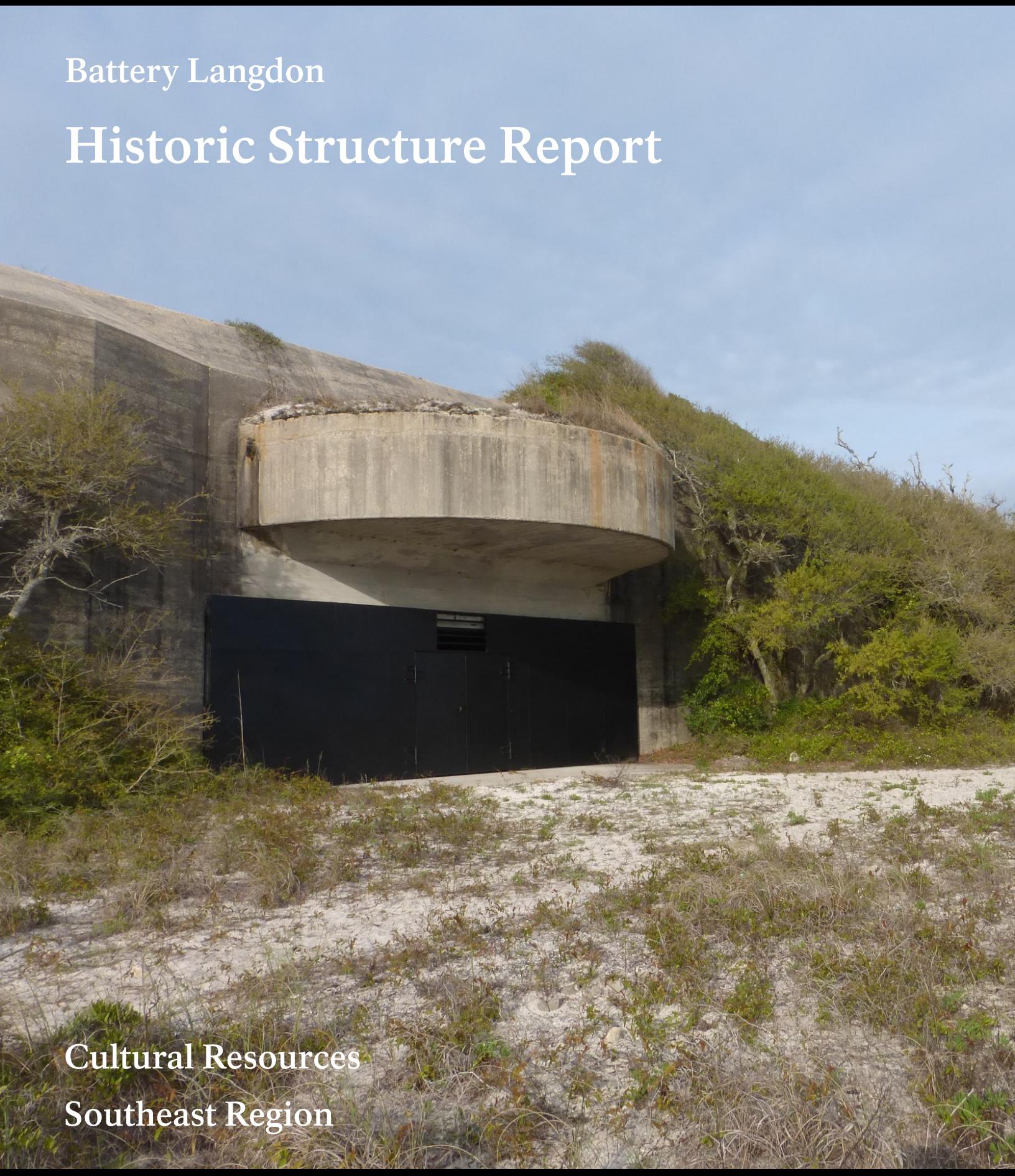
National Park Service
U.S. Department of the Interior

Gulf Islands National Seashore
Florida

# Battery Langdon

# Historic Structure Report



Cultural Resources

Southeast Region

# Gulf Islands National Seashore
# Battery Langdon

Pensacola Bay, Florida

# Historic Structure Report

December 2015

Prepared by:
Wiss, Janney, Elstner Associates, Inc.
330 Pfingsten Road
Northbrook, Illinois 60062

Prepared for:
National Park Service
Southeast Regional Office
100 Alabama Street SW
Atlanta, Georgia 30303


**Cultural Resources, Partnerships and Science Division**
**Southeast Regional Office**
**National Park Service**
**100 Alabama Street, SW**
**Atlanta, Georgia 30303**
**(404) 507-5787**

About the front cover: View of the Battery Langdon looking northeast, March 2015. Source: Wiss, Janney, Elstner Associates, Inc.

# Gulf Islands National Seashore
# Battery Langdon

Pensacola Bay, Florida

# Historic Structure Report

Approved: _____ 12/9/15
Superintendent, Gulf Islands National Seashore — Date

Acting
Recommended: _____ 12/14/15
Chief, Cultural Resources, Partnerships and Science, Southeast Region — Date

Recommended: _____ 12-15-15
Deputy Regional Director, Southeast Region — Date

Approved: _____ 12-15-15
Regional Director, Southeast Region — Date

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# Project Team

## National Park Service – Southeast Regional Office

Laurie Chestnut, Contracting Officer
Danita Brown, Historical Architect and Contracting Officer's Representative
Brian Coffey, Historian

## National Park Service – Gulf Islands National Seashore

Dan Brown, Superintendent
Steven McCoy, Deputy Superintendent
David Ogden, Cultural Resources Program Manager
Cassity Bromley, Chief of Science and Resource Stewardship
Jeff Halstead, Head, Historic Preservation Branch

## Wiss, Janney, Elstner Associates, Inc.

Deborah Slaton, Project Manager/Senior Historian
Paul Gaudette, Project Engineer
Mike Ford, Historical Architect
Liz Sargent, Historical Landscape Architect
Kenneth Itle, Historical Architect
Tim Penich, Historical Architect/Historian

# Foreword

[*To be added by NPS for final draft*]

# Management Summary

At the request of the National Park Service (NPS), Wiss, Janney, Elstner Associates, Inc. (WJE) has developed this Historic Structure Report (HSR) for Battery Langdon at Gulf Islands National Seashore, Florida. Figure 1 is a map of Gulf Islands National Seashore. Figure 2 is a map of Santa Rosa Island and the Pensacola area. Figure 3 is an aerial image showing the location of Battery Langdon in relation to Fort Pickens. Figure 4 is an aerial image showing Battery Langdon and its immediate environs.

Although not listed individually in the National Register of Historic Places, Battery Langdon was identified as a contributing structure in the draft National Register Nomination for the proposed Fort Pickens Historic District.[1] The battery is considered to be a contributing structure in the historic district that encompasses the Endicott System and later military resources located on western Santa Rosa Island, for which a National Register nomination is currently in progress. Battery Langdon is significant for its association with World War I and World War II-era activities conducted by the U.S. Army to protect the strategically important Pensacola Harbor. It survives with sufficient integrity to convey its historic associations. Therefore, treatment and use of Battery Langdon should be considered within the context of the legal mandates and policy directives established by National Park Service Cultural Resources Management Guideline (Director's Order 28) for the protection of cultural resources.

## Historical Data

The United States began development of the Third System of coast defenses in 1816, following British attacks during the War of 1812 that indicated a need for stronger fortifications. After control of the Florida territory was transferred from Spain to the United States in 1821, the U.S. Army Board of Engineers surveyed the newly acquired coastline to identify desirable locations for defensive works. Pensacola Bay was identified as the principal Gulf Coast port, primarily because of its protected deep water harbor. To protect this harbor, the western end of Santa Rosa Island was chosen as the site for the first of the fortifications in Florida—Fort Pickens. The fort was constructed beginning in 1829 and was completed by early October 1834.

Throughout the Civil War, Fort Pickens remained under Union control. From 1862 until the end of the Civil War, Fort Pickens was used as a prison for military and political prisoners. From October 25, 1886, until June 21, 1888, Fort Pickens served as a prison for about fifty Chiricahua Apaches, the most famous among them being Geronimo.

In the 1890s, in response to new military technology and deterioration of older fortifications, the U.S. Army began construction of the Endicott System of coast fortifications. At Fort Pickens, this effort initially included the construction of a mining casemate in the northeast bastion of the fort in 1894–1895. Between 1897 and 1899, four reinforced concrete fortifications—

1. Anne Castellina-Dudley, Historian, Gulf Islands National Seashore, Fort Pickens Historic District National Register of Historic Places nomination form, draft, May 27, 1977.

Battery Pensacola, Battery Cullum, Battery Van Swearingen, and Battery Worth—were built in the Fort Pickens area, while a mine defense was prepared for the harbor entrance. After a hurricane caused significant damage in 1906, a masonry and concrete seawall was built around the military structures in the Fort Pickens area.

Battery Langdon was constructed in 1917–1923 based on plans prepared by the U.S. Army Corps of Engineers. The most important and powerful element of the Harbor Defense Project, Battery Langdon was designed to protect Navy shore installations, harbor facilities and shipping in Pensacola Bay from naval gunfire in minor attacks; deny enemy ships access to the bay; and support the defense against amphibious attack within range of its armament.

The site chosen for Battery Langdon was located 2 miles east of Fort Pickens, 600 feet from the north shore of Santa Rosa Island, and 1,700 feet from the south shore, on a low sand ridge approximately 6 feet higher than the terrain of the beachfront. Work on the project was delayed, however, by a lack of labor resulting from the draft associated with World War I. After the war, work continued, and by March 1922, the battery was nearly complete. When completed in 1923, Battery Langdon featured a massive casemate to protect the magazines, storerooms, and plotting rooms located between the two 1895 M1 12-inch rifles capable of 360-degree fire to a range of 17 miles, as well as engine and radiator rooms to provide electricity to the battery. Loomis L. Langdon, for whom Battery Langdon would be named, commanded a battery of 10-inch mortars at Fort Pickens during the bombardment of Confederate positions across the bay on November 22–23, 1861. He had returned to Fort Barrancas as a captain of artillery in 1874, and again in 1885 as lieutenant colonel of the 5th Artillery Regiment in command of the Pensacola Bay forts. Colonel Langdon was the commanding officer when the Apaches were imprisoned at Fort Pickens.

In 1923, searchlights 6 and 7 (originally 9 and 10) were built to support use of Battery Langdon at night. These were located 2,900 and 3,149 feet to the east of the structure.

In 1926, the U.S. Army Corps of Engineers erected three steel-frame towers, supported on concrete piers, near the beach 800 yards northwest of Battery Langdon. Positioned on these towers were 10 foot by 10 foot fire control stations. Atop each station was an observation platform with a pipe handrail. These stations were part of the Butler Group and served as secondary stations for Batteries Sevier, Cullum, and Langdon. In 1933, after Batteries Sevier and Cullum were withdrawn from the HDP, the westernmost station was assigned to Battery GPF and the middle one to Fire Group II. During the 1930s, another trio of steel frame towers supported on concrete piers, known as the Davis Group, was erected approximately 300 yards west of Battery Langdon. The middle tower served as Battery Worth's secondary station, while the tower to the west was assigned to the harbor defenses and the eastern structure for auxiliary purposes.[2] (These types of fixed coastal defenses mounting long-range guns were later made obsolete by the atomic bomb.)[3]

During World War II, the Army again determined the need to make changes in the nation's coast defense systems. Responding to the effectiveness of dive-bombers in the Spanish Civil War and the German "Blitzkrieg" of 1939–1941, as well as the Japanese attack on Pearl Harbor, existing emplacements such as Battery Langdon were casemated, while new gun emplacements would be protected by armored shields or turrets, to protect against aerial bombardment. In 1942–1943, Battery Langdon was altered through the addition of massive reinforced concrete casemates, designed to protect the guns and crews. These new

2. Edwin C. Bearss, *Historic Structure Report, Historical Data Section, Fort Pickens, 1821–1895, Gulf Islands National Seashore, Florida/Mississippi* (Denver, Colorado: National Park Service, 1983), 222.

3. Ibid., 269–288.

structures, while affording overhead protection, diminished the field of fire associated with the guns from 360 to 145 degrees. Each emplacement was connected with the magazines in the traverse by reinforced concrete corridors, with more than 8 feet of masonry, 20 feet of sand fill, and a 2-foot-thick outer course of concrete overhead. A new power room was built in the rear of the traverse. It was protected by 5-foot-thick concrete walls and 5 feet of concrete and more than 6 feet of sand fill overhead. The interior walls were concrete and divided the space into a power room, storeroom, water cooler room, muffler gallery, corridor, and two exhaust tunnels.

Fort Pickens remained an active military installation until 1947. After World War II, however, airplanes, improved sea-borne assault tactics, guided missiles, and the atomic bomb rendered the defenses at Fort Pickens obsolete. Fort Pickens was decommissioned in 1947 after 118 years of service.

An Act of July 2, 1948 (62 Stat. 1220) authorized the establishment of Pensacola National Monument, to include approximately 13 acres encompassing Fort San Carlos de Barrancas, Fort Redoubt, and Fort Pickens.

In 1949, Fort Pickens became part of the Florida State Park system. The State of Florida built the first paved road on the island to access the fort in 1953–1954.

In 1972, the western half of Santa Rosa Island, including Fort Pickens, became part of a newly formed unit of the National Park System known as Gulf Islands National Seashore.

## Treatment and Use

Battery Langdon is considered to be a contributing structure in the historic district that encompasses the Endicott System and later military resources located on western Santa Rosa Island, for which a National Register nomination is currently in progress. The battery is significant for its association with World War I and World War II-era activities conducted by the U.S. Army to protect the strategically important Pensacola Harbor. It survives with sufficient integrity to convey its historic associations.

In recent decades, Battery Langdon has been disused and closed to the public. The battery is in fair condition, with localized concrete distress and extensive graffiti. As part of a planned project to provide visitor access to the park by ferry, electric trams have been proposed for visitor transport within the park. As part of this plan, Battery Langdon is anticipated to be used for storage of the trams. The recommended overarching treatment for the battery is determined to be *Rehabilitation*, to support its adaptive reuse for tram storage while retaining and protecting historic character-defining features.

## Administrative Data

### Locational Data

*Building Name*: Battery Langdon

*Location*: Gulf Islands National Seashore, Florida

*UTM Coordinates:* Zone 16R N: 3354150 E: 474250

*Latitude/Longitude Coordinates*: 30° 19' 10" north, 87° 15' 45" west

*LCS Number*: Battery Langdon is listed in the LCS. Its LCS ID is 005395.

*NPS Asset Numbers:* Battery Langdon asset number is 59630.

### Related Studies

Bearss, Edwin C. *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.

———. *Historic Structure Report and Resource Study: Pensacola Harbor Defense Project, 1890–1947.* Florida Unit, Gulf Islands National Seashore, Escambia & Santa Rosa Counties, Florida, March 1982.

Berhow, Mark A., ed. *American Seacoast Defenses: A Reference Guide.* Bel Air, Maryland: Coast Defense Study Group Press, second edition, 2004.

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

### Cultural Resources Data

Battery Langdon is not currently listed in the National Register of Historic Places. The battery is considered a contributing structure to the National Register-eligible district encompassing military resources located on western Santa Rosa Island.

*Period of Significance*: 1917–1947

*Proposed Treatment*: Rehabilitation

## Project Scope and Methodology

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

The HSR addresses key issues specific to Battery Langdon, including the history and construction chronology of the structure; the existing physical condition of the materials and structural systems; and the historic significance and integrity of the battery.

The following project methodology was used for this study.

**Research and Document Review.** Archival research was performed to gather information about the original construction and past modifications in assessing existing conditions and developing treatment recommendations for the battery. Documents reviewed included maps, historic photographs, and other written and illustrative documentation about history, construction, and modification of the structure. The research for this study built upon prior historical and archival research by the National Park Service and others, as outlined in the bibliography provided with this report. Primary reference material for this study was obtained from the Gulf Islands National Seashore collections with assistance from David Ogden, Cultural Resources Program Manager. Project team members also met with Mr. Ogden and with Jeff Halstead, Head of the Gulf Islands Historic Preservation Branch, to discuss past repair efforts at the battery. Information about future planning efforts for western Santa Rosa Island within the park was provided by the National Park Service for reference in this study. Additional research material was also obtained from the National Park Service Technical Information Center (TIC) in Denver.

**Condition Assessment and Documentation.** Concurrent with the historical research, a condition survey of Battery Langdon was performed and observations documented with digital photographs, field notes, and annotation on existing drawings. The condition assessment included the concrete and steel elements of the battery and was conducted from the exterior and interior.

**Development of History, Chronology of Construction, and Evaluation of Significance.** Based on historical documentation and physical evidence gathered during the study and the concurrent National Register nomination project, a context history and a chronology of design and construction were developed. An evaluation of the significance was also prepared, taking into consideration guidelines provided by

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 Rehabilitation.** Based on the evaluation of historical and architectural significance of the structure, guidelines were prepared to assist in the selection and implementation of rehabilitation treatments.

**Treatment Recommendations.** The Secretary of the Interior's Standards for the Treatment of Historic Properties guided the development of treatment recommendations for the significant exterior and interior features of the battery. Following the overall treatment approach of *rehabilitation*, which ensures preservation of character-defining features while allowing new and continued use of the structure, specific recommendations were developed to address observed existing distress conditions as well as long-term preservation objectives.[5]

**Preparation of Historic Structure Report.** Following completion of research, site work, and analysis, a narrative report was prepared summarizing the results of the research and inspection and presenting recommendations for treatment. The HSR was compiled following the organizational guidelines of NPS *Preservation Brief 43: The Preparation and Use of Historic Structure Reports*, with modifications to organizational structure as required for purposes of this project.[6]

4. *National Register Bulletin: How to Apply the National Register Criteria for Evaluation* (Washington, D.C.: National Park Service, National Register of Historic Places, 1990, revised 1995).
5. Kay D. Weeks and Anne E. Grimmer, The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings (Washington, D.C.: National Park Service, Historic Preservation Services, 1995).
6. Deborah Slaton, *Preservation Brief 43: The Preparation and Use of Historic Structure Reports* (Washington, D.C.: National Park Service, Technical Preservation Services, 2005).


**FIGURE 1.** A map of Gulf Islands National Seashore in Florida and Mississippi. Source: National Park Service.


**FIGURE 2.** A map of Santa Rosa Island and the Pensacola area. Source: National Park Service.


**FIGURE 3.** Aerial photo showing the location of Battery Langdon in relation to Fort Pickens at the western end of Santa Rosa Island.


**FIGURE 4.** Aerial photo showing the immediate area around Battery Langdon.

# Developmental History

## Historical Background and Context

### Prehistoric Cultural Activities Associated with Santa Rosa Island

Archeological evidence suggests that Paleo-Indian hunters and gatherers first occupied and regularly traversed parts of Florida approximately 8,000 to 10,000 years before the common era (BCE). At that time, sea levels were lower than today and many areas that are now islands were thus connected to the mainland and readily accessible to early nomadic peoples.

By the beginning of the Archaic period (circa 6500 BCE to 1000 BCE), sea levels had begun to rise and the climate had become warmer and wetter. With this change, biological diversity within the region increased, bringing an abundance of shellfish and other food resources. Local peoples adapted by adding fishing and plant gathering to nomadic hunting activities; in response, human populations increased significantly.

Village communities are believed to have been in existence in Florida by 5000 BCE. Watercraft are thought to have been in use for travel between regional islands and mainland areas for cultural exchange and subsistence purposes. While it is likely that peoples associated with these cultures visited Santa Rosa Island, little is known about prehistoric activities that occurred there.

Cultural activities during the Woodland period (circa 1000 BCE to 1000 CE) were characterized by the introduction of pottery, and an increase in settlement and community development that in part revolved around early agriculture. However, it was not until the Mississippian period (1000 CE to 1600 CE) that intensive agriculture became widespread.

Within the coastal areas of North Florida, Georgia, and South Carolina, as well as portions of the Gulf Coast, a distinct culture arose that spanned the Woodland and Mississippian eras—the Deptford culture (800 BCE to 700 CE). Deptford culture was characterized by mound burial, the establishment of permanent settlements, social and political complexity, and an increasing reliance on agriculture, including specific crops. Circa 500 CE, the Deptford culture in the Gulf region evolved into the Swift Creek and Santa Rosa-Swift Creek cultures. Because sea level has risen approximately 80 inches over the past 2,000 years, it is possible that many Deptford culture sites along the Gulf coast may now be underwater, or have been eroded.[5]

By circa 1100 CE, the Pensacola Indians, whose territory stretched from Choctawhatchee Bay in Florida to the Mississippi River Delta near Biloxi, Mississippi, had replaced Deptford culture within the region. The Pensacola, a Muskogean-speaking people, continued to occupy the region through European Contact, which occurred during the early sixteenth century.

5. Jerald T. Milanich, *Archaeology of Precolumbian Florida* (Gainesville, Florida: University Press of Florida, 1994), 115.

## Early European-American History of the Pensacola Region, 1513–1821

The first recorded European visitors to the region were the Spanish. Several Spanish expeditions traversed the gulf during the early sixteenth century, including the first chronicled—that was led by Juan Ponce de León in 1513. The first expedition to explore Pensacola Bay more extensively was recorded by Panfilo de Narvaez in 1528. It was not until 1559 that the Spanish attempted to establish a permanent settlement in Pensacola. The first effort, led by Tristan de Luna y Arellano, was short-lived, however.

Efforts to establish colonies along the gulf shores were abandoned in favor of the eastern coast of Florida after St. Augustine was settled in 1565. The establishment of the Presidio San Agustin was quickly followed by Spanish development of a chain of missions to its north and south used to Christianize Native Americans.[6]

It was not until the late seventeenth century, when the French set about controlling the region, that the Spanish renewed their efforts to occupy Pensacola Bay.[7] One of the factors contributing to Spanish interests in controlling Pensacola was its relationship to trade and shipping lanes. The Spanish regularly traveled through the gulf for trade. By the mid-sixteenth century, Spanish ships carrying silver mined in Peru and New Spain sailed across the Gulf of Mexico on their way to Spain. The Pensacola Bay area was a strategically important location along the route. As such, it became the target of Spanish occupation after the French threat became clear. To protect their naval interests, the Spanish built several fortifications around the bay, beginning with Fort Carlos de Austria, which together with the settlement Santa Maria de Galve formed the Presidio Santa Maria de Galve. Located on the bluffs overlooking the pass into the bay, the presidio was completed in 1698.

In 1719, during the War of Quadruple Alliance (1718–1721), contested primarily in Europe, the French captured the Presidio of Santa Maria from the Spanish. In the 1720 Treaty of Hague, France returned Pensacola to Spain. Once the Spanish regained control of the area in 1722, however, they found that the presidio had been burned to the ground. Rather than rebuild in the same location, which had been subject to a series of American Indian attacks, the Spanish elected to build a new presidio on Santa Rosa Island, located at the mouth of the bay. Lt. Col. Alejandro Wauchope, the recently appointed governor of the area, was ordered to oversee construction of the new presidio. Wauchope chose a site for the fort approximately one-half mile east of the western tip of the island and 240 feet south of the Pensacola Bay shoreline, where a few trees and dunes offered protection.[8] Once completed, the presidio housed soldiers, officers, and convict laborers from Mexico; women and families joined the settlement later. Hurricanes and other severe weather contributed to the need for regular rebuilding of presidio structures. In 1752, a severe hurricane destroyed much of the settlement. In response to the hurricane, and several other recent damaging storms, the Spanish abandoned the presidio in 1755.

Spain continued to control Florida until 1763, at which time it was forced to cede the territory to Great Britain as part of the treaty resulting from the Seven Years' War (1754–1763). The British subsequently reorganized the territory into the provinces of East Florida—consisting of most of the present-day state of Florida—and West Florida, an area bounded by the Mississippi River

6. John W. Griffin, "Foreword," in Bonnie G. McEwan, *The Spanish Mission of "La Florida"* (Gainesville, Florida: University Press of Florida, 1993), xv.
7. William S. Coker, "Pensacola, 1686–1821," in Judith A. Bense, editor, *Archaeology of Colonial Pensacola* (Gainesville, Florida: University Press of Florida, 1996); Paul E. Hoffman, *Florida's Frontiers* (Bloomington and Indianapolis: Indiana University Press, 2002).
8. Alejandro Wauchope, Letter to Juan de Acuña, Marqués de Casafuertes, February 27, 1723. AGI Mexico 380. Translation by R. Wayne Childer on file, Archaeology Institute, University of West Florida, Pensacola.

and Lake Pontchartrain on the west, the 31st parallel on the north, and the Apalachicola River on the east. For the next twenty years, the British worked to colonize the region. Spain regained control of Florida in the 1783 Treaty of Paris that resulted from the American Revolutionary War.

