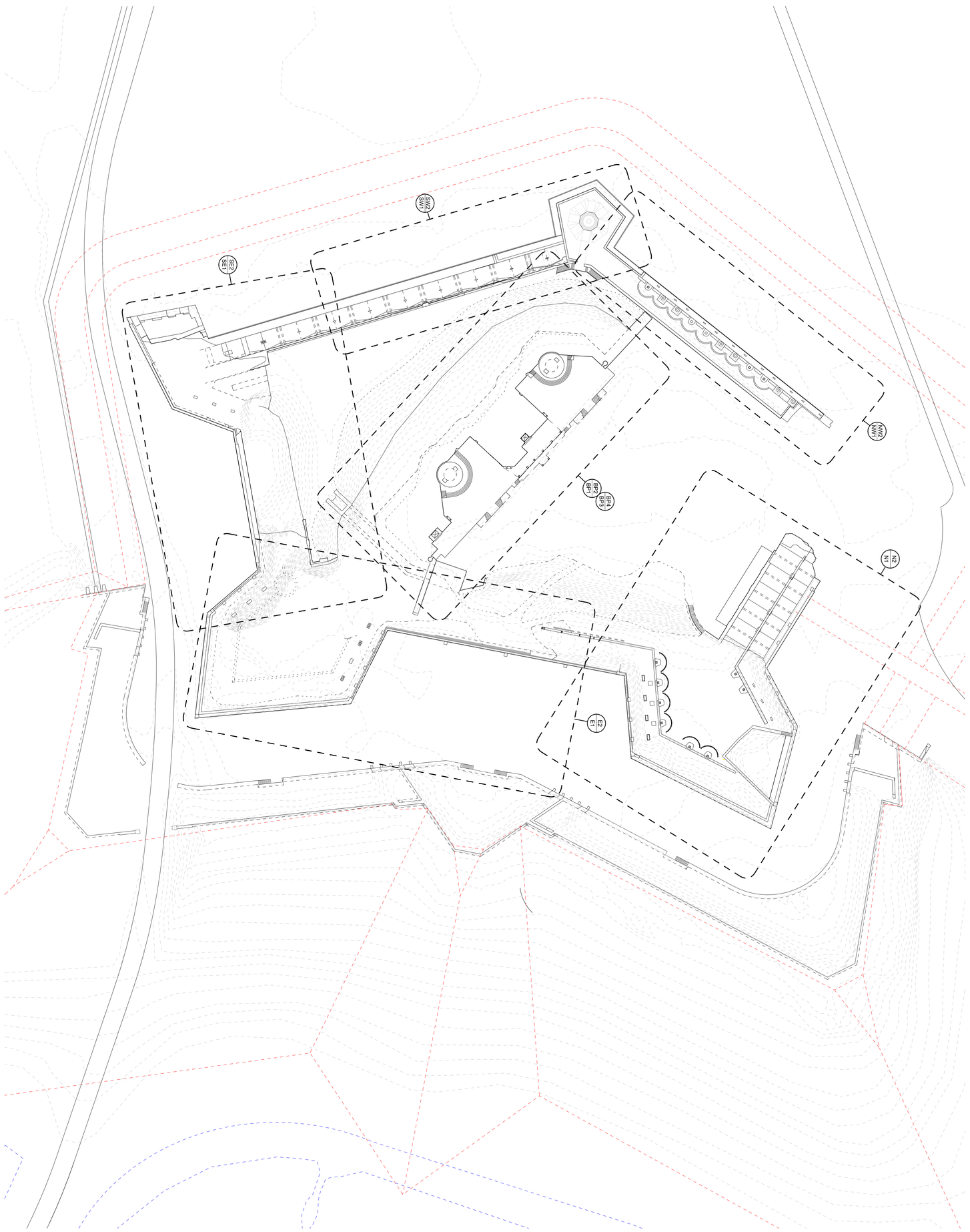
2023 TOPOGRAPHY

1834 SITE PLAN

2023 WATER LINE

ROOF LEVEL PLAN

GROUND LEVEL PLAN



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NATIONAL PARK SERVICE U.S. DEPARTMENT OF THE INTERIOR SOUTHEAST REGIONAL OFFICE	FORT PICKENS AND BATTERY PENSACOLA SANTA ROSA ISLAND GULF ISLANDS NATIONAL SEASHORE ESCAMBIA COUNTY, FLORIDA	HISTORIC STRUCTURE REPORT	SHEET 2

GROUND FLOOR LEVEL PLAN
1"=50'-0"

LEGEND

2023 TOPOGRAPHY

2023 WATER LINE

1834 SITE PLAN

ROOF LEVEL PLAN
GROUND LEVEL PLAN

N

N

U.S. D
SOU

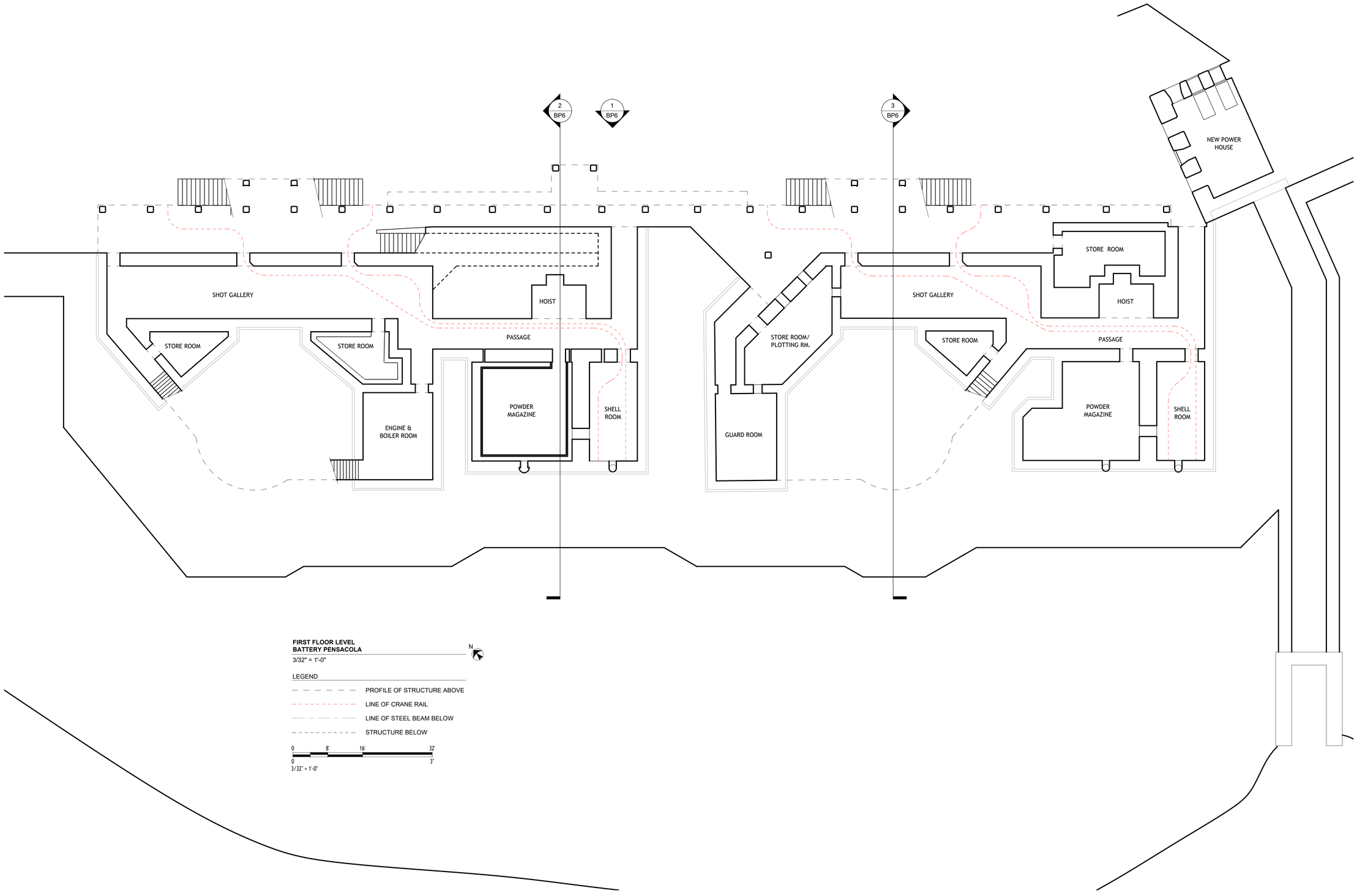
FORT PICKENS AND BATTERY PENSACOLA
GULF ISLANDS NATIONAL SEASHORE
ESCAMBIA COUNTY, FLORIDA

HISTORIC STRUCTURE REPORT

SANTA ROSA ISLAND

3/2025

SHEET
3



FIRST FLOOR LEVEL
BATTERY PENSACOLA

3/32" = 1'-0"

N

LEGEND

- PROFILE OF STRUCTURE ABOVE
- LINE OF CRANE RAIL
- LINE OF STEEL BEAM BELOW
- STRUCTURE BELOW

0 8' 16' 32'
0 3"
3/32" = 1'-0"

SHEET
BP1

HISTORIC STRUCTURE REPORT

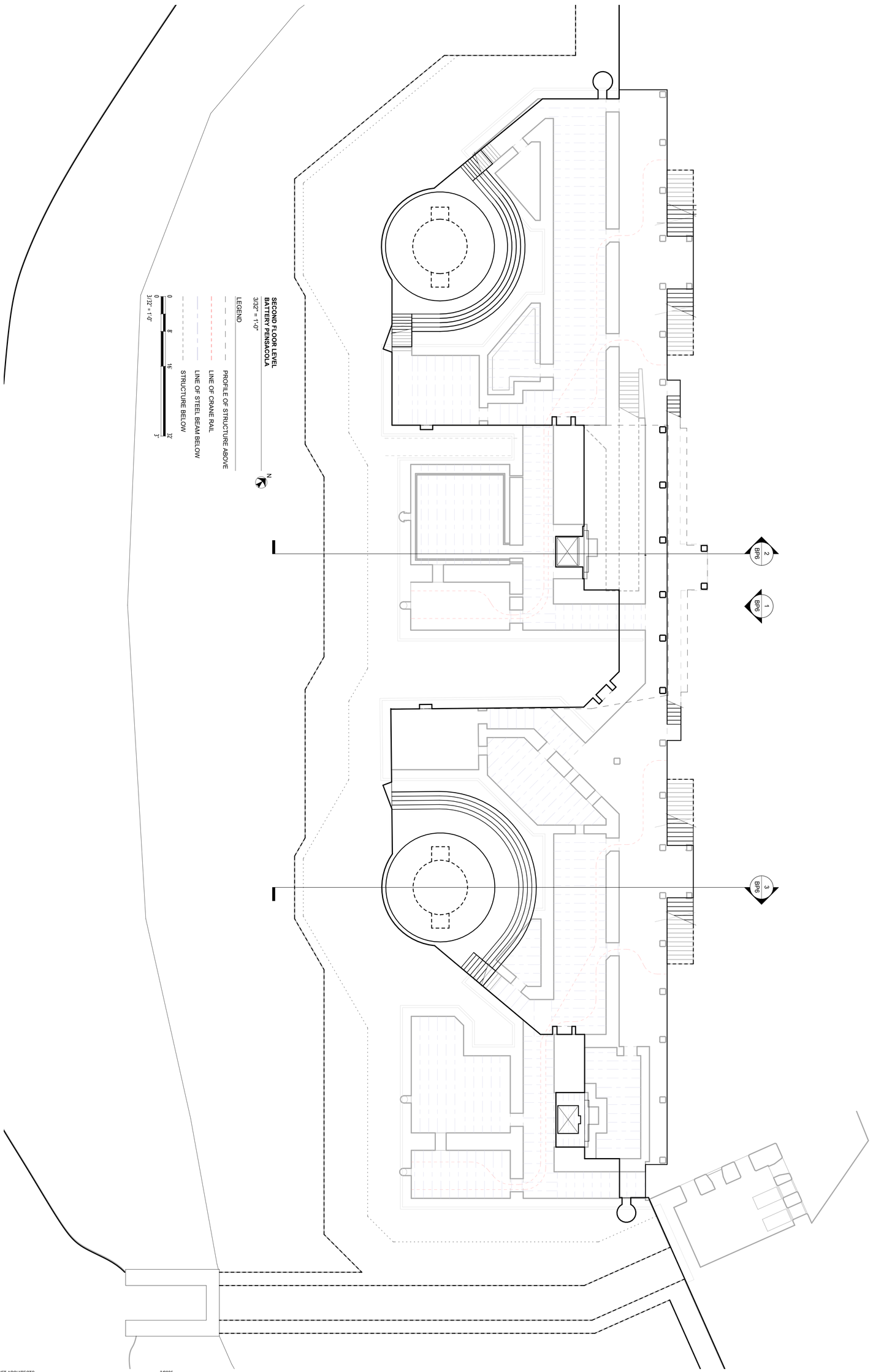
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GULF ISLANDS NATIONAL SEASHORE
ESCAMBIA COUNTY, FLORIDA

