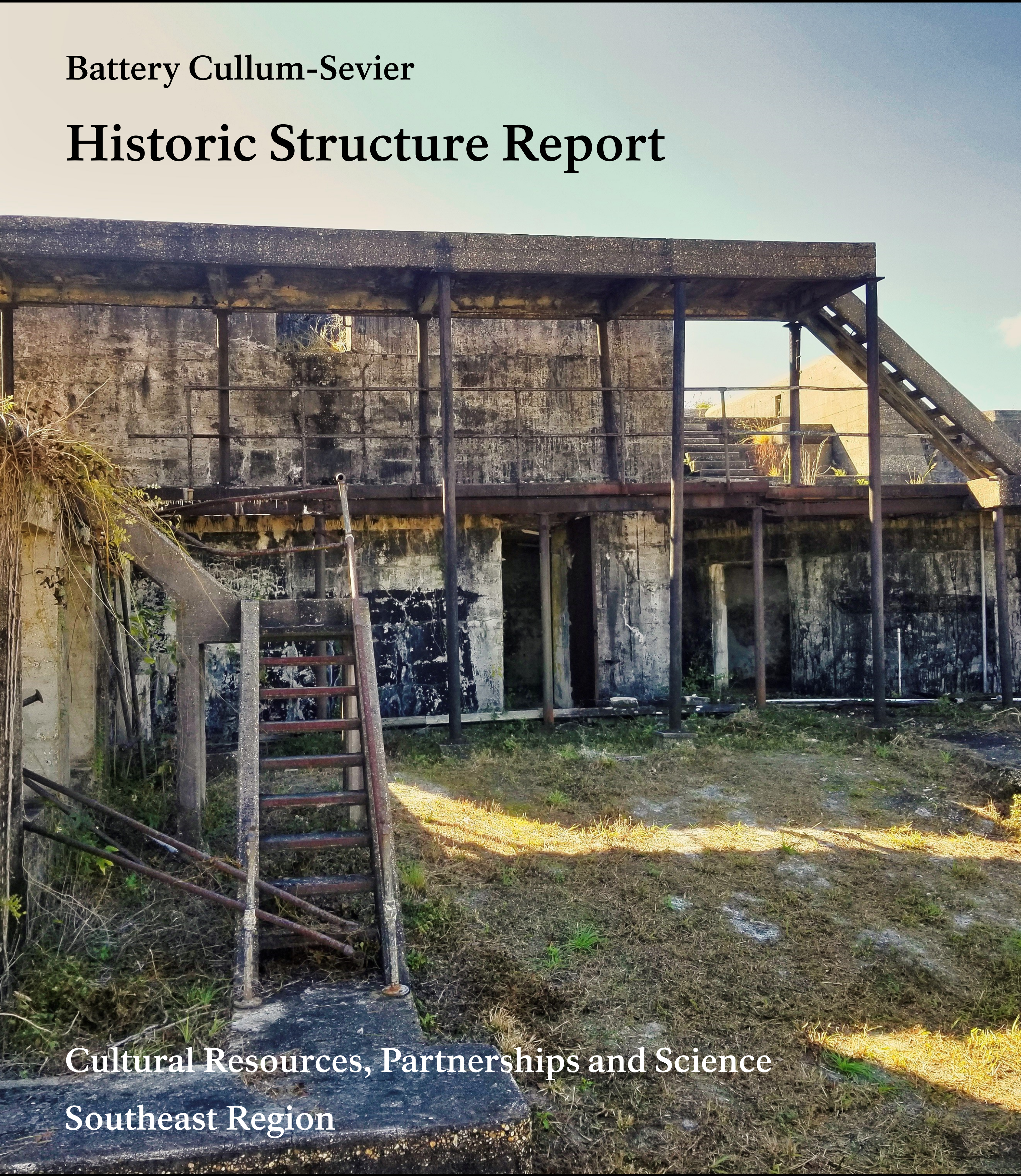
National Park Service
U.S. Department of the Interior

Gulf Islands National Seashore
Florida

Battery Cullum-Sevier

Historic Structure Report



Cultural Resources, Partnerships and Science

Southeast Region

Gulf Islands National Seashore
Battery Cullum-Sevier

Pensacola Bay, Florida

Historic Structure Report

December 2018

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About the front cover: View of the Battery Cullum-Sevier looking south, November 2017. Source: Wiss, Janney, Elstner Associates, Inc.

This manuscript has been authored by Panamerican Consultants, Inc., with consultant Wiss, Janney, Elstner Associates, Inc., under Contract Number P16PC00097 with the National Park Service. The United States Government retains and the publisher, by accepting the article for publication, acknowledges that the United States Government retains a non-exclusive, paid-up, irrevocable, worldwide license to publish or reproduce the published form of this manuscript, or allow others to do so, for United States Government purposes.

Gulf Islands National Seashore
Battery Cullum-Sevier

Pensacola Bay, Florida

Historic Structure Report

Approved: 9/26/18
Superintendent, Gulf Islands National Seashore Date

Recommended: 10/4/18
Chief, Cultural Resources, Partnerships and Science, Southeast Region Date

Recommended: 10/10/18
Deputy Regional Director, Southeast Region Date

Approved: 10/11/18
Regional Director, Southeast Region Date

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Foreword

We are pleased to make available this Historic Structure Report, part of our ongoing effort to provide comprehensive documentation for the historic structures and cultural landscapes of National Park Service units in the Southeast Region. A number of individuals contributed to the successful completion of this work, but we would particularly like to thank the project team members who authored the report. The authors would like to thank the staff at the Gulf Islands National Seashore who assisted with the project, including Acting Chief of Science and Resource Stewardship Amanda Babson, PhD, and then Historian /Cultural Resources Program Manager David Ogden, and the several Park staff who assisted with the inspection of Battery Cullum-Sevier, as well as Historical Architect Danita Brown, AIA, of the Southeast Regional Office for her assistance. We hope that this study will prove valuable to park management in ongoing efforts to preserve the building and to everyone in understanding and interpreting this unique resource.

Dan Scheidt, Chief
Cultural Resources, Partnerships and Science Division
Southeast Regional Office
2018

Management Summary

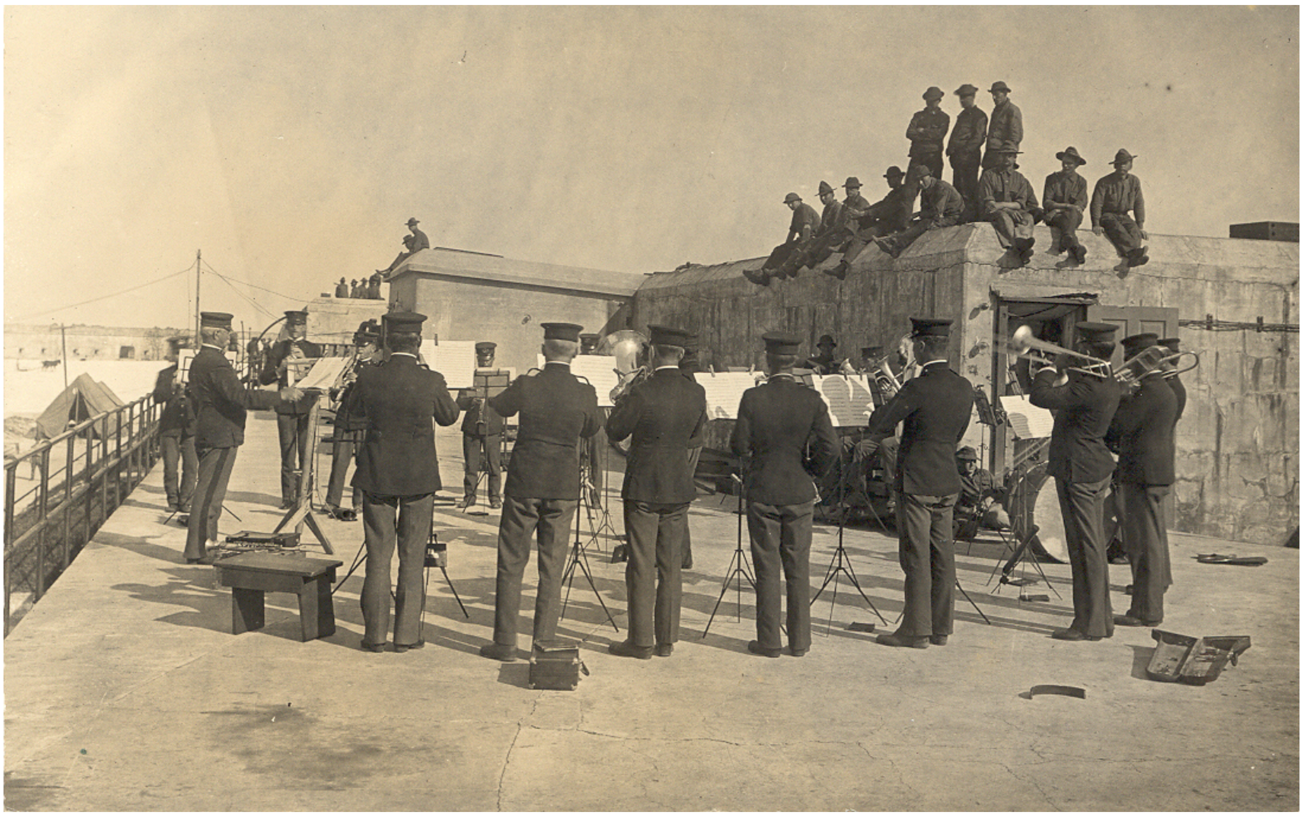

FIGURE 1. A band playing at Battery Cullum-Sevier, circa 1912. Note the hoist rooms constructed in 1908 are visible in the background. (Source: Gulf Islands National Seashore, Florida unit, Pensacola, Florida, Stillions Collection)

At the request of the National Park Service (NPS), Panamerican Consultants, Inc. and its subconsultant, Wiss, Janney, Elstner Associates, Inc. (WJE), have developed this Historic Structure Report (HSR) for Battery Cullum-Sevier at Gulf Islands National Seashore, Florida. Figure 2 is a map of Gulf Islands National Seashore. Figure 3 is a map of Santa Rosa Island and the Pensacola area. Figure 4 is an aerial image showing the location of Battery Cullum-Sevier in relation to Fort Pickens. Figure 5 is an aerial image showing Battery Cullum-Sevier and its immediate environs.

Battery Cullum-Sevier is a contributing structure in the National Register nomination for the Pensacola Harbor Defense Project.[1] The battery is significant for its association with Spanish-American War, World War I, and World War II-era activities conducted by the US Army to protect the strategically important Pensacola Harbor. It retains the integrity to convey its historic associations. Therefore, treatment and use of Battery Cullum-Sevier should be considered within the context of the legal mandates and policy directives established by National Park Service

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

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 coastal defenses in 1816, following British attacks during the War of 1812 that revealed a need for stronger fortifications.[2] After control of the Florida territory was transferred from Spain to the United States in 1821, the US 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. Construction of the fort was initiated in 1829 and was completed by early October 1834.[3]

Throughout the Civil War, Fort Pickens remained under Union control. From 1862 until the end of the Civil War, the fort 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.[4]

In the 1890s, in response to new military technology and deterioration of older fortifications, the US Army began construction of the Endicott System of coastal 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 1895 and 1899, four reinforced concrete fortifications—Battery Cullum, Battery Pensacola, 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.[5]

Construction of Battery Cullum was begun in 1895 and completed in June 1896 as part of a new commitment to coastal defenses by the United States as a result of changes in technology.[6] This four-gun concrete battery was created as a part of the Pensacola Harbor Defense Project at Fort Pickens, Florida. On April 12, 1916, War Department General Order No. 15 divided Battery Cullum into two batteries—emplacements 1 and 2 became Battery Sevier and emplacements 3 and 4 continued to be Battery Cullum.[7]

In 1926, the US Army Corps of Engineers erected three steel-frame towers, supported on concrete piers, near the beach 800 yards northwest of Battery Langdon. Fire control stations, measuring 10 feet by 10 feet were positioned on each of these towers. Further, 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. 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.

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2. Coast Defense Study Group, "United States Seacoast Defense Construction 1781–1948: a Brief History," accessed May 2018, http://www.cdsg.org/ cdsghis2.htm.
3. "Fort Pickens," Gulf Islands National Seashore. National Park Service, Department of the Interior, accessed May 2018, https://www.nps.gov/guis/learn/historyculture/fort-pickens.htm.
4. Edwin C. Bearss, *Historic Structure Report, Historical Data Section, Fort Pickens, 1821–1895, Gulf Islands National Seashore, Florida/Mississippi* (Denver, Colorado: US Department of the Interior, National Park Service, Denver Service Center, Historic Preservation Division, 1983), 768–769, 770, 772–789; Thomas Muir Jr. and David P. Ogden, *The Fort Pickens Story* (Pensacola, Florida: Pensacola Historical Society, 1989), 11–13.
5. Edwin C. Bearss, *Historic Structure Report and Resource Study: Pensacola Harbor Defense Project, 1890-1947.* Florida Unit, Gulf Islands National Seashore, Escambia & Santa Rosa Counties, Florida (Denver, Colorado: National Park Service, 1982), 26–30.
6. Ibid., 302.
7. Ibid., 56.

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.[8] (These types of fixed coastal defenses mounting long-range guns were later made obsolete by the atomic bomb.[9])

During World War II, the Army again determined that changes were necessary to the nation's coastal 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.[10]

In 1943, to provide better beach and water coverage, Battery Trueman was relocated into emplacements 1 and 2 at Battery Cullum. A Battery Commanders' and Coincidence Range-Finder station were added to Cullum-Sevier's easternmost end. After World War II, the battery was never used again for military purposes.[11]

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.[12]

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 was transferred as a Historic Monument (now the Historic Surplus Property Program) to the Florida State Park system, thus ensuring the preservation of the property in perpetuity.[13] The State of Florida built the first paved road on the island to access the fort in 1953–1954.

In 1972, the governor and cabinet of Florida voted to transfer Fort Pickens State Park—including Fort Pickens—to Gulf Islands National Seashore, including approximately 7 miles of the westernmost part of Santa Rosa Island. Escambia County donated an additional 7 miles located between the communities of Pensacola Beach and Navarre Beach—a total of 14 miles of the 48-mile-long island (approximately 29 percent). The 14 miles in two disconnected parcels are on the western half of the island; the western half of the island also includes 9 miles of Pensacola Beach, which is owned by Escambia County.[14] With these transfers, the property became part of a newly formed unit of the National Park System designated as Gulf Islands National Seashore, which had been established in 1971.

On May 15, 2017, the Pensacola Harbor Defense Project Historic District was entered in the National Register of Historic Places (National Register no. 100000992). Battery Cullum-Sevier is a contributing structure within the district, as further discussed below. The period of significance for the historic district extends from 1896 to 1947.

Treatment and Use

Battery Cullum-Sevier is a contributing structure in the Pensacola Harbor Defense Project Historic District that encompasses the Endicott System and later military resources located on western Santa Rosa Island. The battery is significant for its association with Spanish-American War, World War I, and World War II-era activities conducted by the US Army to protect the strategically important Pensacola Harbor. It retains the integrity to convey its historic associations.

8. Ibid., 222.
9. Ibid., 269–288.
10. Ibid., 286.
11. Ibid., 58.
12. Ibid., 288.
13. Gulf Islands National Seashore, Florida unit, Pensacola, Florida, archives.
14. Correspondence with Gulf Islands National Seashore, August 2018.

In recent decades, Battery Cullum-Sevier has been disused and closed to the public. The battery is in fair to poor condition overall.

The administratively determined management category for Battery Cullum-Sevier is *Must be Preserved and Maintained*.[15] The ultimate treatment is *Preservation*, as characterized in the Secretary of the Interior's Standards for Treatment of Historic Properties. The overarching treatment *Preservation* will involve stabilization, retaining, and repairing historic fabric (where not too severely deteriorated for repair), interpretation, and access for public visitation to the historic structure. This approach will permit selective restoration of severely deteriorated historic features and reconstruction of missing historic features, in the future, as possible based on the park's program for the resource and available funding.

Administrative Data

Locational Data

Building Name: Battery Cullum-Sevier

Location: Gulf Islands National Seashore, Florida

UTM Coordinates: Zone 16R N: 3355069 E: 471765

Latitude/Longitude Coordinates: 30° 19' 37" north, 87° 17' 39" west

LCS Number: Battery Cullum-Sevier is listed in the LCS with the LCS ID of 005419.

NPS Asset Numbers: Battery Cullum-Sevier 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: US 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, 1982.

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

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 Cullum-Sevier is listed in the National Register of Historic Places as a contributing structure to the Pensacola Harbor Defense Project Historic District, which encompasses military resources located on western Santa Rosa Island.

Period of Significance: 1896–1947

Proposed Treatment: Preservation

Project Scope and Methodology

The goal of the HSR is to develop planning strategies and 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.

This HSR addresses key issues specific to Battery Cullum-Sevier, including the history and construction chronology of the structure; the

15. Correspondence with NPS SERO, August 2018.

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, former Cultural Resources Program Manager.[16] 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 Cullum-Sevier 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*.[17] This evaluation of history and significance provided the basis for the development of recommended treatment alternatives.

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

Treatment Recommendations. The Secretary of the Interior's Standards for the Treatment of Historic Properties guided the development of treatment recommendations for the significant exterior and interior features of the battery. The recommended overall treatment approach is *preservation*, which ensures stabilization and repair of the structure, retaining historic fabric where not too severely deteriorated for repair, as well as the selective restoration of character-defining features where missing or altered. Specific recommendations were developed to address observed existing distress conditions as well as long-term preservation objectives.[18]

16. For archival images included in this report, the source of the image is indicated in the figure caption. Where catalogue, box/file, or image number is available, that information is also provided with the source citation. Not all images obtained from the referenced collections had assigned catalogue numbers at the time the research for this study was conducted.

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

18. 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.: US Department of the

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.[19]

Interior, National Park Service, Technical Preservation Services, 2017).

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

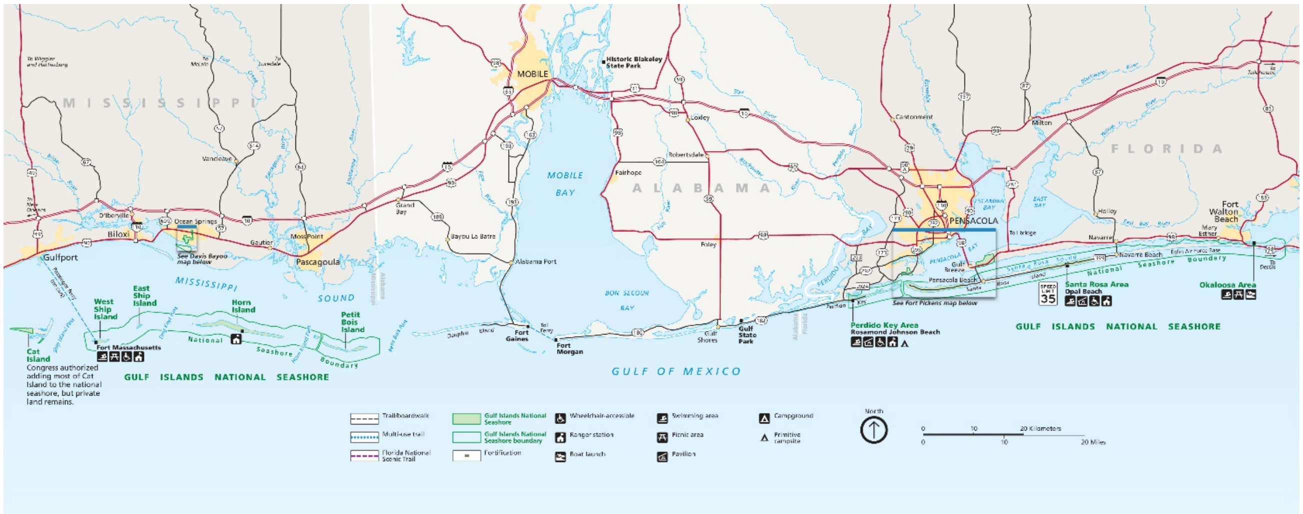

FIGURE 2. A map of Gulf Islands National Seashore in Florida and Mississippi. (Source: National Park Service)

FIGURE 3. A map of Santa Rosa Island and the Pensacola area. (Source: National Park Service)

FIGURE 4. Aerial photo showing the location of Battery Cullum-Sevier in relation to Fort Pickens at the western end of Santa Rosa Island. (Source: Google Earth, annotated by the authors)

FIGURE 5. Aerial photo showing the immediate area around Battery Cullum-Sevier. (Source: Google Earth, annotated by the authors)

Developmental History

FIGURE 6. Overview of Battery Cullum Sevier, LCS 005419, Gulf Islands National Seashore, Florida unit, Pensacola, Florida. (All images by Wiss, Janney, Elstner Associates, Inc., 2017, unless otherwise noted)

Historical Background and Context

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

The first recorded European visitors to the region were the Spanish, with the first chronicled expedition led by Juan Ponce de León in 1513. In 1528, an expedition led by Panfilo de Narvaez reached Pensacola Bay. It was not until 1559 that the Spanish attempted to establish a permanent settlement in Pensacola. In that year, Tristan de Luna y Arellano brought 1,500 soldiers, colonists, slaves, and Aztec Indians in eleven ships from Veracruz, Mexico, to Pensacola to begin Spanish settlement of the Gulf Coast. The settlement was short lived, however; a hurricane struck the area a month later, destroying many of the colony's vessels and provisions.[20] The occupants were rescued by Spanish ships and taken to Mexico in 1561, and the settlement was abandoned only two years after it had been established.[21] Following the

20. John Worth, Elizabeth Benchley, and Tom Garner, *Tristán de Luna y Arellano: Pensacola Settlement 1559–1561* (Pensacola: University of West Florida, 2015).

21 Ibid.

failure of the settlement at Pensacola, efforts to establish colonies along the gulf shores were abandoned in favor of the east coast of Florida after St. Augustine was settled in 1565.