Control of the area was again contested during the War of 1812. The British and allied Creek Indians arrived in Pensacola ahead of the pursuing United States Army, under the command of Gen. Andrew Jackson, in 1814. British forces attempted to destroy the Spanish Fort San Carlos de Barrancas a few miles away, so that the American forces could not use its guns to fire on the British as they sailed out of Pensacola Harbor. Britain's Spanish allies fought a brief delaying action against Jackson's troops in downtown Pensacola before surrendering. Seeing that the British had escaped, Jackson abandoned Pensacola and marched his troops on to Mobile. (Jackson also captured and held the town briefly in 1818 during the First Seminole War.)

## Overview History of U.S. Military Defenses, Pensacola Bay and Santa Rosa Island

**United States Ownership of Florida and the Establishment of Coast Defense Systems, 1821–1861.** Spain continued to control Florida until the Adams-Onís Treaty, signed in 1819, eventually resulted in its transfer to the United States in 1821. As part of the treaty, the United States renounced any claim to Texas.

By 1821, trade activities between Atlantic and Gulf Coast ports had increased substantially, along with the number of ships passing through the Gulf. To support trade and commerce in the region, the United States government took action to protect American shipping interests in the gulf. Following his reconnaissance of the region, U.S. Navy Commodore Matthew C. Perry identified the need to establish naval bases in Florida as part of this effort.

American shoreline defenses had been revealed as fragmented and weak when the British burned the nation's capital during the War of 1812. These coast defenses, known as the Second System, were actually a haphazard assortment of batteries and outposts developed over time and not routinely maintained. In response to the dangers posed to national security during the War of 1812, army officials identified the need for a new coast defense system.

Based on the recommendations of army leaders, U.S. Congress appropriated more than $800,000 for establishment of the so-called Third System of coast defenses in 1816. President James Madison appointed a Board of Engineers for Seacoast Fortifications to prepare a plan for the system. The board's first report, published in 1821, suggested the creation of a chain of forts strategically placed along the coast from Maine to Texas that would house advanced armaments.[9]

Shortly after Florida was transferred to the United States in 1821, the federal Board of Engineers updated the plan to include the newly acquired stretch of coastline. Pensacola Bay was selected as the principal naval depot along the Gulf Coast due to its deep water harbor. To protect the depot, the board recommended building several fortifications as part of the Third System. The western end of Santa Rosa Island was chosen as the site for the first of these fortifications, known as Fort Pickens (1829–1834). Additional forts were later built at other strategic locations around the harbor and navy yard, including Fort McRee, built between 1834 and 1839, and Fort Barrancas, constructed between 1839 and 1844. Advanced Redoubt was added to Fort Barrancas in 1845–1870 to protect against landward approaches to the Pensacola Navy Yard.

9. Coast Defense Study Group, "United States Seacoast Defense Construction 1781–1948: a Brief History," http://www.cdsg.org/cdsghis2.htm.

Fort Barrancas was constructed on the site of the 1798 Spanish Fort San Carlos de Barrancas that overlooked the entrance to Pensacola Bay north of Fort Pickens, in an area known as Warrington. Fort McRee was located to the west of Fort Pickens and Santa Rosa Island, on the eastern edge of Perdido Key. Fort Pickens, Fort Barrancas, and Fort McRee were all masonry structures.

Construction of Fort Pickens, named in honor of Revolutionary War hero Maj. Gen. Andrew Pickens, began in late May 1829 and was completed by early October 1834. To provide access to the site for personnel and materials delivery, the U.S. Army built the Engineers' Wharf on the bay side of the island by 1828. The brick and masonry fortification was built in a pentagonal shape, with walls 40 feet high and 12 feet thick. The fort featured three powder magazines, protected passageways, a ditch, and flanking outerworks. It was designed for the emplacement of more than 200 artillery pieces arranged on two levels to fire on all potential enemy avenues of approach. The lower level walls included regular openings, known as bomb-proof casemates, where guns could be emplaced. The upper level was located on top of the walls on the terreplein. Here, the artillery positions were established *en barbette*, with the guns elevated so as to fire over the top of a parapet rather than through embrasures. Corner bastions projected forward from the fort walls to allow for cross fire.

The fort's first garrison, Company H of the 2nd U.S. Artillery, arrived on October 21, 1834. Over time, the degree to which the fort was garrisoned varied, with few men stationed on site except during periods of military conflict.

**The Civil War, 1861–1865.** At the onset of the military conflicts associated with the Civil War, Fort Pickens was unoccupied. Following the passage of Florida's secession ordinance on January 10, 1861, the U.S. Army determined that Fort Pickens would be the most defensible post in the area and moved quickly to garrison the fort. Lt. Adam J. Slemmer, in charge of United States forces at Fort Barrancas, destroyed over 20,000 pounds of gunpowder at Fort McRee, spiked the guns at Barrancas, and evacuated with 51 soldiers and 30 sailors to Fort Pickens.

Despite repeated threats from Confederate attack, Fort Pickens remained in Federal control throughout the war. The vulnerability of masonry forts to the new rifled artillery was demonstrated during the April 10, 1862, Federal attack on Fort Pulaski near Savannah, Georgia, where the masonry walls of the Third System structure were repeatedly damaged, leading to Confederate surrender of the fort. Fort Pickens, however, was not attacked by the Confederates in this way, and remained operational throughout the war.

Third System forts such as Fort Pickens and Fort Pulaski were designed to protect coast areas from naval attacks; they were not expected to hold out under extended, land-based assaults. The walls of Fort Pulaski that were breached in 1862 were not protected from land-based cannon because there was no land within a mile, and beyond a mile the smoothbore guns of 24-, 32-, and 42-pounds used in the 1830s and 1840s were ineffective. Rifled guns had longer ranges, as did the larger (8 inch [65 lb. shot] and 10 inch [125 lb. shot]) smoothbore guns developed after these forts had been built. Fort McRee's walls were demolished by 8-inch and 10-inch smooth-bore guns from Fort Pickens in 1861 in a single day's bombardment.

Third System forts became obsolete with the advent of bigger and more effective cannon, armored ships, and steam-driven screw propellers (as opposed to vulnerable paddle-wheels) that allowed ships faster and more reliable propulsion than sails; ships were thus able to pass the forts without being sunk (notably at the mouth of the Mississippi in 1862 and at Mobile Bay in 1864). Only underwater mines, called "torpedoes," were effective against these ships.

While new cannon made masonry forts obsolete, keeping enemy fleets out of the harbors and rivers presented a different problem. The answer was initially minefields, and better waterproofing of the mines, as further discussed below. New gun batteries with longer-range guns would be designed to engage enemy fleets outside of the

harbor approaches and before they got to the minefields, while smaller, rapid-fire guns protected the minefields from penetration by destroyers and torpedo guns.

**Post-Civil War Military Use of Santa Rosa Island, 1865–1893.** After the Civil War, Fort Pickens remained in use for several years as a prison for military and political prisoners. In late October 1886, Batteries B and H of the 2nd U.S. Artillery under the command of Capt. James E. Wilson were ordered to Pensacola to guard the famous Apache warrior Geronimo; the chief, Naiche; and several other Chiricahua Apache Indians. The first group of Apache to be held at the fort consisted of fifteen men, with two more arriving a few days later. Within six months, their families had arrived from Fort Marion and the number rose to forty-eight prisoners. The Apache were held at the fort for eighteen months. The prisoners attended to the routine maintenance of the grounds, and frequently entertained visitors, until their departure on May 12, 1888.[10]

During the 1870s and early 1880s, the condition of the nation's coast defenses declined due to a lack of funding. At the same time, changes in the design of heavy ordnance suggested the vulnerability of the United States to attack and an overall need to improve coast defensive systems and the army's ability to operate them.

As early as 1882, President Chester A. Arthur noted the need to improve seacoast defenses in his Second Annual Message to Congress, suggesting "appropriations be made for high-power rifled cannon for the torpedo service and for other harbor defenses."[11]

In 1885, President Grover Cleveland followed up on Arthur's recommendation by convening a board, under the auspices of Secretary of War William C. Endicott, to evaluate the nation's coast defenses and propose a program to modernize them. The so-called Endicott Board submitted a report in 1886 recommending that twenty-three key ports, Pensacola among them, be improved through the construction of new coast defense structures. One of the areas to be improved was Santa Rosa Island.[12]

In 1901, Fort Pickens became a U.S. Army Coast Artillery Post, a new designation related to the recognition by Army leaders that heavy fixed artillery required different training programs and tactics than mobile field artillery. The coast artillery became responsible for the installation and operation of the proposed new system, which included controlled explosive mine fields that could be set out in the harbor as a defense against submarines and armored warships but would be monitored, fired electrically, and protected by fixed guns.

**Endicott System Implementation, 1893–1905.** Because most of the nation's existing coast brick and masonry fortifications were in a state of deterioration by the late 1880s, the U.S. Army Corps of Engineers ceased funding their repair and preservation between 1891 and 1894. Instead, by January 1893, the Board of Engineers had specifically indicated the need to begin implementing Endicott Board recommendations at Pensacola and elsewhere.

The first Endicott System project completed on Santa Rosa Island was a mine casemate in the northeast bastion of Fort Pickens in 1894. The casemate was built using $8,000 in funds allocated to the project from appropriations for "Torpedoes for Harbor Defense" made on August 23, 1894.[13] In support of the project, plans were made to rebuild the Engineers' Wharf near Fort Pickens, which had fallen into a state of disrepair, and to

10. Bearss, 766, 768–769, 770, 772–789; Thomas Muir, Jr., and David P. Ogden, *The Fort Pickens Story* (Pensacola, Florida: Pensacola Historical Society, 1989), 11–13.
11. The American Presidency Project, "Chester A. Arthur, Second Annual Message, December 4, 1882," Available at http://www.presidency.ucsb.edu/ws/index.php?pid=29523%7C (accessed January 12, 2015).
12. Bearss (1983), 756–759, 761.
13. Ibid., 799–804.

build a narrow gauge rail line that would facilitate the movement of ordnance and materials to construction sites. Although the mine casemate was completed in 1895, work on the wharf did not commence until 1896. Construction of both the wharf and 7,500 feet of narrow gauge railroad track were completed in July 1896.[14]

Between 1897 and 1899, four reinforced concrete fortifications—Battery Pensacola, Battery Cullum (later redesignated Battery Cullum and Battery Sevier), Battery Van Swearingen, and Battery Worth—were built in the Fort Pickens area, while a mine defense was planned for the harbor entrance, as part of the Endicott System. The first of these fortifications was Battery Pensacola, a reinforced concrete structure built in the center of the parade ground of Fort Pickens in 1898 in anticipation of Pensacola's involvement in the Spanish American War. The railroad was used to support the battery's construction. It was also used to construct Battery Cullum through establishment of two spurs that coursed south from the wharf: one of the spurs led to the battery construction site, while the other ran toward the southern beach where sand could be obtained for mixing concrete. An additional spur was added in 1898 to connect the wharf with the construction site of Battery Worth.

In 1898, several additional mine structures, including a torpedo (or mine) storehouse, concrete cable tank, and loading room were constructed adjacent to the railroad between the fort and the wharf to support the mine field in the harbor.

Progress on these projects was interrupted on June 20, 1899, when the powder magazine in the northeast bastion of Fort Pickens exploded, sending up a shower of debris and reportedly hurling bricks as far away as Warrington on the other side of the bay. Although extensive damage occurred to the mine defense facilities, they were soon rebuilt.[15] Repairs were also made to the railroad track and locomotive in June 1900. Soon thereafter, the Army post was improved with new quarters, administration buildings, and maintenance facilities added to the north and west of Fort Pickens. It was also around this time, in 1901, that the Artillery Corps was divided into two types: field artillery and coast artillery.

With additional technological advances, including the development of torpedo boats, the coast defenses at Santa Rosa Island were again improved with the addition of three batteries in 1904–1906. These new structures included Battery Payne, constructed in 1904; Battery Trueman, constructed in 1905; and Battery Cooper, constructed in 1905–1906.

**Development of Batteries, 1905–1945.** In 1905, building upon the experience of the Spanish-American War, President Theodore Roosevelt elected to improve on the efficacy of the nation's coast defense system. To identify needed improvements, Roosevelt appointed a new coast defense board to be led by U.S. Secretary of War William Howard Taft. Based on its evaluation of the system, the board developed updated standards and suggested the addition of several technical features such as searchlights, as well as the electrification of lighting, communication systems, and projectile handling. In addition, the board recommended that optical aiming techniques and associated equipment be updated.[16] Fortification design under the Taft Board differed slightly in battery construction and accommodated fewer guns at a given location than those of the Endicott Program.[17] The board's recommendations were used to upgrade the coast defense system even further; by the beginning of World War I, the United States had a coast defense system that was equal to that of any other nation.

The new facilities were threatened on September 26, 1906, when a severe hurricane

14. Edwin C. Bearss, *Historic Structure Report, Fort Pickens, 1821–1895* (Denver, Colorado: National Park Service, 1982), 26–30, 44–46, 67.
15. Bearss (1982), 182–196.
16. Mark A. Berhow, ed. *American Seacoast Defenses: A Reference Guide* (Bel Air, Maryland: Coast Defense Study Group Press, second edition, 2004), 10.
17. Ibid.

struck Pensacola, inflicting heavy damage on the Santa Rosa Island installation. In response, U.S. Army Corps of Engineers District Engineer Cavanaugh recommended erecting a concrete seawall around the installation to protect the facility from future hurricanes. Within two years, a masonry and concrete structure measuring 11 feet high, 13 feet wide at the base, and 5 feet wide at the top had been completed. A concrete-lined ramp was constructed over the seawall to allow rail access to the wharf (Figure 5).[18] Hurricanes continued to pose a threat. On August 11, 1916, another hurricane swept away the superstructure of the wharf, leaving only the pilings.

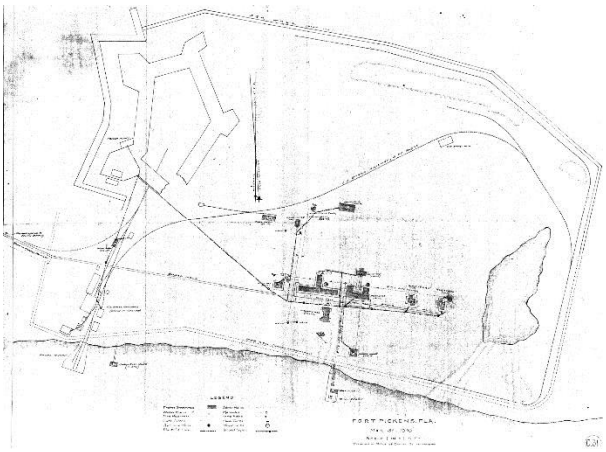


**FIGURE 5.** Map of the Fort Pickens area, showing the seawall under construction, 1909. Source: Gulf Islands National Seashore.

By 1914, the design of armaments had advanced such that older magazines were inadequately protected against the powerful rifles found on dreadnaught class battleships. To address the problem and increase protection, it was sometimes possible to excavate sand around the structure and add concrete to the exterior and superior slopes; this was not always possible, however, as it could also reduce the range of the guns emplaced within the batteries.

Also problematic was the fact that the battery positions were often deficient in overhead protection. In particular, some of the older positions needed protection from plunging fire. When first built, the Endicott batteries did not include overhead protection because a battleship's turrets did not permit high angle fire at the time.

The Endicott batteries, too, were difficult to adapt to the emerging heavier and more powerful guns and their associated carriages. A new coast defense board, convened in 1914, indicated that the 12-inch guns and mortars of the late nineteenth century were not equal in range and power to major caliber guns on board many battleships. Existing guns would need to be modified to permit an elevation of 15 degrees, which, when combined with a lighter 700-pound projectile, allowed for an increase in range from 15,500 to 20,000 yards.[19] Where modernization required extensive changes, the policy would be to construct new works and provide new armaments adequate to the demands of the situation. Wherever new works were needed at the entrances to principal harbors, such as at Fort Pickens, the board recommended new 16-inch guns that could be mounted so as to have the greatest possible protection and command a 360-degree field of fire. Mortars were to be at least 12 inches in size with a range of 21,000 yards.[20] In summary, the board noted that the guiding principal of coast defense policy would be "to mount armament of greater range and power than any which can be brought against it."[21]

In July 1915, Chief of Coast Artillery E. M. Weaver recommended the incorporation of two additional 12-inch rifles, mounted for long-range fire directed against long-range naval bombardment, to update the defense system designed to protect the city of Pensacola and the navy yard.[22]

On December 22, 1915, the Secretary of War called for fabrication of seventeen barbette

18. Bearss (1982), 226–242; Muir and Ogden, 18.
19. Bearss (1982), 271.
20. Ibid., 272.
21. Board to Secretary of War, undated, National Archives, RG 77, Correspondence 1894–1923, Doc. 95991/3.
22. Bearss (1982), 273, citing Weaver to Board of Review, July 8, 1915, National Archives, R.G. 77, Correspondence 1894–1923, Doc. 95991/11.

carriages for high angle fire on which to mount the 12-inch rifles. After President Woodrow Wilson signed related legislation for Fortifications and Other Works of Defense on July 6, 1916, two 12-inch barbette carriages and two 3-inch anti-aircraft guns and mounts were authorized for delivery to Fort Pickens.[23] To accommodate the guns, the Army and U.S. Army Corps of Engineers determined that retrofitting older emplacements would potentially be more trouble than mounting the new, heavier armament in emplacements constructed specifically for them.[24]

Before the gun battery could be designed, however, the United States was forced to sever diplomatic relations with Germany after the German ambassador announced that his country would resume unrestricted submarine warfare.[25] At the same time, the introduction of aerial bombing (from both airplanes and zeppelins) during World War I indicated that coast defense complexes would also require the addition of new facilities for the emplacement of anti-aircraft weaponry.

To address these needs, the U.S. Army Corps of Engineers built two new gun batteries at Fort Pickens—Battery Langdon (1917–1923) and Battery Fixed (1917–1918). The new batteries were supported by searchlights and towers installed at several locations between 1917 and 1919. Although searchlights had been recommended by the Taft Board to illuminate mine fields and light up targets for nighttime firing, they were now needed to spot approaching aircraft. Battery Langdon would house the 12-inch, long-range guns recommended by the board. To accurately target and fire the long-range guns, a new modern system of range finding would also need to be installed, and existing electrical systems upgraded.[26]

In 1930, the narrow gauge railroad leading from Battery Worth to Battery Langdon and searchlights 6 and 7 was rebuilt by troops assigned to Fort Barrancas. At the same time, the wharf was rebuilt and the channel re-dredged.[27]

During the 1930s, additional changes were made to the harbor defense system, including the relocation of Battery Fixed to the east of Battery Langdon and the construction of Battery GPF to replace Battery Cooper.

After Pearl Harbor, the Army again determined the need to make changes in the nation's coast defense systems. Responding to the effectiveness of dive-bombers in the Spanish Civil War, the German "Blitzkrieg" of 1939–1941, and the Japanese attack on Pearl Harbor, existing emplacements such as Battery Langdon were casemated, while new gun emplacements would be protected by armored shields or turrets.

In 1943, two 90mm guns were located on platforms just outside the seawall south of Fort Pickens in Battery AMTB (Anti-Motor Torpedo Boat). Also in that year, Battery Trueman was relocated to old Battery Cullum, Battery Worth was converted into the Harbor Entrance Control Post and Harbor Defense Command Post, and the Harbor Entrance Signal Post was built on old Battery Sevier. In 1943–1944, improved range-finding towers were established in new locations, radar towers were constructed, and Battery 234 with its BCS/CRF tower was completed.

Fort Pickens remained an active military installation until 1947. After World War II however, airplanes, improved sea-borne assault tactics, guided missiles, and the atomic bomb rendered the defenses at Fort Pickens obsolete. Fort Pickens was decommissioned in 1947 after 118 years of service.

23. Bearss (1982), 274, citing Crozier to Chief Engineer, July 22, 1916, National Archives, R.G. 77, Correspondence 1894–1923, Doc. 38148.
24. Bearss (1982), 273.
25. Ibid., 275.
26. Ibid., 270.
27. Ibid., 284.

## Public Access and Park Development, 1929–1972

While the western end of Santa Rosa Island remained a military enclave, other parts of the island became the focus of preservationists and developers. Developers hoped to use the historic structure of Fort Pickens, as well as the pristine beaches of the island, to establish a tourism mecca with hotels and an amusement park, while politicians and others sought to ensure protection and open public access.

In 1929, the War Department elected to sell the majority of the island, with the exception of the Fort Pickens Military Reservation, to Escambia County, Florida, for $10,000. The land was to be used for public purposes, and the county was prohibited from further conveyance of the land except to Florida or the federal government. Escambia County later released 3 miles of the island for development at Pensacola Beach. In 1931, the first Pensacola Bay Bridge was opened, along with the bridge across Santa Rosa Sound to the island.

In the late 1930s, the National Park Service expressed interest in preserving the surviving evidence of the historic Pensacola Harbor forts. In response, Escambia County conveyed undeveloped portions of Santa Rosa Island to the Department of the Interior in 1939 based on the assumption that the National Park Service would develop the land as a park and preserve the Pensacola Harbor fortifications. In 1939, President Franklin Delano Roosevelt signed a Presidential Proclamation establishing Santa Rosa Island National Monument.[28] Due to a lack of funding and the mobilization needs associated with World War II, the Department of Interior was not able to take action at the site for several years.

In 1941, the Department of the Interior permitted the War Department temporary use of the eastern half of Santa Rosa Island as part of Eglin Field. The U.S. Army Air Corps used the field for early rocket and missile applications and to test a replica of the German V-1. The first launch over the Gulf occurred in October 1944. In 1945 this area was assigned permanently to the War Department.

In 1946, Congress disestablished Santa Rosa National Monument based on a proposal by Congressman Robert Sikes that suggested the area be returned to Escambia County for public use.[29]

An Act of July 2, 1948 (62 Stat. 1220) authorized the establishment of Pensacola National Monument, to include approximately 13 acres encompassing Fort San Carlos de Barrancas, Fort Redoubt, and Fort Pickens. However, Pensacola National Monument was never established.

In March 1949, the War Assets Administration published a "Notice of Availability: Government Real Property for Disposal: Fort Pickens." This document noted that 87 acres had been reserved as a "Historic Monument" (the future state park), with the remaining 1,484.6 acres of land, with improvements, offered for sale as a whole. Included in the itemized list of assets were "five steel towers with steel buildings on top" and "one steel tower with concrete building on top." At the same time, the State of Florida filed an application with the War Assets Administration for all 1,571.6 acres for a park, to encompass Batteries Langdon, Worth, Cooper, and 234.[30]

In 1949, Fort Pickens became part of the Florida State Park system. The State of Florida built the first paved road on the island to access the fort in 1953–1954; the Army had relied entirely on boats to bring supplies and personnel to the island. In 1972, the western half of Santa Rosa Island, including Fort Pickens and Battery Langdon, became part of a newly formed unit of the

28. Proc. No. 2337, May 17, 1939, 53 Stat 2542.
29. National Park Service, Bureau of Outdoor Recreation, "A report for the Proposed Gulf Islands National Seashore" (January 1968), 1.
30. "Defense Environmental Restoration Program for Formerly Used Defense Sites, Preliminary Assessment, Fort Pickens Military Reservation, Pensacola, Escambia County, Florida, Property Number – I04FL0063," September 2007.

National Park System known as Gulf Islands National Seashore.[31]

## Chronology of Development and Use

### Planning and Construction of Battery Langdon

During World War I, the U.S. Army Corps of Engineers began two new gun emplacement structures at Fort Pickens—Battery Langdon (1917–1923) and Battery Fixed (1917–1918).[32] The site chosen for Battery Langdon was located 2 miles east of Fort Pickens, 600 feet from the north shore of Santa Rosa Island, and 1,700 feet from the south shore, on a low sand ridge approximately 6 feet higher than the terrain of the beachfront.