SANTA ROSA ISLAND

3/2025

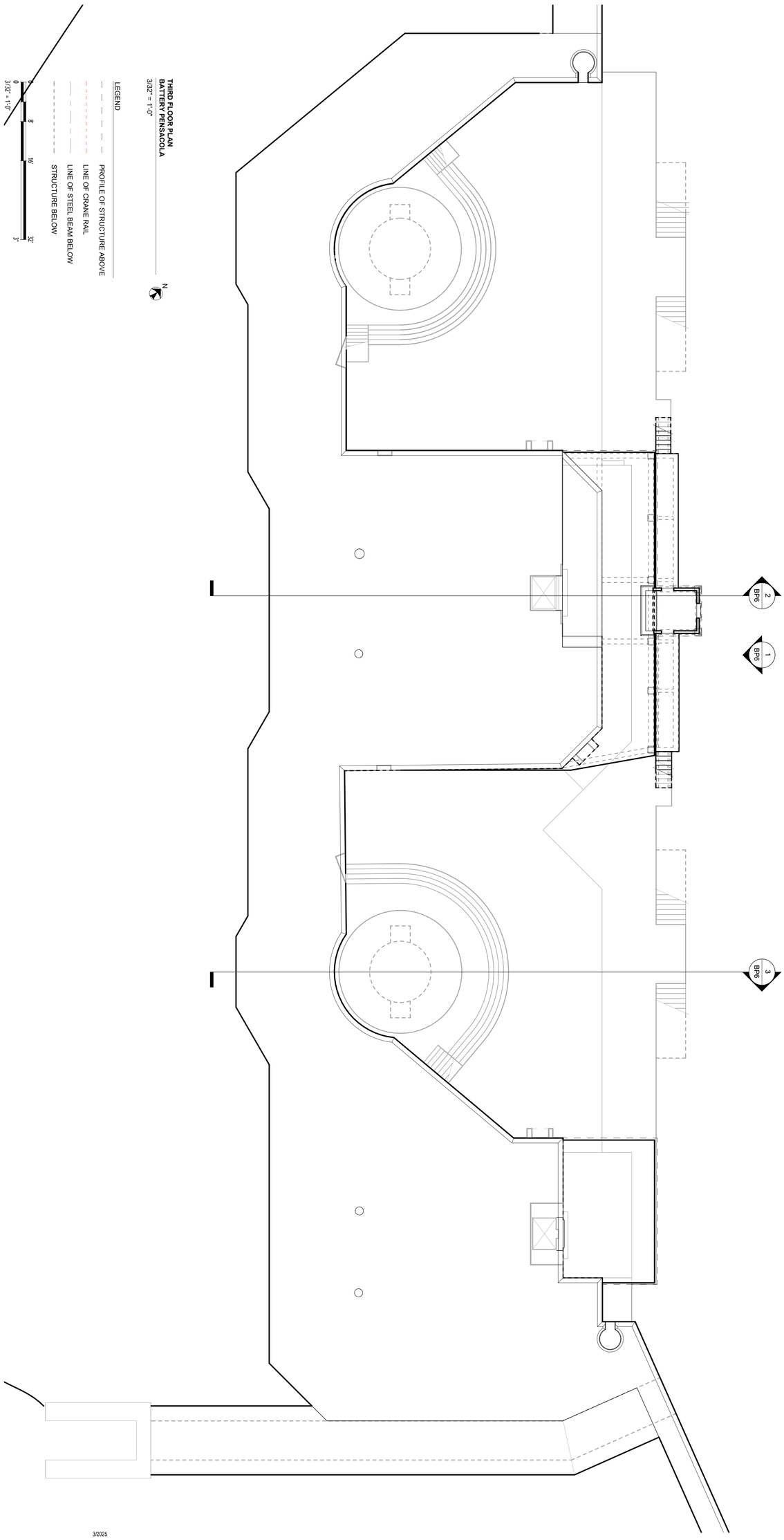
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SOUTHEAST REGIONAL OFFICE

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NATIONAL PARK SERVICE U.S. DEPARTMENT OF THE INTERIOR SOUTHEAST REGIONAL OFFICE	FORT PICKENS AND BATTERY PENSACOLA SANTA ROSA ISLAND GULF ISLANDS NATIONAL SEASHORE ESCAMBIA COUNTY, FLORIDA	HISTORIC STRUCTURE REPORT	SHEET BP2



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NATIONAL PARK SERVICE U.S. DEPARTMENT OF THE INTERIOR SOUTHEAST REGIONAL OFFICE	FORT PICKENS AND BATTERY PENSACOLA SANTA ROSA ISLAND GULF ISLANDS NATIONAL SEASHORE ESCAMBIA COUNTY, FLORIDA	HISTORIC STRUCTURE REPORT	SHEET BP3

ROOF LEVEL PROGRESS PLAN

3/32" = 1'-0"