It was not until the late seventeenth century, in response to developing French interests in the region, that the Spanish renewed their efforts to occupy Pensacola.[22] One of the factors contributing to the Spanish desire to control Pensacola Bay was its relationship to trade and shipping lanes. The Spanish regularly traveled through the region for trade, and 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. Once the French threat became clear, the Spanish built several fortifications around the bay to protect their naval interests, beginning with Fort San 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.[23]

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. The site chosen for the fort was located 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.[24] 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 and relocated to the mainland.[25]

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, known as the French and Indian War in North America (1754/1756–1763). 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 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, following the American Revolutionary War.[26]

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 US Army, under the command of Gen. Andrew Jackson, in 1814. Britain's Spanish allies fought a brief delaying action against Jackson's troops in Pensacola before surrendering, which allowed the British forces to escape. Seeing that the British had escaped, Jackson abandoned Pensacola and marched his troops on to Mobile. (Jackson also

22. William S. Coker, "Pensacola, 1686–1821," in Judith A. Bense, editor, *Archaeology of Colonial Pensacola* (Gainesville: University Press of Florida, 1996); Paul E. Hoffman, *Florida's Frontiers* (Bloomington and Indianapolis: Indiana University Press, 2002).
23. Ibid.
24. Alejandro Wauchope, Letter to Juan de Acuña, Marqués de Casafuertes, February 27, 1723. AGI Mexico 380. Translation by R. Wayne Childer, Archaeology Institute, University of West Florida, Pensacola.
25. University of South Florida, College of Education, "Transfer of Florida," *A Short History of Florida*, accessed May 2018, https://fcit.usf.edu/florida/lessons/trnsfer/trnsfer1.htm.
26. Ibid.

captured and held Pensacola briefly in 1818 during the First Seminole War.)[27]

Overview History of US Military Defenses, Pensacola Bay, and Santa Rosa Island

United States Ownership of Florida and the Establishment of Coastal Defense Systems, 1821–1861. Spain continued to control Florida until the Adams-Onís Treaty, signed in 1819, which 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 Coastal 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, US Navy Commodore Matthew C. Perry identified the need to establish naval bases in Florida as part of this effort.[28]

American shoreline defenses had been revealed as fragmented and weak when the British burned the nation's capital during the War of 1812. These coastal 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 coastal defense system.[29]

Based on the recommendations of army leaders, the US Congress appropriated more than $800,000 for establishment of the so-called Third System of coastal 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.[30]

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.[31]

Fort Barrancas was constructed on the site of the 1798 Spanish Fort San Carlos de Barrancas, which 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 Advanced Redoubt, and Fort McRee were all masonry structures.[32]

Construction of Fort Pickens, named in honor of Revolutionary War hero Maj. Gen. Andrew

27. *Pensacola Harbor Defense Project National Register Nomination*, Section 8, page 71.
28. "Fort Pickens," Gulf Islands National Seashore. National Park Service, Department of the Interior, accessed May 2018, https://www.nps.gov/guis/learn/historyculture/fort-pickens.htm.
29. *Pensacola Harbor Defense Project National Register Nomination*, Section 8, page 72.
30. Coast Defense Study Group, "United States Seacoast Defense Construction 1781–1948: a Brief History," accessed May 2018, http://www.cdsg.org/ cdsghis2.htm.
31. "Fort McRee," Gulf Islands National Seashore. National Park Service, Department of the Interior, accessed May 2018, https://www.nps.gov/guis/learn/historyculture/fort-mcree.htm.
32. *Pensacola Harbor Defense Project National Register Nomination*, Section 8, page 73.

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 US 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.[33]

The fort's first garrison, Company H of the 2nd US 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.[34]

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 US Army determined that Fort Pickens would be the most defensible post in the area and moved quickly to garrison the fort. Supplies were also moved to Fort Pickens. Naval Lt. Henry Erben of the USS *Supply* destroyed the remaining supplies at Fort McRee, including over 20,000 pounds of gunpowder.[35]

Despite repeated threats from Confederate attack, Fort Pickens remained in Union control throughout the war. The vulnerability of masonry forts to the new rifled artillery was demonstrated during the April 10, 1862, Union 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.[36]

Third System forts such as Fort Pickens and Fort Pulaski were designed to protect coastal 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 cannons 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.[37]

Third System forts became obsolete with the advent of larger and more effective cannons, 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).

33. "Fort Pickens," Gulf Islands National Seashore. National Park Service, Department of the Interior, accessed May 2018, https://www.nps.gov/guis/learn/historyculture/fort-pickens.htm.
34. *Pensacola Harbor Defense Project National Register Nomination*, Section 8, page 73.
35. "Fort McRee," Gulf Islands National Seashore, National Park Service, Department of the Interior, accessed May 2018, https://www.nps.gov/guis/learn/historyculture/fort-mcree.htm. See also US Navy Department, *Official Records of the Union and Confederate Navies in the War of the Rebellion*, series I, vol. 4, 34.
36. *Pensacola Harbor Defense Project National Register Nomination*, Section 8, page 73–74.
37. Ibid.

Only underwater mines, called "torpedoes," were effective against these ships.[38]

While new cannons 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 reached the minefields, while smaller, rapid-fire guns protected the minefields from penetration by destroyers and torpedo gunboats.[39]

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 US 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.[40]

During the 1870s and early 1880s, the condition of the nation's coastal 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 coastal defensive systems and the army's ability to operate them.[41]

As early as 1882, President Chester A. Arthur noted the need to improve seacoast defenses in his Second Annual Message to Congress, suggesting that ". . . appropriations be made for high-power rifled cannons for the torpedo service and for other harbor defenses."[42]

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 coastal 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 coastal defense structures. One of the areas to be improved was Santa Rosa Island.[43]

In 1901, Fort Pickens became a US 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 coastal 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.[44]

Endicott System Implementation, 1893–1905. Because most of the nation's existing coastal brick and masonry fortifications were in a state of deterioration by the late 1880s, the US

38. Coast Defense Study Group, "United States Seacoast Defense Construction 1781–1948: A Brief History" (Bel Air, Maryland: Coast Defense Study Group, Inc., nd), accessed May 2018, https://web.archive.org/web/20121105102511/http://www.cdsg.org/cdsghis4.htm.
39. Ibid.
40. Bearss, *Fort Pickens,* 768–769, 770, 772–789; Thomas Muir Jr. and David P. Ogden, *The Fort Pickens Story* (Pensacola, Florida: Pensacola Historical Society, 1989), 11–13.
41. Mark A. Berhow, ed. *American Seacoast Defenses: A Reference Guide* (Bel Air, Maryland: Coast Defense Study Group Press, second edition, 2004), 8.
42. The American Presidency Project, "Chester A. Arthur, Second Annual Message, December 4, 1882," accessed February 28, 2018, http://www.presidency.ucsb.edu/ws/index.php?pid=29523%7C.
43. Bearss, *Fort Pickens*, 756–759.
44. Bearss, *Pensacola Harbor Defense Project*, 10.

Army Corps of Engineers ceased funding its repair and preservation between 1891 and 1894.[45] Instead, by January 1893, the Board of Engineers had specifically indicated the need to begin implementing Endicott Board recommendations at Pensacola and elsewhere.[46]

The first Endicott System project initiated on Santa Rosa Island was a mine casemate constructed 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.[47] In support of the project, plans were made to rebuild the Engineers' Wharf near Fort Pickens, which had fallen into disrepair, and to 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.[48]

Between 1895 and 1899, as part of the Endicott System, four reinforced concrete fortifications—Battery Cullum (later re-designated Battery Cullum and Battery Sevier), Battery Pensacola, Battery Van Swearingen, and Battery Worth—were built in the Fort Pickens area, while a mine defense was planned for the harbor entrance. The first of these fortifications to be constructed was Battery Cullum, a reinforced concrete structure built in anticipation of Pensacola's involvement in the Spanish American War (refer to Figure 6). Construction of Battery Cullum was begun in 1895.[49] The railroad was used to support the battery's construction 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.[50]

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.[51]

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.[52] Although extensive damage occurred to the mine defense facilities, they were soon rebuilt.[53] Repairs were also made to the railroad track and locomotive in June 1900.[54] 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 coastal artillery.[55]

With additional technological advances, including the development of torpedo boats, the coastal 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.[56]

45. Muir and Ogden, 15.
46. *Pensacola Harbor Defense Project National Register Nomination*, Section 8, page 79.
47. Bearss, *Fort Pickens*, 799–804.
48. Bearss, *Pensacola Harbor Defense Project*, 26–30.
49. Ibid., 302.
50. Bearss, *Fort Pickens,* 67, 69.
51. Bearss, *Pensacola Harbor Defense Project,* 183.
52. Ibid., 195.
53. Ibid., 182–196.
54. Ibid., 50.
55. Ibid., 10. See also Bolling W. Smith and William C. Gaines, "Coast Artillery Organization: A Brief Overview" (Bel Air, Maryland: Coast Defense Study Group, Inc., 2011), accessed May 2018, http://cdsg.org/wp-content/uploads/pdfs/FORTS/CACunits/CACorg2011.pdf.
56. *Pensacola Harbor Defense Project National Register Nomination*, Section 8, page 96–98.

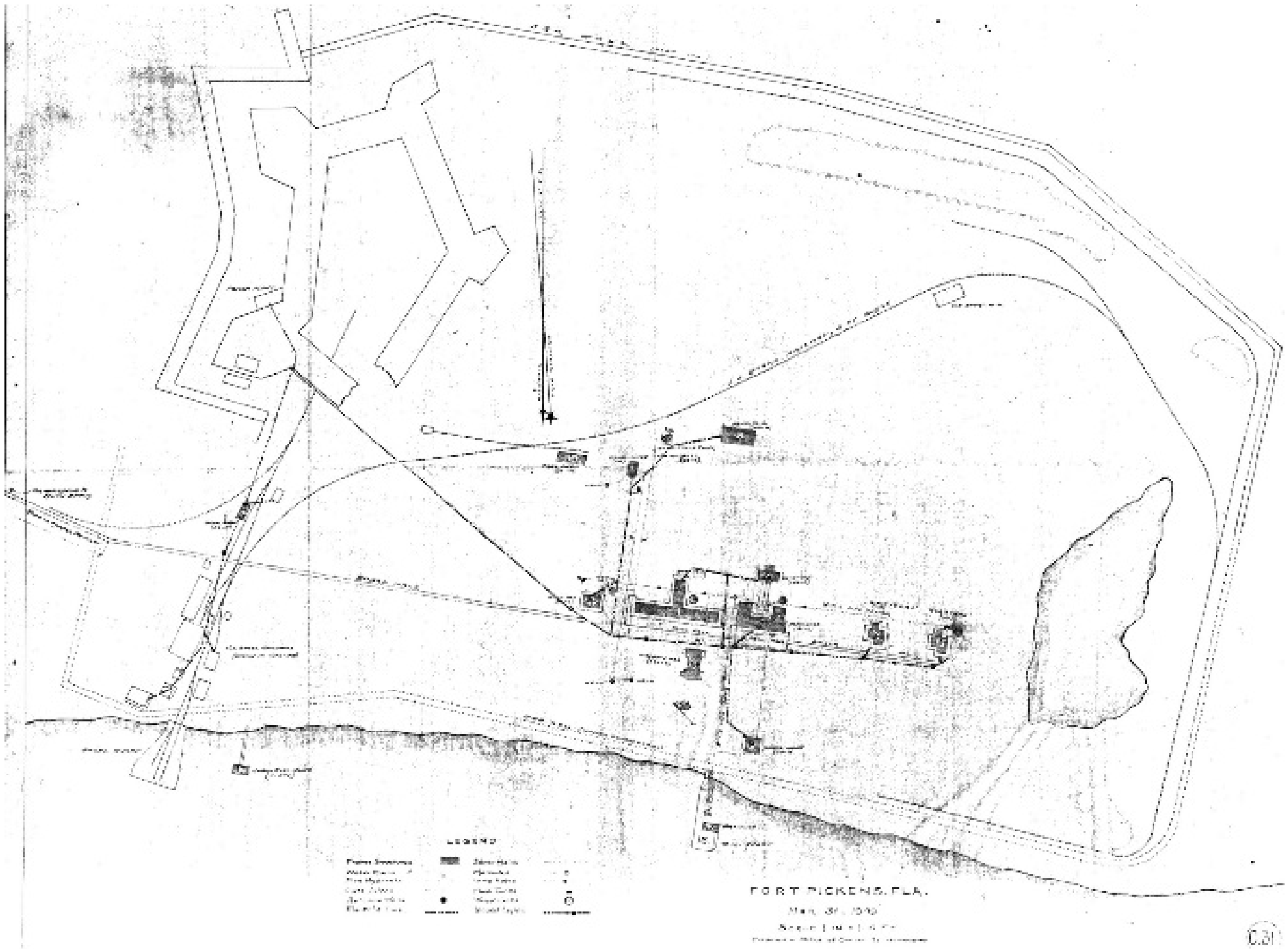

FIGURE 7. Map of the Fort Pickens area, showing the seawall under construction, 1909. (Source: Gulf Islands National Seashore, no catalogue number, image name "1909 Ft. Pickens area")

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 coastal defense system. To identify needed improvements, Roosevelt appointed a new coastal defense board to be led by US 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.[57] 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.[58] The board's recommendations were used to upgrade the coastal defense system even further; by the beginning of World War I, the United States had a coastal defense system that was equal to that of any other nation.

The new facilities were threatened on September 26, 1906, when a severe hurricane struck Pensacola, inflicting heavy damage on the Santa Rosa Island installation. In response, US 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

57. Berhow, np.

58. Ibid.

constructed over the seawall to allow rail access to the wharf (Figure 7).[59] Hurricanes continued to pose a threat. On July 5–6, 1916, another hurricane swept away the superstructure of the wharf, leaving only the pilings.[60]

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.[61]

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 at the time, a battleship's turrets did not permit high angle fire.[62]

The Endicott batteries, too, were difficult to adapt to the emerging heavier and more powerful guns and their associated carriages. A new coastal 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.[63] 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.[64] In summary, the board noted that the guiding principal of coastal defense policy would be "to mount armament of greater range and power than any which can be brought against it."[65]

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.[66]

On December 22, 1915, the Secretary of War called for fabrication of seventeen barbette 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.[67] 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.[68]

On January 31, 1917, before the gun battery could be designed, Germany announced that it would resume unrestricted submarine warfare on any ships—including civilian passenger carriers—in war-zone water. Three days later, the United

59. Bearss, *Fort Pickens*, 226–242; Muir and Ogden, 18.
60. Bearrs, *Pensacola Harbor Defense Project,* 246.
61. Ibid., 270.
62. Ibid.
63. Ibid., 271.
64. Ibid., 272.
65. Board to Secretary of War, undated, National Archives, R.G. 77, Correspondence 1894–1923, Doc. 95991/3.
66. Bearss, *Pensacola Harbor Defense Project*, 273, citing Weaver to Board of Review, July 8, 1915, National Archives, R.G. 77, Correspondence 1894–1923, Doc. 95991/11.
67. Bearss, *Pensacola Harbor Defense Project,* 274, citing Crozier to Chief Engineer, July 22, 1916, National Archives, R.G. 77, Correspondence 1894–1923, Doc. 38148.
68. Ibid., 273.

States severed diplomatic relations with Germany, and on April 6, 1917, the United States would enter the war.[69] At the same time, the introduction of aerial bombing (from both airplanes and zeppelins) during World War I indicated that coastal defense complexes would also require the addition of new facilities for the emplacement of anti-aircraft weaponry.[70]

To address these needs, the US 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.[71] 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.[72]

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.[73]

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.[74]

After Pearl Harbor, the Army again determined the need to make changes in the nation's coastal 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.[75]

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 Battery Sevier. In 1943–1944, improved range-finding towers were established in new locations, radar towers were constructed, and Battery 234, with its Battery Commander's Station/Coincidence Range Finder tower, was completed.[76]

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.[77]

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 during the mid-twentieth century. 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.[78]

In 1929, the War Department elected to sell the majority of the island, with the exception of the Fort Pickens Military Reservation, to Escambia

69. Ibid., 275.
70. *Pensacola Harbor Defense Project National Register Nomination*, Section 8, page 102.
71. Bearss, *Pensacola Harbor Defense Project,* 289-290.
72. Ibid., 270.
73. Ibid., 284.
74. Ibid., 290-293.
75. Ibid., 286.
76. Ibid. 58.
77. Ibid., 288.
78. Gulf Islands National Seashore, Florida unit, Pensacola, Florida, archives.

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.[79] Escambia County later released three 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.[80]

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.[81] 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.[82]

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 US 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.[83]

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.[84]

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 1946, Congress passed P.L. 546, which abolished Santa Rosa Island National Monument and conveyed those lands back to Escambia County. A portion of those lands, minus 4 miles of Navarre Beach and 9 miles of Pensacola Beach, became a part of Gulf Islands National Seashore in 1971.[85]

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."[86] At the same time, the State of Florida filed an application with the War Assets Administration

79. Gulf Islands National Seashore, Florida unit, Pensacola, Florida, archives.
80. Brian R. Rucker, Pensacola State College, "1916 Pensacola: A City in Transition," Pensacola Scenic Bluffs, Florida Scenic Highway, accessed May 2018, http://pensacolascenic bluffs.org/1916-pensacola-city-transition/.
81. Proc. No. 2337, May 17, 1939, 53 Stat 2542.
82. *Pensacola Harbor Defense Project National Register Nomination*, Section 8, page 110.
83. Gulf Islands National Seashore, Florida unit, Pensacola, Florida, archives. See also "History of Eglin Air Force Base," accessed May 2018, http://www.eglin.af.mil/ About-Us/Fact-Sheets/Display/Article/390964/ eglin-air-force-base-history/.
84. National Park Service, Bureau of Outdoor Recreation, "A report for the Proposed Gulf Islands National Seashore" (January 1968), 1.
85. Correspondence with Gulf Islands National Seashore, August 2018.
86. Gulf Islands National Seashore, Florida unit, Pensacola, Florida, archives.

for all 1,571.6 acres for a park, to encompass Batteries Langdon, Worth, Cooper, and 234.[87]

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.[88]

Public Law 91-660, enacted January 8, 1971, established Gulf Islands National Seashore which included Fort Pickens and Battery Cullum-Sevier. 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. 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.[89]

Battery Cullum-Sevier is a contributing structure in the Pensacola Harbor Defense Project Historic District, listed in the National Register of Historic Places on May 15, 2017. The battery contributes to the national significance of the district under National Register of Historic Places Criterion A for its association with the Endicott Period fortification system at Pensacola Harbor.

87. "Defense Environmental Restoration Program for Formerly Used Defense Sites, Preliminary Assessment, Fort Pickens Military Reservation, Pensacola, Escambia County, Florida, Property Number – I04FL0063," September 2007.
88. Gulf Islands National Seashore, Florida unit, Pensacola, Florida, archives.
89. 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.

Battery Cullum-Sevier: Chronology of Development and Use

Refer to Figure 30 for conceptual plans showing the development of Battery Cullum-Sevier from initial construction to present.

The above historical background and context narrative provides an overview of the site history and the development of coastal defense fortifications at the site. The following section provides a chronology specific to Battery Cullum-Sevier within this historical context.

The construction of Battery Cullum-Sevier began in 1895 as part of the Endicott System improvements to coastal fortifications at the Pensacola Harbor Defense Project at Fort Pickens, Florida. The four-gun battery was in continuous use until the War Department declared it obsolete in 1933. During World War II, Battery Trueman was relocated to what had been Battery Cullum, while a Battery Commander's Station and Coincidence Range Finder was added to Battery Cullum-Sevier. The signal and meteorological stations were also relocated to Battery Sevier at this time.[90] Toward the end of World War II, in 1947, Fort Pickens was decommissioned, and the battery ceased to be used for military purposes.

Throughout its history, Battery Cullum-Sevier has regularly been affected by the hurricanes and intense weather events that have occurred at Pensacola Bay. A severe storm at the end of May 1896 damaged the wharf and affected transport of materials. Heavy rains throughout the life of the battery caused problems with seepage, water infiltration, standing water in rooms, and damage to floors. The hurricane of 1906 removed one-third of its slopes. The sea wall constructed in 1906 to protect the fortifications held water when it was overtopped by the storm surge during the hurricane of 1926. Like the military services before it, the National Park Service must address the challenge of making Battery Cullum-Sevier, and the other resources at Fort Pickens, better able to

90. Bearss, *Pensacola Harbor Defense Project*.

endure weather storms, although it is no longer a military fortification. With sea-level rise and the potential for more frequent and more intense storms, this issue is of increasing importance.

In 1982, the *Historic Structure Report and Historic Resource Study of the Pensacola Harbor Defense Project, 1890–1947*, was prepared by NPS historian Edwin Bearss. The report is an exhaustive and well-researched study of Fort Pickens's batteries, including detailed construction histories.[91] Hurricanes and severe weather, and their contributions to the changes within the batteries, are also discussed in the report. Because the Bearss report is so detailed, the chronology of development and use prepared for the current Historic Structure Report has been prepared as an expanded timeline based on the Bearss study and other resources, rather than a detailed narrative. (Excerpts of the Bearss report that pertain especially to the history of this battery are provided in Appendix B.)

Expanded Timeline Battery Cullum-Sevier

1828

The construction of Fort Pickens, the largest of the "Third System" of coastal defense fortifications built for the defense of Pensacola, was initiated in 1828 and completed in 1834.

1885

In 1885, President Grover Cleveland created a board headed by Secretary of War William C. Endicott, thereafter called the Endicott Board, to review all coastal defenses in the United States and submit recommendations for a program to update them based on new technology in weaponry (Figure 8).

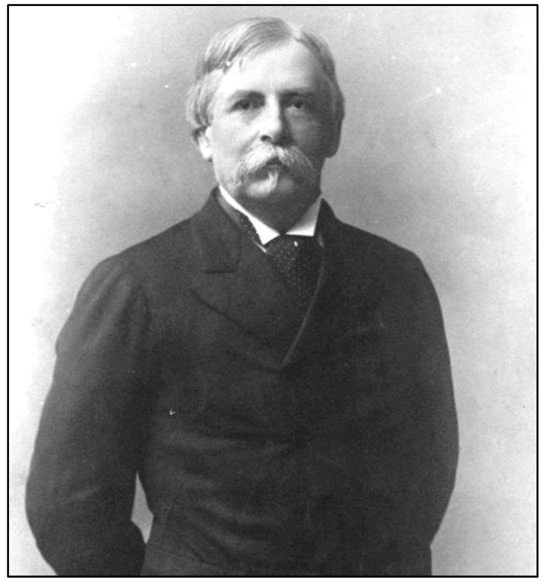

FIGURE 8. William Crowinshield Endicott (1826–1900), Secretary of War. (Source: Library of Congress, Prints and Photographs division, Digital ID cph.3c00784)

1888

In 1888, Congress began making appropriations for the construction of new coastal defenses based on Endicott Board recommendations.

1893

The Board of Engineers found that Pensacola Harbor was a "port of refuge" for the merchant marine and a supply depot for cruisers in time of war (Figure 9). Further, the Board noted that the harbor possessed ". . . sufficient value to warrant the erection of modern works able to defy serious operations of the enemy."[92] Toward this end, it recommended:

> Two 12-inch guns in a lift battery on the Fort Pickens parade; four 10-inch guns on disappearing carriages on the sand ridge east of Fort Pickens; sixteen 12-inch mortars in a battery still farther eastward, provided with local flank defense; and two 10-inch guns on disappearing carriage near the site of Fort McRee.[93]

It also proposed to retain emplacements for three 8-inch converted rifles *en barbette,* in Fort

91. Ibid.

92. Bearss, *Pensacola Harbor Defense Project,* 8.
93. Ibid., 9, citing Board of Engineers, June 22, 1893, National Archives, Record Group 77, Correspondence 1893–1894, Doc. 881/12.