Designs for the battery were developed from standard drawings that were adapted to local conditions (Figure 6). Drainage of the interior passages was improved, and the magazines were to be damp-proofed using a brick lining.[33]

To facilitate construction, it was proposed that a wharf be built on the bay side, thereby avoiding a 4 mile round trip on the existing narrow gauge rail line to convey materials from the Fort Pickens Engineers' Wharf. The cost of the wharf was estimated to be less than the cost of materials transport from Fort Pickens.[34]

Construction of the wharf was authorized on March 7, 1917. A dredge was employed to create a channel and reduce the length of wharf to be built from 800 to 124 feet. Authorization was also granted to build a narrow-gauge railroad to the battery site from the wharf. Work on the project was delayed, however, by a lack of labor resulting from the draft associated with World War I.

31. Gulf Islands National Seashore was established "to preserve for public use and enjoyment certain areas possessing outstanding natural, historic, and recreational values." 16 U.S. Code sec. 459h (a) (Pub. L. 91-660.); Bearss (1982), 248–250; Muir and Ogden, 21.
32. Bearss (1982), 270.
33. Ibid., 275–277.
34. Ibid., 276.

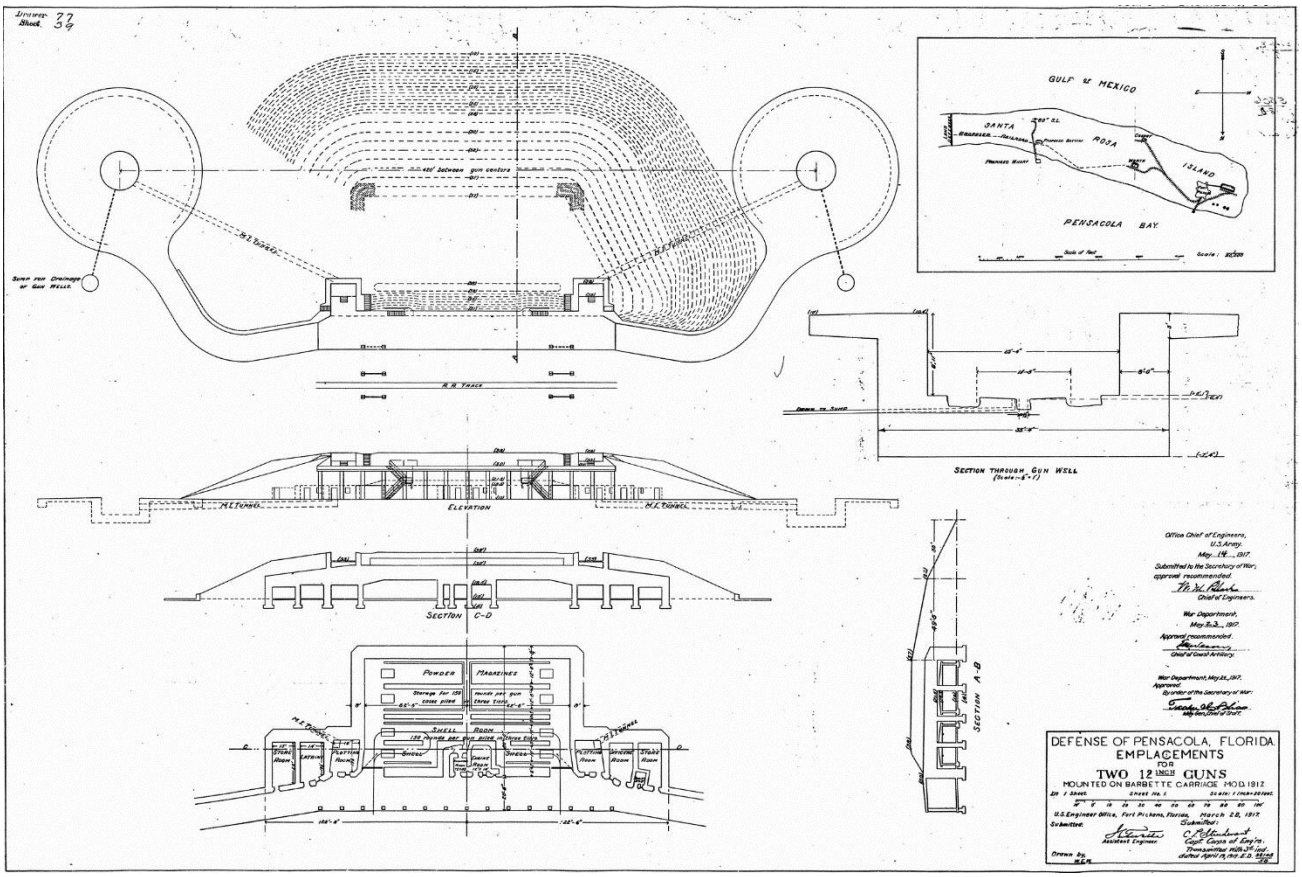



**FIGURE 6.** U.S. Army Corps of Engineers design for Battery Langdon, 1917. Source: NPS Drawing No. 635-61002.

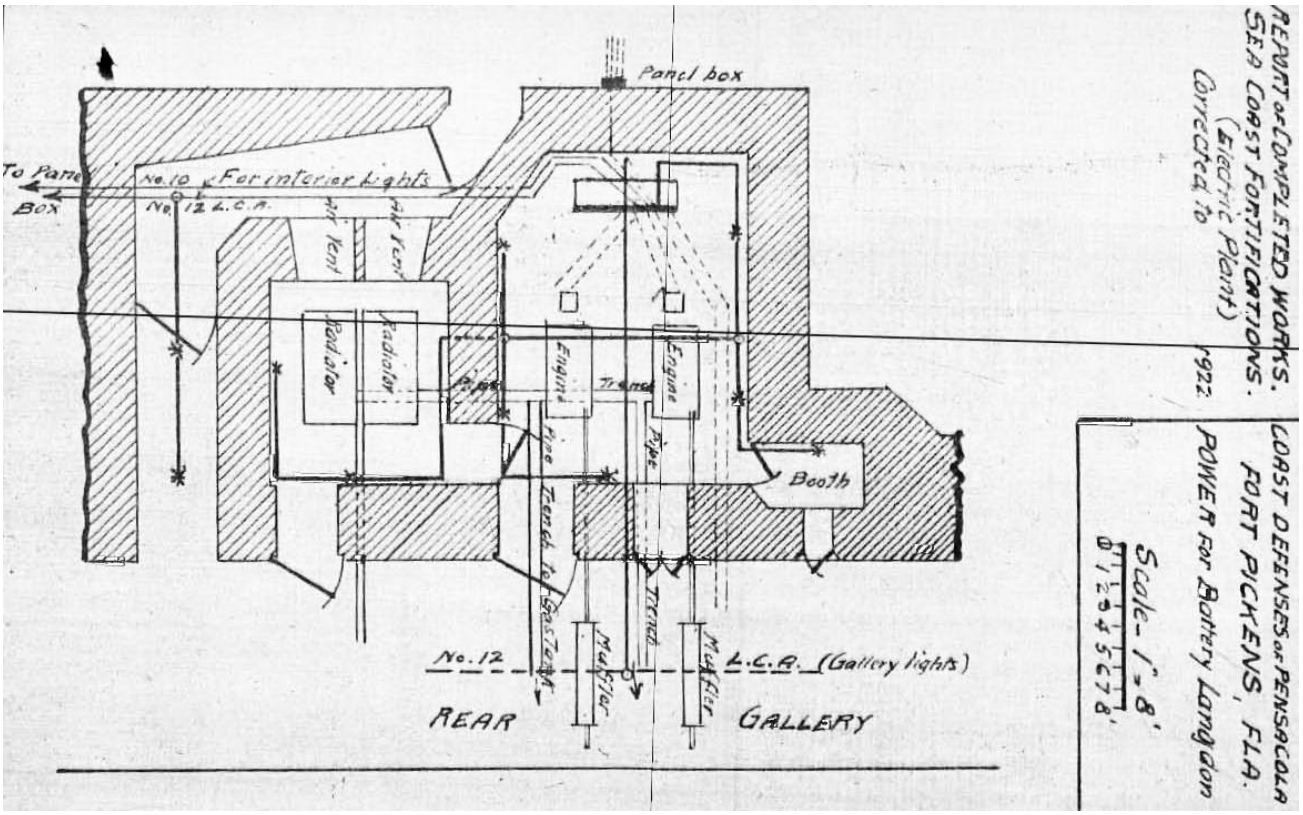



**FIGURE 7.** Detail plan of the power plant for Battery Langdon as constructed, 1923. Source: Gulf Islands National Seashore.

After the war, the work continued on both the wharf and the battery, but slowly. By March 27, 1922, the battery was nearly complete, and the Army took the opportunity to officially name the structure for Brig. Gen. Loomis L. Langdon, who had been stationed at Fort Pickens three times during his career—in 1861 when he commanded a battery of 10-inch mortars at Fort Pickens, in 1874 as an artillery captain, and in 1885 as a Lieutenant Colonel in charge of the 2nd U.S. Artillery. Construction of Battery Langdon was finally completed in May 1923. It was armed in the early summer of that year and proof-fired on August 8. The artillery mounted were two 12-inch/35 caliber M1895MI guns on 1917M barbette carriages.

When completed in 1923, Battery Langdon featured a massive casemate to protect the magazines, storerooms, and plotting rooms located between the two 12-inch guns mounted *en barbette* and capable of 360-degree field of fire to a range of 17 miles (Figure 8 through Figure 10). An engine room and a radiator room in the center provided power to the battery (refer to Figure 7), while an open, covered parade to the rear provided a protected passage below and a walkway between the Battery Commander's Station on top, and allowed for engine exhaust. At completion, Battery Langdon was in fact the most important and powerful element of the Harbor Defense Project. During the 1930s, it continued to receive much attention from the army and was used regularly for artillery drills.[35] By the summer of 1932, Battery A, 13th Coast Artillery, had taken over as the manning detachment of Battery Langdon.[36]

**FIGURE 8.** Battery Langdon, view from traverse looking over east gun emplacement, circa 1931: note 12-inch rifle at right; small kiosk-type structure (pump house) to left; and Coast Guard Station faintly visible in distant background. Railroad tracks in front and to the left of gun. Muzzle and breech covers in place. Source: National Archives, Record Group 77, Box 102, File 660, Pt. 1, #1; Gulf Islands National Seashore image 603.

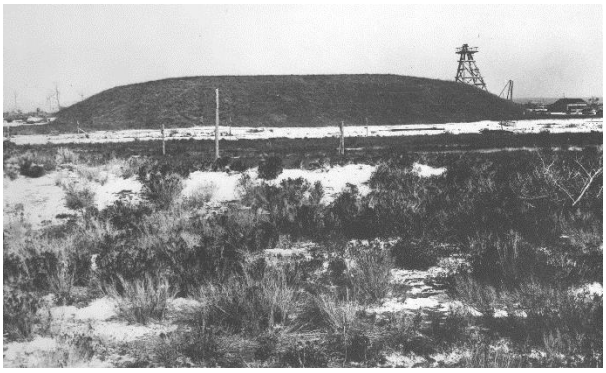


**FIGURE 9.** View of Battery Langdon from the south, circa 1930s. Source: Gulf Islands National Seashore, image 604.

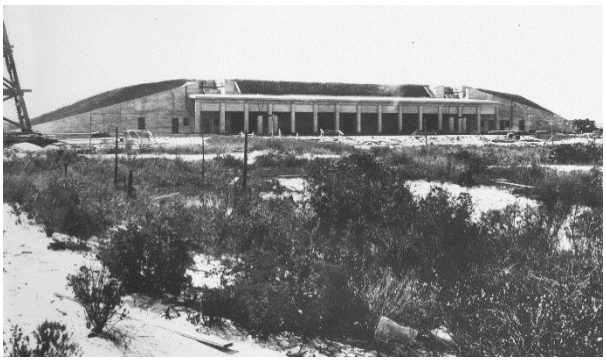


**FIGURE 10.** View of Battery Langdon from the north, circa 1930s. Source: Gulf Islands National Seashore, image 605.

35. Ibid., 284.

36. William Gaines, "The Coast Artillery at Pensacola Bay, 1898–1946," *Coast Defense Study Group Journal*, February 1994, 26.

The wharf was destroyed in a 1926 hurricane that also buried the locomotive under tons of sand and debris.[37] The locomotive was finally excavated and sold as scrap in 1943.[38]

In 1931, a simple wood-framed Battery Commander's Station, covered with tarpaper, was built on the traverse at Battery Langdon. The structure was later abandoned and was razed in 1941.[39]

## Alterations during World War II

Battery Langdon was one of several batteries at Fort Pickens in service when the United States entered World War II. Others in service included Batteries GPF, Payne, Trueman, and Worth. These batteries were manned by Batteries A, B, C, F, G, H, and I, 13th Coast Artillery.[40]

In 1942–1943, Battery Langdon was altered through the addition of massive reinforced concrete casemates, composed of walls 10 feet thick and overhead protection 17 feet thick, designed to protect the guns and crews. These new structures, while affording overhead protection, diminished the field of fire associated with the guns from 360 to 145 degrees (Figure 11 through Figure 14). A fortified rear corridor connected the casemates to the interior rooms behind, to which was added a new power plant with 5-foot-thick walls and ceiling. The dual Battery Commander's Stations and plotting rooms were replaced by a single plotting room and a spotting room, with a new Battery Commander's Station erected on a steel tower to the rear of the battery.[41] The Report of Completed Works for Battery Langdon noted that:

1. Modernization consisted of the following:
    a. Construct casements over two (2) existing emplacements.
    b. Remove "open back" gallery of existing Central Traverse Magazine and replace with underground corridor connecting with casements (sic).
    c. Construct Power room for Ordnance power plant.
    d. Rehabilitate existing plotting and spotting rooms in Central Traverse Magazine and install gasproofing system therein.
    e. Install overhead monorail ammunition service connecting magazine and casemates.
    f. Construct burster course and provide protective fill over entire structure.

    The above work accomplished under Job No. Ft. Pickens FS-2
    g. Provide soundproofing and dehumidification in Plotting and Data Computer Rooms. Job No. Ft. Pickens FS-6.
    h. Stabilize engine generator foundation for Ordnance power plant by constructing a steel sheet pile cut-off wall and by pressure grouting. Job No. Ft. Pickens FS-8.[42]

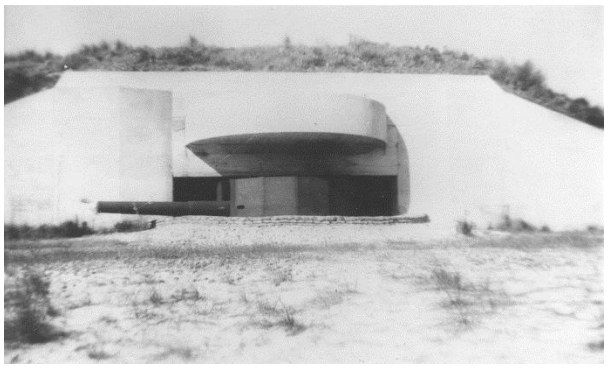


**FIGURE 11.** View of a casemated gun at Battery Langdon, 1940s. Source: Gulf Islands National Seashore.

37. Bearss, 285.
38. Ibid., 284.
39. Ibid., 285.
40. Gaines, 27.
41. Bearss, 287.
42. Report of Completed Works – Seacoast Fortifications (Batteries), Harbor Defenses of Pensacola, Fort Pickens, Florida; Battery Langdon; Part I (Sheet 2), corrected to July 1, 1944.

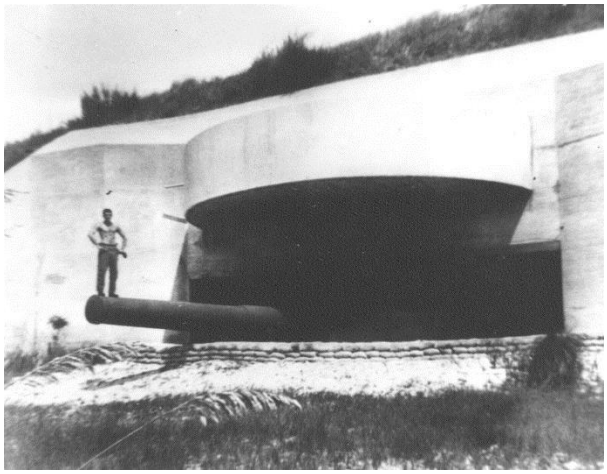


**FIGURE 12.** D. A. Mulvey stands atop one of the guns at Battery Langdon, August 15, 1946. Source: Gulf Islands National Seashore.

**FIGURE 13.** Aerial photograph of concrete casement under construction at Battery Langdon, circa 1943. The eastern gun emplacement is at top center in this view. Source: Gulf Islands National Seashore.

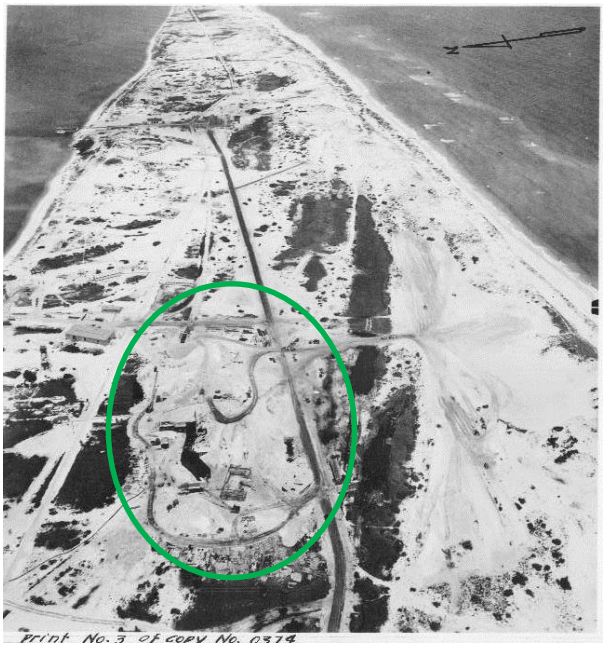


**FIGURE 14.** Aerial photograph of concrete casement under construction at Battery Langdon (circled), circa 1943. The eastern gun emplacement appears complete, while formwork is in place at the western gun emplacement. Source: Gulf Islands National Seashore.

The structure remained the primary element of the Pensacola Harbor defenses, with a mission to:

1. Protect Navy shore installations, harbor facilities, and shipping in Pensacola Bay from naval gunfire in minor attacks;
2. Deny enemy ships access to Pensacola Bay; and
3. Support the defense against amphibious attacks within range of the armament.[43]

In the first months of 1944 the Coast Artillery garrison at Pensacola Bay was reduced when Batteries G, H, and I were transferred or reassigned. In June 1944, the remaining portions of the 13th Coast Artillery were reorganized, and Battery C was re-designated as Battery B, 13th Coast Artillery Battalion, with four officers and 229 enlisted men remaining assigned to Battery Langdon.[44] At the end of March 1945, two provisional battalions were organized that continued to man harbor defenses including

43. Ibid., 288, from Supplement to the Harbor Defense Project, Harbor Defenses of Pensacola, National Archives, R.G. 407.

44. Gaines, 29.

Battery Langdon until the end of the war. These battalions were disbanded at the end of the war, and remaining harbor defense batteries continued to operate the harbor defenses until June 30, 1946, when the harbor defenses of Pensacola were inactivated.[45]

## Decommissioning of Battery Langdon

Fort Pickens remained an active military installation until decommissioned in 1947 after 118 years of service. In June and July of 1947, the Battery Langdon 12-inch guns and associated carriages were "demilitarized, mutilated, and salvaged."[46]

## State Park, 1949–1972, and National Park Service, 1979 to Present

Battery Langdon remained open during the state park period, and partially open (the north-south corridors at either end) until 1988.

The pits at the gun emplacements were filled with sand and capped with concrete during Florida State Parks administration of the battery.

In 1988, the National Park Service constructed steel-framed enclosure walls with paired doors at the south elevation portals at both gun emplacements. Doors were fabricated and hung on all of the north entrances as well.

Prior to being closed to the public in 1988, Battery Langdon was subjected to occasional unauthorized access and vandalism, primarily in the form of graffiti. To remediate graffiti in corridors on the west side of the battery, in the early 2000s the affected wall surfaces were covered with a cementitious parge coat.

On September 15–16, 2004, a 15-foot storm surge associated with Hurricane Ivan inundated the battery. The surge removed the steel doors to the structure, with water entering the covered utility troughs, leading to the deterioration of the reinforced concrete-infilled steel floor panels. Also, the top slab at each gun emplacement was undermined when the sand fill washed out (Figure 15 and Figure 16).

**FIGURE 15.** One of the gun emplacements, showing damage after Hurricane Ivan, 2004. Source: Gulf Islands National Seashore.

**FIGURE 16.** One of the gun emplacements, showing damage after Hurricane Ivan, 2004. Source: Gulf Islands National Seashore.

An effort to remove sand deposited during the hurricane throughout the interior of the battery was completed in 2007. In response to the hurricane damage, in 2009 the park implemented $80,000 worth of repairs. At the gun emplacements, the park removed the area of damaged floor slab, refilled the gun emplacements with sand, and poured new 4-inch-thick concrete slabs in the affected area. The doors at each of the south elevation portals were replaced, and the hinges were re-welded.[47] The doors at the north portals were recovered, rehabilitated, and rehung.

45. Ibid., 29–30.
46. Bearrs, from Fort Pickens Historical Record Book, National Archives, R.G. 392.
47. NPS PMIS 111060, Repair/Rehabilitate Battery Langdon Structure Damaged by Hurricane Ivan.

## Fort Pickens Battery Langdon Chronology

| | |
|---|---|
| 1834 | Fort Pickens was completed on the western edge of Santa Rosa Island. |
| 1917–1923 | Battery Langdon was constructed 2 miles east of Fort Pickens. |
| 1942–1943 | Massive reinforced concrete casemates were added to Battery Langdon, affording overhead protection. A new power plant was constructed behind the battery. |
| 1947 | Fort Pickens was decommissioned. The guns at Battery Langdon were demilitarized in June and July. |
| 1949 | Fort Pickens became part of the Florida State Park system. |
| After 1949, before 1972 | The pits at the gun emplacements were filled with sand and capped with concrete. |
| 1972 | The western half of Santa Rosa Island, including Fort Pickens and Battery Langdon, became part of the newly established Gulf Islands National Seashore, under the administration of the National Park Service. |
| 1988 | Steel-framed enclosure walls with paired doors were built at the south elevation portals at both gun emplacements. Battery Langdon was closed to the public. |
| 2004 | Battery Langdon was damaged by Hurricane Ivan. |
| 2007 | Sand deposited by the hurricane in the battery was removed. |
| 2009 | Hurricane damage to the battery was repaired. |

# Physical Description and Condition Assessment

Battery Langdon is a reinforced concrete coastal defense battery structure located 2 miles east of Fort Pickens on Santa Rosa Island. Battery Langdon falls within the Fort Pickens unit of Gulf Islands National Seashore (Figure 17), and was the most important and powerful element of the Harbor Defense Project. The structure, with overall dimensions that measure approximately 170 by 575 feet in plan, occupies a low sand ridge 600 feet from the north shore of Santa Rosa Island, and 1,700 feet from the Gulf beach on the south side of the island. The battery structure was designed to fire on enemy ships approaching from the seaward side. When originally completed, Battery Langdon was designed to emplace guns with longer ranges than any others on the island. The battery's two 12-inch 1895 MI rifles could shoot projectiles 17 miles out to sea.

**FIGURE 17.** View from south of Battery Langdon and surrounding landscape.

Massive concrete casemates with walls 10 feet thick and overhead masonry 17 feet thick were added in the 1940s to protect the guns and crew from aerial bombardment. The guns were enclosed in concrete berms on top of the bunker to the south (front). Non-historic steel enclosure walls with paired doors cover the front opening of each gun emplacement. Each gun emplacement is connected with magazines located in a traverse by reinforced concrete corridors protected by more than 8 feet of masonry, 20 feet of sand fill, and a 2-foot outer course of concrete overhead. A power plant is located in the rear of the traverse, protected by 5-foot concrete walls, and 5 feet of concrete and more than 6 feet of sand fill overhead. The power plant had concrete interior walls and was divided into a power room, storeroom, water cooler room, muffler gallery, corridor, and two exhaust tunnels.