N

LEGEND

- PROFILE OF STRUCTURE ABOVE
- LINE OF CRANE RAIL
- LINE OF STEEL BEAM
- STRUCTURE BELOW

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3/2025

NATIONAL PARK SERVICE
U.S. DEPARTMENT OF THE INTERIOR
SOUTHEAST REGIONAL OFFICE

FORT PICKENS AND BATTERY PENSACOLA

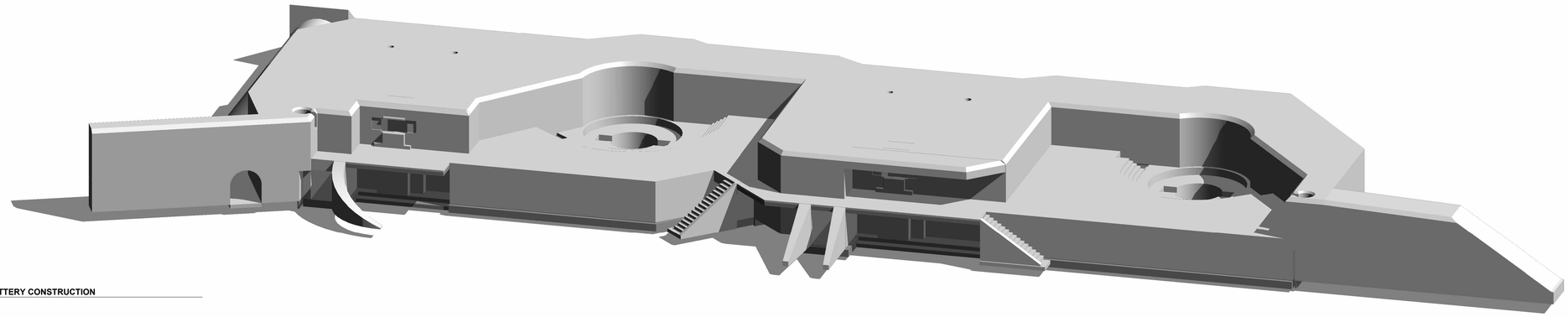
GULF ISLANDS NATIONAL SEASHORE

ESCAMBIA COUNTY, FLORIDA

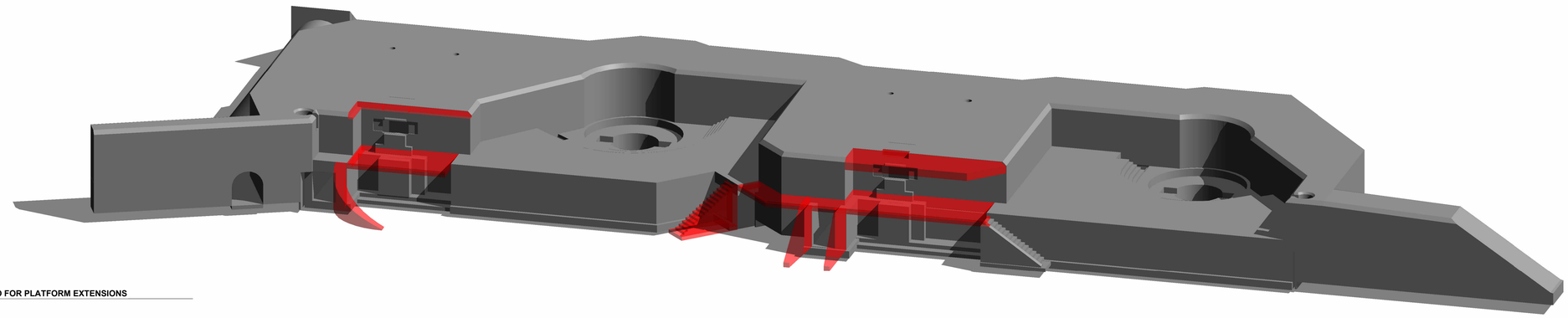
SANTA ROSA ISLAND

HISTORIC STRUCTURE REPORT

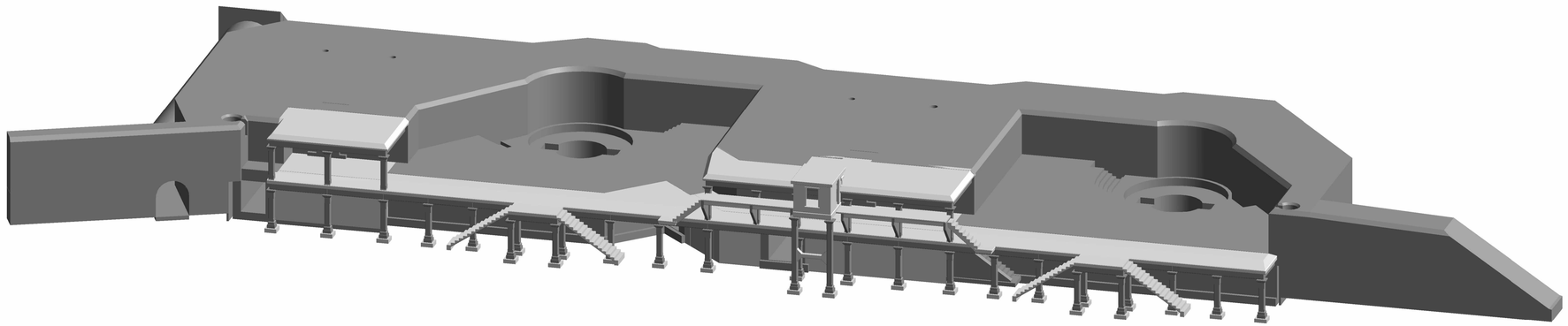
SHEET
BP4



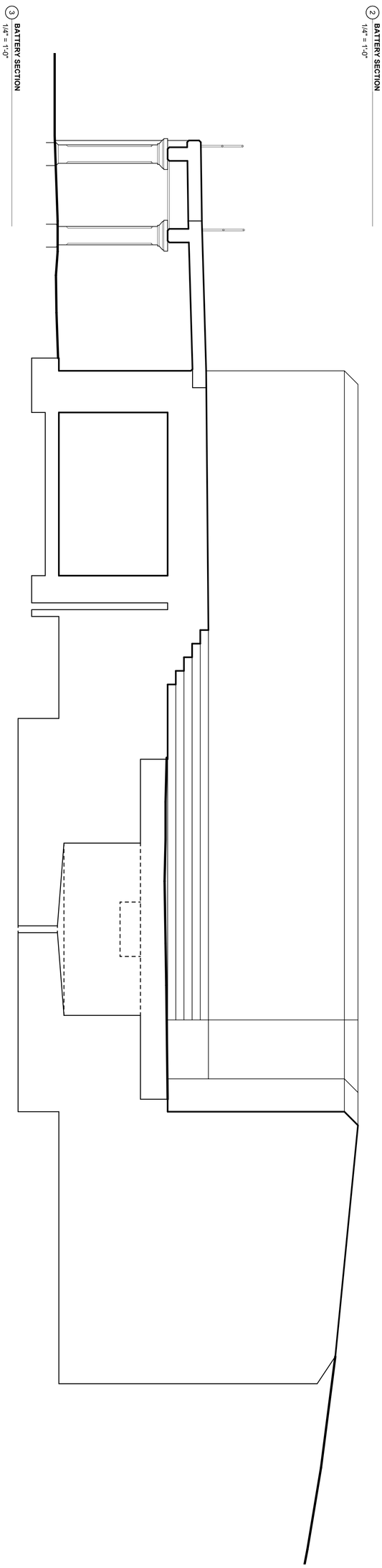
1898 BATTERY CONSTRUCTION



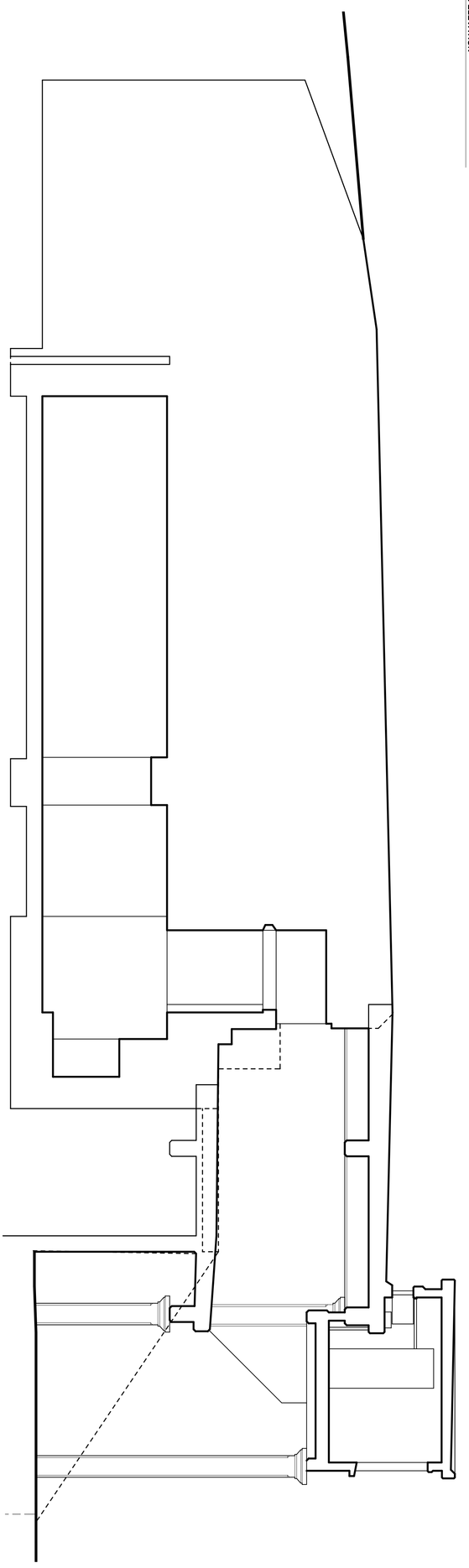
1907 DEMO FOR PLATFORM EXTENSIONS



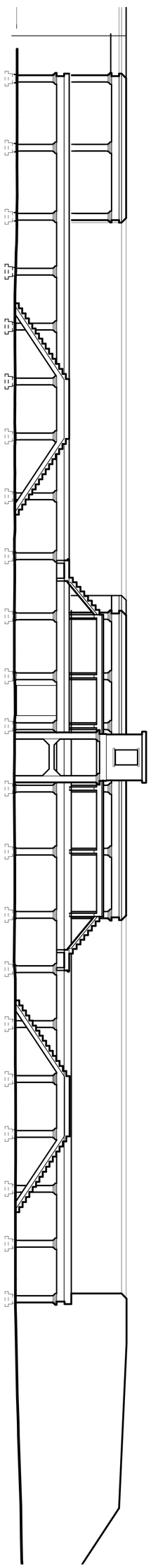
1907 PLATFORM EXTENSIONS



3 BATTERY SECTION
1/4" = 1'-0"



2 BATTERY SECTION
1/4" = 1'-0"



1 BATTERY NORTH ELEVATION
3/32" = 1'-0"

DRAWN BY: WFT ARCHITECTS 3/2025

NATIONAL PARK SERVICE U.S. DEPARTMENT OF THE INTERIOR SOUTHEAST REGIONAL OFFICE	FORT PICKENS AND BATTERY PENSACOLA SANTA ROSA ISLAND GULF ISLANDS NATIONAL SEASHORE ESCAMBIA COUNTY, FLORIDA	HISTORIC STRUCTURE REPORT	SHEET BP6

GROUND LEVEL PLAN
NORTHWEST SCARP

3/32" = 1'-0"

N

LEGEND

PROFILE OF STRUCTURE ABOVE

0 8' 16' 32'
0 3"
3/32" = 1'-0"

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3/2025

NATIONAL PARK SERVICE
U.S. DEPARTMENT OF THE INTERIOR
SOUTHEAST REGIONAL OFFICE

FORT PICKENS AND BATTERY PENSACOLA

GULF ISLANDS NATIONAL SEASHORE

SANTA ROSA ISLAND

ESCAMBIA COUNTY, FLORIDA

HISTORIC STRUCTURE REPORT

SHEET
NW1

ROOF LEVEL PLAN
NORTHWEST SCARP

3/32" = 1'-0"

N

LEGEND

PROFILE OF STRUCTURE BELOW

0 8' 16' 32'
0 3"
3/32" = 1'-0"