Barrancas, along with such of the barbette guns of Fort Pickens as bore on the submarine minefield and beaches.[94]

The cost of implementing the Defense of Pensacola was identified as follows:

Lift Battery in Fort Pickens for two 12-inch guns	$449,000
Disappearing battery with four 10-inch guns on Santa Rosa Island	$200,000
Mortar Battery for sixteen 12-inch mortars with flank defenses	$176,000
Disappearing battery for two 10-inch guns, near Fort McRee	$100,000
Grand Total	$925,000[95]

1894

In August 1894, $100,000 was allotted for the construction of a battery with two 10-inch guns on disappearing carriages on the sand ridge east of Fort Pickens. However, a review of the proposed site was ordered because a project was being considered to widen and deepen the Pensacola channel. The current site, west of Fort Pickens, was finally selected and a plan was submitted and approved in February 1896 (Figure 10 and Figure 11).[96]

FIGURE 9. Pensacola Harbor, 1900. (Source: Library of Congress, Prints and Photographs division, Digital ID det.4a55001)

1896

In 1896, a new wharf was constructed for the movement of materials. Construction included the apparatus for a sawmill and the materials, engine, and cars for a narrow gauge railroad. A railroad incline was built for movement of sand, gravel, and cement; a mixer created; and a large standing cistern erected to collect rainwater to avoid the use of brackish water in the machinery.[97]

On May 31–June 1, 1896, a severe storm occurred, causing the sawn timber at the new wharf to be set adrift.[98]

By November, ground was broken for the new battery.[99]

94. Bearss, *Pensacola Harbor Defense Project,* 9.
95. Ibid., citing Board of Engineers, June 22, 1893, National Archives, Record Group 77, Correspondence 1893-94, Doc. 881/12.
96. Bearss, *Pensacola Harbor Defense Project,* 14, citing Chief Engineer Craighill to Major Mahan, February 1, 1896, National Archives R.G. 77, Correspondence 1894-1923, Doc. 7383/39 in.
97. Bearss, *Pensacola Harbor Defense Project,* 21–24.
98. Ibid., 23.
99. Ibid., 31

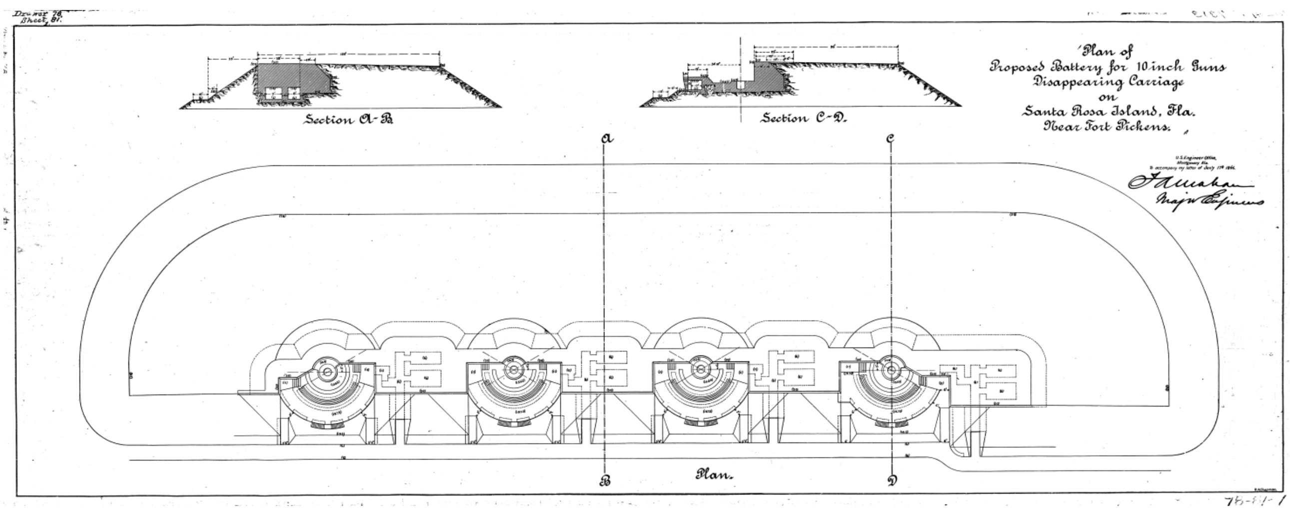

FIGURE 10. *Plan of Proposed Battery for 10 inch Guns on Santa Rosa Island, Fla. near Fort Pickens*, U.S. Engineers Office, Montgomery, Alabama, January 17, 1896. (Source: Gulf Islands National Seashore, Florida unit, Pensacola, Florida, image no. 635-60933)

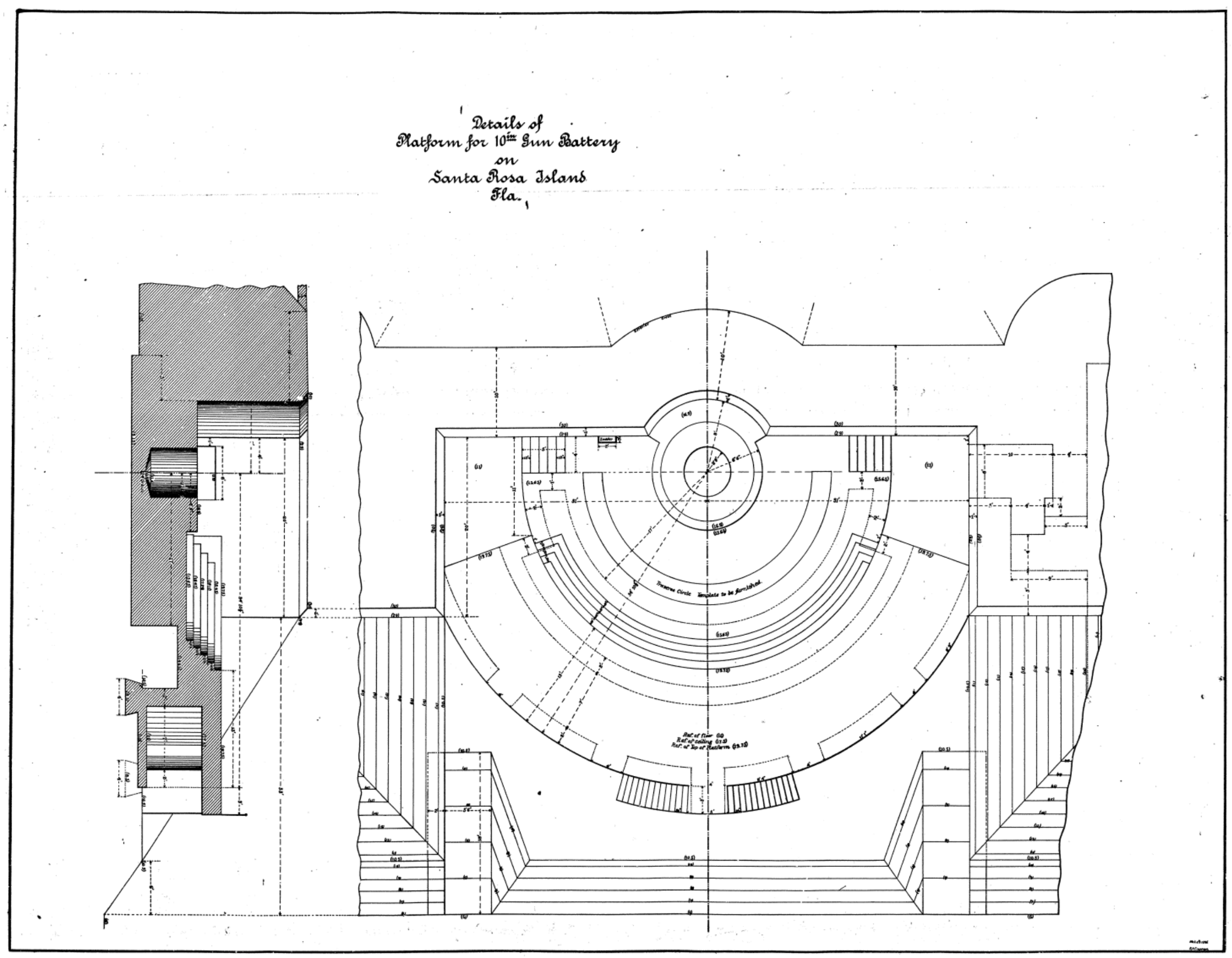

FIGURE 11. *Details of Platform for 10 in Guns on Santa Rosa Island, Fla.,* U.S. Engineers Office, Montgomery, Alabama, undated. (Source: Gulf Islands National Seashore, Florida unit, Pensacola, Florida, Image no. 635-60928)

1897

Work on the battery began in earnest, with three shifts of crews making and placing concrete. Careful records were kept of the three types of concrete used—Louisville, Portland, and Rosendale—and the actual amounts produced per cubic yard. It was determined that the battery needed a revetment and that Bermuda grass sod from nearby Fort Pickens should be used on the glacis.[100]

During the summer and fall, the electric light plant, ammunition conveyors, shot cranes, and hoist were installed; the sewage system was positioned; and the sand slopes were covered with turf.[101]

1898

Plans for the battery as constructed were drawn by R.A. Chapman of the US Engineers Office in Montgomery, Alabama.[102] Heat, yellow fever in Alabama, and slow communications prevented the disappearing carriages and guns from being mounted throughout most of the year in 1897, but between January and April 1898, all four emplacements were finally fitted with rings, disappearing carriages, and guns. Emplacement 4, the last to be completed, was fitted just eleven days before the United States declared war on Spain.[103]

In the same year, heavy rain caused water to rise in the magazines. To prevent this, grates and drains were placed across each doorway. The chert road at the rear of the battery was drained into the main sewer by gratings and connecting drains. To combat overhead leakage, the superior slope above the magazines at emplacements 3 and 4 was covered by a "continuous sheet of asphalt."[104]

1898

The battery saw no action during the Spanish American War, in April through August 1898.

1899

In 1899, water seepage into the magazines continued; however, funds were not available to work on all of the magazines, therefore only those with the most severe leakage were treated. The repairs included the following:

> The sand fill was accordingly removed from the front of emplacement No. 4; the concrete face coated with hot asphalt to below floor level; and a trench drain of broken brick laid against the asphalt, covered with a thin layer of gravel, and filled. The entrance was regraded with a fill to the rear, and two wing walls built to keep rain water from entering from the sides.[105]

Although these repairs stopped the seepage, the magazines were still damp.[106]

Because of cramped conditions in the electric light plant and continual presence of water in the battery's dynamo room, two additional rooms were constructed to house the generator and the storage battery. Some of the sand covering was removed, and ventilation improved. The room formerly used for the plant was converted into the boiler room. The project, begun in 1899, was completed in 1900.[107]

1900

On March 24, 1900, the War Department issued General Order 43 designating the emplacements

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100. Ibid., 31-35.
101. Bearss, *Pensacola Harbor Defense Project,* 39, citing Executive Documents, Serial 3146,126.
102. Bearss, *Pensacola Harbor Defense Project,* 40, citing *Emplacement for Four 10 inch 8. L. Rifles, Disappearing Carriages, Fort Pickens, Santa Rosa Island, Florida*, Drawer 78, Sheet 81-16.
103. Ibid.
104. Bearss, *Pensacola Harbor Defense Project*, 45, citing Flagler to Wilson, Nov. 25, 1896. National Archives R.G. 77, Correspondence 1894–923, Doc. 7363/201.
105. Bearss, *Pensacola Harbor Defense Project*, 46, citing Executive Documents, Serial 4089, 941–942.
106 . Ibid.
107. Ibid., 939; Bearss, *Pensacola Harbor Defense Project*, 46.

"Battery Cullum" in honor of Brigadier General George W. Cullum, a West Point graduate, later Superintendent at West Point. General Cullum is best known as the compiler of *Biographical Register of the Officers and Graduates of the United States Military Academy*, published in three volumes in 1890 and updated every ten years with an endowment provided in his will (Figure 12).

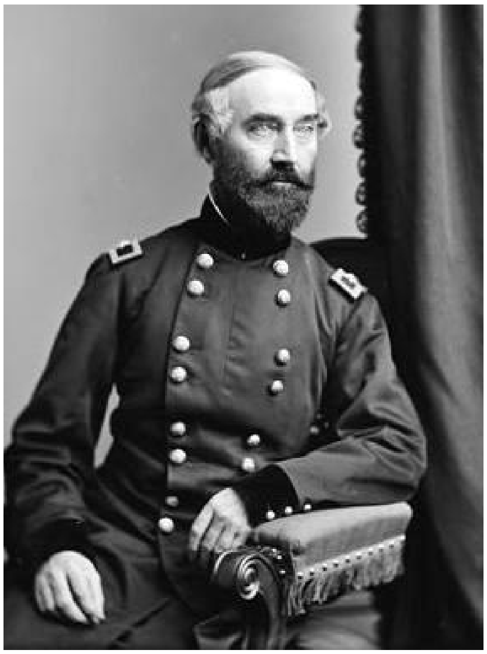

FIGURE 12. Brigadier General George W. Cullum. (Source: Library of Congress, Prints and Photographs division, ID cwpb.04484)

In the same year, ongoing maintenance was performed on the battery. Steel hoods were positioned over exposed doors to prevent rain ingress. Drainage holes were drilled in several magazines and platforms to carry off surface water.

1901

A concrete and steel gallery connection to all four loading platforms was begun and completed in the following year.[108]

108. Bearss, *Pensacola Harbor Defense Project,* 47, citing Executive Documents, Serial 4279, 28.

1902

In 1902, magazines 3 and 4 were lined with brick and sealed with lead to help with excessive moisture. Drains were provided between the old and new wall construction to remove accumulated moisture.[109] However, this system soon failed.

All ironwork was repainted, and old wiring was replaced within a steam-tight nickel conduit system.[110]

The floors of the magazines, shell rooms, etc., had begun to sink because of ongoing exposure to water infiltration, and were at a level lower than their door sills. A systematic program of raising the floors, regrading them, and adding drains had been undertaken, with the last of the floors reworked in 1902.[111]

1903

In 1903, the old chimney was removed from the unused dynamo and the aperture closed; a new wood latrine was erected (location not indicated); fifteen new iron doors were added at all openings; and tool room chests were added (Figure 13).[112]

Also in 1903, orders were placed for Taylor Raymond ammunition hoists.

109. Bearss, *Pensacola Harbor Defense Project,* 48, citing Executive Documents, Serial 4444, 739.
110. Ibid., 738–739.
111. Bearss, *Pensacola Harbor Defense Project,* 50, citing Raymond to Gillespie, July 5, 1902, National Archives, R.G. 11, Correspondence 1894–1923, Doc. 18957/5.
112. Bearss, *Pensacola Harbor Defense Project,* 51, citing Raymond to Gillespie, May 4, 1902 & Abbot to Cavanaugh, June 23, 1903, NA, R.G. 17, Correspondence 1894–1923, Doc. 18957/7.

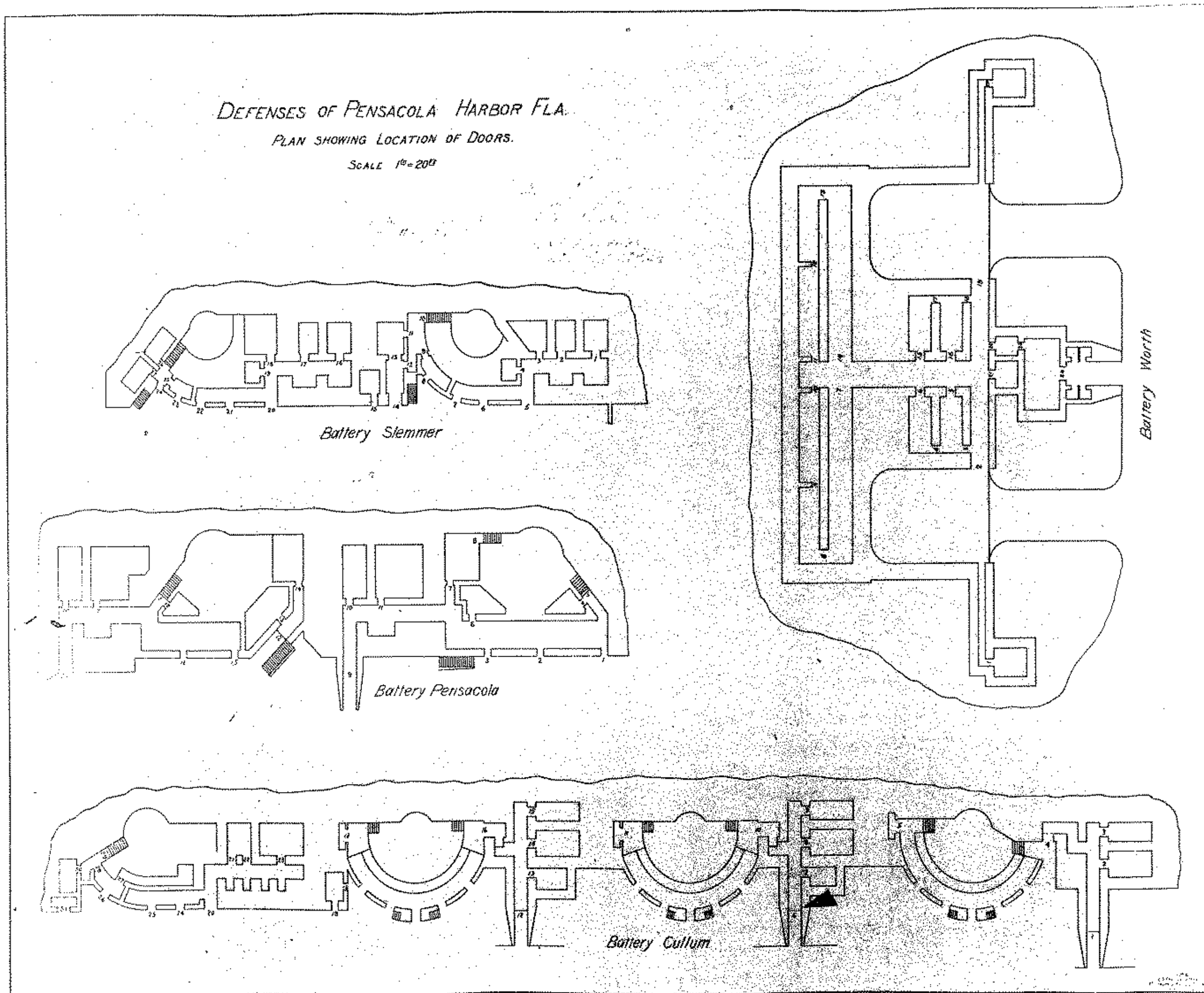

FIGURE 13. *Defenses of Pensacola Harbor Fla. Plan Showing Location of Doors,* undated. (Source: Gulf Islands National Seashore, Florida unit, Pensacola, Florida, Image no. 635-60932)

1904

Additions to the shell and relocator rooms and extensions to the loading platforms were proposed (Figure 14).

In 1904, plans were also prepared for the placement of new Taylor Raymond ammunition hoists to replace the obsolete trolleys and cranes at the employments. Drawings indicate that telautograph rooms were added to the emplacement stations; however, documentation does not indicate whether this work was completed (Figure 15).[113]

Numerous other changes were proposed to modernize the battery (Figure 16).

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113. US Army Corps of Engineers, Montgomery, Alabama, *Defenses of Pensacola Harbor Fla.*

Locations of Telautograph Booths and Niches [Blueprint], December 19, 1903. A telautograph is an analog precursor to the modern fax machine invented by Glisha Gray in 1888. It was the first such device to transmit a drawing to a stationary sheet of a paper. "Telautograph," n.d., accessed February 12, 2018, at https://www.revolvy.com/main/index.php?s=Telautograph.