## Site

The road that provides access to Fort Pickens extends to the south of Battery Langdon. Visitors can access the battery from a gravel spur route that leads north from the main road to a small parking area east of the structure. Sand-covered trails lead from the pull-out to the north entrance portals of the battery, and social trails indicate where visitors have climbed to the top of the structure. Also located in association with the parking area are a picnic shelter and restroom (Figure 18). The picnic shelter is located on the foundation of the construction warehouse built in 1942. A semi-circular concrete drive extends from the parking lot to the east entrance portal at the north elevation of the battery (Figure 19). A gravel service road extends west from the parking area to the north of the battery.

The battery structure is accessed from two openings on the north side. The entrances into the battery arise from a path that follows a former narrow-gauge rail line that has been converted as a hiking trail for park visitors. The rail line, and a wharf located on the bay side of the island north of

Battery Langdon, were used to convey construction materials and workers to the site. The wharf is no longer extant, although the concrete road leading to it survives. Other features that supported battery operations include searchlights installed to the east, and fire control stations. Although these features are no longer extant, remains of some concrete bases can be found in the landscape.

Battery Langdon sits at the transition between coastal grassland and scrub/coastal strand plant communities. The structure itself is covered with sand and earth that supports woody vegetation. Vegetation to the south is composed principally of herbaceous grasses, such as sea oats and bluestems, while atop the structure and on its leeward side to the north, the grasses transition to shrub and tree cover composed of yaupon holly, saw palmetto, sand live oak, laurel oak, slash pine, and sand pine.

**FIGURE 18.** Gravel-paved surface lot and picnic area north of the battery.

**FIGURE 19.** Concrete-paved semi-circular drive that extends along the north elevation of the structure.

## Exterior Description

Measured drawings of the battery are provided in Appendix A.

Battery Langdon is a one-story concrete structure measuring approximately 420 feet long. It is covered on all elevations, except at entrances and gun emplacements, by built-up sand and vegetation. The battery has an irregular but generally symmetrical plan oriented on an east–west axis, with entrances on the north and south elevations. Large enclosed gun emplacements with access doors and overhanging concrete entrance canopies are located on the east and west ends of the south elevation. Three entrance portals with concrete cheek walls are located along the north elevation.

### Structure

The cast-in-place concrete structure at Battery Langdon consists of 2-foot-thick concrete footings, set 5 feet below finished floor height, which support thick concrete walls and a roof slab. The walls and roof slab vary in thickness from 4 feet to 10 feet wide depending on location within the building (Figure 20 and Figure 21). The structure has a concrete slab on grade floor.

Gun emplacement pads were constructed as part of the original battery. The pads measure 35 feet 6 inches in diameter. According to available documentation, the foundation consists of an 8-foot-thick below-grade base slab, which

supports a 6-foot-wide below-grade circular concrete perimeter wall (Figure 22). Within the below-grade perimeter wall is a concrete gun emplacement pad, which measures 23 feet 6 inches in diameter.

The concrete roof of the gun emplacement rooms was constructed in the 1940s with embedded steel I-beams spaced 2 feet on center. The bottom flange of each beam, measuring approximately 16 inches wide, is exposed to view (refer to Figure 22).

The north half of the structure, including the power plant rooms, was constructed as part of the 1940s addition. Foundation pads for the mechanical equipment consist of 4-foot-thick concrete slabs supported by steel sheet piles embedded approximately 16 feet into the ground (Figure 23).

As part of the 1940s addition, alterations were made to the north foundation and wall of the original structure. The alterations included an extension to the existing footing and construction of a 2-foot-thick sleeve wall to support the new addition (refer to Figure 23).

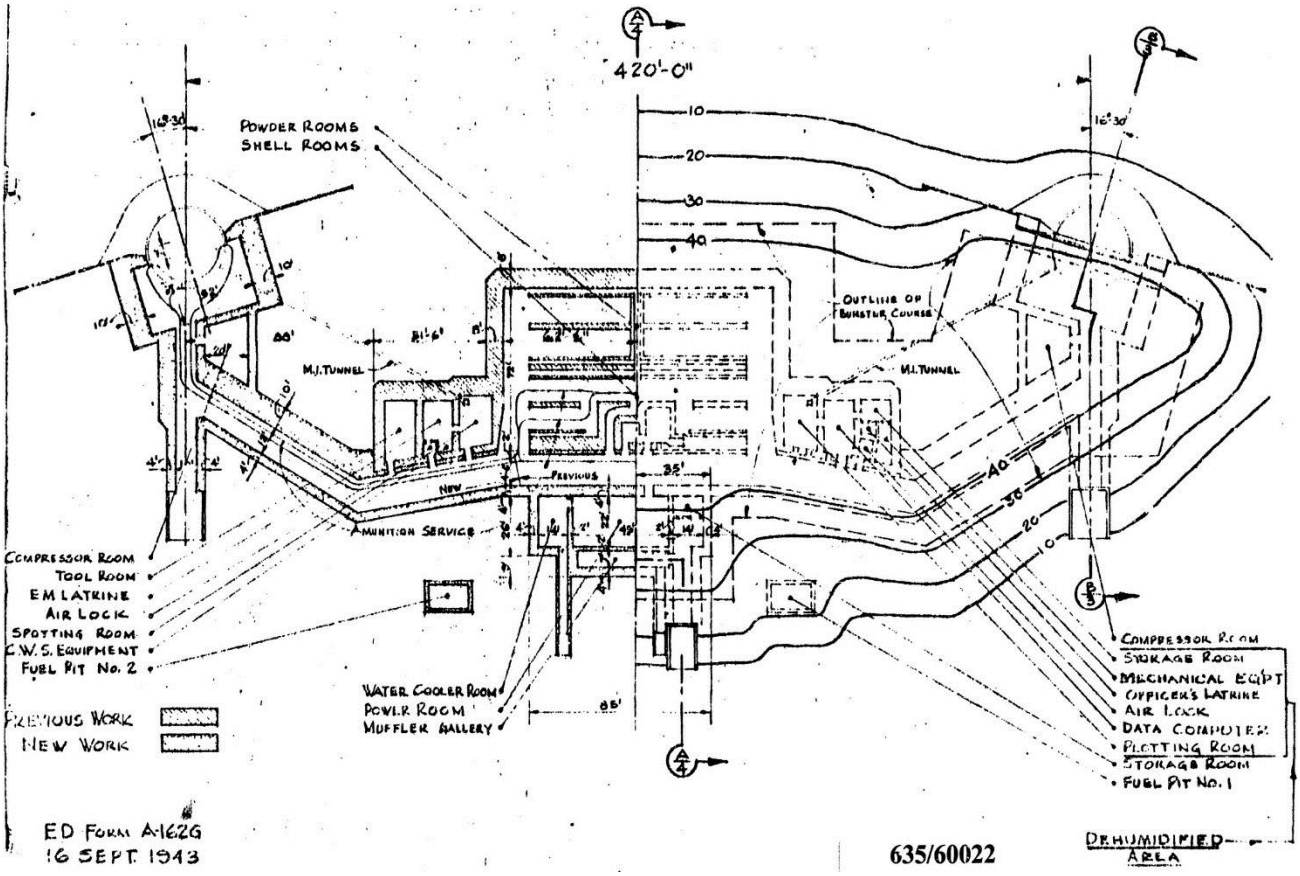



**FIGURE 20.** Plan of Battery as depicted in as-built drawings, dated September 16, 1943. Source: NPS Drawing No. 635-60022.

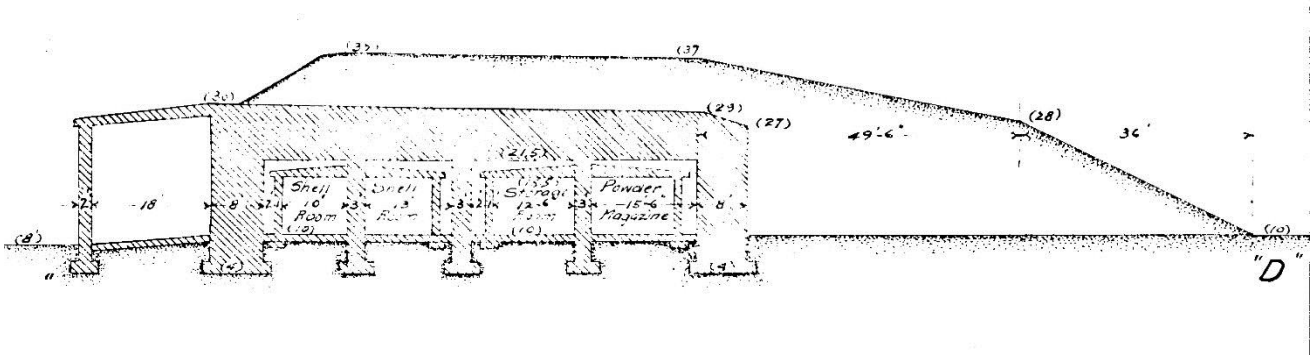



**FIGURE 21.** Section through center magazine as originally constructed. Source: Report of Completed Works, Seacoast Fortifications, Coast Defenses of Pensacola, Fort Pickens, Florida, Battery Langdon, Form 7, Sheet No. 4, 1922.

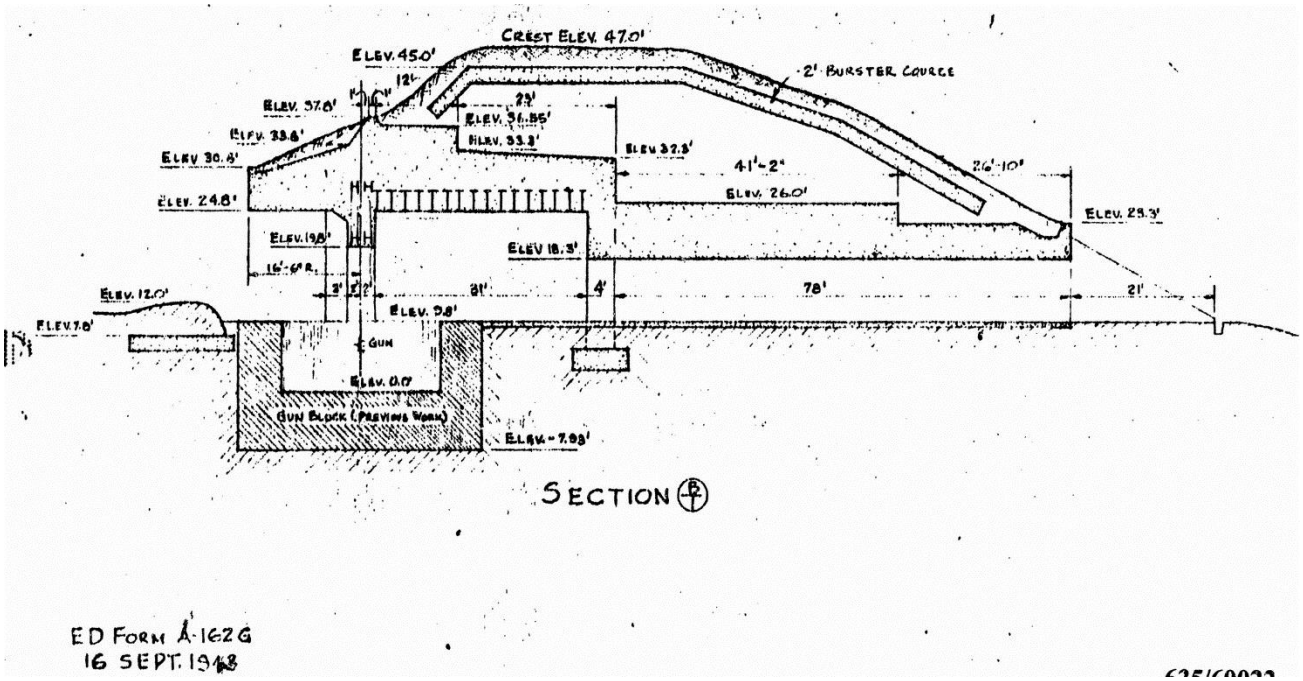



**FIGURE 22.** Section through gun emplacement rooms from as-built drawings, dated September 16, 1943. Source: NPS Drawing No. 635-60022.

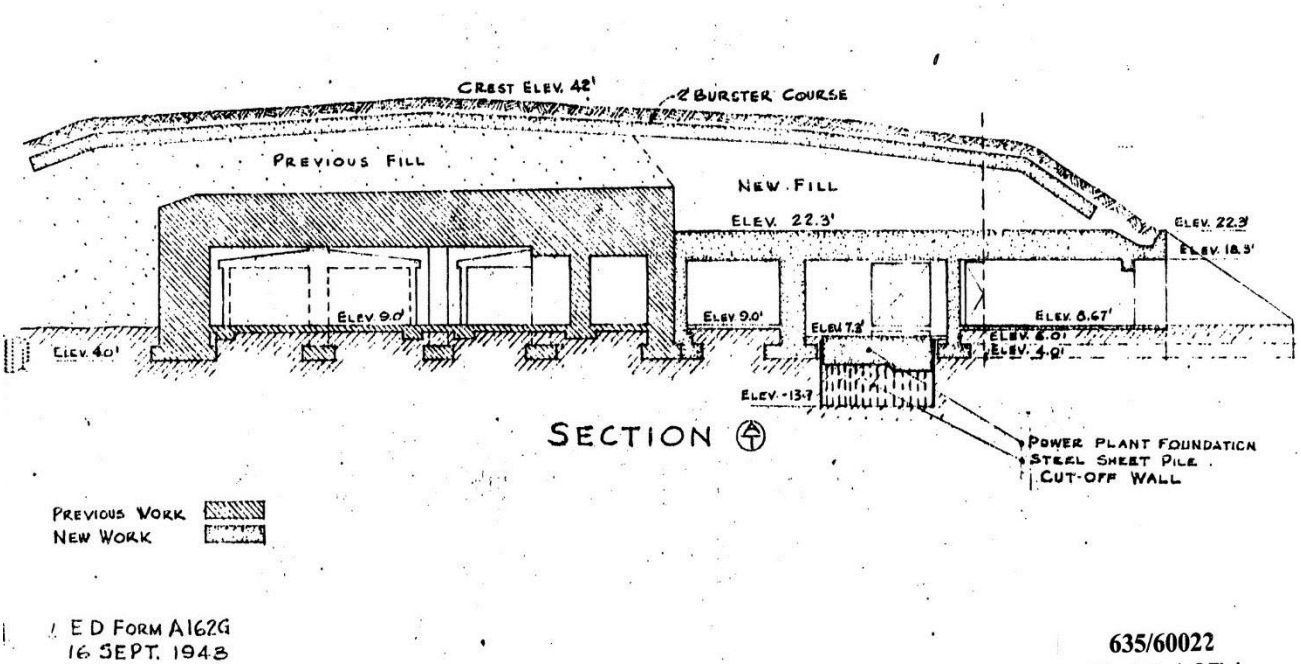



**FIGURE 23.** Section through center magazine as depicted in as-built drawings, dated September 16, 1943.

## Exterior Concrete

Concrete is the primary exterior material of the structure. The south elevation has an east and west gun emplacement entrance, each consisting of a concrete gun emplacement slab, portal, canopy, and wing walls (Figure 24 and Figure 25). Each entrance portal measures 28 feet tall and has a door opening measuring 36 feet 6 inches wide by 10 feet tall. The portal is constructed of 4-foot-thick concrete walls with board form finish. Above the door opening is a cantilevered concrete canopy. The canopy has a semi-circular plan and is 6 feet thick. It projects approximately 18 feet from the exterior face of the battery wall and extends the full width of the door opening. It has a cast concrete drip edge along the underside of the overhang. On either side of the canopy and door opening, the portal wall is angled and projects 3 feet. The upper 4 foot section of the portal wall is battered. On either side of the portal wall are concrete wing walls. The wing walls are an extension of the portal walls, each separated from the adjacent portal wall by a construction joint, and gradually decrease in height, sloping away from the portal wall toward grade. At the east gun emplacement entrance, the wing wall is clad with a cementitious parge coating, approximately 3 inches thick. The parge coating has a board form finish and appears to be part of the 1940s construction.

**FIGURE 24.** Overview of west gun emplacement entrance portal, canopy, and wing walls.

**FIGURE 25.** Overview of east gun emplacement entrance.

The gun emplacement is a circular concrete slab approximately 35 feet 6 inches in diameter, the south half of which extends outside the portal opening and is visible from the exterior (Figure 26). Within the concrete pad are steel tracks, set in a semi-circular plan measuring approximately 23 feet 6 inches; these tracks were used to rotate the gun into position. The tracks at the west gun emplacement have been covered with concrete.

**FIGURE 26.** Circular concrete slab gun emplacement at east entrance.

There are three entrance portals at the north elevation: one at the east end, one at the west end, and one at the center of the elevation. The east and west entrance portals are identical (Figure 27 and Figure 28). The portals consist of a reinforced cast-in-place concrete wall with a board form finish. Each portal has a door opening measuring 10 feet wide by 9 feet 6 inches tall. Above the wall is a concrete parapet wall measuring approximately 6 feet tall. The parapet wall is covered with a cementitious parge coat and the words "Battery Langdon/ U.S.E.D. 1942" are cast into the concrete (Figure 29). The parapet wall extends approximately 24 inches above the roof structure and is covered with a bituminous waterproofing membrane on the back face of the parapet (Figure 30). As observed at spalls, the concrete has a 1-inch-diameter reinforcing bar with 3/8 inch diameter stirrups. The concrete cover over the reinforcing bar was observed at one location to be approximately 5 inches. Each portal is flanked by cast-in-place concrete cheek walls with board form finish. The cheek walls are approximately 12 inches thick and gradually decrease in height, sloping toward grade as they extend perpendicular from the portal wall. At the ends of the walls are anchors, spaced approximately 7 inches apart. At the west portal, the anchors support steel angles (Figure 31).

**FIGURE 27.** East entrance portal at north elevation.

**FIGURE 28.** West entrance portal at north elevation.


**FIGURE 29.** Cast concrete sign above north elevation entrance portals.

**FIGURE 30.** Parapet and waterproofing membrane above east portal at north elevation.

**FIGURE 31.** Steel angles mounted to wing walls at west entrance portal on north elevation.

The center portal is divided into two sections by a concrete cheek wall that extends perpendicular to the entrance portal. The west half of the portal is similar to the east and west portals. It consists of a reinforced concrete wall with board form finish and a recessed entrance (Figure 32). The east half of the portal features a raised concrete landing, approximately 5 feet 6 inches above grade, which provides access to a metal-framed opening in the wall that is infilled with a metal panel (Figure 33).

**FIGURE 32.**Center entrance portal at north elevation.

**FIGURE 33.** Raised concrete landing and portal adjacent to center entrance at north elevation.

## Roof

The battery has a flat concrete roof with a concrete curb over the entrances at the north and south elevations. The exterior of the structure has a bituminous waterproofing membrane visible at portions of the roof area and at the back face of curbs (Figure 34). The entire structure has been covered by sand. On top of the sand fill is a cast in place concrete burster course, which ranges in thickness from 24 inches to 30 inches thick. As observed at spall locations, the burster course has thick welded-wire mesh reinforcing with a 7 inch cover. The concrete burster course covers the roof and extends down the sides of the building, creating a concrete shell (Figure 35).

**FIGURE 34.** Bituminous waterproofing membrane at concrete roof.

**FIGURE 35.** Overview of the concrete burster course.

In general, the roof area is covered by sand and vegetation that obscures much of the burster course (Figure 36). Rooftop features include three concrete piers, each measuring 12 inches square and approximately 30 inches tall (Figure 37). The piers are located at the west end of the north side of the roof. A horizontal metal pipe, 6 inches in diameter, is located on a concrete curb at the center of the three piers and extends to the east along the top of the burster course. A similar sized concrete pier is located at the east end of the north side of the building. Based on drawings dated July 1944, the piers may have supported structures associated with covered fuel pits.

**FIGURE 36.** Typical view showing roof area covered with sand.

**FIGURE 37.** Concrete piers at north side of roof.

The semi-circular canopies over gun emplacement entrances at the south elevation have an exposed concrete roof with a 12 inch tall perimeter curb. According to construction drawings and as verified through physical evidence, the canopies have a conical roof that sheds water toward the perimeter curb (Figure 38). The perimeter curb has circular scuppers for canopy roof drainage. The canopy roof is covered by sand.

**FIGURE 38.** Concrete conical roof at south entrance canopies.

## Doors

There are three types of exterior doors present on the building. Non-original (1988) doors are located at the east and west entrance portals on the north elevation. These doors consist of double-leaf steel-framed doors clad with steel panels welded together (Figure 39). The sheet metal cladding stops approximately 6 inches short of the top of the framing to allow for ventilation of the interior. Each door leaf measures approximately 5 feet wide and 9 feet 6 inches tall and has two welded strap hinges with the door hinge brackets cast into the concrete wall.

The center entrance portal at the north elevation is similar to the east and west doors and was also built and hung in 1988. It consists of a steel-framed double-leaf door clad with metal panels and has three welded strap hinges with the door hinge brackets cast into the concrete wall (Figure 40).

**FIGURE 39.** Typical paired steel-framed metal panel door at east and west entrances on north elevation.

**FIGURE 40.** Double-leaf steel-framed door at center entrance on north elevation.

The original design for the south portals did not include the installation of doors. The existing steel-framed structure at the portal opening is a later addition. The structure consists of an exterior-mounted metal-framed wall that extends beyond the perimeter of the portal door opening (Figure 41). The wall is clad with sheet metal panels and is secured to the structure by metal straps that wrap the perimeter of the concrete door opening (Figure 42). At the center of the wall is a double-leaf flush panel door with strap hinges. Above the door is an opening in the sheet metal cladding to allow for ventilation. The wall and doors are painted black.

**FIGURE 41.** Typical non-original doors at south elevation entrances.

**FIGURE 42.** Metal straps that secure non-original wall enclosure at south elevation doors.

# Exterior Condition Assessment

## Concrete

- The sand fill under the edges of the concrete burster course has washed out, creating large voids under the burster course and, as a result, large unsupported overhangs in the concrete burster course (Figure 43). Large sections of the concrete burster course have collapsed along the south side of the battery.

- At some locations on the south side of the burster course, the wire mesh reinforcing is exposed to view, lacks sufficient cover, and exhibits surface corrosion (Figure 44).

**FIGURE 43.** Washed out fill material resulting in large unsupported area of concrete at burster course.

**FIGURE 44.** Exposed wire mesh reinforcing at concrete burster course.

- Severe vertical cracking was observed at cold joints between the gun emplacement entrance wall and the adjacent wing wall (Figure 45). Vegetation and efflorescence were typically observed at crack locations.

- A large spall was observed at the east corner of the east entrance portal on the north elevation. The spall was located at the juncture between the parapet wall and the concrete cheek wall. Much of the concrete was spalled, leaving the reinforcing bar and stirrups exposed to view.

- The parge coating at the west side of the east gun emplacement entrance has debonded from the concrete substrate and is cracked and spalled (Figure 46).

- The site is overgrown with vegetation (Figure 47). The most extensive vegetation is located near entrances at the north and south elevations and on top of the roof structure.

- Moisture staining was observed at the concrete walls at the gun emplacement entrances adjacent to canopy roof drains and at parapet walls of the north entrance portals (Figure 48).

- Shallow spalling was observed at multiple locations. The locations of the spalls typically have exposed reinforcing bar with surface corrosion.

**FIGURE 45.** Crack at cold joint between portal entrance wall and adjacent wing wall.

**FIGURE 46.** Spalled and debonded concrete parge coating at south elevation entrance portals.

**FIGURE 47.** Overgrowth of vegetation at north elevation entrances.

**FIGURE 48.** Moisture staining at concrete above entrances.

- Graffiti was observed at all three of the north entrance portals. The graffiti typically consisted of etched marking and spray paint on the concrete portal walls or cheek walls (Figure 49).

- The bituminous waterproofing membrane is in poor condition. The membrane was observed to have severe alligatoring and cracking (Figure 50).

## Steel Doors

- Mild surface corrosion was observed at all entrance doors on the north elevation.

**FIGURE 49.** Graffiti at north elevation entrances.

**FIGURE 50.** Cracking and alligatoring of bituminous roof waterproofing.

## Interior Description

The interior of the battery has a mostly symmetrical plan consisting of east and west entrance wings connected by a central corridor with an irregular plan. The interior includes gun emplacement rooms, a power plant, powder and shell rooms, and various support rooms (Figure 52). Typical finishes throughout the interior of the battery include concrete floors and exposed concrete walls and ceiling with board form finish. In some support rooms, the concrete walls and ceiling have been painted. Electrical conduit and fixtures are surface-mounted. Around each ceiling fixture, the ceiling typically has been painted white to improve reflectivity of the light (Figure 51).