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3/2025

NATIONAL PARK SERVICE
U.S. DEPARTMENT OF THE INTERIOR
SOUTHEAST REGIONAL OFFICE

FORT PICKENS AND BATTERY PENSACOLA

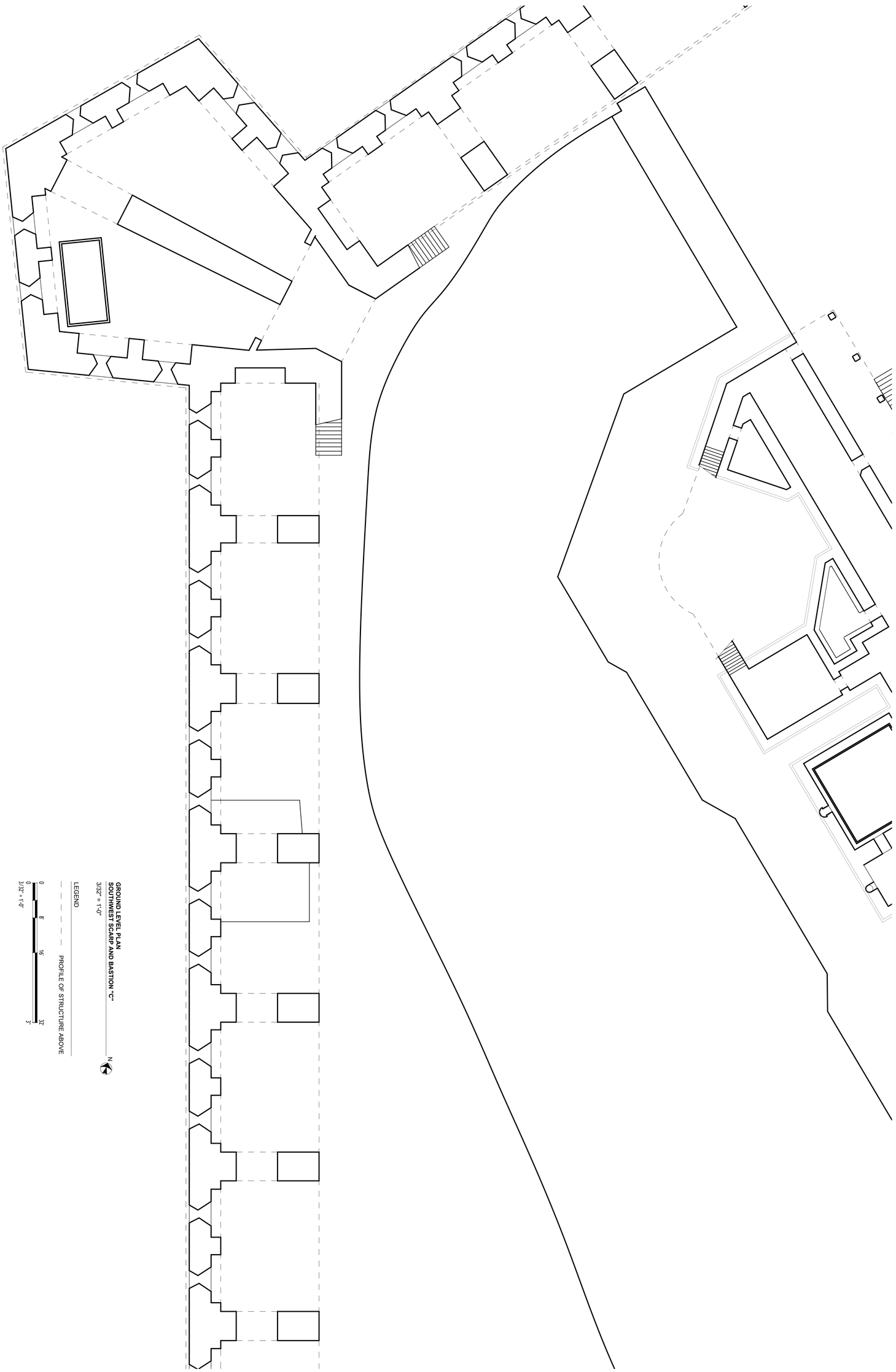
GULF ISLANDS NATIONAL SEASHORE

SANTA ROSA ISLAND

ESCAMBIA COUNTY, FLORIDA

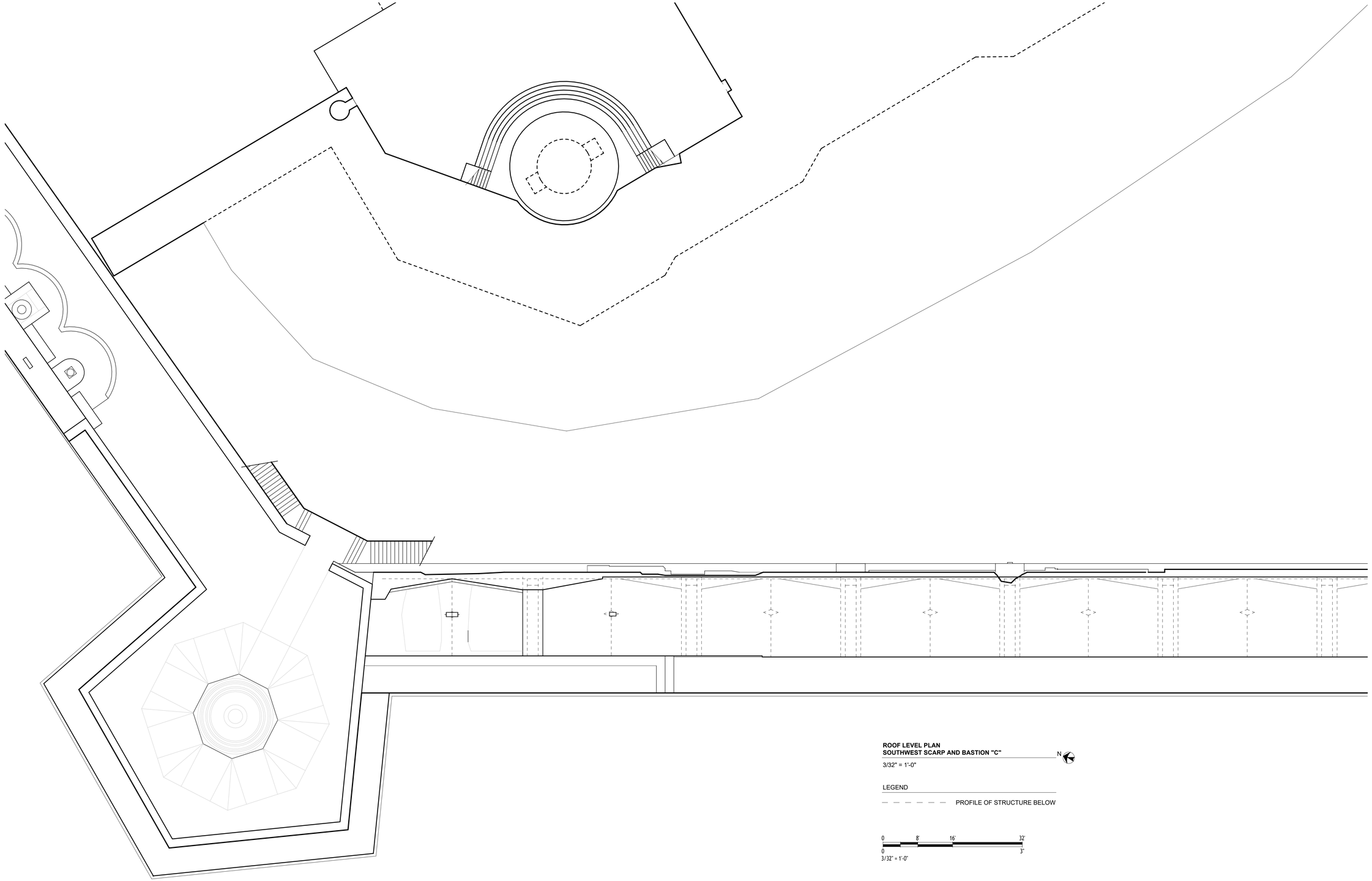
HISTORIC STRUCTURE REPORT

SHEET
NW2



DRAWN BY: WFT ARCHITECTS 3/2025

NATIONAL PARK SERVICE U.S. DEPARTMENT OF THE INTERIOR SOUTHEAST REGIONAL OFFICE	FORT PICKENS AND BATTERY PENSACOLA SANTA ROSA ISLAND GULF ISLANDS NATIONAL SEASHORE ESCAMBIA COUNTY, FLORIDA	HISTORIC STRUCTURE REPORT	SHEET SW1



ROOF LEVEL PLAN
SOUTHWEST SCARP AND BASTION "C"

3/32" = 1'-0"

N

LEGEND

PROFILE OF STRUCTURE BELOW

0 8' 16' 32'
0 3"
3/32" = 1'-0"

DRAWN BY: WFT ARCHITECTS

3/2025

NATIONAL PARK SERVICE
U.S. DEPARTMENT OF THE INTERIOR
SOUTHEAST REGIONAL OFFICE

FORT PICKENS AND BATTERY PENSACOLA

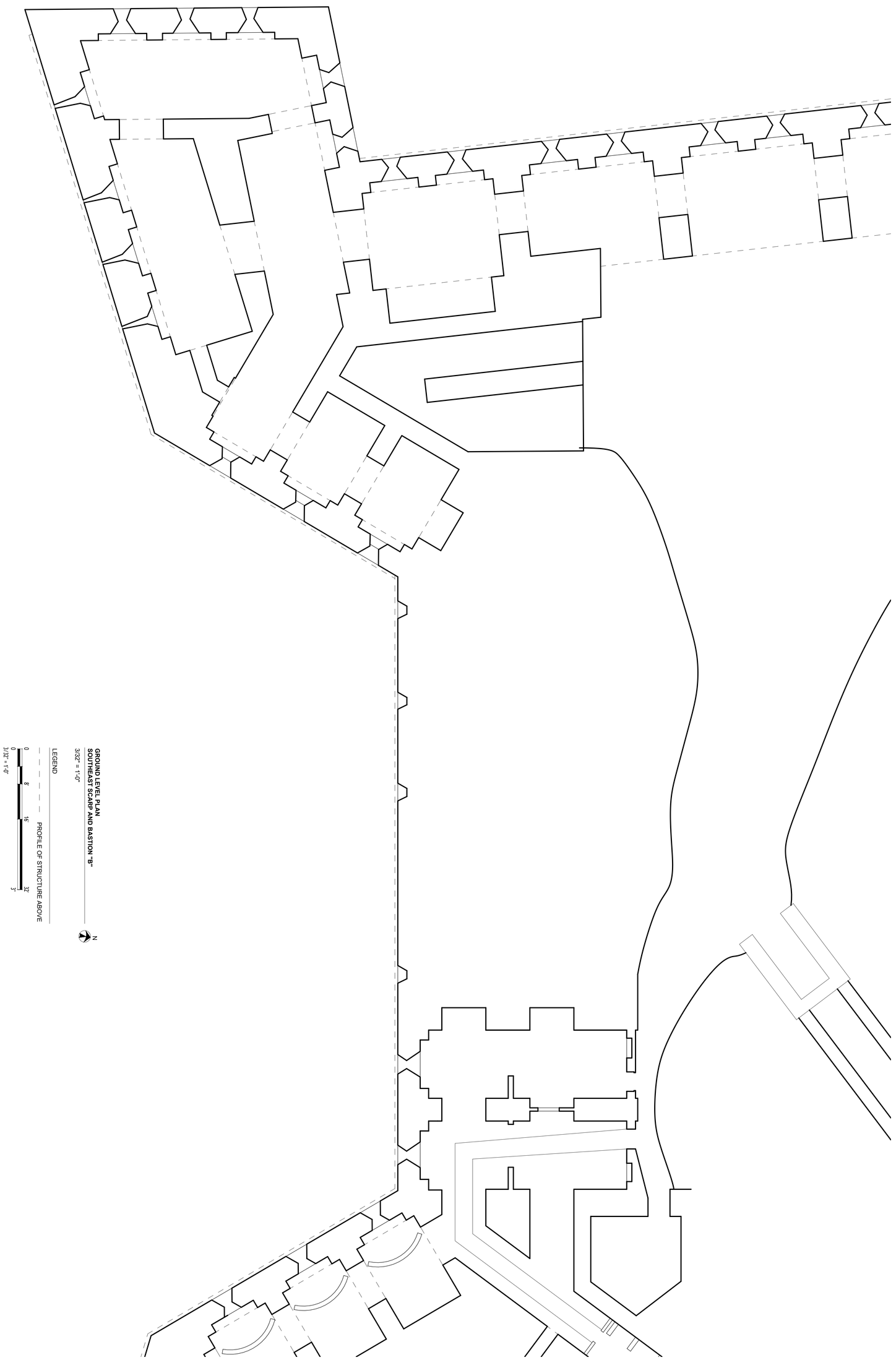
GULF ISLANDS NATIONAL SEASHORE

SANTA ROSA ISLAND

ESCAMBIA COUNTY, FLORIDA

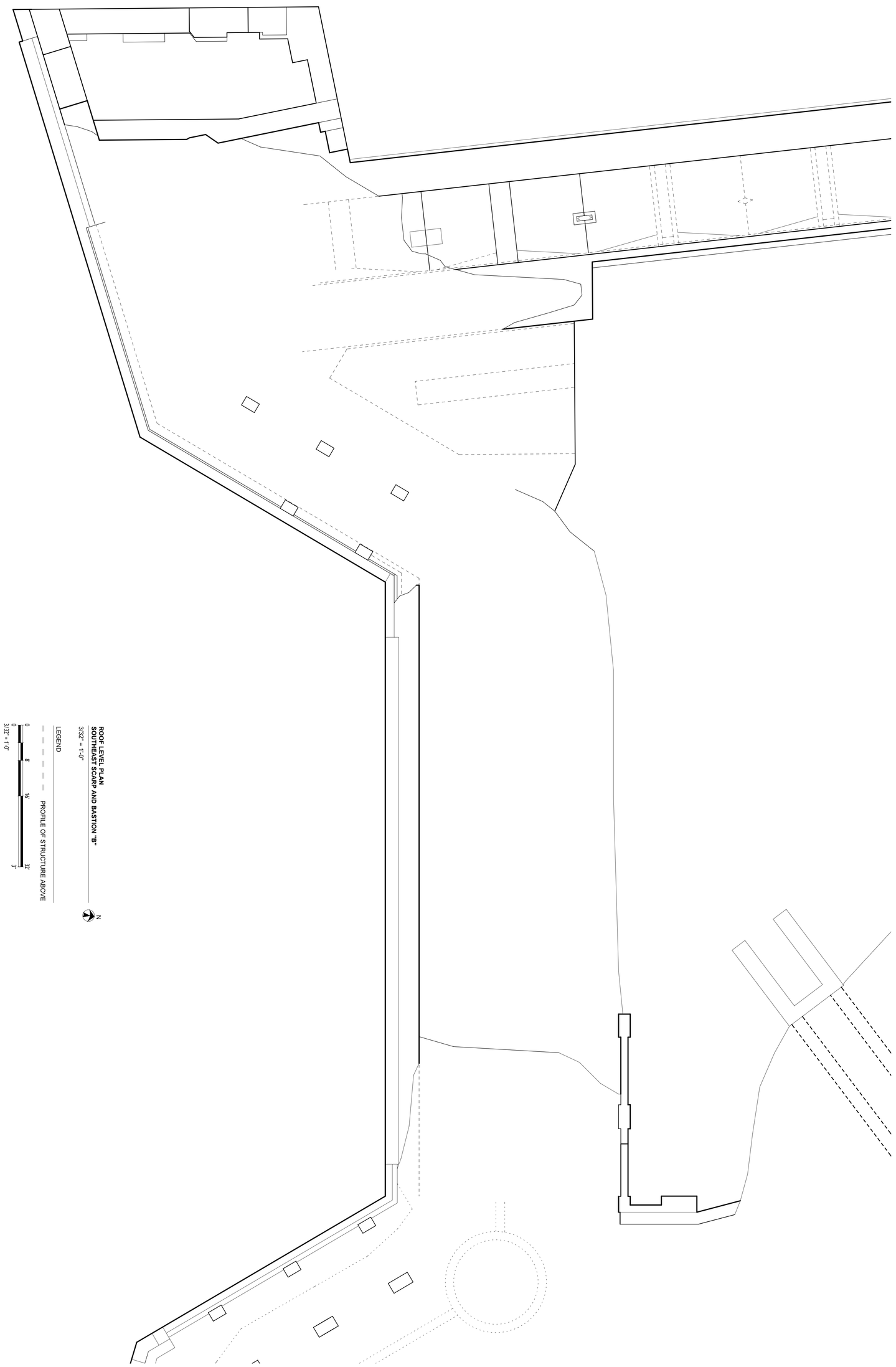
HISTORIC STRUCTURE REPORT

SHEET
SW2



DRAWN BY: WFT ARCHITECTS 3/2025

NATIONAL PARK SERVICE U.S. DEPARTMENT OF THE INTERIOR SOUTHEAST REGIONAL OFFICE	FORT PICKENS AND BATTERY PENSACOLA SANTA ROSA ISLAND GULF ISLANDS NATIONAL SEASHORE ESCAMBIA COUNTY, FLORIDA	HISTORIC STRUCTURE REPORT	SHEET SE 1