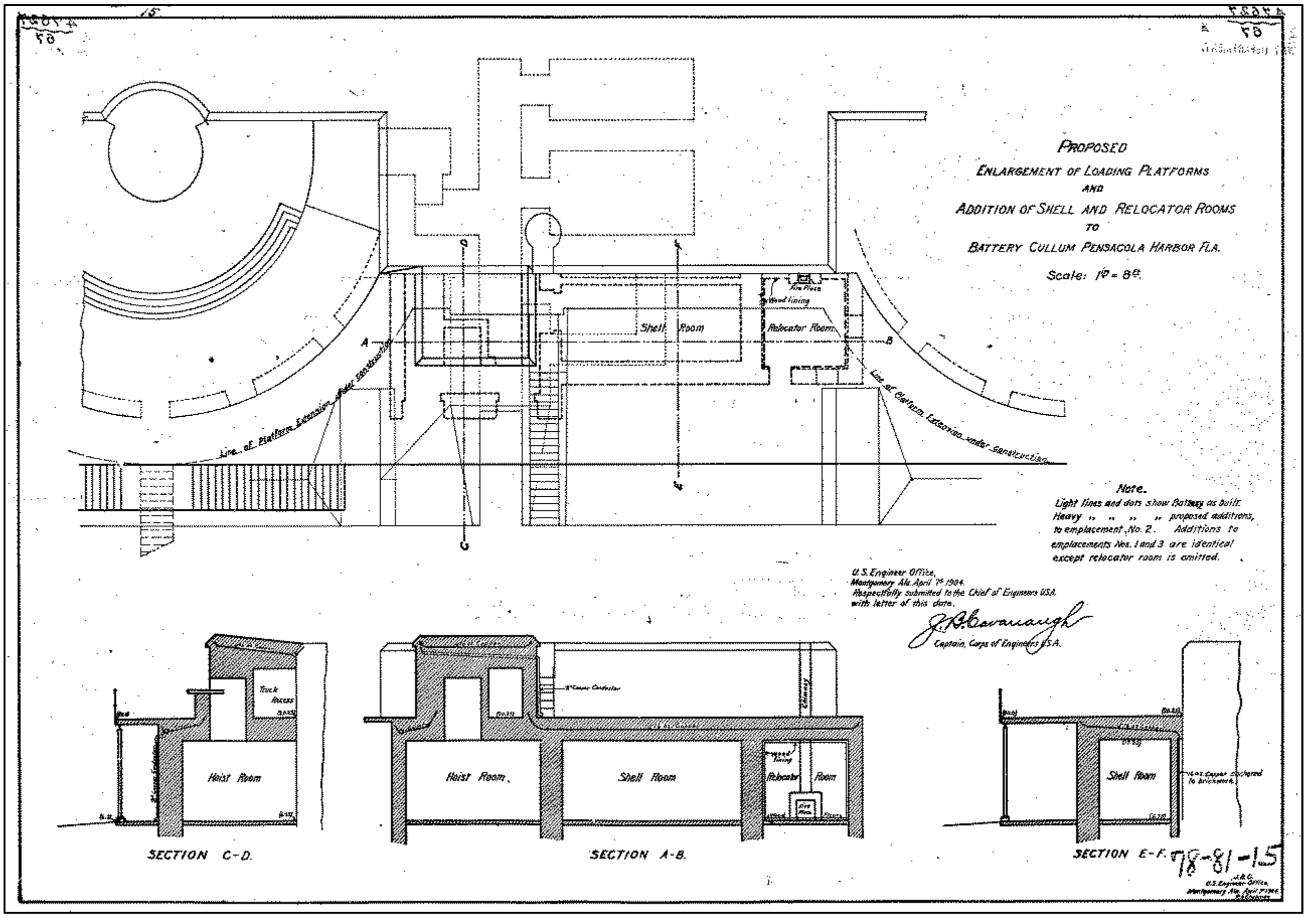

FIGURE 14. *Proposed Enlargement of Loading Platforms and Addition of Shell and Relocator Rooms to Battery Cullum Pensacola Harbor, Fla*., US Engineers Office, Montgomery, Alabama, April 17, 1904. (Source: Gulf Islands National Seashore, Florida unit, Pensacola, Florida, Image no. 635-60919)

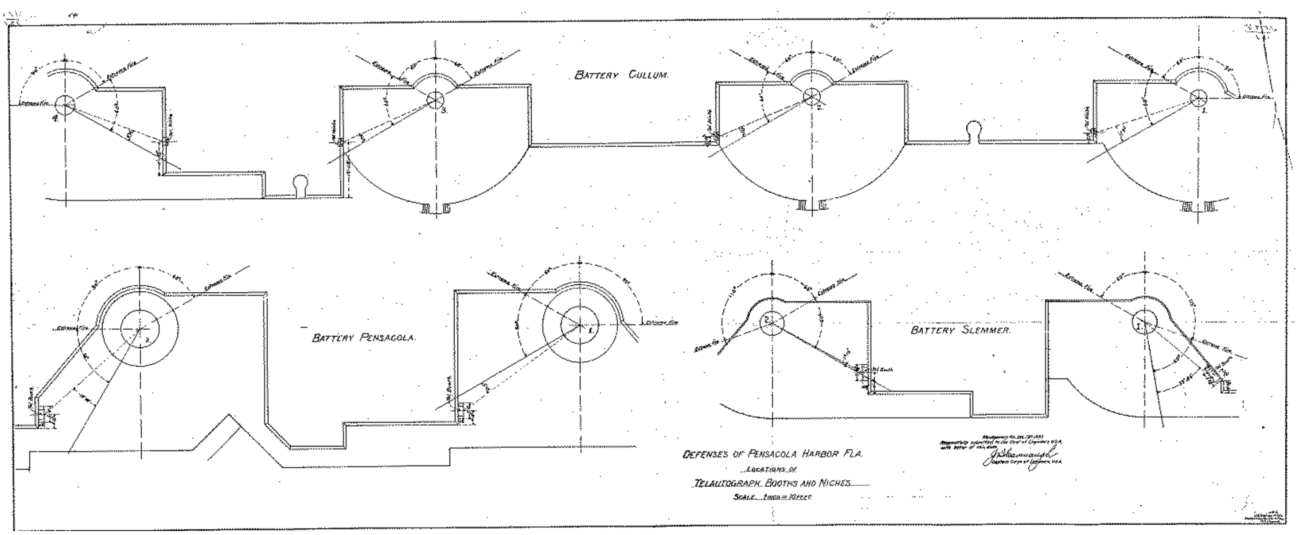

FIGURE 15. *Defenses of* Pensacola *Harbor Fla. Locations of Telautograph Booths and Niches,* US Engineers Office, Montgomery, Alabama, December 29, 1903. (Source: Gulf Islands National Seashore, Florida unit, Pensacola, Florida, Image no. 635-61145)

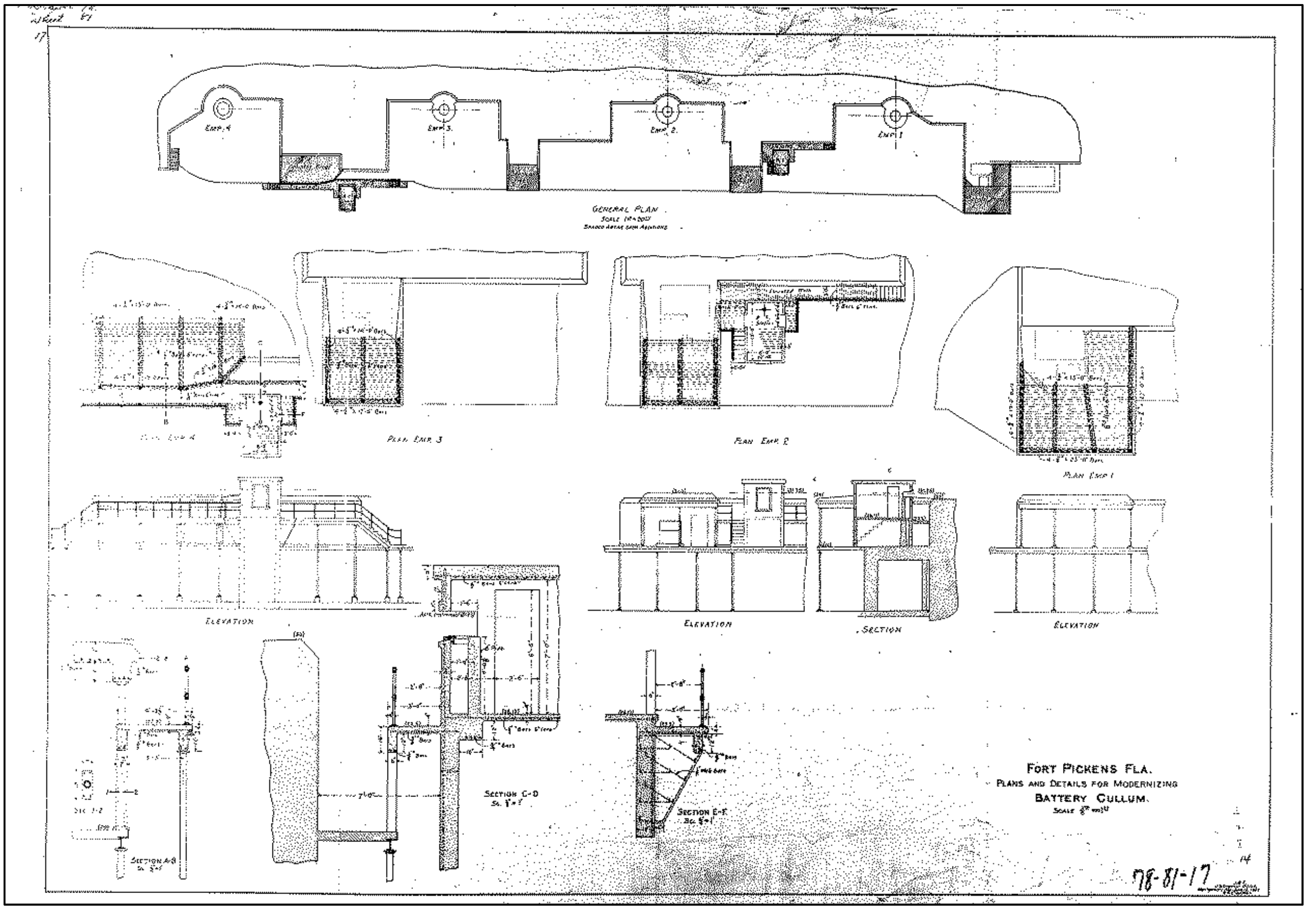

FIGURE 16. *Fort Pickens Fla. Plans and Details on Modernizing Battery Cullum*, undated. (Source: Gulf Islands National Seashore, Florida unit, Pensacola, Florida, Image no. 635-60913)

1906

On September 26, 1906, a hurricane moved into the Gulf of Mexico through the Yucatan Channel, entering the Gulf Coast with winds of more than 85 miles per hour. The winds caused the water in Pensacola Bay to move onshore, and flooding at Fort Pickens reached 10 feet above normal high tide. All telegraph lines were downed in the storm, and the district engineer sent his chief clerk to the District Office in Montgomery, Alabama, to report the damages at Fort Pickens. The report noted, “Cullum—slopes one-third gone, concrete uninjured,” but in fact, most of the batteries at Fort Pickens had lost their slopes; the boat house and launch were destroyed; and the electrical system; and wharf damaged. The dredge appeared to be undamaged, but there was much wreckage to be removed.[114]

1907

There was no relief money left in the 1906 emergency budget for “Preservation and Repair,” to address hurricane damage, so major repairs were postponed to 1907. The movement and finding of sand, was a major expense in the repair of the Gulf Coast batteries. Estimated costs for the repair of Battery Cullum included the following:

114. Campbell to Chief Engineer, Sept. 30. l906, National Archives, R.G. 77, Correspondence l894-1913. Doc. 61026 in Bearss, *Pensacola Harbor Defense,* 228.

Sand filling and repairing slopes	$1,600.00
Sodding and top soil	$7,000
Cleaning up debris and minor repairs	300
Total	$8,900
Superintendence and contingencies (15%)	
	$1,335
Grand Total	$10, 235

Because of the storm surge, it was recommended that a retaining wall be built around the parades of the batteries where flooding had occurred (Cullum and Van Swearingen), at a cost of $10,000.00.[115]

On March 2, 1907, President Theodore Roosevelt signed an act appropriating $200,000 for "Preservation and Repair of Fortifications," of which $50,000 was expected to be used for the repair and restoration of the batteries at Pensacola. By the time all money was appropriated, Battery Cullum received $2,000 for the completing sand filling, sodding, and top soil, less than one-quarter of estimated expenses.[116]

1908

The Congressional Fortifications Act of 1907 included the construction of a seawall to protect Fort Pickens. Funding was to be used for construction of the south, west, and a significant portion of the north side walls of the structure. When it became clear that additional funding would be appropriated, the plans were expanded to include:

- Back fill behind the Fort Pickens wall, to about 100 feet in width and raised to an elevation of 8-1/2 feet, or to within 4-1/2 feet of the top of the wall, to provide a suitable roadway alongside the wall. To prevent erosion, the backfill on the inside of the roadway was to be sodded and planted in Bermuda grass.
- Construction of retaining walls behind Batteries Cullum, Van Swearingen, Pensacola, Slemmer, and Center.
- Placement of additional riprap on the north beach fronting Fort Pickens. This riprap was in addition to that placed front of the Fort Pickens wall already in the contract.[117]

Also in 1908, new powder hoists were positioned at Battery Cullum (Figure 17 and Figure 18).

115. Bearss, *Pensacola Harbor Defense,* 229-230.

116. Ferguson to Marshal, July 11, 1908, National Archives, R.G. 77, Correspondence 1894-1923, Doc. 61026/74, in Bearss, *Pensacola Harbor Defense*, 233.

117. Bearss, *Pensacola Harbor Defense Project,* 238, citing Ferguson to Chief Engineer, June 2, 1909, National Archives, R.G. 17, Correspondence 1894–1923, Doc. 61026/85.

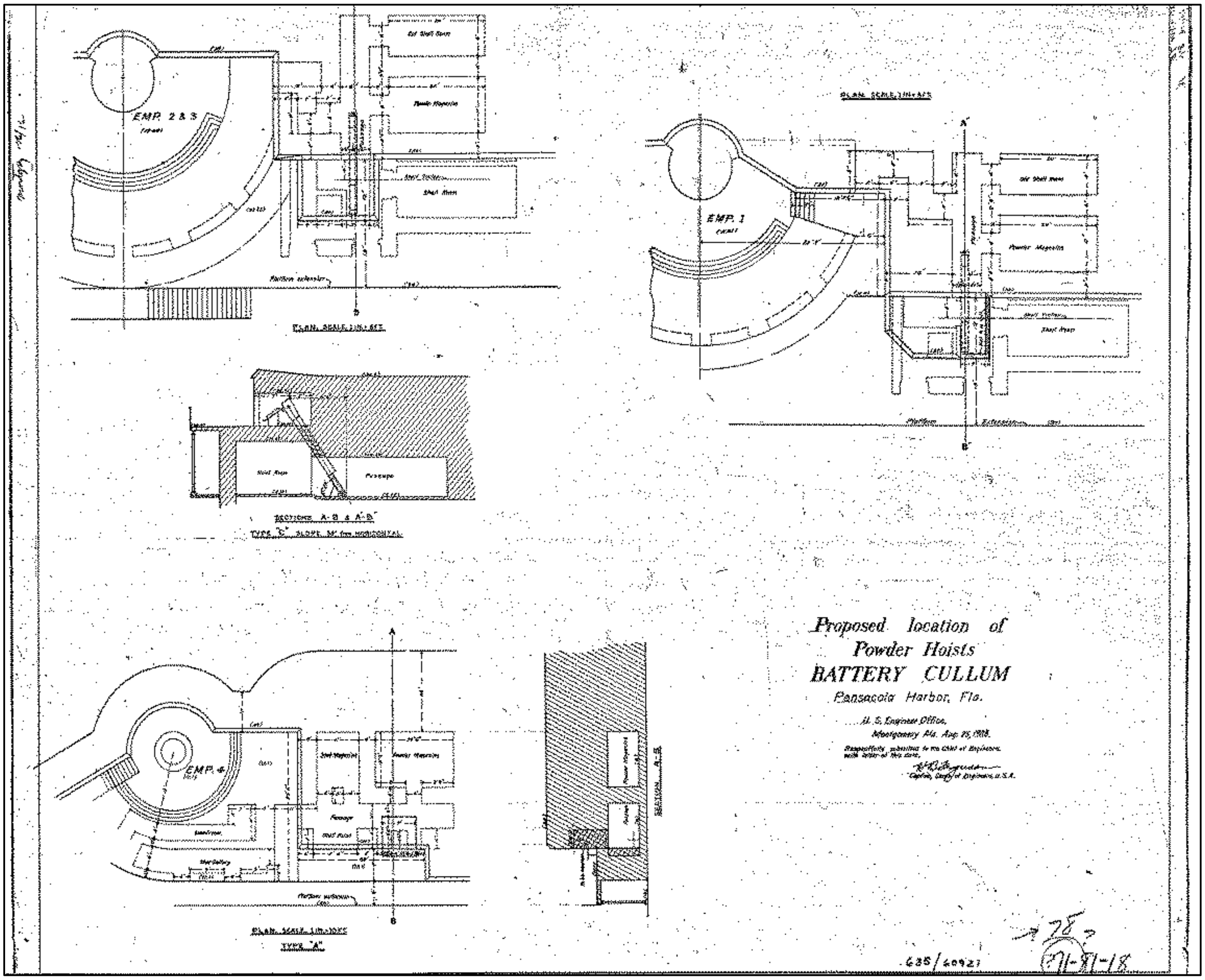

FIGURE 17. *Proposed location of powder hoists, Battery Cullum, Pensacola Harbor, Fla.,* US Engineers Office, Montgomery, Alabama, August 25, 1908. (Source: Gulf Islands National Seashore, Florida unit, Pensacola, Florida, Image no. 635-60921)

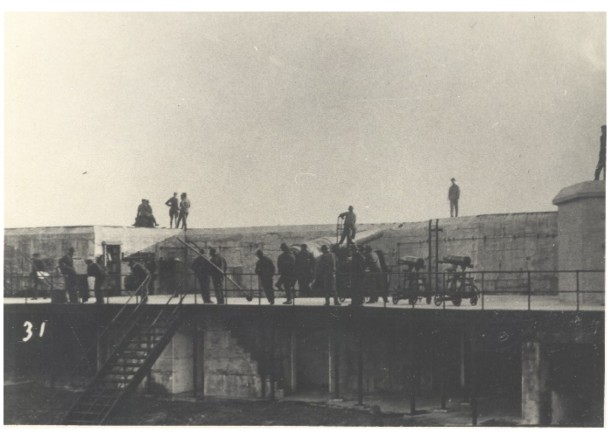

FIGURE 18. Battery Cullum-Sevier power station showing hoist rooms, circa 1910. (Source: Gulf Islands National Seashore, Florida unit, Pensacola, Florida, catalogue no. 451.)

1909

In 1909, construction of the seawall was begun at Fort Pickens. (Drawings for the new seawall were not found in documentation reviewed for this study.)[118]

Two drawings extant from this year relate to other work at the batteries. One drawing indicates the proposed addition of ventilation shafts to Batteries Cullum, Pensacola, and Slemmer (Figure 19), and the second indicates proposed alterations of old shell rooms and powder magazines in the batteries (Figure 20). (Documentation does not confirm whether the proposed work was implemented.)

118. Bearss, *Pensacola Harbor Defense,* 238–239.

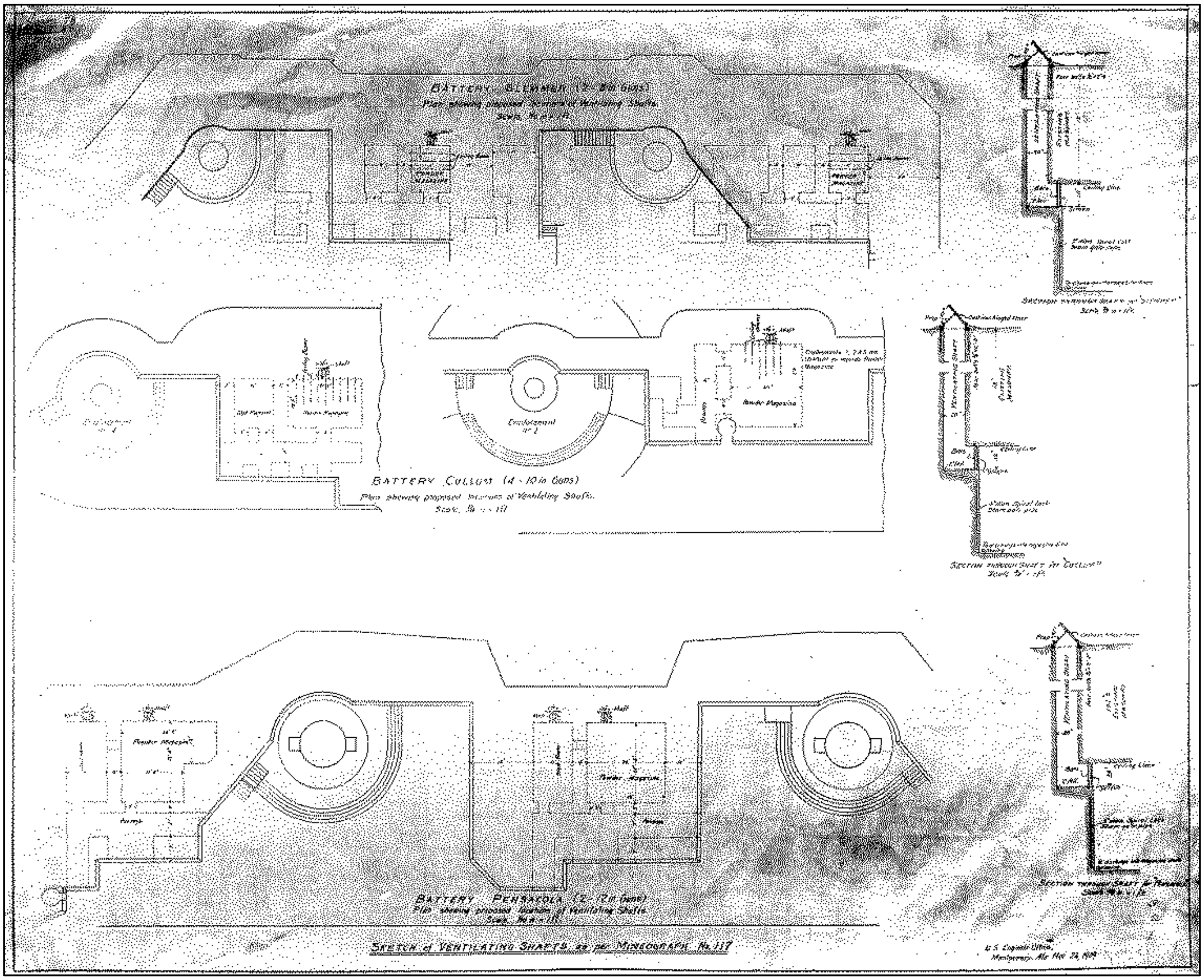

FIGURE 19. *Sketch of ventilating shafts as per mimeograph no. 117*, US Engineers Office, Montgomery, Alabama, November 24, 1909. (Source Gulf Islands National Seashore, Florida unit, Pensacola, Florida, Image no. 635-61064)

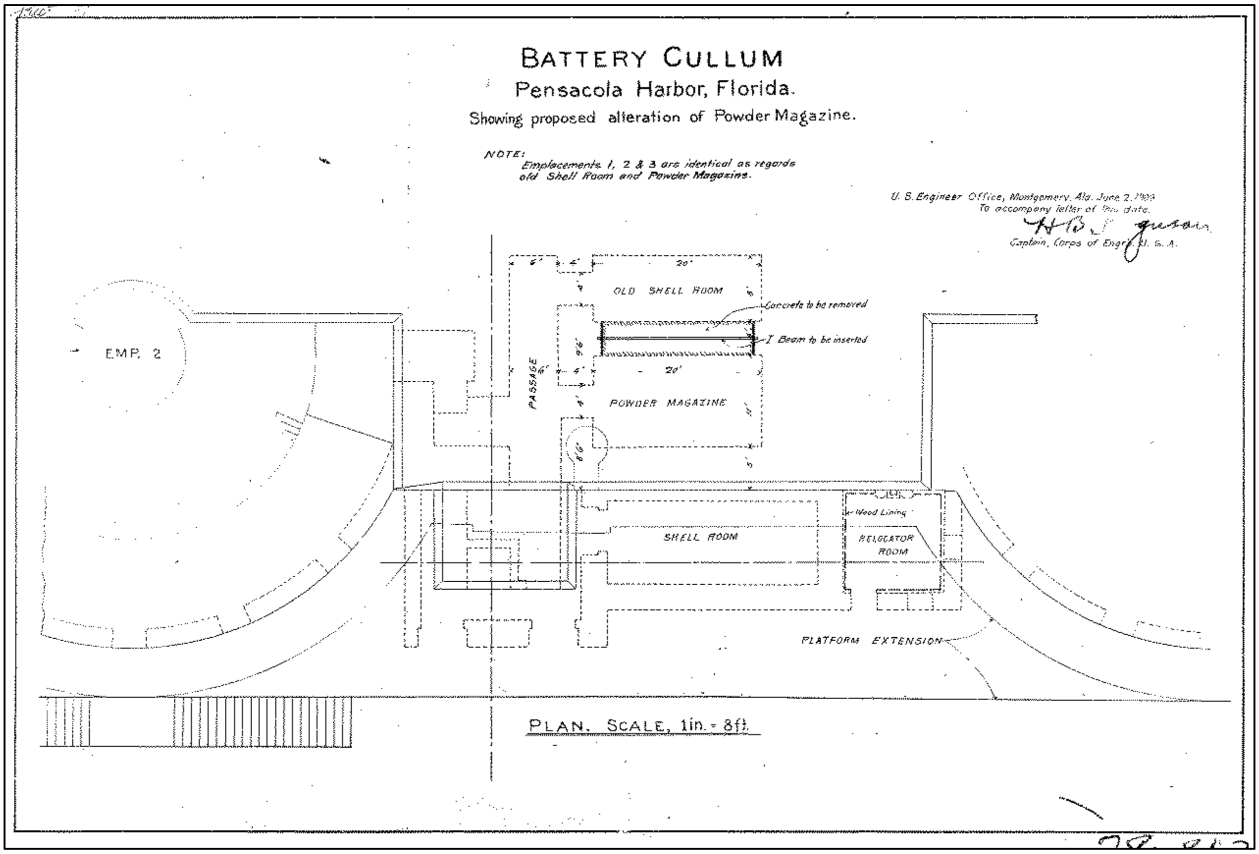

FIGURE 20. *Battery Cullum, Pensacola Harbor, Florida, showing proposed alteration of powder magazine.* US Engineers Office, Montgomery, Alabama, June 2, 1909. (Source: Gulf Islands National Seashore, Florida unit, Pensacola, Florida, Image no. 635-61003)

1912

In 1912, fill behind Fort Pickens seawall was completed, and the road was staked out.[119]

1914–1918

World War I

1915

By 1915, landscaping of the areas inside the seawall with sod was well underway and had been completed in some areas.[120]

1916

On April 12, 1916, War Department General Order No. 15 divided Battery Cullum into two batteries—emplacements 1 and 2 became Battery Sevier and emplacements 3 and 4 would continue as Battery Cullum (Figure 21). Battery Sevier was named in honor of John Sevier, a frontiersman and lieutenant colonel in the North Carolina militia during the Revolutionary War. Sevier led the militia at the Battle of Kings Mountain, and also served as Tennessee's first and third governor (Figure 22).[121]

On July 15–16, 1916, a hurricane reached the Pensacola area with winds up to 105 miles per hour. At Fort Pickens, the quartermaster wharf was badly damaged, and the wharf near the secondary stations was swept away. The boardwalk to Battery Worth was swept off its foundation, but Battery Cullum-Sevier appears to have sustained no damage.[122]

119. Ibid., 242.
120. Bearss, *Pensacola Harbor Defense,* 246, citing Brown to Chief Engineer, June 30, 1915, National Archives, R. G. 77, Correspondence 1894-1923, Doc. 94520.
121. Bearss, *Pensacola Harbor Defense*, 56.
122. Ibid., 246.