**FIGURE 51.** Area of ceiling adjacent to light fixtures is painted white.

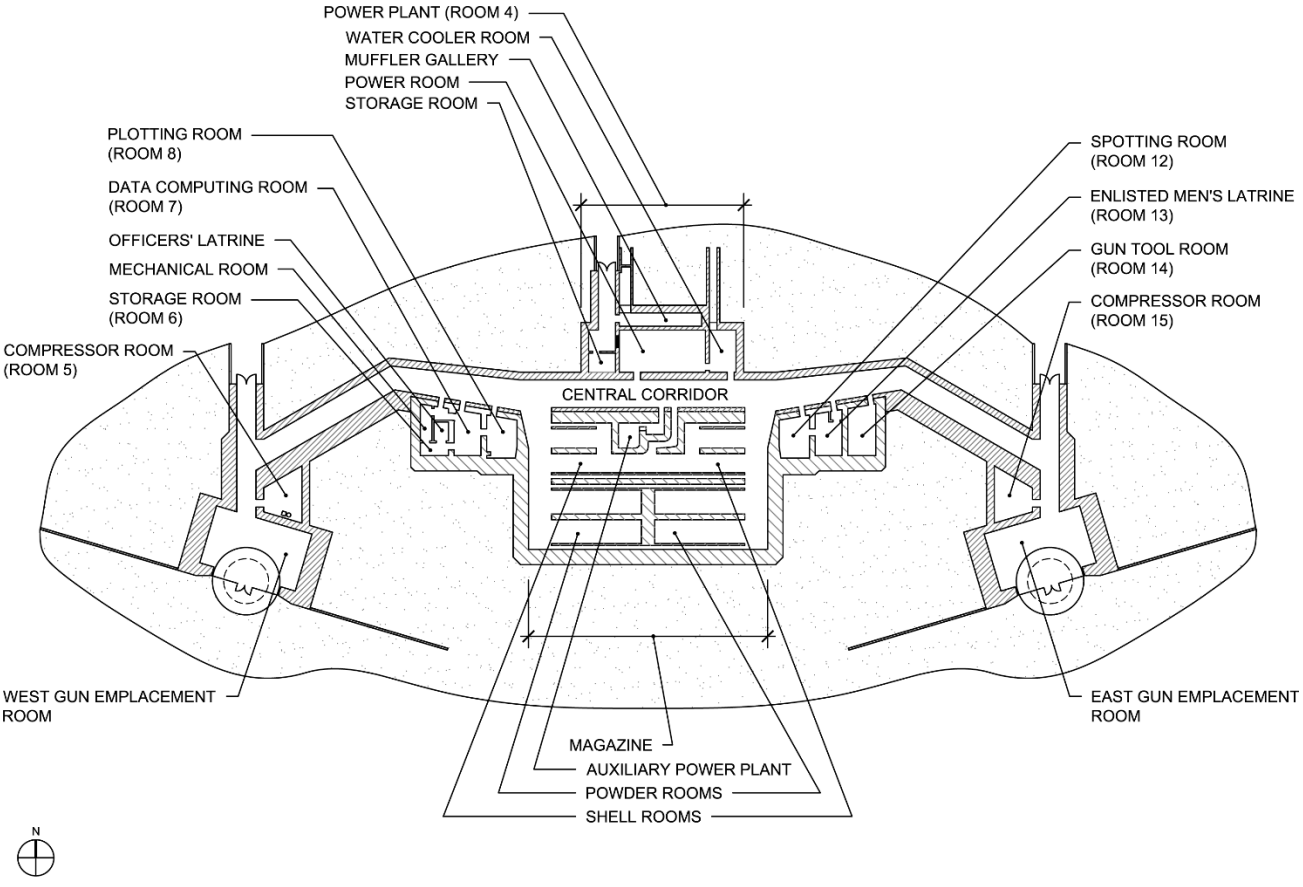



**FIGURE 52.** Plan of the battery with interior rooms identified.

## Interior Wings

The east and west entrance wings have identical plans and are symmetrical along the center axis of the building. Each wing consists of a corridor, measuring 71 feet long by 10 feet wide and 9 feet 6 inches in height. The corridors are oriented on a north–south axis with an entrance at the north end and a gun emplacement room with an entrance portal at the south end (Figure 53). The corridors have typical interior finishes and feature 6-inch-wide floor trenches that extend along both sides of the hall (Figure 54). Recesses in the wall, which measure approximately 20 inches square and 8 inches deep, are located approximately 5 feet above floor height.[47] There are five recesses in each gun emplacement room and two recesses in the corridor immediately adjacent to each gun emplacement room. A solid metal tie is embedded in the concrete at the center of each recess (Figure 55).[48] There are metal anchors in the ceiling, evidence of previously existing equipment suspended from the ceiling (Figure 56).

**FIGURE 53.** Overview of corridor at east entrance wing.

**FIGURE 54.** Floor trench extending along the wall in the wing corridor.

47. These recesses are found in all of the concrete batteries on Santa Rosa Island and are assumed to have been used as anchor points for maneuvering the guns during mounting and dismounting operations. Rifling in the barrels wore out after approximately 200 firings, requiring dismounting the barrels and shipping them to arsenals for re-rifling. For this reason, most live-fire training was conducted with ex-caliber or sub-caliber barrels, usually 37 mm cannon, mounted either on top of or within the main guns. Correspondence by the authors with David Ogden, Cultural Resources Program Manager, Gulf Islands National Seashore, October 2015.

48. When it became necessary to mount the guns in the first emplacements built, it was found that no arrangements had been made for the attachment of the blocks and falls necessary for handling the large pieces of the carriage and the guns. To address this need, emplacement construction began to incorporate maneuvering rings formed of wrought iron or mild steel, passed through a staple extending into the concrete walls. Correspondence by the authors with David Ogden, Cultural Resources Program Manager, Gulf Islands National Seashore, October 2015. See also E. E. Winslow, *Notes on Seacoast Fortification Construction* (Washington, D.C.: Government Printing Office, 1920).

**FIGURE 55.** Typical wall recesses with embedded metal ties.

**FIGURE 56.** Typical metal ties embedded in the ceiling.

**Gun Emplacement Rooms.** At the south end of the east and west wings are the gun emplacement rooms (Figure 57). Each gun emplacement room measures 52 feet by 31 feet and features a large exterior door opening measuring 35 feet 6 inches wide by 10 feet tall. The east gun emplacement room is oriented on a northeast-southwest axis with the exterior entrance located at the southeast elevation. The west gun emplacement room is oriented on a northwest-southeast axis with the entrance at the southwest. The room has a 15 foot ceiling height and steeply sloped side walls, and typical exposed concrete finishes. The concrete ceiling has embedded steel I-beams, spaced 24 inches on center (Figure 58). The underside of the beams is exposed to view. Other features include a circular concrete gun emplacement pad located at the floor of the exterior entrance. As previously noted, the north half of the concrete pad is located within the gun emplacement room (Figure 59). The concrete pad was replaced in 2009 to address damage caused by Hurricane Ivan in 2004. The room has wall recesses with embedded metal tie anchors located on each wall and surface-mounted electrical conduit and fixtures.

**FIGURE 57.** Overview of gun emplacement room.

**FIGURE 58.** Embedded I-beams in ceiling of gun emplacement room.

**FIGURE 59.** Circular concrete pad at gun emplacement room.

**Compressor Rooms (Rooms No. 5 and No. 15).** The compressor rooms are polygonal in plan and are located north of the gun emplacements. These rooms are accessed from an opening in the wing corridors (Figure 60 and Figure 61). Steel hinges for lift-off doors are embedded in the concrete at each door opening; however, the doors are no longer present. There is a compressor room associated with each gun emplacement; the east compressor room (Room No. 15) is located at the east entrance wing, and the west compressor room (Room No. 5) is located at the west entrance wing. The room has typical concrete finishes and surface-mounted electrical conduit and fixtures. In addition, both compressor rooms have a raised concrete utility pad with embedded anchors at the south end of the room (Figure 62; also refer to Figure 61). Previously existing mechanical equipment has been removed from the pads.

**FIGURE 60.** Overview of west compressor room.

**FIGURE 61.** East compressor room; note the raised mechanical equipment slab at the right.

**FIGURE 62.** Concrete mechanical equipment slab at west compressor room.

## Central Corridor

The central corridor has an irregular but symmetrical plan consisting of five interconnected halls, 9 feet 6 inches in height, each oriented on a different axis (Figure 63). The total length of the corridor measures 433 feet and ranges in width from 12 feet at the end segments to 14 feet 6 inches at the center three segments of the corridor. A 6-inch-wide trench extends along the north side of the corridor. The center section of the corridor has a concrete utility trench, measuring 21 inches wide by 2 feet deep, which extends along the south side of the hall. The trench is capped by steel-framed concrete panels, each 47 inches in length (Figure 64).

The central corridor provides access to a central magazine, six support rooms, and a power plant with auxiliary rooms.

**FIGURE 63.** Typical central corridor.

**FIGURE 64.** Typical concrete utility trench with steel and concrete cap.

## Magazine

The magazine is a large space located on the south side of the central corridor and consists of the powder storage shelters, shell storage rooms, and the auxiliary power plant, and is accessed by 12-foot-wide halls that extend perpendicular from the central corridor (Figure 65). The magazine measures 125 feet wide by 74 feet deep and has a ceiling height of approximately 12 feet. It houses four freestanding divided concrete powder storage shelters and a series of small shell rooms. The powder storage shelters each measure 30 feet wide and 49 feet long. The shelters are arranged in two rows of two, with each pair of shelters parallel to each other and separated by a 3-foot-thick concrete blast wall. The rows are set back to back and spaced 3 feet apart. Each shelter has a low-slope gable roof and is constructed of 12-inch-wide concrete walls and roof slab (Figure 66). A 3-foot-wide concrete wall divides each shelter longitudinally into two bays (Figure 67). The south powder shelters are enclosed on three sides, while the north powder shelters consist of north and south walls and are open on the east and west ends.

**FIGURE 65.** Perimeter corridor at magazine.

**FIGURE 66.** View of entrance to powder storage shelters.

**FIGURE 67.** Interior view of powder storage shelters.

North of the powder storage shelter is the auxiliary power plant, which includes two interconnected rooms and a perimeter hall. Typical finishes include concrete floors, exposed concrete walls and ceiling with board form finish, and a ceiling height of approximately 9 feet 6 inches. The auxiliary power plant rooms are accessed from an opening along the central corridor (Figure 68). The primary room, accessed directly from the corridor, has two large raised concrete pads at the center of the room (Figure 69). The room provides access to an adjacent room which also has two raised concrete pads as well as a booth (as shown on the 1923 drawing of the power plant; refer to Figure 7) with a wood-framed door opening (Figure 70 and Figure 71). The perimeter hall, measuring 5 feet wide, is accessed from a door opening off the central corridor, wraps around the perimeter of the auxiliary power plant rooms, and extends to one of the north powder storage shelters. Openings in the wall of the perimeter hall look onto the adjacent auxiliary power plant rooms. Metal lift-off-door hinges are embedded in the wall of the hall but the doors are no longer present (Figure 72).

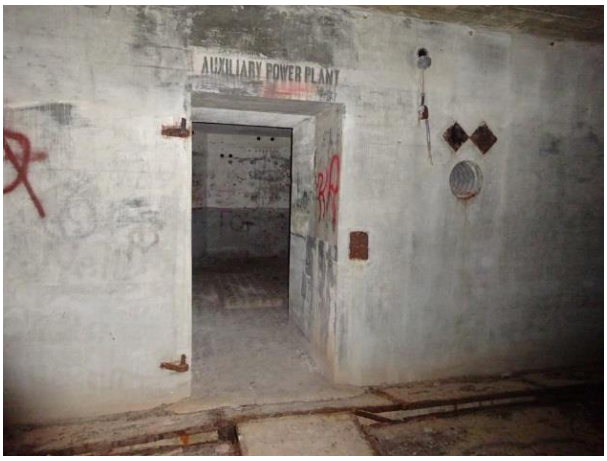



**FIGURE 68.** Entrance from central hall to auxiliary power plant room.

**FIGURE 69.** Interior of auxiliary power plant; note supports for radiators. This room was part of the original power plant for the battery.

**FIGURE 70.** View of room adjacent to auxiliary power plant; this was the engine room of the original power plant.


**FIGURE 71.** Entrance to booth adjacent to auxiliary power plant primary room.

**FIGURE 72.** Embedded hinge for lift-off door, embedded in concrete wall.

Also of particular interest is the wood framed shell table observed in the southeast powder room (Figure 73). The table is 12 feet long and approximately 3 feet 9 inches high. According to Winslow:

> Instead of having shell tables extending the whole length of the shell rooms, they were provided at the service ends only, each table being large enough to hold eight projectiles ready for instant service. The tables are at just the proper height to permit the projectiles to be rolled directly into the shell trucks. By using short shell tables only, the floor of the rest of the shell room is left for projectile storage and a much larger number can be stored. This being a matter of ammunition service, it will be again referred to under that heading.[49]

**FIGURE 73.** Wood framed shell table located in the south magazine, likely original to 1923 construction. Source: Gulf Islands National Seashore.

Winslow also noted that rolling projectiles had an important disadvantage, in that projectiles in use at the time of his writing (1920) were:

> . . . fitted with copper bands to take the rifling of the bore of the gun and thus give the projectile, in its flight, a rotation about its axis. This copper band projects from the circumference of the shell and if the shell be rolled along a floor or table having a hard surface the copper band is quite apt to be injured. Consequently, whenever projectiles have regularly to be rolled horizontally, arrangements are usually made so that this motion takes place on rails, imbedded in a table and so spaced that the copper bands will come between the rails and will, therefore, not be damaged as the projectile is rolled. Such an arrangement of rails is made on the receiving and delivery tables of all hoists, and on the service and storage tables in all shell rooms.[50]

The table observed in the south magazine likely dates to 1923, as part of original furnishing of the battery.

49. E. E. Winslow, *Notes on Seacoast Fortification Construction* (Washington, D.C.: Government Printing Office, 1920), 76.

50. Ibid., 81.

## Support Rooms

The six support rooms are aligned along the south side of the central corridor, with three rooms on either side of the magazine. The rooms differ in size but typically have a trapezoidal plan oriented on a north-south axis with the north wall angled and deviating from the otherwise rectangular plan. Some of the rooms have chamfered corner walls, giving the room a polygonal-shaped plan. Over the entrances to some of the rooms, room numbers and names are stenciled on the corridor wall. (It is not known when these stenciled labels were applied. Archival drawings do not have numbered rooms.)

The north wall of each room, which extends along the central corridor, is approximately 5 feet 2 inches thick. Archival drawings indicate that a 2-foot-thick concrete sleeve wall was installed on the north face of the existing wall as part of the 1940s addition. A vertical cold joint at the center of the door frame is consistent with the archival documentation (Figure 74).

**FIGURE 74.** Typical crack at cold joint in door opening between original and later construction.

Each room has an 8 foot 6 inch ceiling height with door openings measuring 3 feet wide and 7 feet 4 inches tall. The door openings typically have metal door frames with lift-off-door hinges, although the interior doors have been removed (Figure 75). Non-original door frames are typically wood. Typical finishes include concrete floors, painted concrete walls and ceiling with board form finish, and door openings with radius corners (Figure 76). At some of the rooms, additional finishes have been applied over the concrete. All ductwork, conduit, and light fixtures are surface mounted.


**FIGURE 75.** Typical metal door frame with lift-off door embedded hinges at most openings.

**FIGURE 76.** Typical radius corner detail at door openings.

**Gun Tool Room (Room No. 14).** The gun tool room is located at the east end of the six support rooms and has a trapezoidal plan measuring approximately 14 feet 8 inches by 24 feet 6 inches. This room is accessed from the central corridor (Figure 77). The room has typical concrete finishes including painted walls and ceiling, a vent opening, and a wall-mounted light fixture.


**FIGURE 77.** Overview of gun tool room.

**Enlisted Men's Latrine (Room No. 13).** The enlisted men's latrine has a trapezoidal plan and is accessed from the central corridor, as well as from one door opening from the adjacent supply room to the west (Figure 78). The room measures approximately 14 feet by 21 feet 6 inches and has a small entrance vestibule with concrete walls.[51] The room has typical painted concrete finishes, wall vents, pipe chases, and surface-mounted conduit and light fixtures. Waste and plumbing pipes, as well as anchors embedded in the ceiling, are evidence of previously existing restroom and stall dividers (Figure 79).


**FIGURE 78.** View of enlisted men's latrine.

**FIGURE 79.** Plumbing pipes and evidence of stall dividers remain at enlisted men's latrine.

**Supply Room (Room No. 12).** The supply room is located immediately adjacent and to the east of the magazine. The room has a polygonal plan measuring 15 feet by 22 feet 6 inches (Figure 80). It is accessed from the central corridor and the adjacent enlisted men's latrine to the east. The room has typical painted concrete finishes as well as vent openings and surface-mounted conduit, light fixtures, and junction boxes. A distinguishing feature of the room is a continuous recess, measuring 7 inches tall and 4 inches deep, which wraps around the lower portion of the east, north, and west interior elevations (Figure 81). Anchors in the ceiling indicate the location of previously existing partition walls.


**FIGURE 80.** View of supply room.

51. The entrance vestibule is referred to as the Air Lock on archival drawings.

**FIGURE 81.** View of recessed channel at walls in supply room.

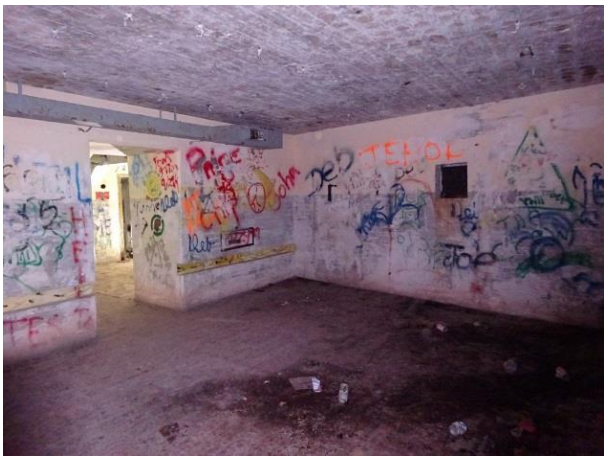


**FIGURE 82.** View of interior of the plotting room (Room No. 8) at the west side of the structure.

**Plotting Room (Room No. 8).** Immediately west of the magazine is a plotting room.[52] The room is accessed from an opening from the adjacent plotting room (Room No. 7) to the west and the door opening to the central corridor has been infilled with concrete. It is similar in plan and dimensions to the previously described supply room. It features a continuous recess that wraps around the lower portion of the east, west, and north interior elevations (Figure 82). At the southwest corner of the room is a steel-framed concrete access panel which provides access to a utility shaft extending to the west gun emplacement room (Figure 83). Typical finishes include 9-inch-square red linoleum floor tile applied to the concrete substrate, and painted concrete walls and ceiling (Figure 84). Some painted markings on the wall are dated September 20, 1926, and appear to date to the original construction (Figure 85). Evidence of adhesive residue was observed on the ceiling, indicating that an acoustic tile finish has since been removed (Figure 86).

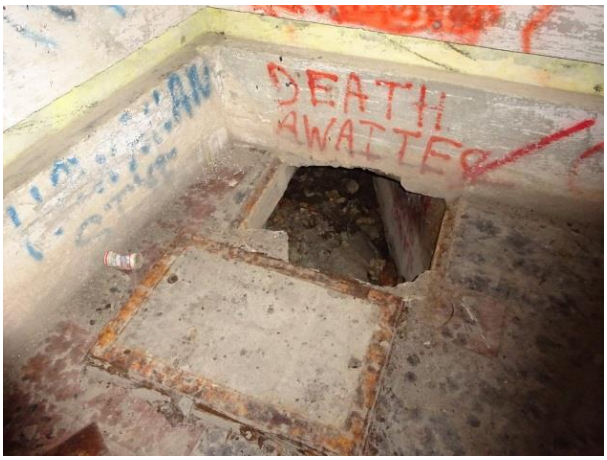



**FIGURE 83.** Shaft at southwest corner of the east plotting room.

52. Both room no. 8 and room no. 12 were identified as plotting rooms on the 1922 drawings. In the 1944 plan, room no.12 was identified as the Spotting Room and Chemical Warfare Service Equipment, while room no. 8 was still identified as the Plotting Room. The shaft running out of room no. 8 was used for a mechanical data device that transmitted firing coordinates to the gun crew; the drawings indicate that a similar shaft once ran from room no. 12 to the east gun. Room no. 7 was the data computer room in 1944, where data from the plotting room was used to derive the firing coordinates for the guns. As the only access to room no. 8 is through room no. 7, it may be that both were considered components of a single plotting suite. Correspondence by the authors with David Ogden, Cultural Resources Program Manager, Gulf Islands National Seashore, October 2015.

**FIGURE 84.** Red linoleum floor tile at the east plotting room.

**FIGURE 85.** "High Water Mark Sept 20 1926," stenciled on the plotting room wall notes flooding from one of the area's most severe hurricanes.

**FIGURE 86.** Evidence of acoustic tile on ceiling in the east plotting room.

**Plotting Room (Room No. 7).** The plotting room is similar to the previously described enlisted men's latrine but has a polygonal plan with an entrance from the central corridor as well as to the adjacent plotting room to the east and two door openings from the air conditioning room to the west (Figure 87). The central corridor opening is currently secured by a metal-framed hinged door grate (Figure 88). The room has a 9-inch-square red linoleum floor tile applied to a concrete substrate as well as the typical wall and ceiling finishes and surface-mounted ductwork, conduit, and light fixtures. A grid pattern of adhesive residue was observed on the ceiling, indicating that an acoustic tile finish has been removed.

**FIGURE 87.** View of the plotting room (Room No. 7).


**FIGURE 88.** View of door grate to the plotting room (Room No. 7) from central corridor.

**Air Conditioning Room (Room No. 6).** The air conditioning room is similar in size and trapezoidal plan to the previously described gun tool room. It is accessed from the central corridor as well as from two door openings from the adjacent plotting room to the east. The room is divided into four smaller spaces by original parge-coated concrete walls and non-original clay tile partition walls with plaster (Figure 89 through Figure 92). Interior finishes include 9-inch-square red linoleum tile flooring applied over the concrete substrate, as well as painted walls and concrete ceiling. This room was originally a storeroom, but was extensively modified during the 1942–1943 modernization. In the 1944 battery plan the entrance is an air lock, which leads into a "mechanical equipment" room (apparently for a dehumidifier), off which is a supply room and an officer's latrine, with a door into the data computer room. The waste and plumbing pipes remain while the fixtures have been removed. The room includes abandoned ductwork and vent and pipe chase penetrations at the partition walls and at walls between the adjacent plotting room and central corridor.


**FIGURE 89.** Entrance vestibule within the air conditioning room.

**FIGURE 90.** Corridor at air conditioning room.


**FIGURE 91.** Corridor at air conditioning room.


**FIGURE 92.** Latrine within the air conditioning room.

**Power Plant (Room No. 4).** The power plant is located to the north of the central corridor and consists of five rooms: the power room, water cooler room, muffler gallery, storage room, and an entrance hall. The power room is the largest of the five spaces and is accessed by a door opening from

the central corridor (Figure 93). It has a perimeter trench, recessed 18 inches below finished floor height, which isolates a series of four concrete mechanical pads with concrete equipment cradles (Figure 94). All generator equipment has been removed. The room has painted concrete walls and a fiberboard tile ceiling with each panel measuring 20 inches wide by 6 feet long (Figure 95). Vent openings along the north wall open to the muffler gallery, a shaft and wood-framed door with transom on the east wall that provides access to the water cooler room, and a stair and entrance to the adjacent entry hall at the west wall. The room contains a wood boardwalk constructed of planks attached to framing members and is, supported on wood piers. The boardwalk was reportedly displaced and damaged by flooding that occurred during Hurricane Ivan, and is significantly deteriorated. Based on discussion with the park, this feature is likely original to the 1940s construction.

**FIGURE 93.** The power room of the power plant at the north side of the central corridor. Note the boardwalk in the center of this photo.