DRAWN BY: WFT ARCHITECTS 3/2025

NATIONAL PARK SERVICE U.S. DEPARTMENT OF THE INTERIOR SOUTHEAST REGIONAL OFFICE	FORT PICKENS AND BATTERY PENSACOLA SANTA ROSA ISLAND GULF ISLANDS NATIONAL SEASHORE ESCAMBIA COUNTY, FLORIDA	HISTORIC STRUCTURE REPORT	SHEET SE 2

GROUND LEVEL PLAN
EAST SCARP AND BASTION "A"

3/32" = 1'-0"

N

LEGEND

PROFILE OF STRUCTURE ABOVE

0 8' 16' 32'
0 3"
3/32" = 1'-0"

3/2025

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NATIONAL PARK SERVICE
U.S. DEPARTMENT OF THE INTERIOR
SOUTHEAST REGIONAL OFFICE

FORT PICKENS AND BATTERY PENSACOLA

GULF ISLANDS NATIONAL SEASHORE

SANTA ROSA ISLAND

ESCAMBIA COUNTY, FLORIDA

HISTORIC STRUCTURE REPORT

SHEET
E1

ROOF LEVEL PLAN
EAST SCARP AND BASTION "A"

3/32" = 1'-0"

N

LEGEND

PROFILE OF STRUCTURE BELOW

0 8' 16' 32'
0 3"
3/32" = 1'-0"

DRAWN BY: WFT ARCHITECTS

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NATIONAL PARK SERVICE
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SOUTHEAST REGIONAL OFFICE

FORT PICKENS AND BATTERY PENSACOLA

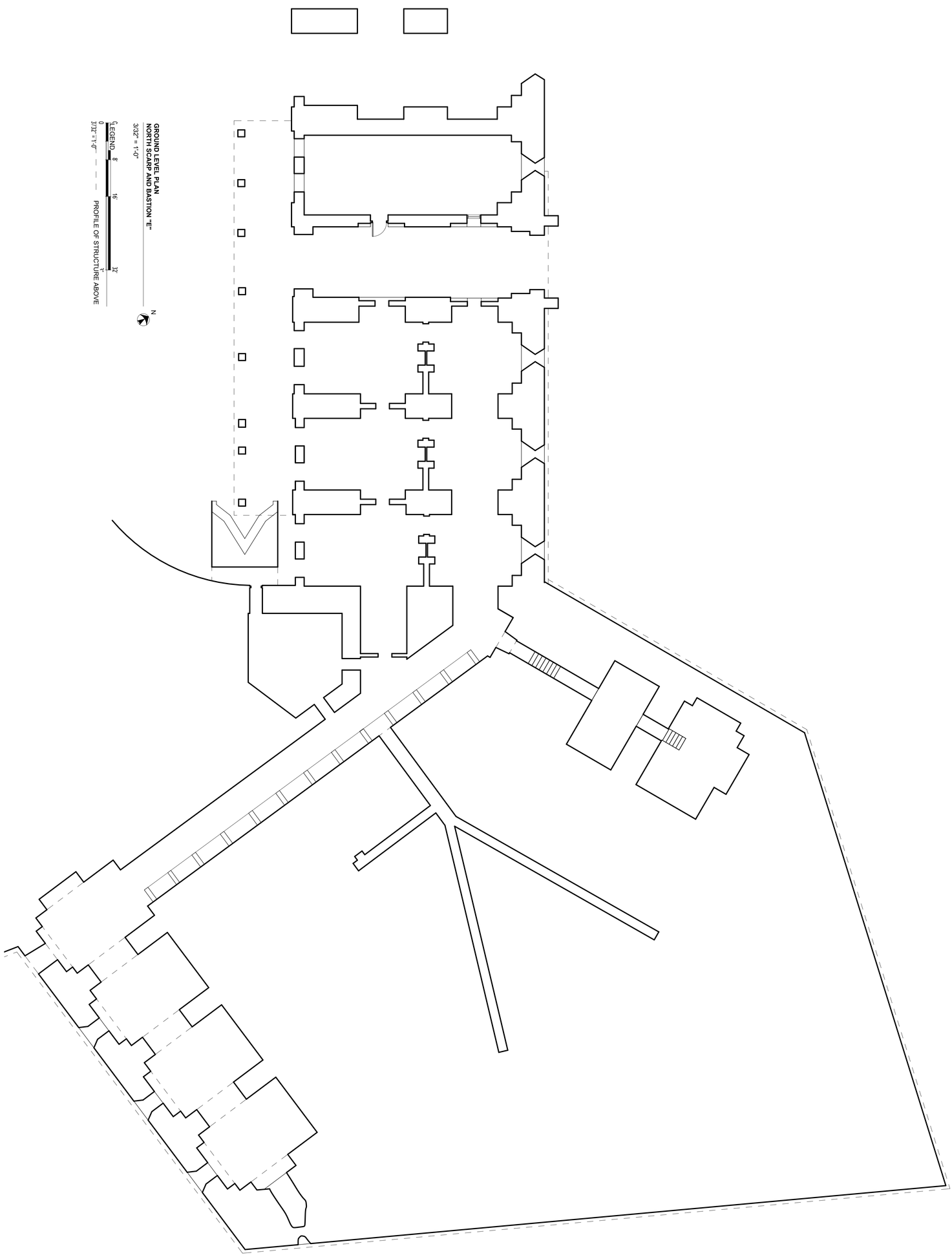
GULF ISLANDS NATIONAL SEASHORE

SANTA ROSA ISLAND

ESCAMBIA COUNTY, FLORIDA

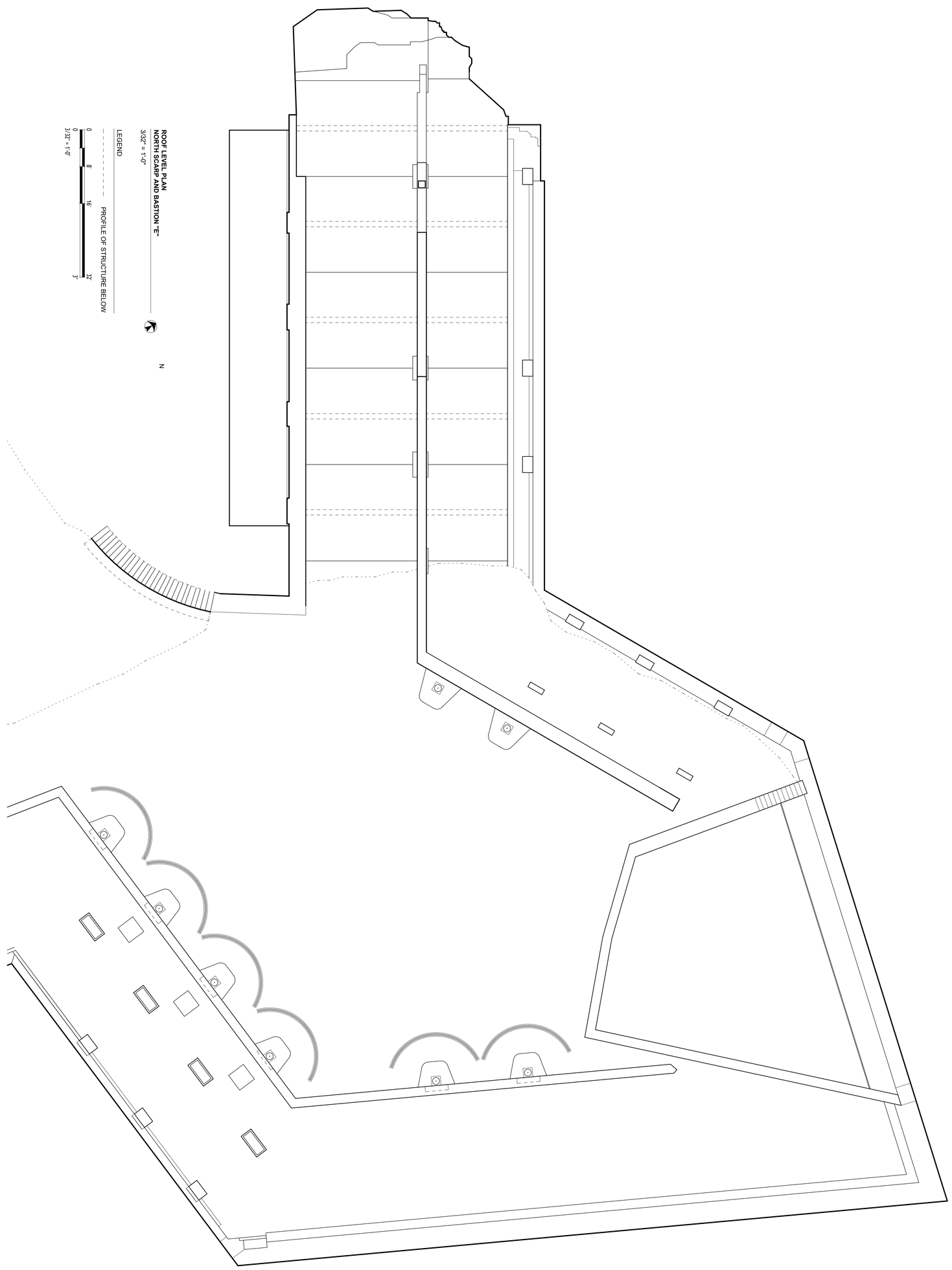
HISTORIC STRUCTURE REPORT

SHEET
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DRAWN BY: WFT ARCHITECTS 3/2025

NATIONAL PA U.S. DEPARTMENT SOUTHEAST RE	FORT PICKENS AND BATTERY PENSACOLA LAND GULF ISLANDS NATIONAL SEASHORE ESCAMBIA COUNTY, FLORIDA	HISTORIC STRUCTURE REPORT	SHEET N1



DRAWN BY: WFT ARCHITECTS 3/2025

NATIONAL PARK SERVICE U.S. DEPARTMENT OF THE INTERIOR SOUTHEAST REGIONAL OFFICE	FORT PICKENS AND BATTERY PENSACOLA SANTA ROSA ISLAND GULF ISLANDS NATIONAL SEASHORE ESCAMBIA COUNTY, FLORIDA	HISTORIC STRUCTURE REPORT	SHEET N2

Appendix B: Structural Analysis

Structural Analysis

Introduction and Background

Fort Pickens and Battery Pensacola at Gulf Islands National Seashore are part of the Pensacola Harbor defenses situated on the west end of Santa Rosa Island. Fort Pickens was constructed primarily in the early to mid-nineteenth century and is pentagonal in plan. Situated at the southeast half of the interior parade ground of Fort Pickens, Battery Pensacola was constructed in the 1890s. An addition to the northeast end of the battery was completed in the early twentieth century. Figure 1 shows an overall view of the site.