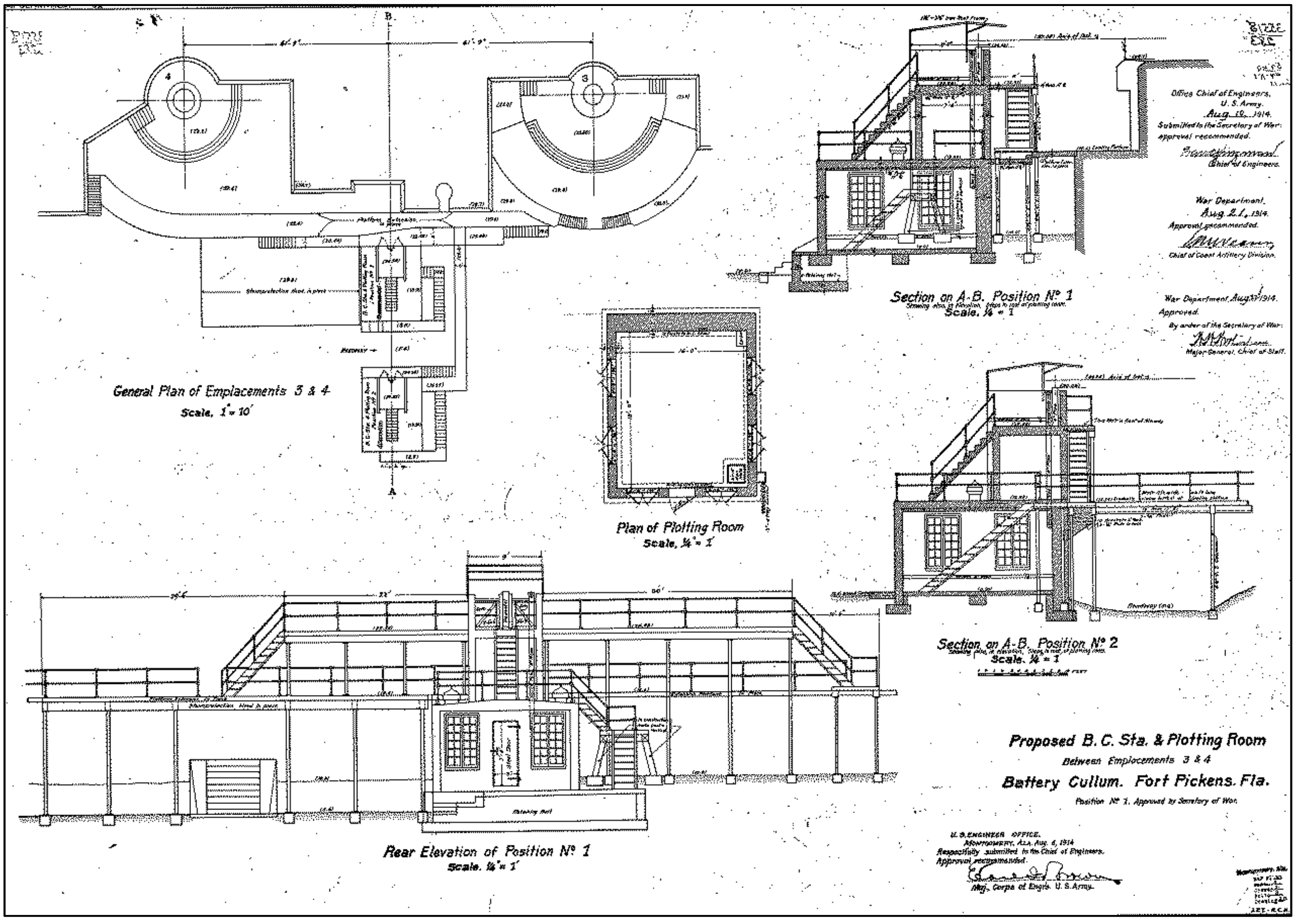

FIGURE 21. Changes associated with dividing Battery Cullum into Batteries Cullum and Sevier: *Proposed B.C. [Battery Commander] Sta. & Plotting Room, between Emplacements 3 and 4, Battery Cullum, Fort Pickens, Fla*. US Engineers Office, Montgomery, Alabama, August 8, 1914. (Source: Gulf Islands National Seashore, Florida unit, Pensacola, Florida, Image no. 635-60922)

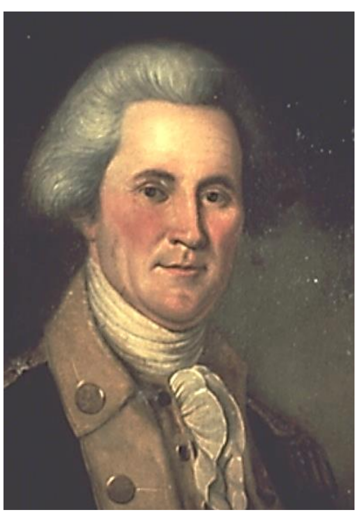

FIGURE 22. John Sevier (1745–1815), first and third governor of state of Tennessee, painting by Charles Willson Peale, 1792. (Source: Tennessee Historical Society Collection, Tennessee State Museum)

On October 18, a cyclone struck the area just as repairs to address damage from the July hurricane damage were being completed. The winds reached 114 miles per hour and once again destroyed the wharf and damaged other parts of the installation; however, Battery Cullum-Sevier was again undamaged.[123]

1917

In April 1917, the United States entered the World War I.

123. Bearss, *Pensacola Harbor Defense*, 249.

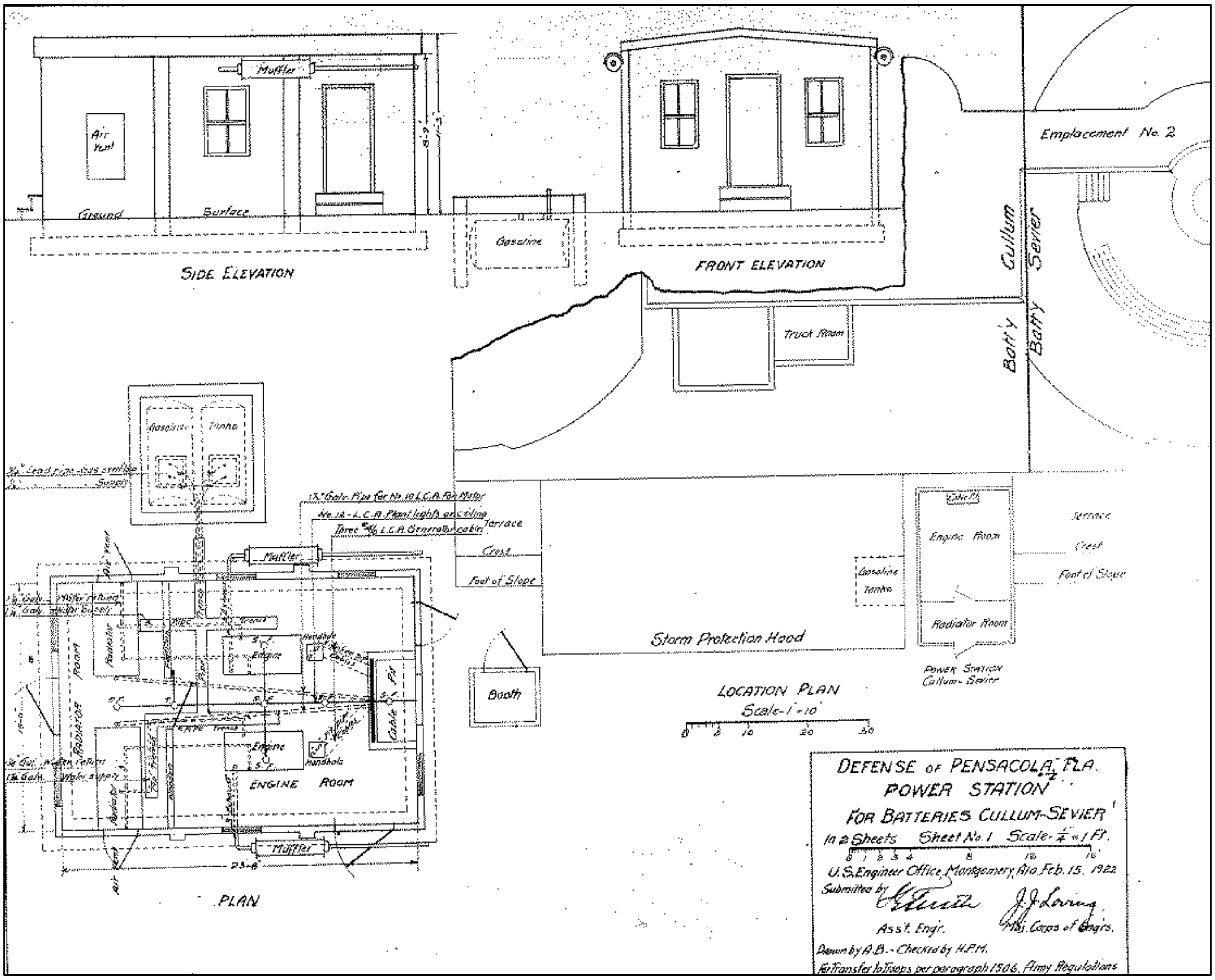

FIGURE 23. Defense of Pensacola, Fla., Power Station, Batteries Cullum-Sevier. US Engineers Office, Montgomery, Alabama, February 15, 1922. (Source: Gulf Islands National Seashore, Florida unit, Pensacola, Florida, Image no. 635-25106)

On September 28, a hurricane sent storm surge surf sweeping over the area of the construction site for new batteries Langdon and Fixed. The sea wall had protected the other batteries, although Battery Cullum-Sevier sustained minor damage to its foundation, stairs, roof, and shutters estimated at approximately $250.[124]

1923–1924

In 1923–1924, a reinforced concrete power station was constructed to serve Battery Cullum-Sevier (Figure 23, Figure 24, and Figure 25). It was built adjacent to the exterior slope of Battery Cullum, near the division point between the two batteries.[125]

124. Ibid., 250.

125. Ibid., 57, citing Fort Pickens Historical Record Book, National Archives, R.G. 392; "Defenses of Pensacola, Fla., Power Station for Batteries Cullum -Sevier," Drawer 18, Sheet 81-39.

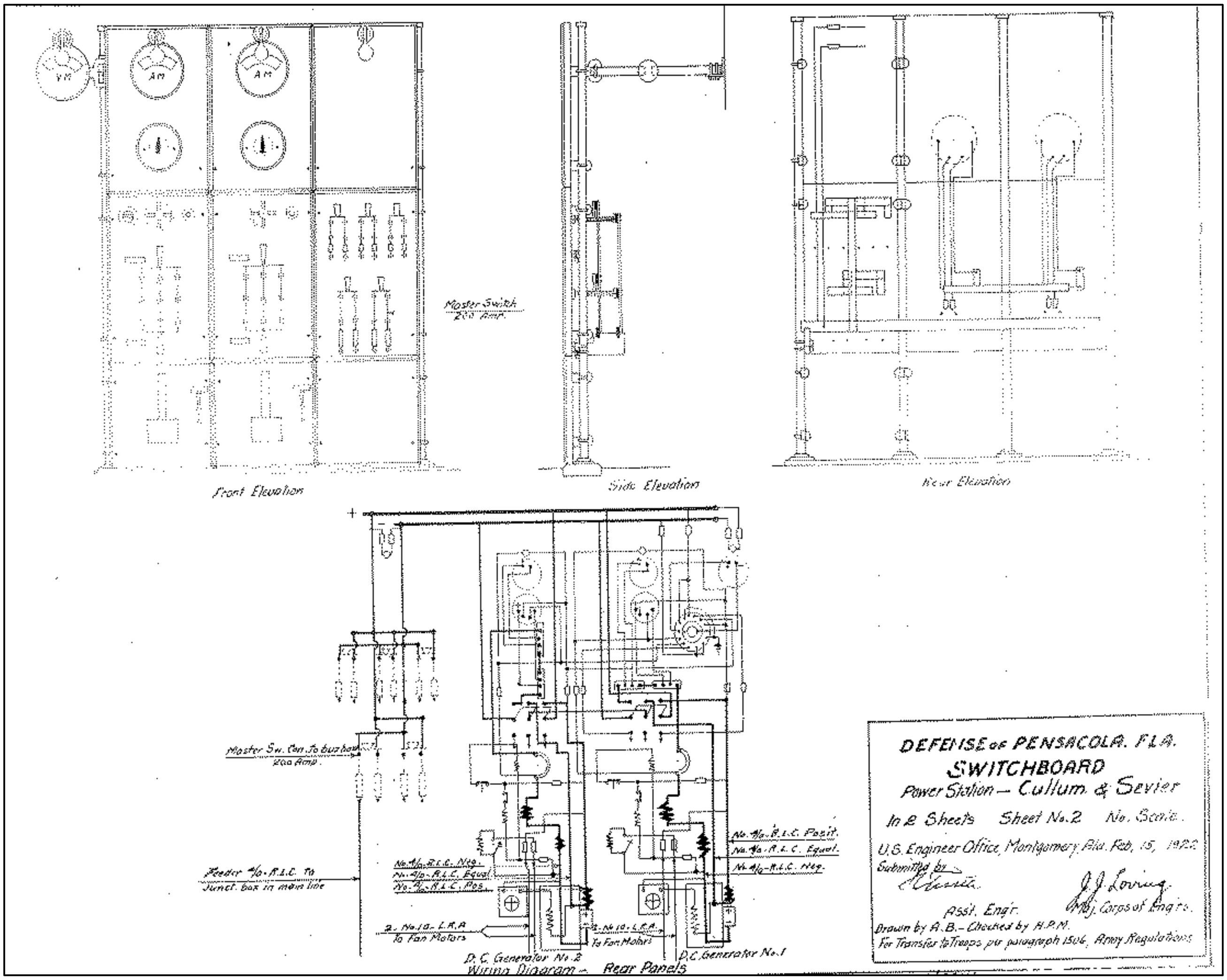

FIGURE 24. *Defense of Pensacola, Fla., Switch Board for Power Station—Cullum & Sevier.* US Engineers Office, Montgomery, Alabama, February 15, 1922. (Source: Gulf Islands National Seashore, Florida unit, Pensacola, Florida, Image no. 635-25106)

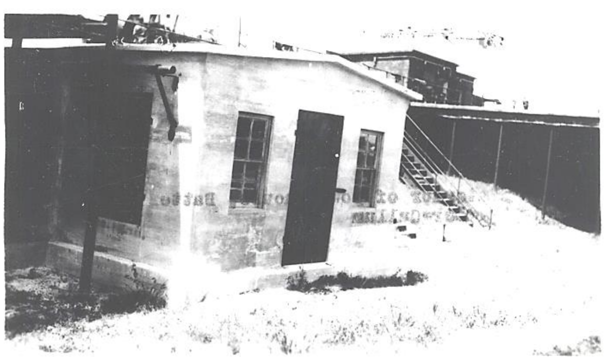

FIGURE 25. Battery Cullum-Sevier power station, circa 1930. (Source: Gulf Islands National Seashore, Florida unit, Pensacola, Florida, Image no. 5482 B)

1926

On September 20, 1926, the "Great Miami Hurricane" caused severe damage to military and civilian property, crops, and shipping in the Pensacola area (Figure 26). The hurricane, with winds reaching 130 miles per hour, caused the Pensacola Naval Air Station to lose almost all of its seaplanes. Fort Pickens was flooded by the storm surge and at times was completely submerged. Most of its buildings were damaged and Batteries Cullum, Sevier, Payne, and Trueman were still submerged in four feet of water three days after the hurricane, making it impossible to make estimates of the loss of ammunition.[126]

126. Bearss, *Pensacola Harbor Defense,* 251.

FIGURE 26. View of hurricane damage - Pensacola, Florida. 1926. (Source: State Archives of Florida, Florida Memory. https://www.floridamemory.com/items/show/29948)

Bearss noted that a reassessment of conditions at Fort Pickens and Fort McRee after the storm concluded that the forts:

> . . . had served their purpose "admirably" as "a buffer against the force of the waves." But . . . they also served as reservoirs. When constructed, floodgates had been installed to allow trapped water to escape into the bay. But when the area within the walls was sand filled and sided, the floodgates became inoperable. In addition, the magazines of Batteries Cullum and Sevier had "been converted into enormous reservoirs by their construction . . . for the prevention of ingress of water . . . in case of storm." The construction was excellent, provided water did not spill over the seawall. But when it did, as in the September 20 Hurricane, the magazines became huge cisterns. To drain them, a fire engine had to be transferred from the mainland to Fort Pickens.[127]

1930

In 1930, aprons and earthen parapets at Battery Cullum-Sevier were repaired (Figure 27).[128]

1933

In 1933, War Department listed Battery Cullum-Sevier as obsolete. The breech mechanisms were removed from the four 10-inch guns, and the guns were given a heavy coat of cosmoline.[129]

1939–1945

World War II

An aerial view of Fort Pickens in July 1942 is shown in Figure 28.

1943

In 1943, in the midst of World War II, Battery Trueman was relocated to Battery Cullum:

> . . . to provide better coverage of the beach and water areas within its range . . . . The two 3-inch rapid-fire guns were emplaced on concrete platforms between emplacements nos. 1 and 2. Battery Commander's and Coincidence Range-Finder station was erected at the easternmost point of the battery. At the same time, the signal and meteorological stations were relocated to Battery Sevier.[130]

1947

In 1947, Fort Pickens was decommissioned and transferred to the State of Florida.[131]

1948

On July 2, Pensacola National Monument was established, to include approximately 13 acres encompassing Fort San Carlos de Barrancas, Fort Redoubt, and Fort Pickens.[132]

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127. Bearss, *Pensacola Harbor Defenses,* 252, citing Major Singles to Adj. Gen., Oct. 6, 1926, National Archives, R.G. 77, Harbor Defense File, Doc. 600.913.
128. *Coast Artillery Journal*, Vol. 74, p. 66 in Bearss, *Pensacola Harbor Defense*, 57.
129. Bearss, *Pensacola Harbor Defense Project,* 58, citing Emplacement Book, Battery Cullum, National Archives, R.G. 392. Cosmoline is a wax-like, petroleum-based rust inhibitor.
130. Annexes to Harbor Defense Project, Harbor Defenses of Pensacola, January 22, 1943, National Archives, R.G. 407, in Bearss, *Pensacola Harbor Defenses,* 58. The Battery Payne Coincidence Range Finder was built at the west end of Battery Sevier. The location of this feature is described incorrectly in the referenced document (Bearss, 178).
131. Bearss, *Pensacola Harbor Defenses,* 288, citing Fort Pickens Historical Record Book, National Archives, R.G. 392.
132. Act 62, ch. 806, Sections 1–4, 62 Stat. 1220, July 2, 1948.