**FIGURE 94.** Concrete mechanical pads in the power plant.

**FIGURE 95.** Fiberboard ceiling at power room of power plant.

The water cooler room is located at the east end of the power plant and has a door opening with steps that extend from the central corridor. Access through the central corridor entrance is presently restricted by a wall-mounted metal-framed grille (Figure 96). In addition, there is a wood-framed door opening with transom that provides access from the power room (Figure 97 and Figure 98). The room features a utility trench in the floor with steel-framed concrete panels and a large sheet metal duct along the west side of the room which extends to a vent open in the muffler gallery. The room has typical finishes including concrete floors and painted concrete walls and ceiling.


**FIGURE 96.** View of entrance to water cooler room from central corridor.

**FIGURE 97.** Overview of water cooler room within the power plant.


**FIGURE 98.** Door opening between the water cooler room and power room.

The muffler gallery is located at the north end of the power plant and consists of a narrow room with a rectangular plan and exposed concrete floor, wall, and ceiling (Figure 99). Vent openings to the power room and water cooler room are located along the south wall. A concrete shaft extends from the north wall to an exterior opening with hatch (Figure 100).

**FIGURE 99.** Muffler gallery within the power plant.

**FIGURE 100.** Concrete shaft that extends north from the muffler room.

The entrance hall is located at the west side of the power plant and accessed by concrete steps from the adjacent power room (Figure 101). The hall has exposed concrete finishes and features a utility trench with steel-framed concrete access panels. The hall extends to the double-leaf entrance doors associated with the center entrance portal on the north elevation. At the south end of the hall is a small storage room with exposed concrete finishes (Figure 102).

**FIGURE 101.** The entrance hall within the power plant extends to the center entrance at the north elevation.

**FIGURE 102.** Small storage room within the power plant.

## Interior Condition Assessment

- Extensive graffiti was observed throughout the interior of the structure. Graffiti consists of non-historic marking, primarily on the interior walls of the structure (Figure 103). There is evidence of overcoating of graffiti with a cementitious coating at the east and west gun emplacement rooms, compressor rooms, and corridors (Figure 104). Extensive graffiti remains at the central corridor, support rooms, and power plant.

**FIGURE 103.** Extensive graffiti within interior spaces.

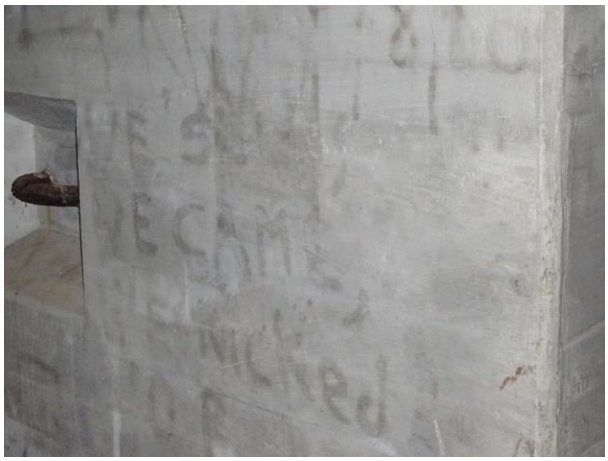


**FIGURE 104.** Evidence of previous cementitious overcoating applied as mitigation effort at locations of graffiti.

- Visible condensation was observed on the concrete ceiling adjacent to the west and center entrances on the north elevation (Figure 105). Evidence of condensation, in the form of a distinct pattern of drip marks on the floor, was evident throughout the structure (Figure 106).

**FIGURE 105.** Visible condensation on concrete ceilings adjacent to entrance portals.

**FIGURE 106.** Evidence of condensation within interior rooms of the battery.

- Corrosion and spalling were observed at the floor slab and utility trench in the central corridor and power plant rooms (Figure 107). The steel-framed panels that conceal the utility trench are corroded and the concrete infill is spalled. The corrosion has resulted in displacement of the panels and spalling and heaving of the concrete topping slab adjacent to the utility trench (Figure 108). The spalling of the concrete extends approximately 18 inches north of the utility trench and the concrete has uplifted as much as 4 inches. At one location in the power plant, corrosion associated with the utility trench resulted in severe deterioration of the stairs extending between the power room and adjacent entrance hall (Figure 109).

**FIGURE 107.** Severe spalling and corrosion of concrete and steel at recessed utility trench.

**FIGURE 108.** Heaving of concrete floor slab adjacent to utility trench.

**FIGURE 109.** Severe deterioration of concrete stairs adjacent to utility trench.

- Spalling was observed at the ceiling of the gun tool room (Figure 110). The deteriorated area is approximately 50 square feet in plan, with spalls 3 inches thick. Reinforcing bar with a diamond dimpled pattern is visible at some locations and was observed to be corroded.

- Two large diagonal cracks were observed at the southwest powder storage shelter (Figure 111). The cracks, located at the rear and side wall of the magazine, extend from the floor diagonally to the ceiling. The cracks are approximately 3/8 inch thick and extend the full depth of the 12-inch-thick concrete walls.

- Spalling was observed at the corners of soffits in the magazine (Figure 112). The spalls were typically 3 feet long, extending the full width of the soffit. Reinforcing bar with mild surface corrosion was visible at each spall location.

- Diagonal cracking was observed at concrete walls in the gun tool room and air conditioning room, located at either end of the row of support rooms. The cracks were 3/8 inch wide and extended nearly the full height of the wall.

- Small circular pop-out spalls were observed along the side elevations of each interior powder storage shelter (Figure 113). At each pop-out spall, the end of a reinforcing bar was visible and was observed to have mild surface corrosion.

**FIGURE 110.** Concrete spalling and exposed reinforcing bar at ceiling of gun tool room.

**FIGURE 111.** Diagonal cracking at corner of magazine powder storage room.

**FIGURE 112.** Spalling of concrete at corners at soffits of power room.

**FIGURE 113.** Semi-circular pop-out spalls at reinforcing bar locations at powder storage shelters.

- A large crack was observed at the north end of the east and west corridors (Figure 114). The crack extended vertically on the walls and across the ceiling and appeared to be associated with a cold joint in the concrete, possibly indicating later construction.
- Most linoleum floor tiles at the three west support rooms were debonded or missing.
- Mild surface corrosion was observed on the exposed face of steel I-beams embedded in the ceiling of the east and west gun emplacement rooms (Figure 115).
- Minor spalling was observed at a few locations within the interior of the structure (Figure 116). The spalls were typically only one to two inches in diameter. Corroded reinforcing bar was often visible at the spall locations.
- Hairline cracking was observed at isolated areas throughout the structure. The hairline cracks were typically located at horizontal pour lines or cold joints, such as at corners between adjacent walls or between the wall and ceiling slabs.

**FIGURE 114.** Cracking at ceiling of east and west wing corridors.

**FIGURE 115.** Surface corrosion of I-beams embedded in ceiling of gun emplacement room.

**FIGURE 116.** Minor spalling of concrete and exposed reinforcing bars at a few locations.

# 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.[51]

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.

### Criteria Considerations

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

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

51. National Park Service, "National Register of Historic Places" available at http://www.nps.gov/nr/ (accessed January 29, 2015.)

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

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

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

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

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

g. A property achieving significance within the past 50 years if it is of exceptional importance.[52]

## National Register Status of Battery Langdon

Battery Langdon is not presently listed in the National Register of Historic Places. The early nineteenth century Fort Pickens was listed in the National Register in 1972 as a structure significant for its role in the nation's Third System Coastal Defenses, the American Civil War, and post-Civil War use as a prison. However, there are other resources in the vicinity of the fort and on western Santa Rosa Island, ranging from early twentieth century mining support structures and Endicott Program batteries, to World War I-era structures such as Battery Langdon and World War II-era structures such as Battery 234, that postdate the period of significance associated with Fort Pickens; these features are nonetheless important examples of the evolving military response to advances in armaments and other technology designed to protect American coastal areas from attack and invasion.[53] A draft nomination for a Fort Pickens historic district to address the collection of coastal defense structures on western Santa Rosa Island associated with the Endicott System and later engineered features was developed in 1977. However, it appears that the nomination was never completed, and these features are not currently listed in the National Register of Historic Places. In the draft documentation prepared in 1977, Battery Langdon is assessed as contributing to the significance of the proposed historic district.[54]

This HSR is being prepared in coordination with a National Register nomination for a historic district that encompasses the Endicott System and later military resources located on western Santa Rosa Island. Typically, Endicott System structures were not fortresses like Fort Pickens, but instead were components of a system of well-dispersed emplacements with a few large guns at each location. The structures were often open-topped concrete walls protected by sloped earthworks. Many of these featured disappearing guns, protected by the concrete front walls, which could be raised to fire and lowered again afterwards. Anti-ship mines in the harbor were a critical component of the defense, and smaller guns were also employed to protect the mines from minesweeping vessels.

52. Code of Federal Regulations, Title 36, Part 60, "The National Register Criteria for Evaluation."
53. 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.
54. Anne Castellina-Dudley, Historian, Gulf Islands National Seashore, Fort Pickens Historic District National Register of Historic Places nomination form, draft, May 27, 1977.

Based on findings of this report and the concurrent National Register study, Battery Langdon is considered a contributing structure to the larger National Register-eligible historic district currently in development. The battery is significant for its association with World War I and World War II-era activities conducted by the U.S. Army to protect the strategically-important Pensacola Harbor using reinforced concrete gun batteries.

Under National Register Criterion A, Battery Langdon is an example of the broad pattern of coastal defense in the history of the eastern United States, as described above.

Under National Register Criterion C, the battery is notable as an example of utilitarian military design applied to meet the specific needs of 1910s defensive technology, as modified to address new threats in the 1940s. The distinctive features of the battery, such as the concrete structure, gun emplacements, earth sheltering, and interior connecting passageways, reflect its particular function. Therefore, the design of the battery is significant and representative of the military technology of the World War I and World War II eras.

Battery Langdon survives with sufficient integrity to convey its historic associations.

### Period of Significance

The period of significance for Battery Langdon begins with the start of construction of the battery in 1917 and concludes with deactivation of Fort Pickens, including Battery Langdon, and decommissioning of all military facilities on Santa Rosa Island in 1947.

The battery also contributes to the larger historic district, which is currently assessed as significant between 1894, when the earliest examples of the Endicott system were constructed, and 1947, when the property ceased being used for military defense purposes.

Since the end of U.S. Army use of the site, Battery Langdon has been vacant. Parts of the battery have been and are currently being used for storage of construction and repair materials and equipment. The battery has been interpreted as part of the military history of the site, initially as part of the Florida State Park from 1949 to 1972, and later as part of the Gulf Islands National Seashore from 1972 to present.

## Character-Defining Features

The historic nature of significant buildings and structures is defined by their character, which is 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.[55]

The following list identifies existing character-defining features found on the exterior and interior of Battery Langdon:

- Generally symmetrical layout, plan, and orientation toward Gulf of Mexico
- Sand fill and earth sheltering
- Concrete structure (exterior and interior)
- Gun emplacements
- Steel doors, hatches, and gates
- Steel and concrete floor trenches
- Other built-in fixtures

55. 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).

## 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.[56]

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."[57]

The historic integrity of Battery Langdon has been assessed within the context of its contribution to the proposed National Register historic district for western Santa Rosa Island.

**Integrity of Location.** The battery retains a high degree of integrity of location. The location of the battery has remained unchanged since construction began in 1917.

**Integrity of Design.** The battery retains a high degree of integrity of design to the World War II era. Although heavily modified in 1942–1943 from its original design, the original 1917 footprint and layout survives. The 1940s design is significant in its own right as an example of adapting earlier installations to meet new defensive needs during World War II.

**Integrity of Setting.** The battery retains a high degree of integrity of setting. Its most important spatial relationship is from the gun emplacements to the Gulf of Mexico to the south. Much of the battery is covered with native plants and shrubs; however, the World War II military strategy would have called for the environs of the battery to be left in a natural state to better camouflage the gun positions. The main road that passes to the south of the battery is a historic feature of the site but has been changed slightly by the addition of a parking area near the battery and a new loop road and parking lot for beach access to the south. The unpaved trail that wraps around the east and north sides of the battery incorporates the trace of historic roads and the light-gauge railroad on the island. In general, the setting of the battery is little changed from the 1940s.

**Integrity of Materials and Workmanship.** The battery retains a high degree of integrity of materials and workmanship. The structure's primary materials, concrete and steel, exhibit only localized areas of deterioration.

**Integrity of Feeling.** Battery Langdon retains a high degree of integrity of feeling. The battery was built as a utilitarian structure to serve specific

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

57. Ibid.

defensive functions. While the battery no longer serves a military function, it remains a tangible example of construction from the World War I and World War II eras on western Santa Rosa Island as part of Gulf Islands National Seashore.

**Integrity of Association.** Battery Langdon retains a high degree of integrity of association. The battery was built as part of a network of fortifications to provide unobstructed views over the Gulf of Mexico to track and target enemy ships. The sweeping views out to sea afforded from the gun emplacements remain a distinctive aspect of the battery today.

# Treatment and Use

## Requirements for Treatment and Use

Although not listed individually in the National Register of Historic Places, Battery Langdon was identified as a contributing structure in the draft National Register Nomination for the proposed Fort Pickens Historic District.[58] Battery Langdon is also considered to be a contributing structure in the historic district that encompasses the Endicott System and later military resources located on western Santa Rosa Island, for which a National Register nomination is currently in progress. The battery is significant for its association with World War I and World War II-era activities conducted by the U.S. Army to protect the strategically important Pensacola Harbor. It survives with sufficient integrity to convey its historic associations.

Therefore, treatment and use of Battery Langdon should be considered within the context of the legal mandates and policy directives established by National Park Service Cultural Resources Management Guideline (Director's Order 28) for the protection of cultural resources. Battery Langdon should be understood for its association with the other military resources on western Santa Rosa Island and preserved for the enjoyment of present and future generations.

### Laws, Regulations, and Functional Requirements

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

- National Park Service Cultural Resources Management Guideline (Director's Order 28), which requires planning for the protection of cultural resources on park property.
- Section 106 of the National Historic Preservation Act (NHPA), which mandates that federal agencies, including the National Park Service, take into account the effects of their actions on properties listed or eligible for listing in the National Register of Historic Places and give the Advisory Council on Historic Preservation a reasonable opportunity to comment.

Treatment of the building and site is also to be guided by the following:

- Secretary of Interior's Standards for the Treatment of Historic Properties
- Americans with Disabilities Act (ADA)
- *International Building Code* (IBC), 2012
- *International Existing Building Code* (IEBC), 2012

58. Anne Castellina-Dudley, Historian, Gulf Islands National Seashore, Fort Pickens Historic District National Register of Historic Places nomination form, draft, May 27, 1977.

- Florida Building Code, 2015 (which references the 2012 IBC and 2012 IEBC)[59]

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, NPS endeavors to have the work comply with model building code standards. At this time, the 2012 IBC with Appendices (replacing Chapter 34 with the IEBC) is the model building code used by the NPS and is referenced by the NPS Denver Service Center for design and construction. The NPS Denver Service center also references the 2012 IEBC, with Appendices and Resource A.

In the 2012 editions of the *International Building Code*, Section 3409–Historic Buildings, paragraph 3409.1 states:

> Historic Buildings. The provisions of this code relating to the construction, *repair*, *alteration*, *addition*, restoration and movement of structures, and change of occupancy shall not be mandatory for *historic buildings* where such buildings are judged by the *building official* to not constitute a distinct life safety hazard.

Since Battery Langdon is a historic structure, alternatives to full prescriptive legislative and code compliance should be considered where such compliance would compromise the integrity of the structure. Code-related issues related to the use of Battery Langdon have not be identified as part of the *Ferry and Shuttle Transportation Feasibility Study* (see further discussion below).

The structure requires repairs and mitigation to address structural conditions and adverse conditions that are potential hazards to life safety. At many locations the sand fill under the concrete burster course has been washed away, which has undermined the structural integrity of the concrete cap, creating a hazardous condition. Areas of displaced concrete panels and spalled concrete at utility trenches at the building interior are also a potentially hazardous condition. The hazardous conditions requiring repair before the structure can be safely accessed are discussed in the specific recommendations presented below.

## Current Planning Efforts

Planning is underway to develop a commercial ferry service, connecting the Fort Pickens area to nearby Pensacola and Pensacola Beach. In addition to the new ferry service, a landside tram service is being planned to accommodate those visitors who arrive at Fort Pickens via the planned ferry.

A feasibility study is currently underway by the NPS for a Pensacola Bay ferry and shuttle transportation system. Currently, a schematic site design and architectural planning report are under development. The current draft report proposes development of a 3.6 mile tram tour route that forms a loop between some of the park's landmarks. The route would include up to seven stops at which visitors could board or exit the tram. Each of the proposed stops is associated with a landmark and includes the ferry boat landing, the Fort Pickens museum, Battery 234, Battery Cooper, the campground store, Battery Worth, and Fort Pickens. Infrastructure alterations are proposed at each stop.

Open-air electric-powered trams will be used for visitor transport within the park. The feasibility study proposes that the interior of the Battery Langdon structure be used to store the trams when not in use. Within the storage location, access to standard electrical outlets will be needed for recharging of the tram batteries. The specific location proposed for storing the trams inside Battery Langdon is the east casemate chamber and the corridors leading to that chamber. The trams would enter the battery through the south doors and exit through the north doors.

The feasibility study notes that renovation work required to accommodate the trams within Battery Langdon would include removal of debris inside

59. The Fifth Edition (2014) of the Florida Building Code went into effect on June 30, 2015.

the battery, upgrading of the electrical service for the new charging locations, modifying the doors to the casemate to provide entrance on the east end of the north elevation and exit on the east end of the south elevation, and constructing a suitable drive path from the east door on the south elevation to Fort Pickens Road. The feasibility study also recommends that a solar power system be installed for the battery.[60] The power system could be located on the roof of the non-historic picnic shelter located northeast of Battery Langdon.

## Alternatives for Treatment and Use

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

> **Preservation** is defined as the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project.
>
> **Rehabilitation** is defined as the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values.
>
> **Restoration** is defined as the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period. The limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a restoration project.
>
> **Reconstruction** is defined as the act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location.[61]

Of the four treatment approaches, *rehabilitation*, which involves making possible a compatible use through repair, alterations, or additions, is most appropriate for Battery Langdon. This treatment would allow for the repairs necessary to stabilize and preserve the structure, while also permitting modifications to be made to accommodate a change in use. Preservation and restoration measures would be incorporated within the overarching rehabilitation treatment approach, through repair of the existing historic concrete and potentially through restoration of deteriorated or missing features such as the concrete burster course, entrance portals at the south elevation, the gun emplacement rooms, and the magazine with powder storage shelters and auxiliary power plant.

The use of Battery Langdon is anticipated to be as a historic structure for interpretation to park visitors, and also as a storage facility for the trams associated with the ferry service. Where future modifications are considered to permit these uses, these modifications should be designed taking into consideration the goal of retaining original historic materials and features wherever possible. For example, anticipated modifications to permit tram storage include alterations to doors, creation of new drives/paths, and installation of a solar array (reportedly on the nearby picnic shelter rather

60. The 100 percent draft report for the *Pensacola Bay Ferry Service – Ferry and Shuttle Transportation Feasibility Study* is dated June 2014.

61. Secretary of the Interior's Standards for the Treatment of Historic Properties.

than the battery itself). The design of these new elements should consider the historic character of the battery and should be installed without removing existing historic material wherever possible. Where incorporation of new amenities would require significant alterations to the battery that could diminish its integrity as a historic resource, consideration should be given to limiting or avoiding these modifications.

Many of the distinctive materials, features, and spaces of Battery Langdon are essentially intact, and in spite of certain alterations, the structure retains its historic integrity. Repair of original materials and character-defining features as part of the overall rehabilitation is practical and appropriate, and will assist in the interpretation of the structure.

# Ultimate Treatment and Use

## Guidelines for Treatment

Guidelines and requirements for treatment have been defined based on the objectives and requirements for treatment and use outlined above for Battery Langdon. All treatment guidelines and recommendations were developed in accordance with the Secretary of Interior's Standards for Rehabilitation.

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

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

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

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

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

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

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

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

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

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

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

unimpaired.[62]

The basic guidelines for work on the subject buildings and their immediate setting are as follows:

- Undertake all work in compliance with the Secretary of the Interior's Standards for Rehabilitation.
- Retain the character of the historic site by protecting the individual structure and significant site features.
- Ensure that proposed new elements or construction are compatible with historic character of the structure and site.
- Protect adjacent natural resources during construction activities.
- Document through detailed as-built drawings, photographs, and written narrative all changes and treatments to the historic site and structure. Maintain records of treatments and preserve documentation according to professional archival standards. Maintain a copy of records in NPS archives.
- Retain features and materials at the structure that date from the period of significance to the greatest extent possible.
- Incorporate sustainable design principles in all future projects that respect the preservation principles listed above.

# Recommendations

## Site

- Retain the visual connection between Battery Langdon and the adjacent landscape.
- Retain and maintain the historic patterns of spatial organization that include the circulation routes that provide access to Battery Langdon.
- Avoid constructing new features that interfere with views of the battery.
- Continue to interpret Battery Langdon in relation to other World War I and World War II-era structures at the site.

## Immediate Safety Measures

Rehabilitation work is anticipated to permit use of the battery for storage of trams associated with the ferry service. In addition, the park desires to provide access to the battery in the future for interpretation to visitors. Until more comprehensive repairs are undertaken, public access to the battery should be prevented. To make the battery safe for access by park personnel in the near term, and particularly once the battery is made available for tram storage, the following immediate safety measures should be implemented:

- Visitor access onto the structure should be discouraged. Due to deterioration of the concrete burster course, the area on top of the structure is potentially hazardous. The concrete burster course should be stabilized to mitigate collapse of the concrete at locations where the sand fill has been washed out and the concrete is not supported. (See further discussion below.) In addition, large pieces of concrete that have collapsed from the burster course should be removed if not stable.
- Large areas of displaced steel panels and concrete spalls located along the utility trench of the central corridor present a safety hazard. Displaced panels and concrete should be removed and the utility trench and adjacent deteriorated concrete floor area covered until such time as long-term repairs are performed.

62. Ibid.

## Concrete

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

- Vegetation growth should be removed where necessary to permit clear access to entrances. Further study is required to determine whether existing vegetation is damaging the concrete structure, holding moisture against the concrete, etc. If it is determined that trees and other large vegetation features are damaging to the battery, coastal grasses could be evaluated to determine whether these types of plant materials that would hold sand cover in place would be better for the structure and site than existing trees. This assessment would need to consider historical intent in terms of development of cover over the battery and berm.

- Areas with evidence of moisture movement through cracks or moisture staining should be further investigated to determine source of moisture and required repairs. Specifically, canopy roof drains should be further investigated to determine necessary repairs.

- The concrete should be cleaned with a biocide/detergent at affected areas to remove organic growth. Cleaning mock-ups should be performed to evaluate cleaning systems to be used overall and to determine concrete appearance for matching of concrete repair materials. (See further discussion of graffiti removal treatments, below.)

- Concrete repair mixes should be developed to match the color, finish, and texture of the original concrete. This includes the architectural formboard finish on the surfaces of the concrete elements. 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 will be required. Initial small samples should be prepared off-structure and in unobtrusive locations on structure, followed by larger mock-ups of selected repair mixes and techniques on the battery, as needed to achieve a match to original surface finishing, texture, and color.

- Cracked or spalled original concrete and previous patch materials should be removed and replaced.

- Where severe spalling was observed, such as at the trenches and adjacent stairs, barriers should be installed until repairs are implemented, as current conditions present a hazard to NPS personnel accessing these areas of the battery.

- Long-term repairs should be implemented to address severe corrosion and spalling at the floor slab and utility trench in the central corridor and power plant rooms, which have resulted in displacement of the panels, spalling and heaving of the adjacent concrete topping slab, and deterioration of the stairs between the power room and adjacent entrance hall. The concrete slab and stairs should be repaired as discussed below. The severely deteriorated steel-framed concrete trench covers could be replicated; however, given the vulnerability of the steel frames to corrosion and associated deterioration of the concrete, new precast panels matching the appearance of the original concrete trench covers could instead be fabricated and installed.

- Areas of severe deterioration at the burster course should be shored as required during repair work and until sufficient strength has been developed in the concrete. Repairs at these areas would include installation of bulkheads to create formed edges, followed by installation of repair concrete. Sequencing of the concrete repair work should take into account adequate curing and development strength of the new concrete. Repair at these areas will also need to include replacement of sand (or placement of other fill material) in the openings beneath the concrete.