As part of the work performed for the Historic Structures Report (HSR) to which this report is an appendix, Wiss, Janney, Elstner Associates (WJE) collected field measurements and conducted limited non-destructive evaluation, with assistance from National Park Service (NPS) representatives, to review the structural condition of selected representative components of Fort Pickens and Battery Pensacola. Structural analysis of representative structural elements was also performed by WJE. The purpose of the structural assessment discussed below is to provide the NPS with information regarding the structural characteristics of Fort Pickens and Battery Pensacola, in support of recommendations developed for this HSR and for reference by the park in planning for continuing use of the structures.

Based on information provided by the park, the fort and battery will not be undergoing a change of occupancy and no repair or alteration of the structural framing is intended at this time. The current governing Florida building code for existing buildings, 2023 Florida Building Code, Existing Buildings, eighth edition (FEBC), applies for Repairs, Alterations, Change in Occupancy, and Addition. However, it does not provide criteria for evaluation of existing structures, such as the scope of this assessment. Loading criteria required by the current code, 2023 Florida Building Code (FBC), which is included by reference in the FEBC, was used for the structural analysis of representative structural elements of Fort Pickens.



Figure 1. Overall view of Fort Pickens and Battery Pensacola, Gulf Islands National Seashore. (Source: https://www.nps.gov/places/000/fort-pickens, accessed August 2023)

Description of Structures

Fort Pickens

Fort Pickens is a pentagon-shaped fortification that measures approximately 780 feet north–south by 680 feet east–west in plan, and is composed of two long casemated vertical walls, or scarps, with bomb-proof openings for artillery that face west; two shorter casemated scarps that face southeast and northeast; and a large scarp, counterscarp, and gallery system that face east toward the island interior.

The structure consists of multi-wythe clay brick masonry. The fortification was built on a brick foundation that features inverted arches on the two west walls, which are the longest and mounted the most cannon, in order to spread the weight of the structure and minimize settling within the sand substrate. The casemates have barrel and groined vault construction. Semicircular paving of granite in the floor supported the heavy weight of the inner bearing of pivoting cast iron guns. An additional tier of guns was designed for emplacement atop the terreplein *en barbette*.

A dry moat originally surrounded the fort, beyond which the land was graded to form a glacis, or downward sloped plain, which facilitated viewing and firing from the fort. The exterior walls formed an interior open space, known as the parade, which measures approximately 3 acres. The main gate, or sally port, is in the center of the northeast front.

Battery Pensacola

Battery Pensacola, a combination of unreinforced and reinforced concrete structure, was built in 1898–1899. The battery was constructed from concrete mixed on the island in a temporary concrete plant. Materials were conveyed from the batching plant to the interior of Fort Pickens via the narrow-gauge railroad. Battery Pensacola is a two-level battery with an open arcade with square columns on the north facade, double stairways on the east and west that lead to the second level, and 25-foot-diameter open gun emplacements

that flank the center arcade. The south side is earth-covered. The battery measures approximately 325 by 167 feet in plan, and reaches a height of 26 feet. The center of the structure is marked by a three-level reinforced concrete battery commander's station constructed in 1907. The structure has a flat concrete roof and a horizontal opening near the top of the upper level for viewing toward the ocean. Door openings are located near the center of the side walls.

The first level consists of various rooms used to store projectiles, powder charges, and tools. In addition to the structure itself, features that survive today include block and tackle beams, an overhead rail system, and ammunition elevators.

The upper level, reached by concrete stairways from both inside and outside, contains two 25-foot-diameter pits for mounting the 12-inch disappearing rifles. A spotting tower can be reached by stairs between and to the rear of the pits. The outside of the battery is painted black to decrease glare, while the inside walls are white.

The original portions of Battery Pensacola were designed to be a mass cast-in-place concrete structure. The walls were shown on archival drawings to range in thickness from 2 feet up to 20 feet thick in some locations. The concrete walls at the emplacements are generally 10 to 20 feet thick. The original upper-level slab contains steel I-shape beams embedded at the base of the concrete.

Circa 1909, an addition to the north end of the battery was completed, which included a commander's station and additional walkways. In 1915–1916, Fort Pickens was modified to enhance the field of fire of Battery Pensacola's guns through the lowering of the breast-height brick wall and sand parapet on the south scarp. A power station walkway was built in 1920 to service the battery.

Condition Assessment

A visual condition assessment was conducted for Fort Pickens and Battery Pensacola as part of this project. Findings of the assessment are provided in the Physical Description and Condition Assessment chapter of the Historic Structures Report.

Non-Destructive Evaluation

Assessment using non-destructive techniques to evaluate the depth, spacing, and orientation of embedded steel reinforcement, if present, was completed at Battery Pensacola. These techniques were not used at Fort Pickens, as embedded steel is not a structural component of the historic mass masonry construction of this era and hence, typically not found in the masonry structure. Generally, such non-destructive evaluation of mass masonry is not performed due to the inherent voids that are present in the joints between brick masonry units.

At Battery Pensacola, WJE utilized two non-destructive evaluation test methods: 1) ground-penetrating radar (GPR) and 2) sonic echo-impulse response. Ground-penetrating radar surveys performed on concrete structures allow for the detection of embedded objects, material interfaces, and assessment of some internal flaws. The testing method involves the use of a dipole radar antenna that transmits electromagnetic wave pulses along discrete scans from the surface of the structural element. The electromagnetic waves propagate through the material and reflect at material interfaces characterized by a change in dielectric properties. The reflected waves are collected by the antenna and are amplified, filtered, and displayed for subsequent interpretation. It is important to note that GPR surveys reveal the presence and location of embedded material or voids, but provide limited information on the size of the material or void. Precise information regarding embedded objects or voids is determined through inspection openings. For this investigation, a Sir-4000 GPR control unit with multiple antennas, including 350 MHz, 1600 MHz, and 2000 MHz frequency antennas, as well as a 2600 MHz StructureScan Mini GPR system, all manufactured by Geophysical Survey Systems, Inc., were used to assess the concrete structure. Sonic-echo impulse response surveys involve a low-

strain impact on the concrete structure using an instrumented rubber-tipped modal hammer capable of generating stress waves with a frequency range of 0 Hz to 1000 Hz. The dynamic response of the structural element to the stress wave is measured using a velocity transducer positioned adjacent to the impact point. Impulse-response testing is commonly used for measurement of overall thickness of a structural element.

Figure 2 and Figure 3 show the overall locations (in plan and elevation) of the non-destructive testing performed throughout the battery. A total of fourteen locations in the battery were studied using non-destructive techniques. The locations are labeled S1 through S14.

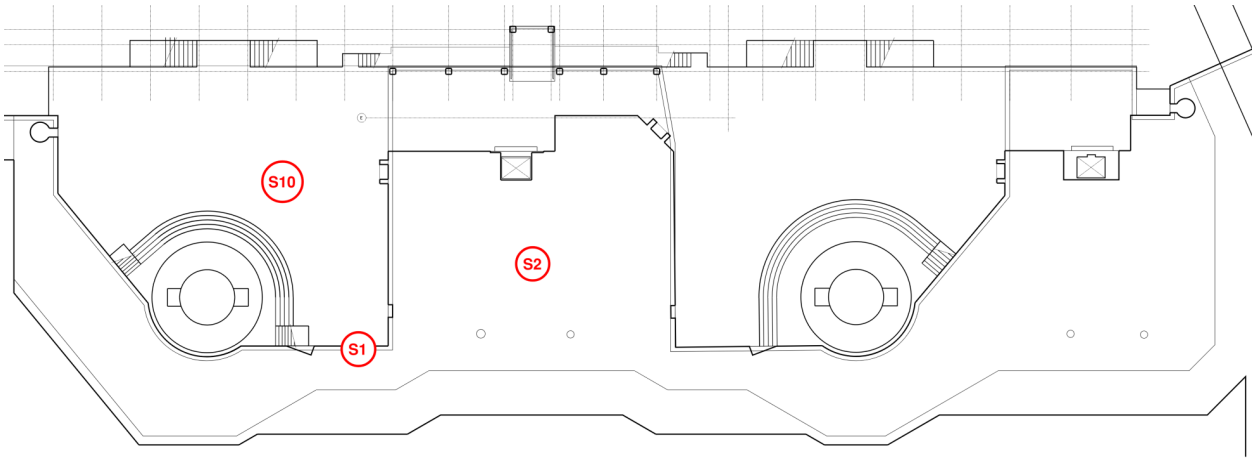


Figure 2. Plan of Battery Pensacola showing locations of scans.

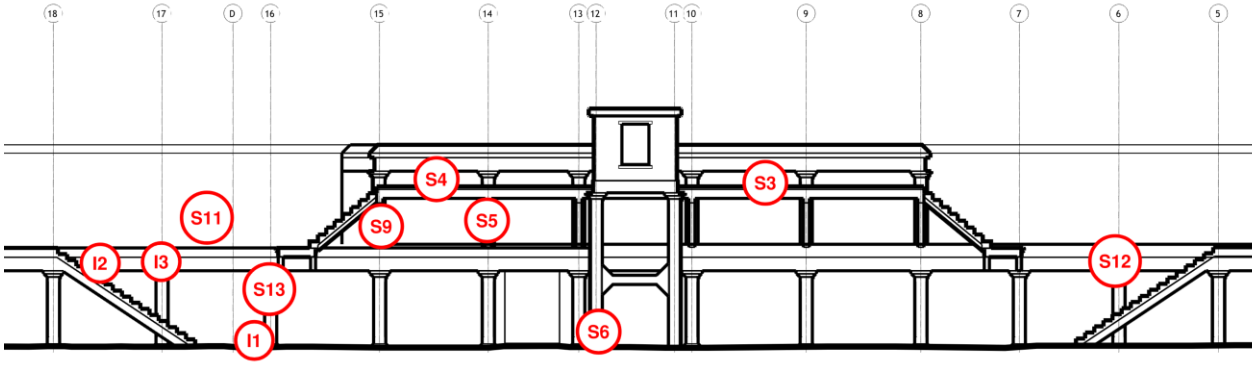


Figure 3. Partial north elevation with labeled scans and inspection openings.

The findings of the non-destructive testing performed at each location are presented in the following paragraphs.

S1 - South Mass Concrete Wall

Scans of the south concrete wall by the west gun emplacement using GPR indicate that no steel reinforcement is present in the wall. Sonic-echo impulse response testing showed that the thickness of the wall at this location is approximately 20 feet.

S2 – Mass Concrete Between Gun Encasements

Scans at this location using GPR indicated unreinforced mass concrete, measuring approximately 14 feet in thickness. The results of the GPR scans at this location were field verified by measuring the depth of the mass concrete from a vertical air vent located in the shell room associated with the west gun emplacement.