FIGURE 27. "Powder detail, Battery Cullum," circa 1930, showing concrete aprons and storm hoods. (Source: Gulf Islands National Seashore, Florida unit, Pensacola, Florida, catalogue no. 117)

FIGURE 28. Aerial view of Fort Pickens, July 1942, Battery Cullum-Sevier is at the far left in the middle ground. (Source: Gulf Islands National Seashore, Florida unit, Pensacola, Florida)

1949

In 1949, the War Assets Administration advertised the disposal of Fort Pickens with 87 acres set aside as a "Historic Monument."[133]

In the same year, Fort Pickens opened to the public as part of the Florida State Park System.[134]

1953–1954

The State of Florida built the first paved road on the island to access the fort.[135]

1971

On January 1, the Gulf Islands National Seashore was created by the US Congress. The Florida unit of the national seashore included the western end of Santa Rosa Island, the location of Fort Pickens.[136]

1975

On September 23, Hurricane Eloise came ashore ten miles east of Fort Walton Beach with winds of more than 120 miles per hour. Rainfall in the Florida Panhandle was estimated between 6 and 10 inches and the storm surge was as high as 10 feet in some areas. Destruction of property was significant, with 85 to 95 percent of the buildings between Fort Walton Beach and Panama City severely damaged or destroyed.[137]

1979

On September 12–13, Hurricane Frederick made landfall as the first hurricane to directly strike Mobile, Alabama, since 1932. More than 500,000 people were evacuated along the Gulf Coast, the largest evacuation along the coast up to that time. A Category 3 storm with peak winds of 145 miles per hour, Hurricane Frederick did significant damage across the Florida Panhandle and along the Alabama and Mississippi coasts.[138] Gulf Islands National Seashore received substantial damage, especially the Fort Pickens area. Fort Pickens Road was closed for six months as a result of the

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133. Gulf Islands National Seashore, Florida unit, Pensacola, Florida, archives.
134. Ibid.
135. Ibid.
136. 16 U.S. Code sec. 459h (a) (PL 91-660).
137. National Weather Service, "Hurricane Eloise – September 23, 1975," National Weather Service Mobile – Pensacola, November 2016, accessed February 8, 2018, https://www.weather.gov/mob/Eloise.
138. National Weather Service, "Hurricane Frederick," National Weather Service Mobile – Pensacola, September 2016, accessed February 8, 2018, https://www.weather.gov/mob/frederic.

storm. However, the historic buildings, including Battery Cullum-Sevier, were not damaged.[139]

1995

After striking Vero Beach, Florida, several days earlier, Hurricane Erin made a second landfall on August 2, between the National Seashore Day Use Center and the west end of Navarre Beach, with winds of up to 100 miles per hour. Hurricane Erin spawned four tornados and created significant structural and beach damage along Pensacola Beach, Navarre Beach, Mary Esther, and Pensacola.[140]

On October 4, Hurricane Opal entirely over-washed Santa Rosa Island leveling dunes as high as 15 feet, causing shoreline changes, and washing out Fort Pickens Road.[141] The road reopened nine months later.

1996

On October 7, Tropical Storm Josephine advanced across Apalachee Bay, Florida, at about 69 miles per hour, causing storm surge of 3 to 9 feet from Tampa, around the Gulf rim of Florida, and northward through the Panhandle. This storm contributed to the changing shore line of Santa Rosa Island.[142]

1997

On July 18 and 19, Hurricane Danny made landfall twice, once in Louisiana and, after moving back into the Gulf, again in Alabama at the Florida state line. It slowly moved into extreme western Florida and stalled, sending record amounts of rain into Alabama and the Florida Panhandle.[143]

1998

On September 28, Hurricane Georges first made landfall in Key West, then near Biloxi, Mississippi, and then moved slowly north ultimately dissipating at the Florida-Georgia line. Georges dumped 15 to 20 inches of rain on the Florida panhandle, where rivers crested at record high levels, and portions of Interstate10 were closed. Major beach erosion occurred at Santa Rosa Island.[144]

2004

On August 31, 2004, Hurricane Ivan became one the strongest and most destructive hurricanes to strike Florida's Panhandle since Hurricanes Eloise in 1975 and Opal in 1995. Santa Rosa Island was entirely over-washed, and parts of the park road were washed away or undermined.[145] The historic

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139. News Release, "Hurricane Damage is High for Gulf Islands National Seashore," National Park Service, U.S. Department of Interior, September 14, 1997 in Memorandum to Regional Director, Southeast Region from Superintendent, Gulf Islands National Seashore, re: Preliminary Report – Hurricane Frederick, September 19, 1997, Gulf Shores National Seashore Archives, nd.
140. National Weather Service, "Hurricane Erin – Early August 1995," National Weather Service Mobile – Pensacola, September 2016, accessed February 8, 2018, https://www.weather.gov/mob/erin.
141. Cheryl J. Hapke and Mark Christiano, *Long-term and Storm-related Shoreline Change Trends in the Florida Gulf Islands National Seashore* (NP: U.S. Department of the Interior and U.S. Geological Survey, 2007).
142. Richard J. Pasch, "Preliminary Report: Tropical Storm Josephine," National Hurricane Center, February 21, 1997, accessed February 2, 2018, https://www.nhc.noaa.gov/data/tcr/AL101996_Josephine.pdf.
143. National Weather Service, "Hurricane Danny produces HISTORIC Rainfall amounts along the Northern Gulf Coast," National Weather Service Mobile – Pensacola, November 2016, accessed February 8, 2018, https://www.weather.gov/mob/danny.
144. National Weather Service, "Hurricane Georges – September 28, 1998, National Weather Service Mobile – Pensacola, September 2017, accessed February 8, 2018, https://www.weather.gov/mob/georges.
145. Robert Wang and Michael Manausa, *Hurricane Ivan Characteristics and Storm Tide Evaluation* (Tallahassee: Beaches and Shores Resources Center, Institute of Science and Public Affairs, Florida State University, 2005).

buildings and structures within the park were submerged and stayed filled with water for days (Figure 29).

FIGURE 29. Aftermath of Hurricane Ivan, one of the Gulf Coast's most destructive hurricanes. (Source: Gulf Islands National Seashore, Florida unit, Pensacola, Florida)

2005

On July 10, Hurricane Dennis came ashore as a Category 3 hurricane near Navarre Beach. This small, fast-moving hurricane did not dump great amounts of rain but created significant shoreline erosion. The combination of wind and storm surge destroyed the newly rebuilt Fort Pickens Road, and damaged or destroyed almost every building in the Navarre Beach area.[146]

2010

On April 20, the British Petroleum (BP) Deepwater Horizon oil rig began to leak oil into the Gulf of Mexico, resulting in the largest offshore oil spill in history. The rig leaked oil for eighty-seven days before it was successfully capped.

On June 1, the first evidence of oil and tar from the Deepwater Horizon spill began to appear on the beaches at Santa Rosa Island.[147]

2016

April 4, District Judge Carl Barbier approved a historic $20.8 billion global settlement agreement with BP, the party ruled primarily responsible for the 2010 oil spill. According to the settlement, BP is required to pay up to $8.8 billion for restoration to address injuries to natural resources. These funds are being used to implement the Programmatic Damage Assessment and Restoration Plan for the affected region, of which the Gulf Islands National Seashore is a part.[148]

2017

October 8, Hurricane Nate left up to two feet of sand and water on roadways and parking areas in the park and undermined some portions of the access road to Fort Pickens.[149] Fort Pickens was closed for about two months while repairs were made to the road and natural areas were cleared of debris.

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146. National Weather Service, "Hurricane Dennis, July 10, 2005," National Weather Service Mobile – Pensacola, November 2016, accessed February 8, 2018, https://www.weather.gov/mob/dennis.

147. Tampa Bay Online, "Pools of Oil Wash Ashore on Pensacola Beach," The Associated Press, June 23, 2010, accessed February 8, 2018, https://archive.is/20130204131149/http://www2.tbo.com/content/2010/jun/23/231630/pools-oil-wash-ashore-pensacola-beach/news-breaking/.

148. U.S. Department of the Interior, "Deepwater Horizon," nd, accessed February 9, 2018, https://www.doi.gov/deepwaterhorizon.

149. *Pensacola News Journal*, "Hurricane Nate: Gulf Island Seashore areas still closed," October 9, 2017, accessed February 8, 2018, http://www.pnj.com/story/news/2017/10/09/hurricane-nate-gulf-islands-national-seashore-areas-still-closed/747279001/.

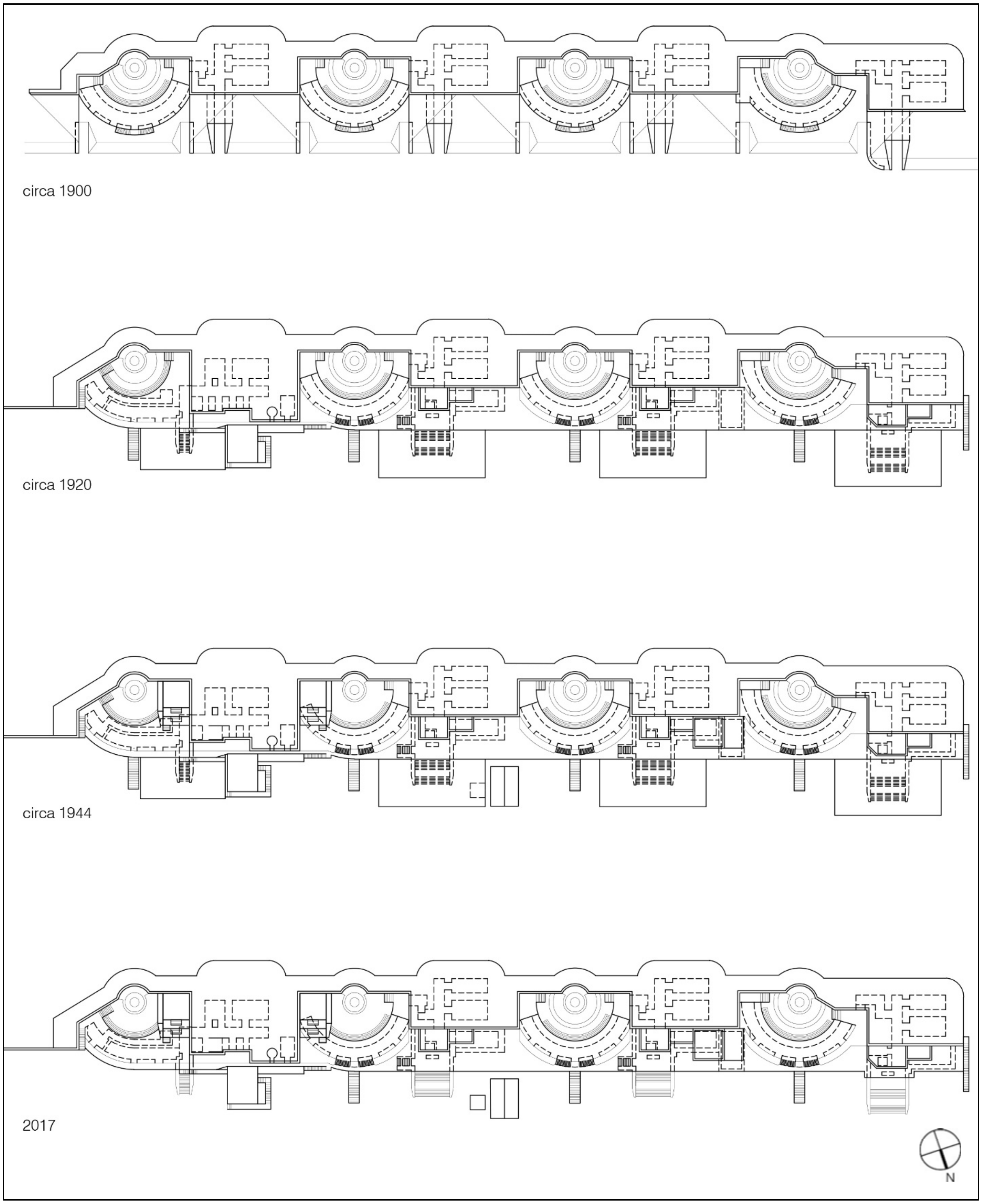

FIGURE 30. Battery Cullum-Sevier at four key points in its development: circa 1900, showing then Battery Cullum, constructed 1896–1898; circa 1920, reflecting modifications including storm hoods, additional stairs, and a battery commander's station at the east end of the structure (in 1916, the battery was divided to house both Battery Cullum (east) and Battery Sevier (west); circa 1944, showing the addition of the power station directly north of the center of the battery, as well as the battery commander's station/coincidence range finder at Battery Sevier (in 1943, Battery Trueman was relocated to Battery Cullum 2 and its guns were placed on two platforms between the existing emplacements no. 1 and no. 2.); and in 2017, showing the configuration at the battery at the time of this study, including the past removal of the storm hoods (Source: Wiss, Janney, Elstner Associates, Inc., 2018).

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Physical Description and Condition Assessment

Battery Cullum-Sevier is a reinforced concrete coastal defense battery structure located approximately 1/8 mile west of Fort Pickens on the west end of Santa Rosa Island (Figure). Originally constructed in 1896–1897, Battery Cullum-Sevier falls within the Fort Pickens unit of Gulf Islands National Seashore. The structure is situated approximately 700 feet north of the south shore of Santa Rosa Island, and immediately south of Fort Pickens Road (refer to Figures 2 and 4). Battery Van Swearingen is located directly north of Battery Cullum-Sevier (Figure 32). Battery Cullum-Sevier is approximately 170 feet by 625 feet in plan, and consists of the gun emplacements and associated spaces of Battery Cullum, Battery Sevier, and Battery Trueman, as further described below.

The two-level battery features four round gun emplacements on the upper level, while the lower level consists of magazines, shot galleries, and passageways. The north elevation of the battery is visible, while built-up sand and vegetation cover the east, south, and west elevations.

FIGURE 31. View from northeast of Battery Cullum-Sevier and Fort Pickens Road.

FIGURE 32. A view of Battery Van Swearingen from the north.

Site

The main branch of Fort Pickens Road is a loop road, passing to the east of Battery Cullum-Sevier, before continuing to the northern edge of the island, where it turns west and loops south in front of the battery (Figure 33). A small pull-off on the south side of the asphalt paved road is located in front of Battery Cullum-Sevier. A small wood-framed wayside sign is located adjacent to the pull-off (Figure 34). A small comfort station is located northwest of Battery Cullum-Sevier, across Fort Pickens Road from Battery Van Swearingen (Figure 35).

A concrete seawall surrounds the perimeter of Fort Pickens and nearby associated buildings on the west end of Santa Rosa Island, including Battery Cullum-Sevier. The seawall runs south of the battery (Figure 36).

A chain-link fence extends around the perimeter of the battery to prevent visitor access to the structure (Figure 37). The fence is situated between the battery and the seawall to the south, and between the battery and Fort Pickens Road to the north.

FIGURE 33. A view of Fort Pickens Road as it passes in front of Battery Cullum-Sevier.

FIGURE 34. A vehicular pull-off on the south edge of Fort Pickens Road in front of Battery Cullum-Sevier.

FIGURE 35. The comfort station on the north side of Fort Pickens Road near Battery Cullum-Sevier.

FIGURE 36. The concrete sea wall that runs south of Battery Cullum-Sevier.

FIGURE 37. A chain-link fence is present around the perimeter of Battery Cullum-Sevier.

In line with the chain-link fence on the north side of the battery is a reinforced concrete wall, approximately 24 inches tall, which extends past the battery on the west and continues in front of Battery Van Swearingen (Figure 38). The wall extends almost to Fort Pickens Road on the east before turning south to meet a concrete retaining wall at the east end of Battery Cullum-Sevier. Three sets of four tapered concrete piers and a pair of tapered piers extend upward from the wall (Figure 39). The locations of the piers appear to correspond with the four stairways on the north side of the battery.

FIGURE 38. The concrete wall on the north side of Battery Cullum-Sevier.

FIGURE 39. A set of four tapered columns at the wall north of the battery.

Exterior Description

Measured drawings of the battery are provided in Appendix A.

Battery Cullum-Sevier is a two-level concrete structure measuring approximately 625 feet in length. It is covered on all elevations, except at the north elevation, which is open. The battery has a generally symmetrical plan oriented on an east-west axis, with four round gun emplacements situated on the upper level in a row in an east-west direction. Battery Cullum consists of the two eastern gun emplacements and associated spaces, while Battery Sevier consists of the two west gun emplacements and associated spaces. An additional two concrete gun platforms, which comprise Battery Trueman, flank the western gun emplacement at Battery Cullum. The upper level of the battery is largely open to the elements, and incorporates some interior spaces. These enclosed spaces include the observation room associated with the signal station, which rises above the rest of the battery between the first and second gun emplacements from the west (Figure 40). North of the main battery structure, between the Battery Cullum gun emplacements, is the three-level structure that originally housed a plotting room and the battery commander's station (Figure 41). The structure is connected to the main battery by a concrete walkway. The one-story power station sits directly to the north of the main battery, where Battery Cullum and Battery Sevier meet (Figure 42).

FIGURE 40. A view of the east gun emplacement at Battery Cullum, with Battery Trueman beyond.

FIGURE 41. The three-level structure which housed a plotting room and battery commander's station.

FIGURE 42. A view of the power station from the east.

FIGURE 43. Steel I-beams are embedded in concrete at many of the interior spaces.

FIGURE 44. Embedded steel bar reinforcing at the walkways added in the 1920s.

FIGURE 45. Pipe columns and I-beams support concrete walkways.

Structure

Based on archival drawings reviewed as part of this study, the cast-in-place concrete structure of the original portions of Battery Cullum-Sevier was designed to consist of approximately 2-foot-thick footings, which would support concrete walls and roof slabs. The walls were shown to range in thickness from 2 feet up to 20 feet thick in some locations.

Four gun emplacement pads were constructed as part of the original battery. The concrete walls at the emplacements are generally 10 feet thick. At the ceilings of the interior spaces at the lower level adjacent to gun emplacements, steel I-beams are embedded in the concrete (Figure 43).

The newer concrete buildings and walkways, constructed in the 1920s, are cast-in-place concrete with embedded steel bar reinforcement (Figure 44). The concrete walkways that line the north edge of the battery are supported by steel I-beams and pipe columns (Figure 45).

Exterior Concrete

Board-formed, cast-in-place concrete is the primary exterior material of the structure. A series of entrances to the interior portions of the structure line the north elevation of Battery Cullum-Sevier, with a number of steel-framed staircases leading to the upper level of the battery from grade.

Battery Cullum. The eastern portion of the structure, including two gun emplacements and two gun platforms, makes up Battery Cullum. At the east end of the north elevation of Battery Cullum is a concrete retaining wall (Figure 46). The retaining wall tapers upward from grade at the east, to the top of the battery, where it is approximately 24 feet tall. An observation room sits atop the battery at the west end of the retaining wall. A steel double door leading to a closet is present at the west end of the retaining wall. At the west end of the retaining wall, the east wall of the battery begins, running south toward the easternmost gun emplacement. A concrete stair that extends along the east wall leads from grade to the upper level of the battery (Figure 47).

Immediately west of the concrete stair at the first level of the structure is a series of three door openings that line the shot gallery (Figure 48). The openings contain steel-framed double doors. There are no glazed openings within the doors. Several of the door units are missing. Concrete knee walls have been constructed at the western two door openings leading to the east shot gallery (Figure 49). A raised concrete walkway at the upper level, which is supported by steel beams and columns, extends along the north elevation of the battery, covering the immediate area outside the shot gallery. A steel-framed metal staircase leads from grade to the upper level walkway (refer to Figure 47).

A concrete staircase located west of the shot gallery leads to the interior magazines on the lower level that are associated with the east gun emplacement of Battery Cullum (Figure 50). The stair consists of five treads leading up followed by five treads leading down to the lower level of the battery. The concrete stair is approximately 6 feet wide with a concrete knee wall at each side. A second stair leads from the covered area adjacent to the east shot gallery down to the lower level. At the base of the stair is an opening with a door composed of vertical steel bars that leads to a passageway and the shot and powder magazines associated with the eastern gun emplacement at Battery Cullum.

FIGURE 46. A view of Battery Cullum showing the retaining wall at the east end of the battery.

FIGURE 47. View of the east end of Battery Cullum. Note the concrete stair at the left and steel-framed staircase at the right.

FIGURE 48. A view of the exterior of the shot gallery associated with the east gun emplacement.

FIGURE 49. Concrete knee walls are present in the door openings at the shot gallery associated with the east gun emplacement of Battery Cullum.

FIGURE 50. View of the concrete stair leading to the interior rooms on the lower level of Battery Cullum associated with the east gun emplacement.

The gun platforms associated with Battery Trueman are visible above the concrete stair leading to the lower level.

North of the main battery, partially obscuring Battery Trueman, is the multi-level plotting room and battery commander's station (Figure 51). The plotting room and battery commander's station consists of the first floor plotting room, the battery commander's station on the upper level, and an open observation level above. The north elevation of the plotting room contains a central doorway flanked by two window openings (Figure 52). The east and west elevations of the plotting room each contain two window openings. No window or door units remain in the openings. A paved concrete walk extends the width of the north elevation, leading to a concrete stair with steel treads on the west side of the plotting room and battery commander's station (refer to Figure 51). The stair is L-shaped in plan and leads to the roof of the plotting room. At the second level, the battery commander's station is centered at the south half of the structure. A concrete stair with steel treads leads from the roof to the observation level above the battery commander's station.

FIGURE 51. A view from the northwest of the plotting room and battery commander's station. Note the concrete stair in the foreground.

FIGURE 52. The north elevation of the first level of the plotting room and battery commander's station.

FIGURE 53. The two-level walkway at the plotting room and battery commander's station.

The upper level walkway extends behind the plotting room and battery commander's station, with a second walkway above leading from the battery commander's station observation level (Figure 53). A concrete stair with steel treads leads from the second walkway down to the upper level walkway.

A concrete step and walk leads from grade toward the area under the upper level walkway, adjacent to the shot gallery at the western gun emplacement of Battery Cullum (Figure 54).

FIGURE 54. A concrete step leads from grade toward Battery Cullum. Note the steel-framed stair at the right.

A series of five door openings lines the exterior wall of the shot gallery adjacent to the western gun emplacement at Battery Cullum (refer to Figure 54). The openings have no doors present. Two concrete staircases straddle the central door opening. The stairs, which originally led to the upper level, are closed off at the top by the addition of the upper level walkways (Figure 55). A steel framed stair extends from grade to the upper level walkway (Figure 56). The stairway aligns with the central door opening. West of the steel stair, portions of the upper level walkway added in the 1920s have collapsed (Figure 57).

FIGURE 55. Two concrete staircases straddle the central entrance to the shot gallery.

FIGURE 56. A steel-framed stair leading to the upper level walkway.

FIGURE 57. Collapsed portions of the upper level walkway.

At the west end of Battery Cullum, a wide concrete staircase leads to the interior passages and magazines associated with the west gun emplacement. The 19-foot-wide staircase consists of seven treads, a landing, and an additional seven treads leading down to the lower level of the battery (Figure 58). Two door openings, each with double doors constructed of vertical steel bars, lead to the interior of the battery.

At the second level, the north elevation of a concrete structure containing two separate rooms is visible (Figure 59). The east room, which housed a hoist and associated spaces, projects outward slightly from the west room, a truck room. The structure is topped with a concrete truncated hip roof. At the east room, a steel hoist is visible at the east side, with a double steel door at the west side. A sliding steel door provides access to the west room.

FIGURE 58. The staircase leading to the lower level interior rooms associated with the west gun emplacement at Battery Cullum.

FIGURE 59. A view of the exterior of the second level rooms associated with the west gun emplacement.

The upper level walkway at the west side of Battery Cullum is collapsed (refer to Figure 59).

Battery Sevier. The western portion of the structure, including two gun emplacements and two gun platforms, makes up Battery Sevier. A concrete stair marks the western edge of the battery (Figure 60). The 3-foot-wide stair leads to the upper level and roof of the battery. A steel pipe rail extends along the east side of the stair. Near the top of the battery, a concrete observation room is located at the far west end of Battery Sevier (Figure 61). The concrete structure has a concrete gable roof, a door opening on the north elevation, and a ribbon window opening that extends the length of the east, south, and west elevation.