- Repair of localized concrete deterioration should include the following steps:
    - A 3/4-inch deep sawcut should be made around the entire perimeter of each repair area. The sawcut may align with edges of the formboard profile when appropriate.
    - Chipping hammers should be used to remove concrete to a depth of at least 3/4 inches beyond the exposed reinforcing steel.
    - The exposed concrete surfaces and exposed reinforcing steel within the repair area should be sandblasted and air blasted to remove corrosion and roughen the surface.
    - 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 should be immediately coated 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 surface, including matching the original board form finish.
    - Repair concrete, customized to match the original concrete color, finish, and texture, should be placed and consolidated.
    - The concrete repair should be wet cured.
- The exterior crack at the interface between the gun emplacement entrance wall and wing wall should be repaired by cleaning and installation of a cement-based repair material. (Fine or hairline cracking of the concrete does not require repair.)
- Cracks exist at the battery interior at several locations, including the southwest powder storage shelter, gun tool room, air conditioning room, and at the north end of the east and west corridors that do not appear to require repair at this time. The cracks should be monitored to confirm that they are non-moving. In addition, the cracks should be monitored to confirm that moisture is not entering the structure at these locations. At the time of this study, moisture penetration was not observed at the crack locations.
- At areas of failed parge coating, such as at the west side of the east gun emplacement entrance, a similar procedure to that described above for localized repairs should be followed. A different mix design may be required for the parge coat than that used for spall repairs.
- As part of the repair program for interior concrete, where linoleum floor tiles are missing, existing mastic should be removed. This material should be tested for potential hazardous materials component (e.g., asbestos) to determine appropriate removal locations.
- Consideration could be given to the installation of bituminous waterproofing at areas where new concrete is installed as part of repairs at the burster course. (Repair or replacement of existing waterproofing in other areas of concrete at the roof of the structure would require removal of extensive cover, and does not appear to be necessary as evidence of systemic leakage was not observed.) Only limited access to the burster course was possible as part of this investigation, and further removals and assessment outside the scope of this study would be needed to determine whether waterproofing would be appropriate. Such further investigation could be undertaken when repairs to collapsed areas of the burster course are undertaken.

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

**Graffiti Mitigation.** The extensive graffiti present in many areas of Battery Langdon is an unfortunate result of uncontrolled visitor access in the past. As a visible sign of lack of respect for the historic resource, graffiti interferes with appreciation of the historic character of the property. It is important to distinguish between non-historic graffiti markings, and markings that are part of the historic character of the structure, such as signage dated 1926, noted in several of the interior spaces.

Graffiti in the east and west gun emplacement rooms has been overcoated, as further discussed below. In addition to these spaces, graffiti is especially extensive in the central corridor, support rooms, and power plant.

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. Each of these approaches is further discussed below. (Note that graffiti applied as an act of vandalism is distinguished from historic markings and signage painted on features of the battery, and associated with its use during the period of significance. Such markings should be documented, retained, and conserved or restored as appropriate.)

Although graffiti can occur in many forms, the most typical are applied coatings including but not limited to ink, indelible marker, wax markings, and paint. Graffiti can also occur in the form of abrasive markings such as glass etching or carving into architectural surfaces. At Battery Langdon, graffiti most commonly appears to consist of spray painted markings on interior concrete surfaces. Markings are present at various locations, and especially at heights on the walls that are readily reached from the floor.

**Available Graffiti Removal Methods.** Three general types of cleaning systems are available for removal of soiling and staining from building facades: microabrasive, chemical, and water methods; however, not all of these methods are appropriate for removal of graffiti. The selection of a cleaning method must take into consideration both the type of graffiti to be removed and the substrate to which the graffiti has been applied. In regard to removal of painted graffiti, the sooner a cleaning product can be applied, the more likely it is to be successful.

We understand that access to the interior of the battery is currently and will in the future be more controlled than in the past; therefore it is hoped that incidences of graffiti application will be substantially reduced. In addition, implementation of a graffiti removal program should be successful in mitigating, if not entirely removing, the appearance of existing graffiti. As the battery cannot be monitored by the park at all times to prevent such vandalism, regular review should be performed of exterior and interior surfaces to identify any new graffiti so that it can promptly be removed.

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

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.

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 in a stream of water (water is used to

soften the soiling and buffer the impact of the media). Other microabrasive techniques use abrasive media embedded in sponges and delivered to the surface with pressurized air.

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. Microabrasive methods may damage glazed masonry (such as terra cotta and brick), polished stone, or the outer surface of fire hardened brick; although these techniques are typically somewhat less damaging to sound concrete. Prior to use, trials should be conducted to evaluate effectiveness and the aesthetic result. (Some microabrasive techniques, such as "soda blasting," have been found to be too aggressive for use on masonry. Other microabrasives, such as the proprietary Quintek Rotec system, have been used successfully for masonry cleaning, as further discussed below.)

Chemical cleaning methods include a wide range of chemicals available to address graffiti, as well as atmospheric soiling, biological growth, and coating removal. The chemicals selected must not result in damage to the substrate material. For example, highly acidic chemicals dissolve calcium carbonate based substrates such as limestone and marble. Additionally, chemicals may damage or etch adjacent surfaces not intended to be cleaned, so protection is frequently an important consideration. Lastly, some chemicals are hazardous and should be avoided. An example is methylene chloride, a common ingredient in certain paint removers, which is considered by the Occupational Safety and Health Administration (OSHA) to be a potential occupational carcinogen.

Poultices (an active chemical mixed with an inert vehicle such as clay or diatomaceous earth) are generally most effective in removing graffiti from masonry and, like all chemical graffiti removal systems, are most effective if applied within 24 hours of the graffiti installation. Poultices have the advantage over liquid paint removers in that they 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. Many liquid paint removers can soften the coating and result in spreading it over a surface or driving it into porous materials instead of removing it as the liquid is wiped away, making the coating even more difficult to remove.

Some poultice-type coating removal systems come with special paper that covers the poultice while it is active; upon completion of the dwell time, the coating remover and coating debris are removed with the paper, making clean-up easier. These systems are especially beneficial if special containment is required, as is the case with the removal of paint coatings that contain lead. Testing for hazardous materials should be performed prior to paint removal.

Chemical graffiti removal from painted substrates is likely to result in removal or damage to the underlying coating. If the existing coating is determined not to be historically significant in itself, then removal of graffiti and/or overpainting in these areas would be an appropriate solution. (See further discussion of overpainting, below.)

Water methods typically include pressure washing, steam cleaning, and hot water pressure washing. These 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. Low pressure rinsing is used in conjunction with chemical cleaning methods to rinse the chemicals from the substrate. Water pressures must be carefully monitored, as high-pressure water can damage building materials. Open or deteriorated joints should be repaired or sealed (depending on location and substrate) prior to using water cleaning methods, as well as chemical cleaning methods that typically require water application for prewetting and rinsing.

**Overpainting.** Overpainting is a graffiti removal method that covers the graffiti instead of removing it. Overpainting may be appropriate for substrates that were painted historically. The overpainting should match the base paint in color and sheen, and should be compatible with the base paint.

Multiple applications may be required to cover dark colored graffiti. Where existing paint coatings are deteriorated or soiled, additional surface preparation such as scraping and/or cleaning may be required prior to overpainting.

Overpainting is generally not an appropriate means to address graffiti on a historic structure if the substrate was not historically painted. However, given the extensive and highly visually intrusive graffiti present in Battery Langdon, overpainting to conceal graffiti may be considered further if the above-mentioned techniques are found to be unsuccessful or infeasible for removing or mitigating the appearance of the graffiti.

At the corridors on the west half of the building, a cementitious parge coat was installed over the graffiti in 2003, prior to Hurricane Ivan.[63] The graffiti is visible through the parge coat, and may be leaching through the cementitious coating. In addition, use of a cementitious parge coat to cover or conceal the graffiti is not recommended as a preservation approach, as this is not a reversible treatment.

**Clear Protective Coatings.** Various clear film-forming protective coatings (also known as sacrificial or barrier coatings) have been developed in an attempt to protect the underlying substrate from the graffiti application, and facilitate the removal of the graffiti. Clear protective coatings can be intended to be long-lasting (remaining on the surface after many uses) or sacrificial (removed from the surface after each graffiti incident) and may also incorporate other characteristics such as water repellency.

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 are not reversible and their effect over multiple decades of weathering is not well documented or understood. Therefore, long-lasting clear protective coatings are not recommended. Sacrificial clear protective coatings are water-based and, if additional graffiti occurs, are removed as part of the graffiti cleaning process. The coating is then reapplied after each graffiti removal event.

If access to Battery Langdon is controlled and incidences of graffiti can be eliminated or greatly reduced, the use of clear protective treatments is likely not warranted.

**Other Graffiti Prevention Methods.** In addition to protective coatings and films, the modification of site features may also deter future graffiti and protect building materials. At Battery Langdon, limiting public access to the interior except when accompanied by park personnel (e.g., guided tours) is a potential approach. Increased site lighting (including motion-detector lights) and high resolution security cameras could also be considered. These methods can discourage vandals, but are of course challenging to implement given the somewhat remote location of the battery, concealed aspect of some of the entrances, and limited staffing available to monitor the structure and other resources within the park. In addition, prompt removal of any new graffiti that occurs (once the extensive coverage in the battery is addressed) may tend to discourage ongoing vandalism.

63. Correspondence with Gulf Islands National Seashore personnel, July 2015.

### Steel

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

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

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

### Wood

There are few wood elements remaining as part of Battery Langdon. Existing wood elements include non-original door frames, although the wood door frame leading to the booth in the auxiliary power plant appears to be original to 1923. Another historic wood feature is the boardwalk in the power room in the power plant that was damaged in 2004 by Hurricane Ivan. The wood boardwalk is likely a feature original to the 1940s construction, and should therefore be retained and repaired/restored, including returning to its original location. Although it does not appear to have originally been coated, consideration may be given to a protective treatment (e.g., a clear coating) to prevent the wood from deteriorating rapidly in the relatively moist interior environment.

Although the scope of services of the Historic Structure Report does not address movable furnishings, the shell table observed in the south magazine is likely original to 1923 construction and is of historical interest. The table should be documented and assessed for any needed repair and conservation measures. It is preferable to retain it within the battery if possible, as it is an important interpretive feature of the magazine.

## Recommendations for Further Research

- Consideration should be given to preparing a cultural landscape study for Battery Langdon, its immediate environs, and the area encompassed by viewsheds from and toward Battery Langdon. Information developed for a cultural landscape study would inform future planning and treatment for the site. Alternately, consider development of a comprehensive Cultural Landscape Report for the western end of Santa Rosa Island, as part of a potential series of cultural landscape studies for Gulf Islands National Seashore.

# Bibliography


Bearss, Edwin C. *Fort Pickens, 1821–1895: Historic Structures Report, Historic Data Section.* Outline for report. No date [circa 1982–1983]. NPS Document No. 635-D223.

———. *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, March 1982. NPS Document No. 635-D1878.

Berhow, Mark A., ed. *American Seacoast Defenses: A Reference Guide.* Bel Air, Maryland: Coast Defense Study Group Press, second edition, 2004.

Castellina-Dudley, Anne, Historian, Gulf Islands National Seashore. *Fort Pickens Historic District National Register of Historic Places nomination form.* Draft, May 27, 1977.

Coker, William S. "Pensacola, 1686–1821," in Judith A. Bense, editor, *Archaeology of Colonial Pensacola* (Gainesville, Florida: University Press of Florida, 1996).

"Defense Environmental Restoration Program for Formerly Used Defense Sites, Preliminary Assessment, Fort Pickens Military Reservation, Pensacola, Escambia County, Florida, Property Number – I04FL0063," September 2007.

Gaines, William. "The Coast Artillery at Pensacola Bay, 1898–1946," *Coast Defense Study Group Journal*, February 1994.

Griffin, John W. "Foreword," in Bonnie G. McEwan, *The Spanish Mission of "La Florida"* (Gainesville, Florida: University Press of Florida, 1993), xv.

Hoffman, Paul E. *Florida's Frontiers.* Bloomington and Indianapolis: Indiana University Press, 2002.

Lewis, Emanuel Raymond. *Seacoast Fortifications of the United States: An Introductory History.* Annapolis, Maryland: Naval Institute Press, 1979.

Mabelitini, Brian. *Historical Background of the Fort Pickens Wharf (1828–1947), Santa Rosa Island, Florida.* Originally published in Gregory D. Cook, Elizabeth D. Benchley, Brian Mabelitini, Sarah Mitchell, Colin Bean, Matt Gifford and Erica Smith, University of West Florida, Archaeology Institute. *Draft Interim Report for Phase II Archaeological Investigations at the Proposed Ferry Pier, Fort Pickens, Santa Rosa Island, Florida.* Report of Investigations #177, Contract #ARPA Permit # GUIS 2011-001, BAR Permit # 1011.048. Prepared for the National Park Service, Gulf Islands National Seashore, March 2011.

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

Milanich, Jerald T. *Archaeology of Precolumbian Florida.* Gainesville, Florida: University Press of Florida, 1994.

Muir, Thomas Jr., and David P. Ogden. *The Fort Pickens Story.* Pensacola: Pensacola Historical Society, 1989.

Nimnicht, Randy F. 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.

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

*Report of Completed Works, Seacoast Fortifications (Fire Control or Torpedo Structure), corrected to November 1, 1920.*

*Report of Completed Works, Seacoast Fortifications, September 16, 1943; corrected to July 1, 1944.*

Winslow, E. E. *Notes on Seacoast Fortification Construction.* Washington, D.C.: Government Printing Office, 1920.

## National Park Service Documents

*Gulf Islands National Seashore, 1991 Annual Narrative Report [FY90].*

*Gulf Islands National Seashore, 1991 Annual Narrative Report.*

*Gulf Islands National Seashore, Annual Narrative Report for 1993.*

*Gulf Islands National Seashore, Annual Narrative.* January 1994 through September 1995.

*Gulf Islands National Seashore, Superintendent's Annual Narrative.* October 1995–September 1996.

*Gulf Islands National Seashore, Superintendent's Annual Narrative.* October 1, 1996–September 30, 1997.

*Gulf Islands National Seashore, Superintendent's Annual Narrative.* October 1, 1997–September 30, 1998.

*Gulf Islands National Seashore, Superintendent's Annual Narrative.* October 1, 1998–September 30, 1999.

*Gulf Islands National Seashore, Superintendent's Annual Narrative.* October 1, 1999–September 30, 2000.

*Gulf Islands National Seashore, Superintendent's Annual Narrative.* October 1, 2000–September 30, 2001.

*Gulf Islands National Seashore, Superintendent's Annual Narrative.* October 1, 2001–September 30, 2002.

*Gulf Islands National Seashore, Superintendent's Compendium. Revised April 2013.*

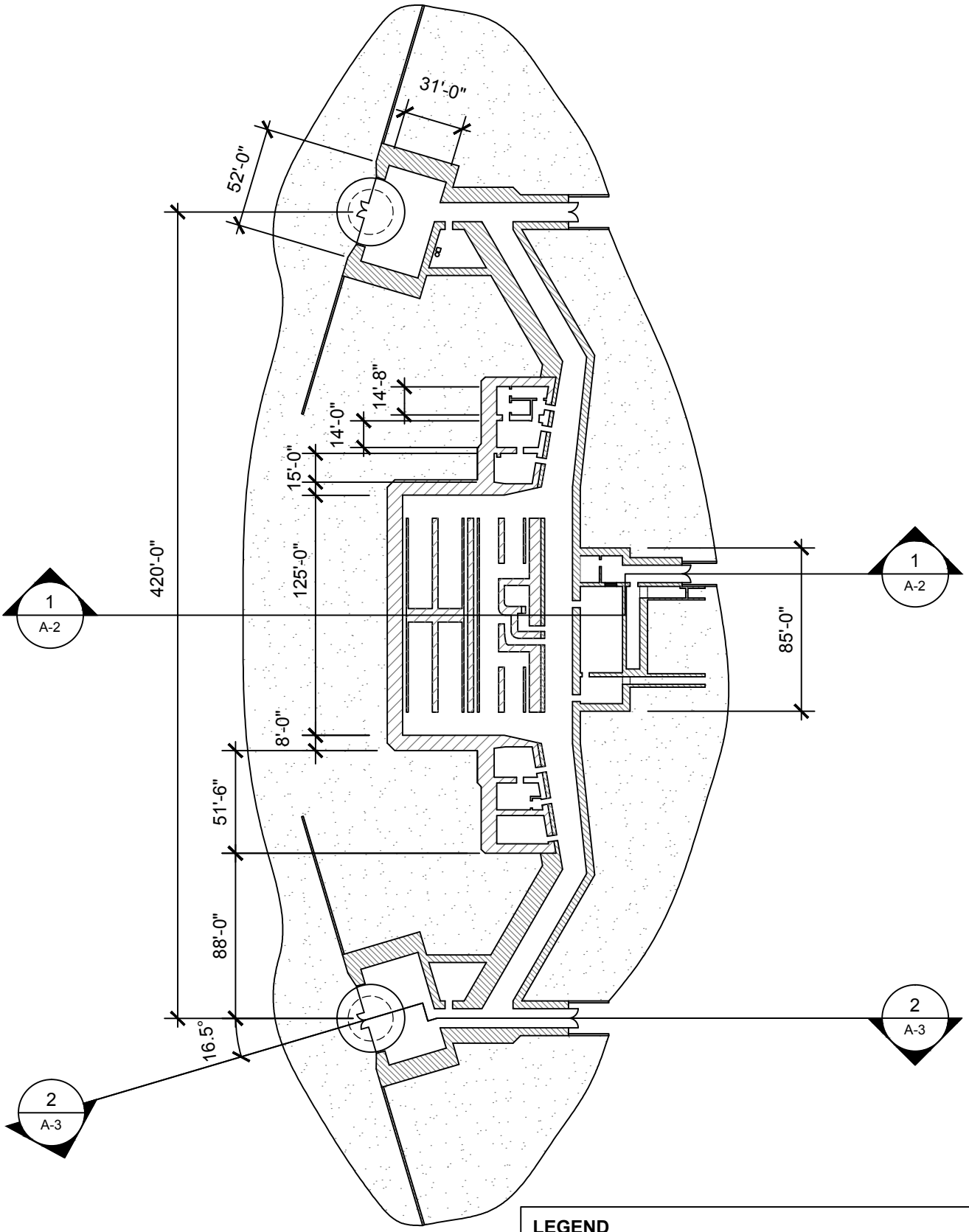
*List of Classified Structures, Gulf Islands National Seashore.*

# Appendices

Appendix A: Measured Drawings

Appendix B: Excerpt, Report of Completed Works

# Appendix A: Measured Drawings

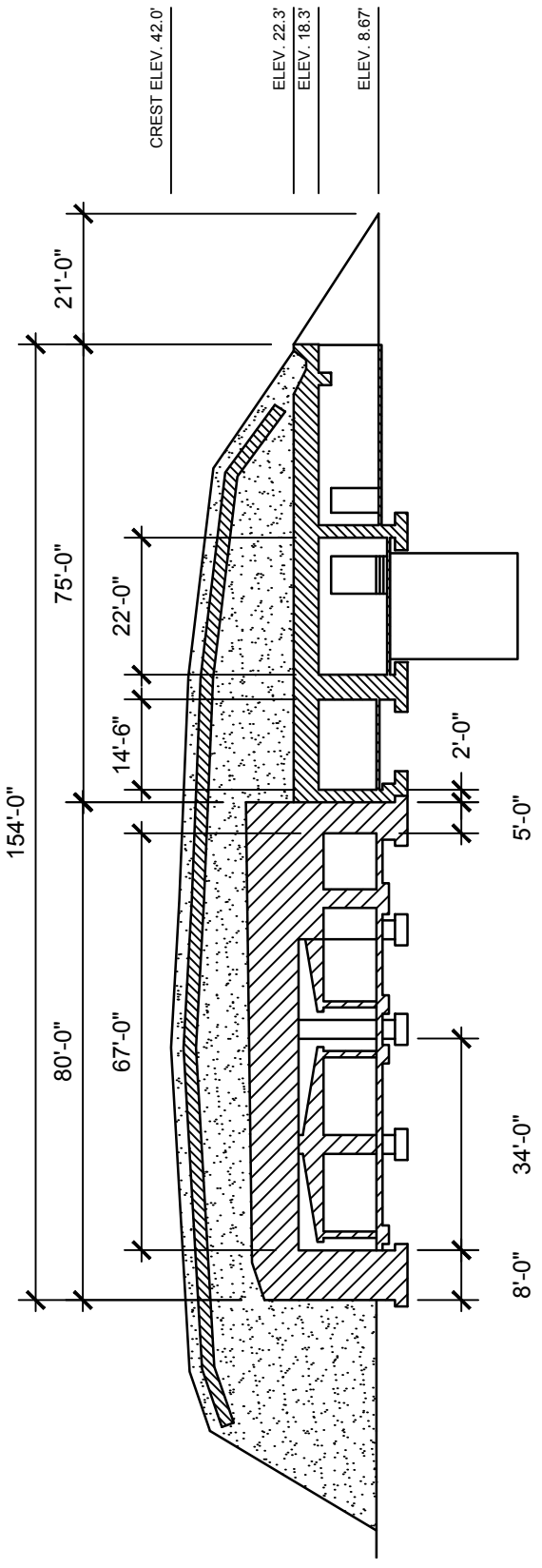



**LEGEND**

- 1922 Structure - Concrete Structure, circa 1922
- 1944 Structure - Concrete Structure, circa 1944
- Sand

**Plan View**

Scale: N.T.S.

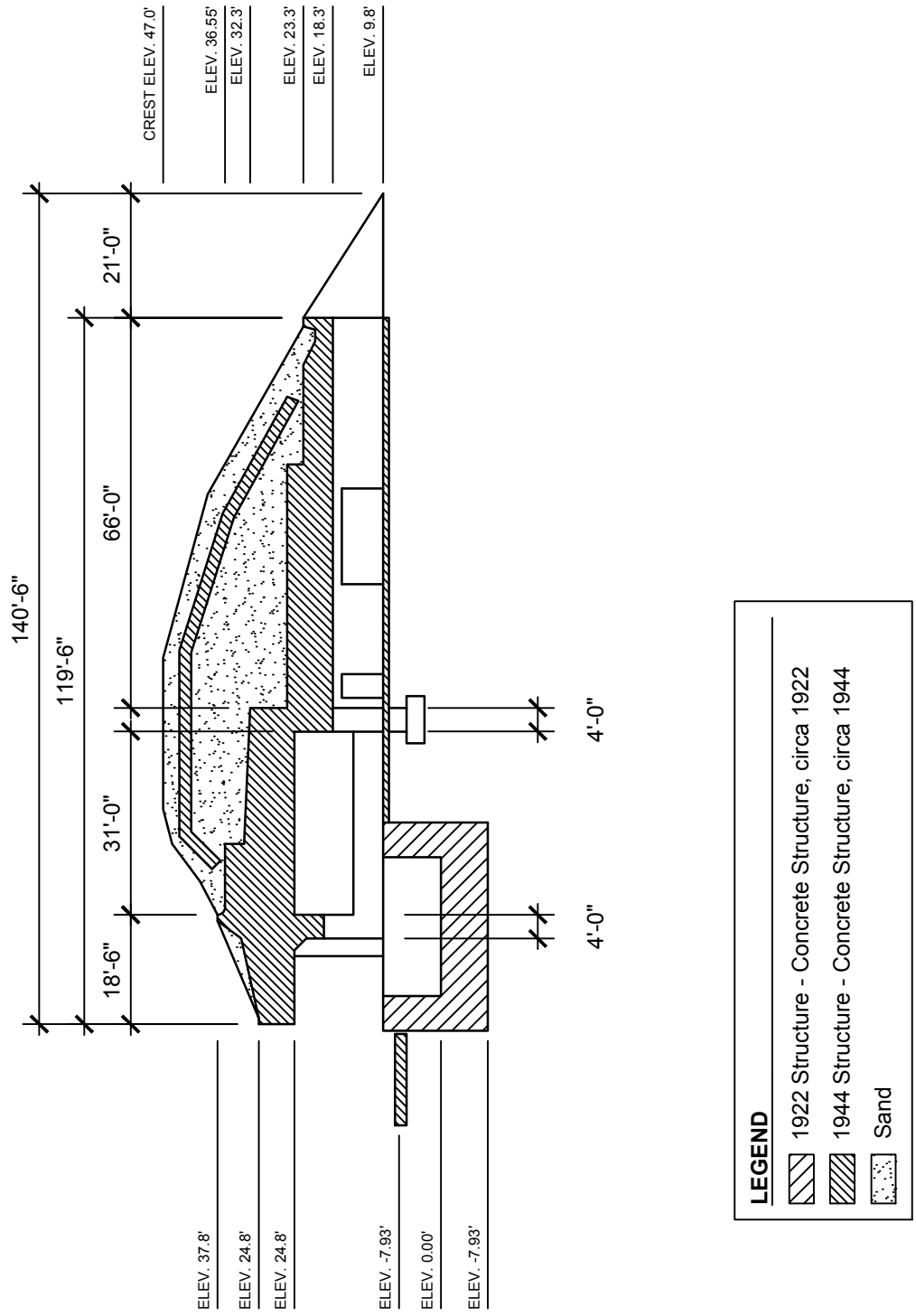



**LEGEND**

- 1922 Structure - Concrete Structure, circa 1922
- 1944 Structure - Concrete Structure, circa 1944
- Sand

**Section 1**

Scale: N.T.S.