S3– Battery Commander's Station Elevated Walkway Slab

The GPR scans of the 4-1/2-inch-thick elevated concrete slab leading to the battery commander's station revealed longitudinal bars in the north-south direction spaced 4 inches on center, with approximately 1 to 1-1/2 inch cover from the bottom of the slab.

S4 – Battery Commander's Station Elevated Walkway Edge Beams

Scans of the south edge beam revealed two longitudinal bottom bars at the base of the beam, with a concrete cover of approximately 1 to 2 inches.

S5 – Battery Commander's Station Walkway Corbel Supports

The concrete corbel supports beneath the commander's station walkway were scanned with GPR. On either face of the concrete corbel, embedded diagonal bars were identified that span perpendicular to the exterior edge of the corbel and have variable spacing between 16 to 24 inches on center. An additional reinforcing bar is located parallel to the exterior edge of the corbel on both faces. Generally, the concrete cover for the reinforcement in this structural element measured approximately 1 inch or shallower.

S6 – Battery Commander's Station Columns

The longitudinal reinforcement of the columns supporting the battery commander's station are located at each corner of the column cross section. Concrete cover on the longitudinal bars was approximately 2 inches on each face of the column. Ties were vertically spaced 1 foot on center, starting approximately 6 inches from the base of the column.

S7 - Battery Commander's Station Walls, Floor, and Roof Slab

Scans of all walls of the battery commander's station revealed both horizontally and vertically oriented reinforcement at mid-depth of the 6-inch-deep walls. Typical spacing of the bars was 1 foot on center in both directions.

S8 – Roof Slab Above 1900s Addition

The 12-inch-deep roof slab of the 1900s addition just south of the battery commander's station was scanned with GPR. The underside of the slab has longitudinal reinforcing bars spanning in the north-south direction, spaced 4 inches on center with approximately 1-1/2 inch cover. No reinforcement was detected near the top side of the slab.

S9 – Upper-Level Edge Columns

The location and concrete cover of longitudinal reinforcement of the upper-level columns supporting the roof is the same as that of the commander's station columns. Ties were vertically spaced approximately 21 to 24 inches on center, starting approximately 6 inches from the base of the column. A total of five ties were detected along the height of the column.

S10 – Upper-Level Floor Slab (1890s Construction)

Scans of the topside of the upper-level 1898 slab indicate a 36-inch thickness. The location of the steel beams at the base of the slab was also visible. Although the depth of the steel beams cannot be confirmed using GPR techniques, the spacing of the beams was approximately 2 feet on center. When scanning the underside of the

slab, between embedded steel beams, no additional mild reinforcement was found in the concrete between the beams.

S11 – Upper-Level Floor Slab (1900s Construction)

Scans of the 12-inch-deep upper-level floor slab show the same orientation, spacing, and concrete cover in reinforcement as that of the roof slab above the 1900s addition.

S12 – Upper-Level Floor Edge Beam

Scans of typical upper-level edge beams revealed four longitudinal bottom bars, evenly distributed across the base of the beam's cross section. The vertical clear cover of the bars ranged from 1 to 2 inches. The outermost longitudinal bars slope diagonally toward the top of the beams within approximately 1 foot from the end of the beam span, at an angle of approximately 45 degrees. The inner two longitudinal bars continue to the end of the beam. No conventional stirrup reinforcement was detected.

S13 – Lower-Level Typical Column

At the lower-level interior and edge columns supporting the upper level, the location, average concrete cover of longitudinal reinforcement, and average vertical spacing of the ties were the same as that of the upper-level columns.

S14 – Lower-Level Typical Interior Walls

No reinforcement is present in the interior partition walls of the 1890s construction on the lower level.

Inspection Openings

Due to exposed steel reinforcement at existing concrete spalls in structural elements, no deliberate inspection openings were made at Battery Pensacola. WJE collected information about the exposed steel reinforcement from the existing spall locations. Also, as no embedded elements are present in the mass masonry structure of Fort Pickens, no inspection openings were completed at the fort itself. The following summarizes information gathered at the battery at three locations with exposed steel reinforcement, all constructed during the 1900s addition. The location and labeling of existing openings are shown in Figure 3.

I1 – Lower-Level Column

An existing spall at the corner of the base of one lower-level column exposed the longitudinal reinforcement (Figure 4). This spall revealed one of the four longitudinal bars in the column. The smooth bar was square in cross section with one side measured to be 3/4 inch wide. The cover was measured to be 2 inches on each side of the column. No column ties were exposed at this spall. The exposed reinforcement exhibited moderate surface corrosion with minor section loss.

I2 – Upper-Level Edge Beam

An existing spall on the underside of an edge beam exposed the bottom of all four longitudinal bars at the base of the beam section (Figure 5). The typical smooth bars were square in cross section, with one side measured to be 7/8 inch wide. The clear cover of the longitudinal bars ranged from 1 to 2 inches at this location. The exposed reinforcement exhibited moderate surface corrosion with minimal section loss.

I3 – Upper-Level Floor Slab

An existing spall on the underside of the upper-level floor slab exposed multiple longitudinal bars at the base of the slab (Figure 6). The typical smooth bars were round in cross section with a diameter of 7/8 inch. The clear cover of the longitudinal bars was measured to be 1-3/8 inch at this location.



Figure 4. View of spall at inspection location I1.



Figure 5. View of spall at inspection location I2.



Figure 6. View of spall at inspection location I3.

Preliminary Structural Analysis

Section strength was evaluated for minimum loadings and load combinations per the requirements of the current governing code, the 2023 Florida Building Code, which references the following standards: American Society of Civil Engineers "Minimum Design Loads for Buildings and Other Structures" dated 2016 (ASCE 7-16) and The Masonry Society "Building Code for Masonry Structures" dated 2016 (TMS 402-16). The 2023 Florida Building Code references the same standards as the 2021 International Building Code with more stringent requirements for wind load design. Due to the limitations of the assessment, the effective strength has been evaluated with the observed as-built reinforcement.

Assumptions

Assumed material properties and reinforcement detailing were used for portions of the analysis due to the limited scope of the assessment. Assumptions are both inferred from observed conditions and based on commonly available construction materials contemporary with the building's construction. The following assumptions have been made for purposes of this analysis:

Geotechnical

The following material assumptions were made about the infill soil above a masonry arch at Fort Pickens spanning over a typical casemate.

- Soil and brick infill density above arches, γ=125 pound per cubic foot (pcf)
- The backfilled soil drains freely.

Brick Masonry

- The following material assumptions were made about the brick masonry at Fort Pickens.
  - Specific weight of brick masonry, γ=115 pcf
  - Brick masonry compressive strength, f`m = 1000 pounds per square inch (psi)
  - Mortar type is conservatively assumed to be masonry cement or air entrained portland cement/lime, Type N.
- Foundations of masonry structure are sufficiently constructed to resist vertical and lateral loading.

Concrete

- Concrete is normal weight, with a density of 150 pounds per cubic foot (pcf), reinforced.
- Concrete is assumed to have a compressive strength of 2,000 pounds per square inch (psi).

Steel Reinforcement

- Steel reinforcement yield strength is assumed to be 30,000 psi, the commonly available reinforcing bar strength in the early 1900s.
- Reinforcing bar modulus of elasticity was assumed to be 29,000,000 psi.
- Due to limited sizes of inspection openings, reinforcement lap splices and anchorages could not be observed but are assumed to be adequate for current design loads.
- Part of the 1900s addition to the north of the bunker, all column sections were assumed to have the same reinforcement as shown in the original construction drawings.

Hot Rolled Steel

- The maximum allowable fiber stress of the steel is 16,000 psi, the commonly available steel strength in the late 1800s and early 1900s.

Fort Pickens Analysis

Typical Masonry Arch in West Casemates

The section strength of a masonry arch spanning over a typical casemate was evaluated for gravity loading, summarized below. The arch's lateral loading is governed by wind forces. By inspection and based on geometry of the structural components, wind load demand on a typical arch is negligible in comparison to the structural capacity. Therefore, a gravity load alone was checked for this component of the structure.

A summary of the uniform gravity loads acting on a typical arch are as follows:

- Occupancy live load of 100 pounds per square foot (psf).
- Dead load of soil and brick infill above masonry arch.
- Dead load of actual weight of structural framing elements.

The typical masonry arch was evaluated, on a per foot basis, using RISA 3D, a commercially available software for structural analysis and design. The structural model was used to determine the resulting stresses along span of the arch, as well as reactions at the load-bearing masonry walls between casemates. The combined applied axial and flexural stresses were subsequently compared to maximum allowable stresses of the historic masonry. This comparison is commonly referred to as the allowable limit or demand-to-capacity ratio (DCR). Typically, a DCR greater than 1.0 indicates that the calculated demand on a member exceeds the design

capacity of the member, while a DCR equal to or less than 1.0 indicates that the demand on the individual frame members does not exceed the published allowable stresses of the individual members.

A uniform dead and live load were applied in the gravity direction to the structural elements. Bearing capacity in the arch at its base was checked, as well as flexural capacity of the as-built arch. The analysis results demonstrated that when symmetrically loaded, only compressive stresses are present in the arch (no tensile stresses), and they are less than the code-permitted allowable stresses considering the assumed material properties. The maximum DCR for flexural compressive stresses was approximately 0.20. The typical masonry arch has adequate strength to meet the gravity load demand, based on the above assumptions.

Exterior Masonry Wall at Tower Bastion

The section strength of an exterior masonry wall at the tower bastion was evaluated for gravity and lateral loading, as summarized below.

- Dead load of actual weight of structural framing elements.
- Components and cladding lateral wind load, based on a maximum design basic wind speed of 152 miles per hour (mph) for a Risk Category II structure per ASCE7-16.

The exterior masonry walls are cantilevered and independent of the perpendicular masonry walls and masonry arches. Also, the infill soil above some arches is laterally restrained by a short masonry wall built above the arches, independent of the exterior masonry walls. Hence, the gravity and lateral loading that the exterior masonry walls experience is limited to its self-weight and wind pressure. Seismic demand is low at the site in comparison to wind and hence is not explicitly considered.

The design basic wind speed of 152 mph is taken from the current governing building code (2023 Florida Building Code, Existing Buildings, eighth edition) and corresponds to a 3-second gust speed at 33 feet above ground for Exposure Category C. As part of the wind load analysis, the basic wind speed is factored to accommodate for height, topographic, and exposure effects.

The combined applied axial and flexural stresses were compared to the code-permitted allowable stresses of the masonry. The exterior wall at this location was found to have nominal tensile stresses due to the maximum transient applied load, but well below the code-permitted allowable tensile stress. The DCRs for flexural tensile and compressive stresses were approximately 0.25 and 0.10, respectively. The as-built construction of the exterior masonry wall is adequate to meet the gravity and lateral load demand, based on the above assumptions.

Battery Pensacola Analysis

At six representative locations, individual components of the battery were evaluated for minimum loading per the requirement of the current governing code. The labeled structural components that were analyzed are shown in Figure 7 and Figure 8. The following summarizes the assumptions and findings of the structural analysis completed for Battery Pensacola.