FIGURE 60. A concrete stair leads to the upper level and the roof of Battery Sevier. Note the concrete wall left of the stair.

FIGURE 61. A concrete observation room at the west end of Battery Sevier.

East of the western stairway, a blank concrete wall is visible at the lower level, with a walkway at the upper level (refer to Figure 60). The upper level walkway leads from the stair to two rooms on the upper level associated with the westernmost gun emplacement of Battery Sevier (Figure 62). The east room projects outward slightly from the west room. The structure is topped with a concrete truncated hip roof. At the east room, a steel hoist is visible at the east side, with a double steel door at the west side. A sliding steel door provides access to the truck room on the west.

FIGURE 62. A view of the two upper level rooms associated with the west gun emplacement at Battery Sevier.

At grade, below the two rooms at the upper floor, a wide concrete staircase leads to the interior passages and magazines associated with the west gun emplacement at Battery Sevier. The 19-foot-wide staircase consists of seven treads, a landing, and an additional seven treads leading down to the lower level of the battery (Figure 63). Two door openings, each with double doors constructed of vertical steel bars, lead to the interior of the battery (Figure 64). Remnants of the concrete and steel storm protection hood that formerly stood above the stairway remain at the base of the stair.

FIGURE 63. The concrete stair leading to the lower level interior rooms.

FIGURE 64. Steel doors lead into the lower level interior rooms.

The west gun emplacement is located to the east of the concrete stair to the lower level, with the shot gallery located on the north side of the emplacement. A series of five door openings lines the exterior wall of the shot gallery (Figure 65). The openings have no doors present. Two concrete staircases flank the central door opening. The stairs, which originally led to the upper level, are closed off at the top by the addition of the upper level walkways. A steel-framed stair extends from grade to the upper level walkway (refer to Figure 65). The stairway aligns with the central door opening, which had been partially infilled with a concrete knee wall (Figure 66). West of the steel stair, portions of the upper level walkway added in the 1920s have collapsed (Figure 67).

FIGURE 65. Five openings line the exterior of the shot gallery associated with the west gun emplacement. Note the steel-framed stair leading to the upper level.

FIGURE 66. The central concrete stair. Note the concrete knee wall at the door opening.

FIGURE 67. Collapsed portions of the upper level walkway.

Between the two gun emplacements at Battery Sevier is the three-level harbor defense signal station added to the structure circa 1944 (Figure 68). The three-level concrete structure has a door opening and two window openings on the first level; a door opening and two window openings on the second level, which extends to the truck room previously constructed; and a third level observation room with two window openings in the north elevation. Ribbon windows line the east, south, and west elevations of the observation room. Steel-framed window frames and sash, but no glass, remain at the openings on the second and third levels. The first level of the signal station was constructed beneath the upper level walkway that was added in the 1920s (Figure 69). Remnants of the steel signal mast are present on the north elevation of the signal station, terminating at the roof level.

FIGURE 68. The three-level harbor defense signal station.

FIGURE 69. The first level of the harbor defense signal station.

Adjacent to the harbor defense signal station is a wide concrete stair, similar to stairs at entrances to interior spaces at Battery Cullum-Sevier (Figure 70). The 19-foot-wide staircase consists of seven treads, a landing, and an additional seven treads leading down to the lower level of the battery. Two door openings, each with double doors constructed of vertical steel bars, lead to the interior of the battery, to spaces associated with the east gun emplacement (Figure 71).

Above the stairway and east of the harbor defense signal station, two rooms are accessible from the upper level walkway (refer to Figure 70). The east room projects outward slightly from the west room. The structure is topped with a concrete truncated hip roof. At the east room, a steel hoist is visible at the east side, with a double steel door at the west side. A sliding steel door provides access to the truck room on the west.

FIGURE 70. The concrete stair that leads to the interior spaces associated with the east gun emplacement at Battery Sevier.

FIGURE 71. Two door openings lead to the lower level interior spaces associated with the east gun emplacement at Battery Sevier.

The eastern gun emplacement is situated at the east end of Battery Sevier, directly adjacent to Battery Cullum. North of the gun emplacement, the exterior of the shot gallery is visible (Figure 72). A series of five door openings lines the shot gallery. No door units are present in the openings. At the center, two concrete staircases flank the central opening. The stairs, which originally led to the upper level, are closed off at the top by the addition of the upper level walkways. A steel-framed stair extends to the upper level walkway from grade. Portions of the upper level walkway have collapsed in the area east of the central steel stair (Figure 73).

FIGURE 72. The exterior of the shot gallery adjacent to the east gun emplacement at Battery Sevier.

FIGURE 73. Portions of the upper level walkway have collapsed.

The power station, a one-story concrete structure, is located outside the main battery structure, where Battery Cullum and Battery Sevier meet (Figure 74). The north elevation of the building contains a central door opening flanked by a window opening on each side. A set of stairs lead from grade into the building. No door is present, while each of the window openings is covered with vertical steel bars. The east and west elevations each have three openings (Figure 75). At the east elevation, a door opening is present at the north end of the elevation, with two windows to the south. Three windows are equally spaced along the west elevation. The window openings are each covered with vertical steel bars. Concrete piers project from the exterior wall between the openings on the east and west elevations. At the south elevation, a door opening is present at the east side, with a window opening at the west. The building has a concrete gable roof.

FIGURE 74. A view of the power station from the northeast.

FIGURE 75. The east elevation of the power station.

Upper Level and Roof

The upper level of Battery Cullum-Sevier is largely exposed to the elements. The upper level generally consists of the upper level walkway, which extends along the north side of both batteries, as well as the gun emplacements, which sit below the upper level walkway. The upper level walkway consists of an outer walk that was added as part of the improvements undertaken in the 1920s (Figure 76). Four gun emplacements line the structure: two in Battery Cullum at the east, and two in Battery Sevier at the west. Battery Cullum also contains the gun platforms associated with Battery Trueman.

FIGURE 76. The upper level walkway added in the 1920s at Battery Cullum-Sevier.

Typically, the gun emplacements are semicircular in plan, and step down from the upper level (Figure 77). In general, the gun emplacements sit approximately 4 feet below the upper level of the battery. A series of stairs also leads from the gun emplacement down into the associated magazines, although the connection between the spaces has largely been cut off by concrete masonry units used to fill in the former door openings (Figure 78). The concrete walls around the gun emplacements typically rise 10 feet from the floor level with a chamfered edge at the top.

FIGURE 77. The west gun emplacement at Battery Cullum.

FIGURE 78. Doorways leading from gun emplacements to associated interior spaces have typically been filled in.

Battery Cullum. The upper level of Battery Cullum is accessed from a concrete stair located at the far eastern side of the battery. The stair, which consists of sixteen concrete risers, ends at upper level south of the east gun emplacement (Figure 79).

FIGURE 79. The upper level of Battery Cullum adjacent to the east gun emplacement.

The east gun emplacement at Battery Cullum is the smallest of the gun emplacements at Battery Cullum-Sevier, and is a circular sector in plan smaller in area than a semicircle. The addition of Battery Trueman to the west further truncated the gun emplacement. A stair at the northeast corner leads from the gun emplacement to the associated interior spaces below. A concrete masonry unit (CMU) wall has been erected at the foot of the stair, preventing access between the two spaces (Figure 80).

FIGURE 80. A concrete masonry unit wall was erected in a former opening preventing access from the gun emplacement to associated interior spaces.

The walls surrounding the east gun emplacement are typical, with the exception of the west wall, which is associated with Battery Trueman (Figure 81). While similar in height, the east wall also has two sloping concrete piers extend the full height of the wall.

FIGURE 81. The west wall at the east gun emplacement. Note the sloping concrete piers.

North of the east gun emplacement, a steel staircase leads from the upper level walkway down to grade (refer to Figure 47).

Immediately west of the east gun emplacement are the gun platforms associated with Battery Trueman (Figure 82). Battery Trueman was added to Battery Cullum circa 1944, and consists of two gun platforms that flank original interior spaces on the upper level (Figure 83). Each gun platform is 15 feet wide by 25 feet deep and is made up of three levels that step up from the main upper level of the battery. A stair with two risers on the outside edge of the platform leads from the upper level to the first level of Battery Trueman. A second stair with three risers, centered on the platform, leads from the first level to the second level, while another stair, also with three risers and centered on the platform, leads to the third level of the platform. The third level, which is the largest, originally housed the gun.

FIGURE 82. A view of Battery Trueman from the northeast.

FIGURE 83. The west gun platform of Battery Trueman.

The multi-level plotting room and battery commander's station is located north of Battery Trueman. This structure is connected to the main battery structure by the upper level walkway.

The west gun emplacement at Battery Cullum sits to the west of Battery Trueman. The gun emplacement is semicircular in plan, and like the east gun emplacement, the plan of the gun emplacement was truncated by the construction of Battery Trueman (Figure 84). A stair at the southwest corner leads from the gun emplacement to the associated interior spaces below. A concrete unit masonry wall has been erected at a former door opening, preventing access between the two spaces (refer to Figure 78).

FIGURE 84. The west gun emplacement at Battery Cullum.

The walls surrounding the east gun emplacement are typical of those previously described, with the exception of the east wall, which is associated with Battery Trueman (Figure 85). While similar in height, the west wall also has two sloping concrete piers that extend the full height of the wall.

FIGURE 85. A partial view of the east wall at the west gun emplacement at Battery Cullum.

North of the west gun emplacement, a steel staircase leads from the upper level walkway down to grade (refer to Figure 54).

West of the west gun emplacement, a door opening provides access from the upper level walkway to the interior rooms at the upper level associated with the gun emplacement. The upper level walkway continues past the interior spaces, connecting to Battery Sevier to the west.

The roof of Battery Cullum is constructed of concrete, and is generally flat and continuous across the length of the battery (Figure 86). The concrete is exposed, except at areas over the interior spaces. Over the interior spaces flanked by Battery Trueman, a bituminous roofing system with gravel has been applied over the top of the concrete roof (Figure 87). At the roof over the interior spaces associated with the west gun emplacement, remnants of a liquid applied membrane system are visible over the concrete roof (Figure 88).

FIGURE 86. A view of the concrete roof at Battery Cullum.

FIGURE 87. A bituminous roofing system is present at portions of the concrete roof of Battery Cullum.

FIGURE 88. A liquid applied membrane is present over interior spaces associated with the west gun emplacement at Battery Cullum.

Battery Sevier. The upper level of Battery Sevier can be accessed from a concrete stair at the west end of the battery (refer to Figure 60). The 3-foot-wide stair extends past the upper level to the roof of the battery. The upper level walkway leads from the stair past the interior spaces associated with the west gun emplacement at Battery Sevier.

The west gun emplacement is similar to the other gun emplacements at Battery Cullum-Sevier, though not a full semicircle in plan (Figure 89). Two stairs, one on each side of the south end, lead from the gun emplacement down into the associated interior spaces. A CMU wall has been erected at the former door openings, preventing access between the spaces (Figure 90). The gun emplacement is heavily vegetated.

FIGURE 89. The west gun emplacement at Battery Sevier.

FIGURE 90. The filled-in door opening between the west gun emplacement and associated interior spaces.

East of the west gun emplacement, the 1920s portion of the upper level walkway passes the harbor defense signal station. A door provides access from the upper level walkway into the second level of the signal station (refer to Figure 68). Additional interior spaces are located to the east, adjacent to the east gun emplacement at Battery Sevier.

The east gun emplacement at Battery Sevier is similar to the other gun emplacements at Battery Cullum-Sevier, and is a semicircle in plan (Figure 91). Two stairs, one on each side of the south end, lead from the gun emplacement down into the associated interior spaces. A concrete unit masonry wall has been erected at the former door openings, preventing access between the spaces (Figure 92). A steel ladder attached to the south wall leads to the roof level from the gun emplacement (refer to Figure 91). The gun emplacement is heavily vegetated.

FIGURE 91. A partial view of the east gun emplacement at Battery Sevier.

FIGURE 92. The filled-in door opening between the west gun emplacement and associated interior spaces.

The roof of Battery Sevier is concrete and is generally flat (Figure 93). The concrete is exposed except at areas over interior spaces, where remnants of a bituminous roofing system are visible (Figure 94 and Figure 95). In the area adjacent to the harbor defense signal station, three concrete posts are present, projecting from the roof in an east-west line (Figure 96). These were likely added during the construction of the signal station. A doorway on the west elevation of the harbor defense signal station provides access between the observation level and the roof (Figure 97).

An observation room at the west end of Battery Sevier can be accessed from the roof level (Figure 98).

FIGURE 93. The concrete roof at Battery Sevier.

FIGURE 94. Remnants of a bituminous roofing system are visible at the portions of the roof over interior spaces.

FIGURE 95. Remnants of a bituminous roofing system are visible at the portions of the roof over interior spaces.

FIGURE 96. Concrete posts at the roof level adjacent to the harbor defense signal station.

FIGURE 97. A doorway from the observation level of the harbor defense signal station provides access to the roof.

FIGURE 98. The observation room at the west end of Battery Sevier can be accessed from the roof level.

Exterior Condition Assessment

Concrete

- Cracking at concrete walls was observed throughout the exterior of the structure (Figure 99). The cracking is most prevalent at retaining walls that abut the earthen fill at the east, west, and south sides of the structure.

- Cracking at the roof level was observed, particularly in the areas that cover earthen fill along the south side of the battery (Figure 100).

- Portions of the concrete structure, particularly those associated with improvements made in the 1920s, are severely deteriorated (Figure 101).

- Steel reinforcing is exposed in areas where concrete was deteriorated and spalled (Figure 102). The exposed reinforcing is typically severely corroded.

- Spalled concrete at the underside of the upper level walkway was observed (Figure 103). Steel reinforcing at these areas is exposed (Figure 104). The exposed reinforcing is generally severely corroded.

- Concrete deterioration and spalling was observed throughout. This condition was particularly prevalent at window and door openings (Figure 105).

- The portions of the upper level walkway added in the 1920s have collapsed in several locations along the north side of the battery (Figure 106 and Figure 107).

- The storm protection hoods that previously covered the stairs leading from grade to the lower level have collapsed (Figure 108 and Figure 109).

- Staining was observed at several locations on the exterior of the battery (refer to Figure 71).

FIGURE 99. Cracking at the concrete wall adjacent to the east gun emplacement at Battery Cullum.

FIGURE 100. Cracking was observed throughout the roof level.

FIGURE 101. The concrete structure is severely deteriorated, particularly at the portions constructed in the 1920s.

FIGURE 102. Corroded steel reinforcing is exposed in areas where concrete has spalled.

FIGURE 103. Spalled concrete at the underside of the upper level walkway was observed.

FIGURE 104. Steel reinforcing at areas of concrete spalling is exposed.

FIGURE 105. Concrete deterioration was observed adjacent to door and window openings.

FIGURE 106. Portions of the upper level walkway added in the 1920s have collapsed in several locations.

- The bituminous roofing system applied to portions of the roof has failed throughout the battery (Figure 110 and Figure 111).

- Vegetation is present throughout the structure, particularly at the roof level and in the gun emplacements (Figure 112).

FIGURE 107. Portions of the upper level walkway added in the 1920s have collapsed in several locations.

FIGURE 108. Collapsed storm protection hoods.

FIGURE 109. Collapsed storm protection hoods.

FIGURE 110. The bituminous roofing system applied to portions of the roof are has failed.

FIGURE 111. Another example of the failure of the bituminous roofing system applied to portions of the roof.

FIGURE 112. Vegetation is present throughout the structure.

Steel

- Severe corrosion of the exposed steel elements was observed throughout the exterior of the structure. This includes structural steel members (Figure 113 and Figure 114), as well as window and door units (Figure 115).
- Cast iron stair treads at the stairs leading to the upper level are cracked in several locations (Figure 116).
- Steel railings are missing and damaged throughout (Figure 117). Damage includes corrosion, and bent and displaced rails (Figure 118).

FIGURE 113. Severe corrosion and degradation of the exposed steel elements was observed throughout the exterior of the structure.

FIGURE 114. Severe deterioration of the exposed steel elements was observed.

FIGURE 115. Steel windows and doors are severely corroded.

FIGURE 116. Cast iron stair treads are cracked at the stairs leading to the upper level.

FIGURE 117. Steel railings are damaged and missing throughout the battery.

FIGURE 118. Extant steel pipe railings were observed to be damaged and corroded.

Interior Description

The interior of Battery Cullum-Sevier is divided into four main sections, with each interior section associated with an adjacent gun emplacement. Typically, the interior spaces include two levels and consist of magazines and passages on the lower level, with a hoist room and truck room at the upper level. The interior spaces between the gun emplacements at Battery Cullum are slightly different due to the addition of Battery Trueman in the 1940s. Additional interior spaces are also present at the three-level harbor defense signal station between the gun emplacements at Battery Sevier.

Typical finishes throughout the interior include concrete floors and concrete walls and ceiling with board form finish (Figure 119). Steel I-beam reinforcement is present in the ceiling of the lower level rooms. At the shot magazines, which are typically located on the north side of the lower level, the walls are concrete unit masonry. A parge coating has been applied to the door jambs (Figure 120). The powder magazines, typically located in the southwest corner of the interior spaces, have masonry walls outboard of the concrete walls (Figure 121).

The interior spaces are typically accessed via concrete stairs that lead from grade into the lower level. Typically, there is no direct access between the lower level interior spaces and those on the upper levels, except at Battery Trueman and harbor defense signal station, which each have internal staircases.

FIGURE 119. View of a typical interior space on the interior of Battery Cullum-Sevier.

FIGURE 120. Concrete masonry unit walls and parged door jamb at shot magazine.

FIGURE 121. The powder magazines typically have masonry walls.

Battery Cullum. At the east edge of Battery Cullum, a closet is present in the retaining wall at grade level. The room was inaccessible; however, holes in the door opening allowed for a limited visual assessment. The small room has typical finishes (Figure 122).

FIGURE 122. A partial view of the closet at the east end of Battery Cullum.

The interior spaces associated with the east gun emplacement at Battery Cullum consist of a shot gallery, shot room, guard room directly north of the gun emplacement, as well as a passage leading to a shot magazine and powder magazine. The layout of these spaces is different than that of the other interior spaces at Battery Cullum-Sevier.

The shot gallery is located along the outside wall and is connected to the exterior with two door openings. The room has typical finishes, including steel I-beams visible at the ceiling (Figure 123). Steel hangers are present at the ceiling and connected to the steel I-beams.

East of the shot gallery is the shot room. The shot room, which provides access to the adjacent guard room, has typical finishes (Figure 124). A steel door separates the shot room from the stair leading up to the east gun emplacement. A second shot room is accessible from the stair. A steel door leads into the second shot room, which also has typical features (Figure 125).

FIGURE 123. The shot gallery adjacent to the east gun emplacement at Battery Cullum.

FIGURE 124. One of the shot rooms associated with the east gun emplacement at Battery Cullum.

FIGURE 125. A steel door leads into the second shot room at the east gun emplacement at Battery Cullum.

The guard room is accessed from the main shot room, and is located between the shot gallery to the north and the east gun emplacement to the south (Figure 126). The room, which is long and narrow, has typical finishes.

The main passage is at the interior spaces associated with the east gun emplacement, which is accessed via a concrete stair that leads into the space from grade. Upon entering the interior passage, the space connects to the shot gallery to the east, which is several steps above (Figure 127). The passage turns west, leading to the shot magazine and powder magazine, which are located to the south (Figure 128). The passage has typical finishes, with the concrete ceiling and walls painted. Opposite the shot magazine, a steel staircase leads to the upper level (Figure 129). A steel hoist is present opposite the powder magazine (Figure 130).

FIGURE 126. A view of the guard room associated with the east gun emplacement at Battery Cullum.

FIGURE 127. Several steps lead from the interior passage to the shot gallery adjacent to the east gun emplacement at Battery Cullum.

FIGURE 128. The passage leading to the magazines associated with the east gun emplacement at Battery Cullum.

FIGURE 129. A steel stair leading to the upper level at Battery Cullum.

FIGURE 130. A steel hoist on the lower level of Battery Cullum.

The shot magazine is located directly west of the east gun emplacement. The room is accessed through two steel double doors (refer to Figure 128). The room has typical finishes (Figure 131).

West of the shot magazine is the powder magazine (Figure 132). A single door made up of vertical steel bars is present at the entrance to the room.

The steel stair located in the lower level passage leads to an exterior door on the upper level (Figure 133). The other interior space associated with the east gun emplacement on the upper level was not accessible.

FIGURE 131. The shot magazine associated with the east gun emplacement at Battery Cullum.

FIGURE 132. The powder magazine associated with the east gun emplacement at Battery Cullum.

FIGURE 133. The top of the steel stair at the interior of Battery Cullum.

North of Battery Cullum is the multi-level plotting room and battery commander station. The first floor plotting room has typical features (Figure 134). At the ceiling, no steel reinforcing is visible, and concrete beams extend the width of the building from east to west. The upper levels of the structure are in deteriorated condition and were not accessible due to safety concerns.

FIGURE 134. The first floor plotting room at Battery Cullum.

The interior spaces associated with the west gun emplacement are laid out in a typical manner, with a shot gallery that is directly north of the gun emplacement, and a hoist room and passage accessible from the exterior concrete stair that leads to a shot magazine and powder magazine.

The shot gallery follows the shape of the gun emplacement, and is circular in plan. The room, which has typical finishes, is lined by five door openings along its north wall (Figure 135). Remnants of a steel rail are present at the ceiling (Figure 136). The west end of the shot gallery terminates at a stair leading to the west gun emplacement (Figure 137). A concrete wall was constructed at the east end closing off the stair that was formerly present on the east side of the gun emplacement, prior to the construction of Battery Trueman (Figure 138).

FIGURE 135. The shot gallery associated with the west gun emplacement at Battery Cullum.

FIGURE 136. Remnants of a steel rail at a ceiling in the shot gallery.

FIGURE 137. A stair leads up to the west gun emplacement from the west end of the shot gallery.

FIGURE 138. The concrete wall at the east end of the shot gallery blocks access to the west gun emplacement.

West of the gun emplacement, a large concrete stair leads from grade into the lower level hoist room (Figure 139). The room has typical finishes. A set of steel rails are present at the ceiling, leading to the adjacent shot magazine (Figure 140). An opening in the ceiling corresponds to the former location of the hoist (Figure 141).

The shot magazine is located west of the hoist room. A steel double door is present at the entrance. The room has concrete floors, while the walls and ceilings are concrete unit masonry (Figure 142). A steel rail is present at the ceiling.

FIGURE 139. The lower level hoist room associated with the west gun emplacement at Battery Cullum.

FIGURE 140. A set of steel rails at the ceiling of the lower level hoist room.

FIGURE 141. An opening in the ceiling of the lower level hoist room.

FIGURE 142. The shot magazine associated with the west gun emplacement at Battery Cullum.