**Section 2**

Scale: N.T.S.

# Appendix B: Excerpt, Report of Completed Works

Sheet No.

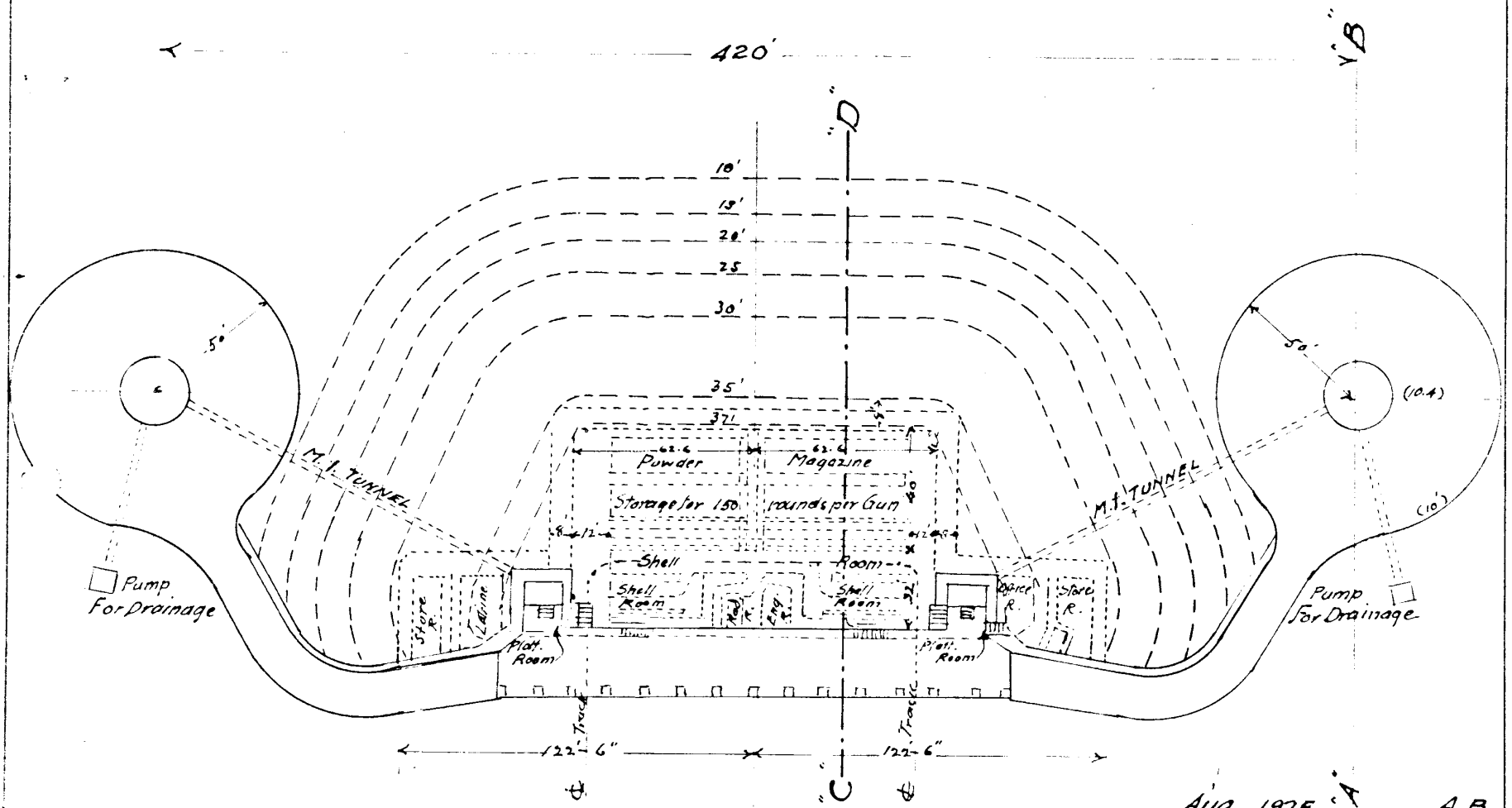
REPORT of COMPLETED WORKS – SEACOAST FORTIFICATIONS
(Battery Plan)

Form 7

Corrected to June 30, 1925

COAST DEFENSES of PENSACOLA
FORT PICKENS, FLA.
BAT. LOOMIS L. LANGDON
No. Guns-2; Cal. 12"; Barb. Carriage
In 4 Sheets; Sheet (a.
Scale – 1" = 50'

0 5 10 20 30 40 60 100'




Aug. 1925

A.B.

Sheet No.

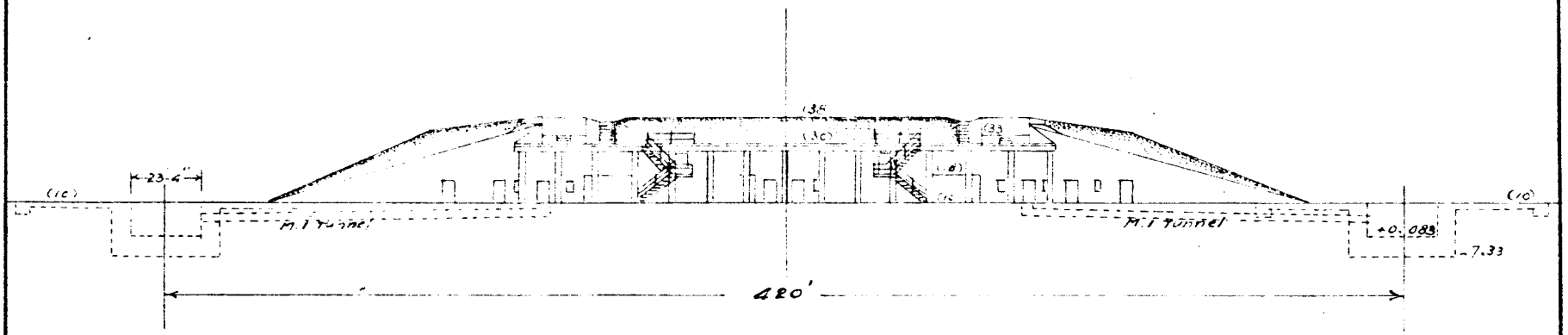
REPORT of COMPLETED WORKS—SEACOAST FORTIFICATIONS
(Rear Elevation)

Form 7

Corrected to 1922

COAST DEFENSES OF PENSACOLA
FORT PICKENS FLA.
BATTERY LANGDON,
No. Guns-2; Cal.-12"; Barb. Carrge
In 4 Sheets; Sheet (b)
Scale: 1" = 50'

0 5' 10' 20' 30' 40' 50' 100'




A.B.

Sheet No 3

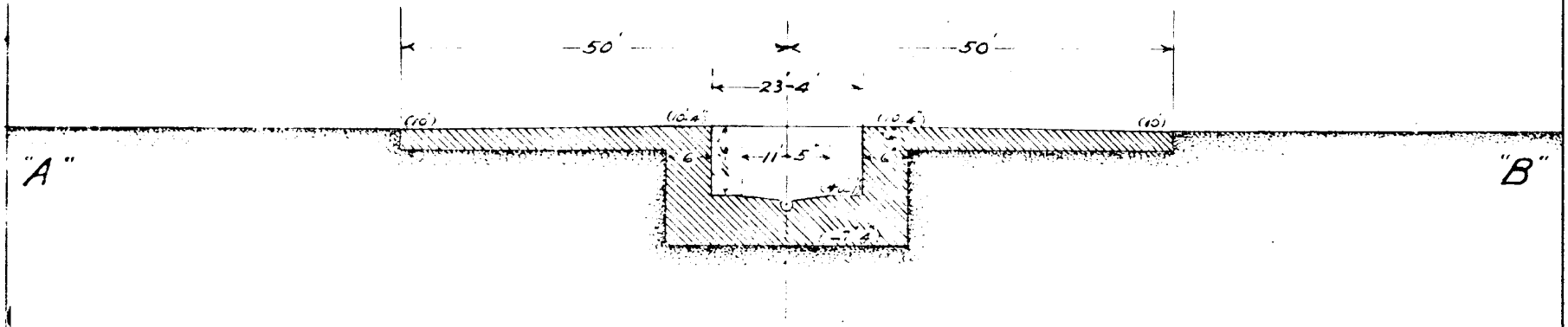
REPORT of COMPLETED WORKS - SEACOAST FORTIFICATIONS
(Cross section thru No. 1 Gun parallel to capital of battery.)

Form 7

Corrected to 1922

COAST DEFENSES of PENSACOLA.
FORT PICKENS, FLA.
BATTERY LANGDON,
No Guns - 2; Cal - 12"; Barb. Carriage
In 4 Sheets; Sheet (C)
Scale: 1" = 20'

0 5' 10' 20' 40'




-1. B.

Sheet No. 4.

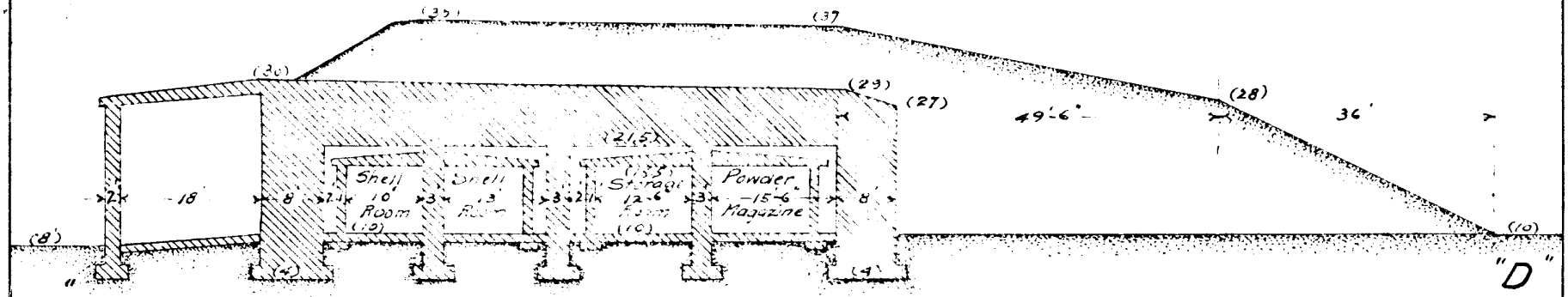
REPORT OF COMPLETED WORKS - SEACOAST FORTIFICATIONS
(Cross section thru Powder Magazine of No. 1 Gun, parallel to capital of battery

Form 7

Corrected to 1922

COAST DEFENSES OF PENSACOLA
FORT PICKENS, FLA.
BATTERY LANGDON,
No. Guns-2; Cal.-12"; Barb. Carriage
In 4 Sheets; Sheet (d)
Scale: 1" = 20'

0 5' 10' 20' 40'




- A.B.

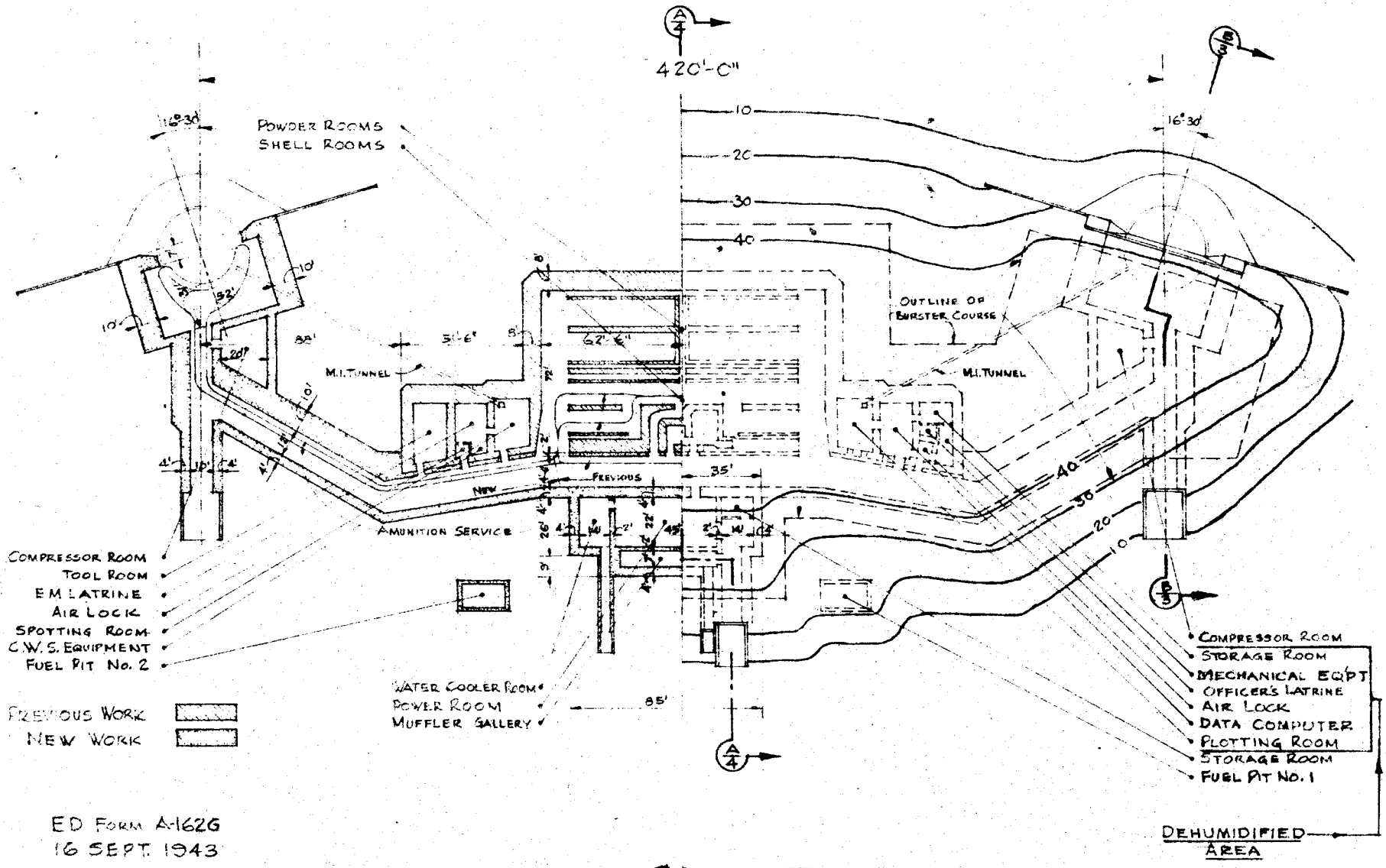
SECRET

REPORT OF COMPLETED WORKS - SEACOAST FORTIFICATIONS
(BATTERY PLAN)

SHEET NO. 1 OF 4 SHEETS

PART VII CORRECTED TO 1 JULY 1944

HARBOR DEFENSES OF PENSACOLA
FORT PICKENS, FLORIDA
BATTERY LOOMIS L. LANGDON
NO. OF GUNS - 2; CALIBER 12"; BARBETTE CARRIAGE
SCALE: 1"=60'; GRAPHIC: 0 5 10 20 30 40 50 60 70 80 90 100 110




ED FORM A-162G
16 SEPT 1943

SECRET

SECRET

REPORT OF COMPLETED WORKS - SEACOAST FORTIFICATIONS HARBOR DEFENSES OF PENSACOLA

REAR ELEVATION OF BATTERY

SHEET NO. 2 OF 4 SHEETS

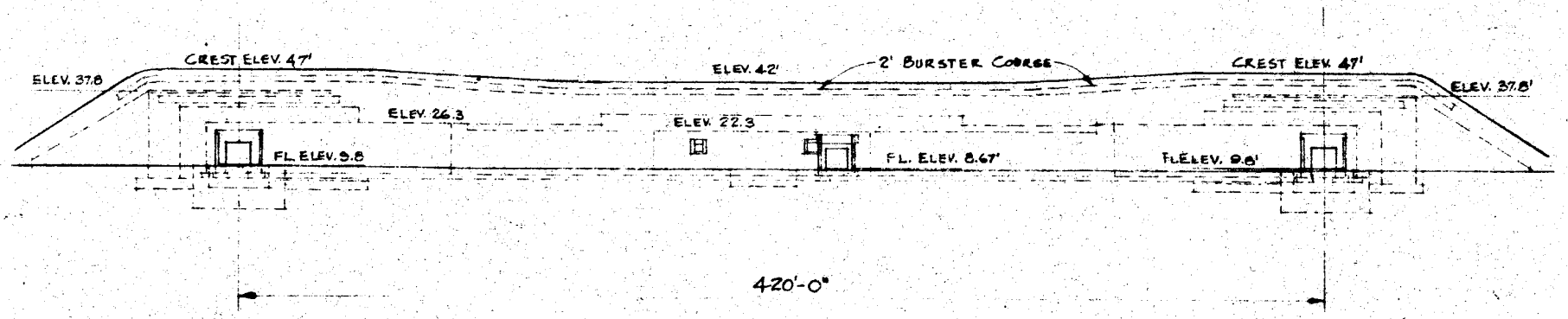
PART VII CORRECTED TO 1 JULY 1944

FORT PICKENS, FLORIDA

BATTERY LOOMIS L. LANGDON

NO. OF GUNS - 2; CALIBER 12"; BARBETTE CARRIAGE

SCALE: 1" = 60'; GRAPHIC:

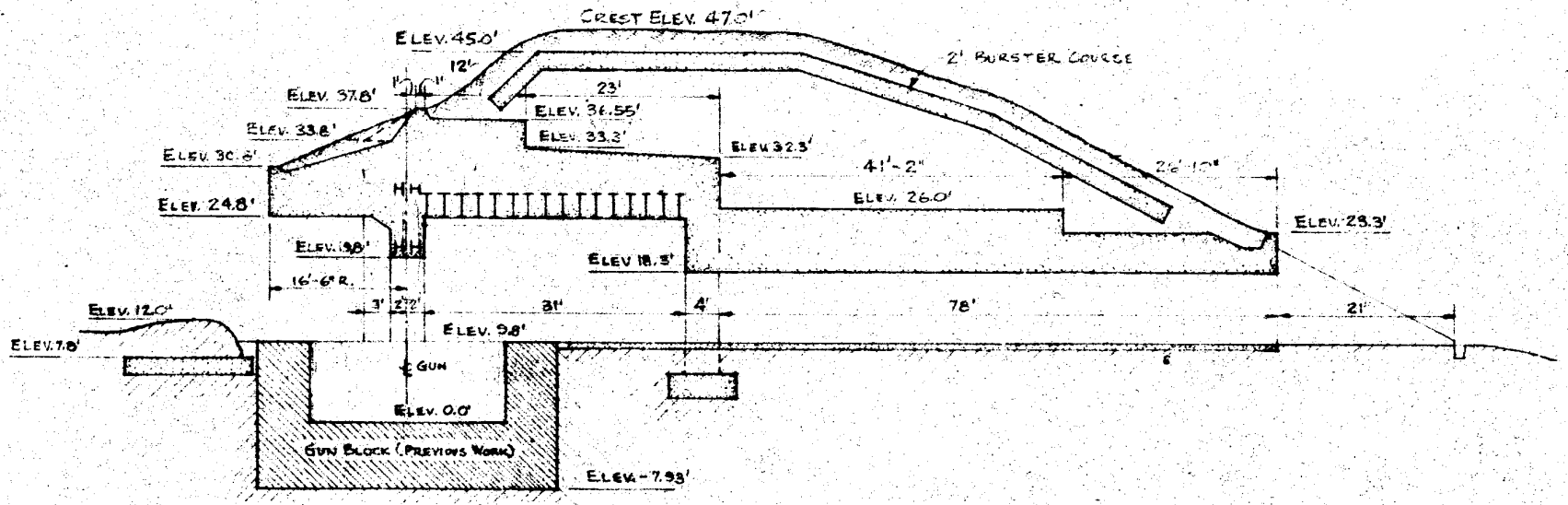



ED FORM A-162G
16 SEPT. 1943

SECRET

REPORT( ~ COMPLETED WORKS- SEACOAST FORTIFICAT( NS
CROSS SECTION THRU NO. 1 GUN
SHEET NO. 3 OF 4 SHEETS
PART VII CORRECTED TO 1 JULY 1944

HARBOR DEFENSES OF PENSA( OLA
FORT PICKENS, FLORIDA
BATTERY LOOMIS L. LANGDON
NO. OF GUNS-2; CALIBER 12"; BARBETTE CARRIAGE
SCALE 1"=20'; GRAPHIC




SECTION B-B

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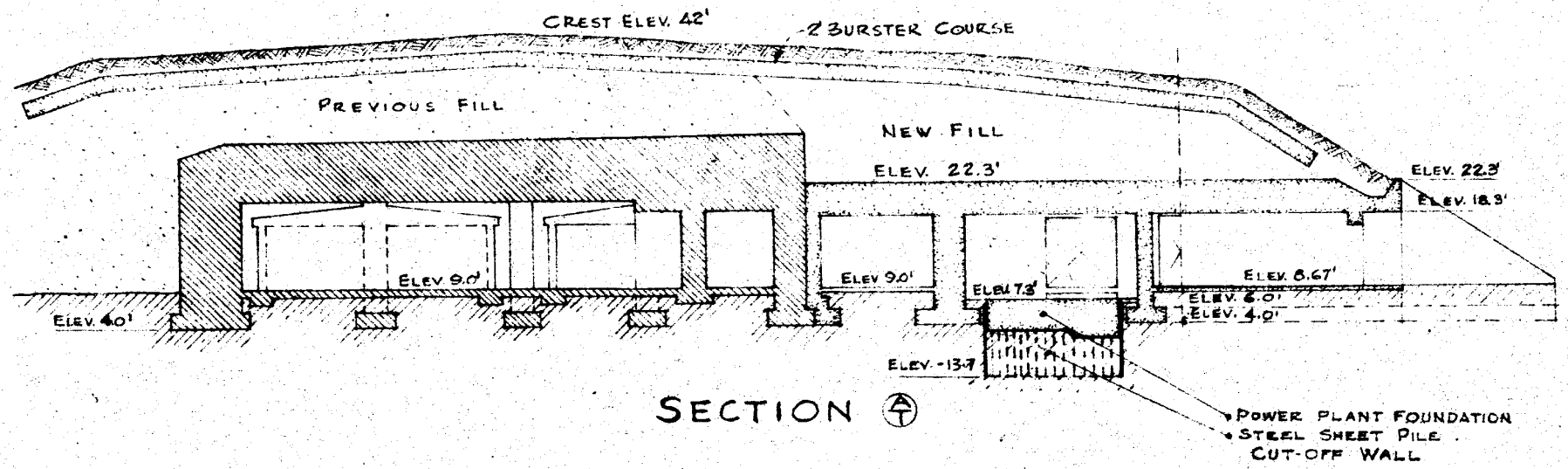
16 SEPT. 1943

SECRET

REPORT OF COMPLETED WORKS - SEACOAST FORTIFICATIONS
CROSS SECTION THRU POWDER MAGAZINE
SHEET NO. 4 OF 4 SHEETS
PART VII CORRECTED TO 1 JULY 1944

HARBOR DEFENSES OF PENSACOLA
FORT PICKENS, FLORIDA
BATTERY LOOMIS L. LANGDON
NO. OF GUNS 2; CALIBER 12"; BARBETTE CARRIAGE
SCALE 1"=20'; GRAPHIC: 0 5 10 20 30




SECTION

PREVIOUS WORK
NEW WORK

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