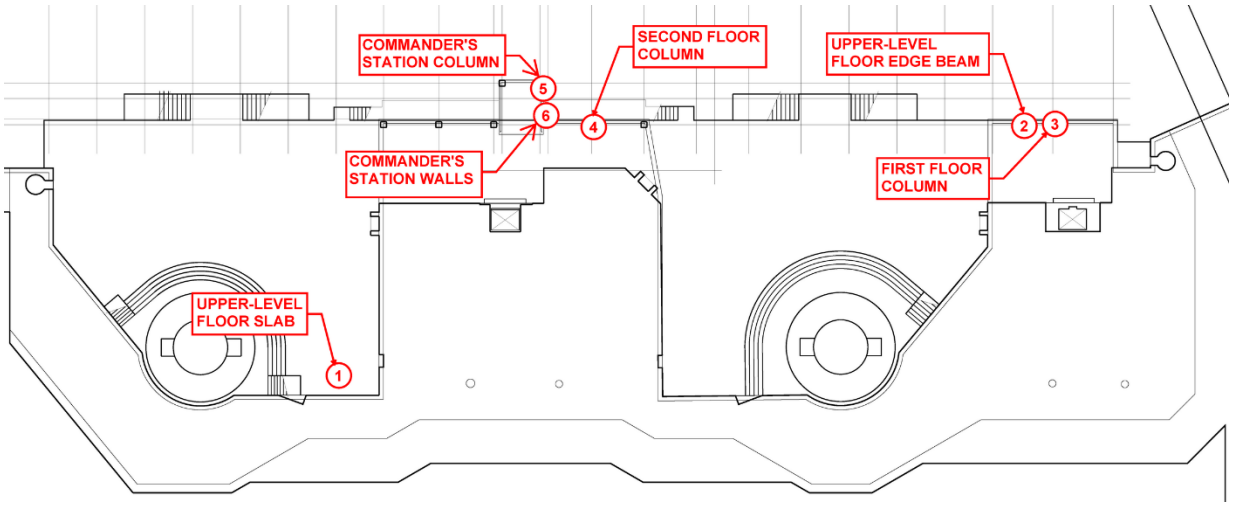


Figure 7. Plan of Battery Pensacola showing locations of structural analysis.

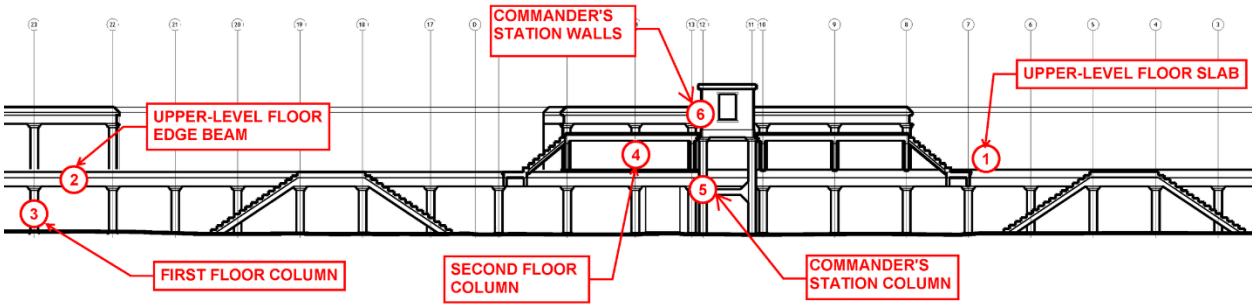


Figure 8. Partial view of north elevation with labeled locations of structural analysis.

Summary of Gravity Loading

For the upper-level floor slab, upper-level floor edge beam, first floor short column, second floor short column, and tall column, the section strength was evaluated for gravity loading summarized below. Further explanation of the evaluation is provided in subsequent sections.

- Occupancy live load of 100 pounds per square foot (psf), uniformly distributed.
- Dead load of actual weight of structural framing elements.

Summary of Lateral Loading

For the commander's station walls, the section strength was evaluated for lateral loading summarized below. Further explanation of the evaluation is provided in subsequent sections.

- Dead load of actual weight of structural framing elements.
- Components and cladding lateral wind load, based on a maximum design basic wind speed of 152 miles per hour (mph) for a Risk Category II structure per ASCE7-16.

Upper-Level Floor Slab (1890s Construction)

The section strength of the typical upper-level floor slab was evaluated for gravity loading. By inspection and based on geometry of the structural components, wind load demand on this element is negligible in

comparison to the structural capacity. Therefore, a gravity load alone was checked for this component of the structure.

The 36-inch-thick upper-level floor slab is composed of an unreinforced concrete slab with 9-inch-deep hot rolled I-shape steel beams embedded at the base of the slab at 2 feet on center. The floor slab was analyzed as a one-way slab spanning in the direction parallel to the steel beams. The steel and concrete elements were analyzed as a composite section (i.e., the concrete as it is reinforced by the steel beams are working together to resist the full gravity loading).

With the assumed material properties and loading, the floor slab was found to meet current code requirements for flexural and shear strengths.

Upper-Level Floor Edge Beam

The section strength of the upper-level floor edge beam of the north addition was evaluated for gravity loading. As this member is not part of the lateral load resisting system of the battery, lateral wind loading is not applicable for this analysis. The reinforced concrete beam was evaluated as simply supported, spanning between edge columns. Due to the lack of conventional stirrups in the member, only concrete capacity was considered in the shear capacity of the member.

With the assumed material properties and loading, the edge beam was found to meet current code requirements for flexural and shear strengths.

First Floor Column

The section strength of a first-floor column was evaluated for gravity loading. As the member is not part of the lateral load resisting system of the battery, lateral wind loading was not applicable for this analysis. Between one interior first-floor column and a typical edge column, the edge columns at the center of the north facade of the battery had the largest gravity demand. Utilizing Structure Point Column (SPC), a commercially available column modeling and design software package, the first-floor column was modeled with an unbraced height of 8 feet 3 inches, four total No. 6 longitudinal bars, and No. 3 ties. The analysis demonstrated that the column has adequate strength to meet the demand, based on the assumptions above, with an axial DCR of 0.2.

Second Floor Column

The section strength of a second-floor column was evaluated for gravity loading. As the member is not part of the lateral load resisting system of the battery, lateral wind loading was not applicable for this analysis. Unlike the first-floor columns, which only exhibit axial loading, the second-floor columns that support the walkway leading to the commander's station also exhibit flexural demand. Utilizing SPC, the first-floor column was modeled with an unbraced height of 8 feet 3 inches, four total No. 6 longitudinal bars, and No. 3 ties. The DCRs were found to be less than 0.1 for axial and approximately 0.4 for flexure. The analysis demonstrated that the column has adequate strength to meet the demand, based on the assumptions above.

Commander's Station Column

The section strength of a commander's station column was evaluated for gravity loading. As the member is not part of the lateral load resisting system of the battery, lateral wind loading was not applicable for this analysis. Between one interior first-floor column and a typical edge column, the edge columns at the center of the north facade of the battery had the largest gravity demand. A typical column supports the north half of the commander's station. Utilizing SPC, the first-floor column was modeled with an unbraced height of 17 feet,

four total No. 6 longitudinal bars, and No. 3 ties. Analysis results demonstrated that the column has adequate strength to meet the load demand, based on the assumptions above.

Commander's Station Walls

The commander's station north wall was assessed for general wind loading (including hurricanes). WJE did not make openings in the walls of the commander's station to verify reinforcing bar sizes. A No. 3 longitudinal bar size was assumed for this analysis. A No. 3 is considered a conservative assumption because it is smaller than would be expected for a concrete wall of this size. Location, terrain, size of structure, and developed wind speeds are among the factors used in determining the wind loads. The maximum hurricane wind pressure (strength level, components and cladding), in accordance with 2023 FBC, was determined to be 90 psf negative pressure (outward direction) and 67 psf positive pressure (inward direction). The north concrete wall is found to have adequate flexural strength to resist lateral wind loads (imposed by hurricane and tornado), based on the assumptions above, with a DCR of 0.83.

Discussion and Conclusions

Fort Pickens

Mass masonry walls and arches are typical construction for this era of fort construction. This system relies on net compressive stresses in load-bearing elements to transfer lateral and gravity load to foundations. Generally, tensile stresses in mass masonry structures would be expected to be minimal because masonry has a low tensile capacity without steel reinforcement. Cracked mortar joints and bricks are a sign of tensile strain developing in masonry. It is particularly critical that masonry arches remain in compression across their span to prevent an unstable overhead condition. Cracks perpendicular to and on the underside of the span of the arch are indicative of tensile strain in the arch. This type of cracking was seen in limited locations at the east end of the southeast scarp and at an arch at Bastion B. A typical masonry arch at the fort was analyzed for its observed gravity loading conditions, which includes self-weight and, conservatively, a full overburden load. With conservative assumptions made regarding material property, the analysis demonstrated that the masonry arch was in net compression and adequate to meet load demand. Only symmetrical loading of the masonry arch was considered, which is traditionally the optimal way to load an arch because it produces the lowest tensile stresses. Non-symmetrical loading, such as infill installed above partial span of the arch, may lead to larger stresses in the masonry arch and is not recommended.

A combined gravity and lateral load analysis on a typical exterior masonry wall was completed. Components and cladding wind forces were used to assess this component of the structure. Based on commentary in ASCE7-16, a basic wind speed of 152 miles per hour for a Risk Category II structure corresponds to 700-year return period and a Saffir-Simpson Hurricane Category 4. In the areas adjacent to Fort Pickens, new structures are designed in accordance with this standard to resist wind loads from a Category 4 hurricane with minimal structural damage due to wind pressures. The representative exterior masonry wall of the fort was evaluated using the same new design standards, which exceeds any wind speed historically recorded from previous hurricanes at this location. The exterior masonry wall was found to be sufficient to resist such loads.

Given the height, geometry, and stiffness of the main structural components comprising Fort Pickens, which include historic masonry walls and arches, structural analysis of these components suggests that significant damage is unlikely to occur to the main structural elements in a high wind event, based on the assumptions made above and the as-built conditions observed.

Battery Pensacola

Numerous individual components of the battery, including beams, columns, slabs, and walls, were evaluated and found to be structurally adequate to meet current code requirements. The unreinforced mass concrete walls of the original battery construction are inherently sufficient to resist structural loading demands due to their thickness, geometry, and stiffness. Findings of the visual assessment also show no significant structural deficiencies in the unreinforced mass concrete components of the battery. It is reasonable to suggest that significant damage is unlikely to occur to the battery in an extreme weather event. However, consideration should be taken to address and further evaluate isolated areas of distress, including corroded embedded steel. Corrosion of embedded steel may reduce the strength of the concrete elements. If left unaddressed, corrosion typically reduces the durability of a concrete element by producing additional cracking and spalling, and may compromise the capacity of the element.

The portions of the battery with embedded steel bars exhibited areas of distress in the form of cracks, spalls, and corroded embedded steel. Areas constructed of concrete with embedded steel reinforcing bars are limited to the 1900s addition to the north side of the battery. Corrosion of varying severity was observed in the exposed reinforcing bars, with the most severe corrosion observed at the corbels supporting the walkway leading to the battery commander's station, and the underside of the walkway. During the site visit, the walkway was closed due to distress at the stairs. The walkway should be kept closed until a detailed evaluation of the corbel's construction and the condition of the corroded reinforcing is performed.

Recommendations

Fort Pickens

Brick masonry deterioration and distress should be repaired using repair techniques and procedures that are outlined in the Treatment chapter of the Historic Structures Report.

Based on the findings of the structural analysis of the masonry structure comprising Fort Pickens, materials study and additional analysis is not necessary or recommended for structural analysis purposes, though other materials studies not related to this analysis are recommended in the Historic Structures Report.

Battery Pensacola

Concrete deterioration and distress should be repaired using concrete repair techniques and procedures that are outlined in the Treatment chapter of the Historic Structures Report.

The walkway to the commander's station should be kept closed until a detailed evaluation of the corbel and walkway's construction and the condition of the corroded reinforcing is performed.

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National Park Service
U.S. Department of the Interior

Fort Pickens and Battery Pensacola
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