A passage leads from the hoist room to the powder magazine (Figure 143). The room has typical finishes, with the concrete ceiling and walls painted. The powder magazine is accessed through two doors constructed of vertical steel bars. The room has typical features, including masonry walls outboard of the concrete walls (Figure 144). A series of piers at the center of the room supports a concrete beam above.

FIGURE 143. The passage leading from the lower hoist room to the powder magazine associated with the west gun emplacement of Battery Cullum.

FIGURE 144. The powder magazine associated with the west gun emplacement at Battery Cullum.

Opposite the powder magazine, a passageway to the gun emplacement has been walled off with concrete unit masonry. The floor of the passageway is several feet higher than the floor at the lower level.

The interior spaces associated with the west gun emplacement at the upper level were not accessible.

Battery Sevier. The interior spaces associated with the gun emplacements at the lower and upper level of Battery Sevier are generally typical in their layout and finishes, with a shot gallery that is directly north of the gun emplacement, and a hoist room and passage accessible from the exterior concrete stair that leads to a shot magazine and powder magazine.

The interior rooms associated with the west gun emplacement are situated at the west end of the battery. The shot gallery follows the shape of the gun emplacement, and is circular in plan. The room, which has typical finishes, is lined by five door openings along its north wall (Figure 145). Remnants of a steel rail are present at the ceiling (Figure 146). Both the west and east ends of the shot gallery terminate at a stair leading to the west gun emplacement (Figure 147).

FIGURE 145. The shot gallery associated with the west gun emplacement at Battery Sevier.

FIGURE 146. Remnants of a steel rail in the shot gallery.

FIGURE 147. The west end of the shot gallery which terminates at a stair leading to the west gun emplacement.

West of the gun emplacement, a large concrete stair leads from grade into the lower level hoist room (Figure 148). The room has typical finishes.

A set of steel rails are present at the ceiling, leading to the adjacent shot magazine (Figure 149). An opening in the ceiling corresponds to the location of the hoist, which is still in place (Figure 150 and Figure 151).

FIGURE 148. The lower level hoist room associated with the west gun emplacement.

FIGURE 149. A set of steel rails at the ceiling of the lower level hoist room.

FIGURE 150. An opening in the hoist room ceiling.

FIGURE 151. The steel hoist remains in place in the hoist room associated with the west gun emplacement of Battery Sevier.

The shot magazine is located west of the hoist room (Figure 152). A steel double door is present at the entrance. The room has concrete floors, with concrete unit masonry walls and ceilings. A steel rail is present at the ceiling.

FIGURE 152. The shot magazine associated with the west gun emplacement.

A passage leads from the hoist room south to the powder magazine (Figure 153). The room has typical finishes, with the concrete ceiling and walls painted. The powder magazine is accessed through two doors constructed of vertical steel bars (Figure 154). The room has typical features, including masonry walls outboard of the concrete walls (Figure 155). A series of piers at the center of the room supports a concrete beam above.

Opposite the powder magazine, a passageway leads toward the gun emplacement (Figure 156).

FIGURE 153. A passage leads from the hoist room to the powder magazine adjacent to the west gun emplacement.

FIGURE 154. Doors with vertical steel bars lead to the powder magazine.

FIGURE 155. Masonry lines the walls of the powder room associated with the west gun emplacement at Battery Sevier.

FIGURE 156. A passageway leads to the west gun emplacement at Battery Sevier.

The passage way has typical finishes. The door leading to the gun emplacement has been walled off with concrete unit masonry.

Two interior spaces associated with the west gun emplacement are located on the upper level: a truck room and the upper hoist room. Both rooms are accessible from the upper level walkway. Two sliding steel doors lead to the truck room, which has typical features, although no steel reinforcing is visible (Figure 157). The upper hoist room is accessed through a double steel door at the north wall. The space contains a passageway along the west side, with a second room in the southeast corner (Figure 158 and Figure 159). The hoist is situated in the northeast corner.

FIGURE 157. A partial view of the truck room at the west end of Battery Sevier.

FIGURE 158. The passageway in the upper hoist room.

FIGURE 159. The southeast room at the upper hoist room.

The three-level harbor defense signal station is situated between the east and west gun emplacements at Battery Sevier. The bunk room is located on the first floor of the signal station (Figure 160). A door and two window openings line the north wall, with a third window opening on the east wall. The room has typical finishes; however, no steel reinforcing is visible at the ceiling. A concrete stair with steel pipe railing is located in the southeast corner of the room (Figure 161). The south wall of the room is the original exterior wall of the battery.

FIGURE 160. The first floor bunk room at the harbor defense signal station.

FIGURE 161. A concrete stair leads from the bunk room up to the second level chart room.

The second level chart room has access to the upper level walkway to the north. The room has a door and two windows at the north wall, with two additional windows at the west, and another window at the east wall (Figure 162). The window frames remain in the opening, and are steel-framed casement units (Figure 163). The room has typical finishes, with concrete beams visible at the ceiling (Figure 164). Remnants of blue paint are visible at the walls, with yellow paint visible at the ceiling. A concrete stair with steel pipe railing leading to the third level is present at the northeast corner of the room (Figure 165).

The third-level observation room has typical finishes (Figure 166). A series of ribbon windows line the east, south, and west walls, with a door leading to the battery roof present at the north end of the west wall (Figure 167). A steel ladder leads to the roof of the observation room (refer to Figure 166).

FIGURE 162. The second level chart room.

FIGURE 163. A steel window at the chart room.

FIGURE 164. Concrete beams are present at the ceiling of the chart room.

FIGURE 165. A concrete stair leads to the third level observation room.

FIGURE 166. The third-level observation room. Note the steel ladder.

FIGURE 167. Ribbon windows line the east, south, and west walls.

East of the harbor defense signal station are the interior spaces associated with the east gun emplacement at Battery Sevier. The interior rooms are located west of the gun emplacement, with the shot gallery to the north.

The shot gallery follows the shape of the gun emplacement, and is circular in plan. The room, which has typical finishes, is lined by five door openings along its north wall (Figure 168). Remnants of a steel rail are present at the ceiling (Figure 169). Both the west and east ends of the shot gallery terminate at a stair leading to the east gun emplacement.

FIGURE 168. The shot gallery associated with the east gun emplacement at Battery Sevier.

FIGURE 169. Remnants of a steel rail along the ceiling of the shot gallery.

West of the gun emplacement, a large concrete stair leads from grade into the lower level hoist room (Figure 170). The room has typical finishes. A set of steel rails are present at the ceiling, leading to the adjacent shot magazine (Figure 171). An opening in the ceiling corresponds to the former location of the hoist (Figure 172).

The shot magazine is located west of the hoist room. A steel double door is present at the entrance (Figure 173). The door is currently inoperable, which prevented access to the shot magazine. Based on portions of the ceiling that were visible, the room likely has similar finishes to the other shot magazines (Figure 174).

FIGURE 170. The lower level hoist room adjacent to the east gun emplacement at Battery Sevier.

FIGURE 171. Steel rails at the ceiling of the lower hoist room.

FIGURE 172. An opening in the ceiling of the lower hoist room once associated with a hoist.

FIGURE 173. A set of steel double doors lead to the shot magazine.

FIGURE 174. View of the shot magazine ceiling. Note the doors were inoperable.

A passage leads from the hoist room south to the powder magazine (Figure 175). The room has typical finishes, with the concrete ceiling and walls painted. The powder magazine is accessed through two doors constructed of vertical steel bars (Figure 176). The room has typical features, including masonry walls outboard of the concrete walls (Figure 177). A series of piers at the center of the room supports a concrete beam above (Figure 178).

Opposite the powder magazine, a passageway leads toward the gun emplacement (Figure 179). The passageway has typical finishes. The door leading to the gun emplacement has been walled off with concrete masonry units. The floor of the passageway is several feet higher than the floor at the lower level.

FIGURE 175. The passage leading to the powder room associated with the east gun emplacement.

FIGURE 176. Doors with vertical steel bars lead to the powder magazine.

FIGURE 177. The powder room associated with the east gun emplacement at Battery Sevier.

FIGURE 178. A series of piers support concrete beams at the ceiling of the powder magazine.

FIGURE 179. A raised passage way leads toward the east gun emplacement.

The interior spaces associated with the east gun emplacement at the upper level were not accessible.

The one-story power station is located north of the battery, where Battery Cullum and Battery Sevier meet. The interior of the building is a single room, with exposed concrete floors, walls, and ceilings (Figure 180). Flat wood trim surrounds the window openings (Figure 181). Portions of the two-over-two wood double-hung window sash and frames remain (Figure 182). The slope of the gable roof is visible from the interior. Two raised platforms that previously housed engines are present at the floor.

FIGURE 180. The interior of the power station.

FIGURE 181. Flat wood trim surrounds the window openings at the power station.

FIGURE 182. Partial view of the wood window sash and frame that remain.

Interior Condition Assessment

- Severe corrosion was observed at exposed steel elements throughout the interior of the battery. This includes structural members as well as steel doors and rails (Figure 183 through Figure 186). In some locations, the steel exhibits severe corrosion and section loss (Figure 187 and Figure 188).
- Extensive graffiti was observed throughout the interior of the structure, primarily on the concrete walls (Figure 189).
- Cracking and deterioration of the concrete walls and finish was observed throughout, particularly at the shot galleries (Figure 190 through Figure 192).
- Spalled concrete was observed throughout the structure. Areas of note include the observation room at the harbor defense signal station (Figure 193); the interior of the power station, where steel reinforcing is exposed (Figure 194); and openings throughout the interior spaces (Figure 195 and Figure 196).
- Staining and biological growth was observed throughout the interior spaces (Figure 197 and Figure 198).

- Evidence of water infiltration was observed at the lower level interior spaces, particularly the powder magazines (Figure 199 and Figure 200). An active leak was observed in the passage associated with the east gun emplacement at Battery Sevier (Figure 201). Evidence of water infiltration includes ponding water on floors, biological growth on concrete surfaces, corrosion of steel, and damp walls, ceilings, and floors. Moisture is likely entering the battery in the form of rainwater through openings in the structure, deteriorated membranes on roof surfaces, and cracks in the concrete. Condensation on interior surfaces is also a likely contributing factor. (The drainage system present in the battery could not be assessed during this study because of access limitations to access and the presence of debris as well as ponded water; however, further assessment of drainage is recommended in the Treatment section of this report.)

FIGURE 183. Corrosion at the steel I-beam reinforcing at the ceiling.

FIGURE 184. The rails at the ceiling of the lower hoist rooms are corroded.

FIGURE 185. Corrosion was observed at the steel hoist at the east gun emplacement at Battery Cullum.

FIGURE 186. The doors throughout the interior of the structure are corroded.

FIGURE 187. Steel rails at the ceilings of the shot galleries are severely deteriorated.

FIGURE 188. A deteriorated steel rail at the ceiling of a shot gallery.

FIGURE 189. Graffiti was observed throughout the interior of the structure.

FIGURE 190. Cracked concrete at the shot gallery interior.

FIGURE 191. Cracked concrete walls at the interior of the shot gallery.

FIGURE 192. Deteriorated concrete walls at the interior of the shot gallery.

FIGURE 193. Spalled concrete at the observation room at the third floor of the harbor defense signal station.

FIGURE 194. Spalled concrete at the interior of the power station.

FIGURE 195. Spalled concrete at a ceiling opening.

FIGURE 196. Spalled concrete adjacent to a door opening.

FIGURE 197. Staining and biological growth along the interior walls.

FIGURE 198. Biological growth at the shot gallery walls.

FIGURE 199. Signs of water infiltration were observed at the powder magazines.

FIGURE 200. Signs of water infiltration observed at the powder magazines.

FIGURE 201. An active leak was observed in the passage associated with the east gun emplacement at Battery Sevier.

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.[150]

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
>
> b. A building or structure removed from its original location but which is primarily significant for architectural value, or which is the surviving

150. National Park Service, "National Register of Historic Places," accessed February 28, 2018, http://www.nps.gov/nr/.

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.[151]

National Register Status of Battery Cullum-Sevier

Battery Cullum-Sevier is a contributing structure in the National Register-listed Pensacola Harbor Defense Project historic district.[152] Battery Cullum-Sevier is significant for its association with Spanish-American War, World War I, and World War II-era activities conducted by the US Army to protect the strategically important Pensacola Harbor.

The Pensacola Harbor Defense Project historic district 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.

Under National Register Criterion A, Battery Cullum-Sevier 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 evolving American coastal defense technology. The distinctive features of the battery, such as the concrete structure, gun emplacements, earth sheltering, and interior spaces, reflect its particular function. Therefore, the design of the battery is significant and representative of the military technology of the Endicott period and the World War I and World War II eras.

As part of the Pensacola Harbor Defense Project historic district, Battery Cullum-Sevier illustrates the evolution of coastal defenses in the United States. Although portions of Battery Cullum-Sevier are in poor condition, the battery overall remains a significant example of Endicott period construction. Together with other batteries at Fort Pickens, Battery Cullum-Sevier also illustrates how defensive structures of this era were adapted to meet changing technologies.

Despite the poor condition of some portions of the structure, Battery Cullum-Sevier remains more intact than many other Endicott System structures. For example, most of the Endicott-era batteries at Fort Screven at Tybee Island near Savannah, Georgia—a similar complex of batteries of this period—have been extensively altered or have fallen into ruin. One battery that remains relatively intact has been repurposed for use as a museum, while the remains of others have been adapted to

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

152. *Pensacola Harbor Defense Project National Register Nomination.*

serve as foundations for new private residential structures. Battery Cullum-Sevier retains the integrity to convey its historic associations. Further, the significance of this battery and other individual resources of the historic district is enhanced by their importance as a collection of structures.

Period of Significance

The period of significance for Battery Cullum-Sevier begins with the start of construction of the battery in 1896 and concludes with deactivation of Fort Pickens, including Battery Cullum-Sevier, and decommissioning of all military facilities on Santa Rosa Island in 1947.

Since the end of US Army use of the site, Battery Cullum-Sevier has been vacant, and portions of the structure are currently in severely deteriorated condition. The battery is interpreted as part of the military history of the site, from its original construction through modifications in the 1920s and 1940s, and through the Spanish-American War, World War I, and World War II. As part of western Santa Rosa Island defense installations, Battery Cullum-Sevier was part of the Florida State Park system from 1949 to 1972, and of 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.[153]

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

- General layout, plan, and orientation toward the Gulf of Mexico
- Sand fill and earth sheltering
- Concrete structure (exterior and interior), including walls, structural members, stairs, and landings
- Concrete site features, including but not limited to tapered columns, low wall, and stairs north of battery
- Gun emplacements
- Configuration of window and door openings
- Extant steel doors (including doors composed of steel bars), and steel windows
- Extant steel stairs and railings
- Masonry walls in the powder magazines associated with the gun emplacements
- Concrete parge coating on walls of the shot magazines scored to look like tile
- Surviving machinery remnants, e.g., hoists

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. . . .

153. 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).

> 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.[154]

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."[155]

The historic integrity of Battery Cullum-Sevier 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 integrity of location. The location of the battery has remained unchanged since construction began in 1896.

Integrity of Design. The battery retains integrity of design to the World War II era. Although modified in the 1920s and 1940s from its original design, the original footprint and layout survive. Some of the design modifications are significant in their own right as an example of adapting earlier installations to meet new defensive needs during World War II.

Integrity of Setting. The battery retains 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 sand berms and vegetation; 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. In general, the setting of the battery is little changed from the 1940s.

Integrity of Materials and Workmanship. The battery retains integrity of materials and workmanship. Integrity is diminished by the significantly deteriorated condition of portions of the structure's primary materials, concrete and steel.

Integrity of Feeling. Battery Cullum-Sevier retains integrity of feeling. The battery was built as a utilitarian structure to serve specific 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 feeling is slightly diminished by the deteriorated condition of portions of the structure. The presence of the non-historic chain link fence that currently surrounds the battery also slightly diminishes integrity of feeling.

Integrity of Association. Battery Cullum-Sevier retains 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.

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

Treatment and Use

Requirements for Treatment and Use

Battery Cullum-Sevier is a contributing structure in the National Register nomination completed for the Pensacola Harbor Defense Project.[156] Battery Cullum-Sevier is significant for its association with the Spanish-American War, World War I, and World War II-era activities conducted by the US Army to protect the strategically important Pensacola Harbor. It retains integrity to convey its historic associations. Therefore, treatment and use of Battery Cullum-Sevier 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 Cullum-Sevier 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.

From original construction through 1947, Battery Cullum-Sevier served as part of the active military installation of Fort Pickens. When Fort Pickens was decommissioned in 1947, the battery was taken out of service. It is currently closed to the public, although interpreted by the National Park Service. The battery is in fair to poor condition overall.

The administratively determined management category for Battery Cullum-Sevier is *Must be Preserved and Maintained*.[157] The ultimate treatment is *Preservation*, as further discussed below.

Laws, Regulations, and Functional Requirements

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

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

Treatment of the historic structure is also to be guided by the following:

- Secretary of Interior's Standards for the Treatment of Historic Properties
- Architectural Barriers Act Accessibility Standards (ABAAS)
- *International Building Code* (IBC), 2018
- *International Existing Building Code* (IEBC), 2018
- Florida Building Code, 2017 (which references the 2015 IBC and 2015 IEBC)

156. *Pensacola Harbor Defense Project National Register Nomination*.
157. Correspondence with NPS SERO, August 2018.

- International Plumbing Code (IPC)
- National Electrical Safety Code (NESC)
- National Fire Protection Association (NFPA) 101: Life Safety Code (LSC), 2015 and NFPA 1 Uniform Fire Code
- NPS Guiding Principles of Sustainable Design

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

The National Park Service is self-regulating in terms of enacting and enforcing building code standards. Gulf Islands National Seashore is therefore not legally subject to local or state building code requirements. When undertaking repairs to buildings and structures, the National Park Service endeavors to have the work comply with model building code standards. At this time, the 2018 IBC with appendices is the model building code used by the National Park Service and is referenced by the NPS Denver Service Center for design and construction. The NPS Denver Service center also references the 2018 IEBC, with appendices and Resource A.

The 2018 IEBC includes the following statements in Section 507, Historic Buildings:

> 507.1 Historic buildings. The provisions of this code that require improvements relative to a building's existing condition or, in the case of *repairs*, that require improvements relative to a building's pre-damage condition, shall not be mandatory for *historic buildings* unless specifically required by this section.
>
> 507.2 Life safety hazards. The provisions of this code shall apply to *historic buildings* judged by the building official to constitute a distinct life safety hazard.
>
> 507.3 Flood hazard areas. Within flood *hazard areas* established in accordance with Section 1612.3 of the *International Building Code*, or Section R322 of the *International Residential Code*, as applicable, where the work proposed constitutes *substantial improvement*, the building shall be brought into compliance with Section 1612 of the *International Building Code*, or Section R322 of the *International Residential Code*, as applicable:
>
> Exception: *Historic buildings* need not be brought into compliance that are:
>
> 1. Listed or preliminarily determined to be eligible for listing in the National Register of Historic Places;
>
> 2. Determined by the Secretary of the US Department of Interior as **contributing** to the historical significance of a registered historic district or a district preliminarily determined to qualify as an historic district; or
>
> 3. Designated as historic under a state or local historic preservation program that is approved by the Department of Interior.
>
> 507.4 Structural. Historic buildings shall comply with the applicable structural provisions in this chapter.
>
> Exceptions:
>
> 1. The *code official* shall be authorized to accept existing floors and existing live loads and to approve operational controls that limit the live load on any floor.
>
> 2. Repair of *substantial structural damage* is not required to comply with Sections 405.2.3, and 405.2.4. *Substantial structural damage* shall be repaired in accordance with Section 405.2.1.[158]

Since Battery Cullum-Sevier 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.

158. International Code Council, Inc., *International Existing Building Code 2018* (Country Club Hills, Illinois: International Code Council, 2018).

Although Battery Cullum-Sevier is sufficiently intact to convey its historic character, the battery requires repairs and mitigation to address structural conditions and adverse conditions that are potential hazards to safety and life, in order to make the structure safely accessible. At many locations the structure is severely deteriorated, most notably at the 1920s walkways, which are in a state of partial collapse. Areas of spalled concrete and corroded steel also present potentially hazardous conditions. The hazardous conditions requiring repair before the structure can be safely accessed are discussed in the specific recommendations presented below.

Current Planning Efforts

Future use of Battery Cullum-Sevier is anticipated to be similar to its current function—a historic structure interpreted for visitors. The park plans to provide visitor access to selected portions of the battery in the future.

Despite deterioration, the distinctive materials, features, and spaces of the battery are essentially intact, and the structure retains its historic integrity. Repair of original materials and character-defining features is practical and appropriate.

The Pensacola Bay ferry and shuttle transportation system recently implemented at Fort Pickens to connect the site to nearby Pensacola and Pensacola Beach, does not directly affect the physical resources of Battery Cullum-Sevier.[159]

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. The limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project. However, new exterior additions are not within the scope of this treatment. The Standards for Preservation require retention of the greatest amount of historic fabric along with the building's historic form.

Rehabilitation is defined as the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values. The Rehabilitation Standards acknowledge the need to alter or add to a historic building to meet continuing or new uses while retaining the building's historic character.

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

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

159. *Pensacola Bay Ferry Service – Ferry and Shuttle Transportation Feasibility Study*, 100 percent draft, June 2014.

vanished or non-surviving building with new materials, primarily for interpretive purposes.[160]

Of the four treatment approaches, *preservation,* which involves sustaining the building in its existing form, is most appropriate for Battery Cullum-Sevier. Within this overarching approach, preservation of the battery would include stabilization and repair of the concrete and steel structure, retaining historic fabric where not too severely deteriorated for repair (and replacing in kind if needed), as well as preservation of the battery for continued interpretation by the park. The treatment *preservation* permits selective restoration of character-defining elements where missing or altered, if appropriate archival documentation is available. Such selective restoration measures can be considered in the future as the park's program and budget permit. In addition, *preservation* permits minor alterations. (Refer to the Developmental History and the Significance and Integrity chapters for further discussion of character-defining features.)

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 Cullum-Sevier. All treatment guidelines and recommendations were developed in accordance with the Secretary of Interior's Standards for Preservation.

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

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

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

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

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

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

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

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

8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.[161]

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 Preservation.

160. Grimmer, 2017.

161. Ibid.

- 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 National Park Service 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 Cullum-Sevier and the adjacent landscape.
- Retain and maintain the historic patterns of spatial organization that include the circulation routes that provide access to Battery Cullum-Sevier.
- Avoid constructing new features that interfere with views of the battery.
- Continue to interpret Battery Cullum-Sevier in relation to historic military structures at the site.

Safety Measures and Visitor Access

In its current condition, Battery Cullum-Sevier presents safety hazards to persons accessing the structure. Until stabilization repairs are undertaken, public access to any portion of the battery should be prevented, and park personnel should only access the structure with extreme care due to the extensive deterioration present.

The park has articulated several goals for the structure, including a near-term goal of providing access to selected portions of the battery for interpretation to visitors. Consideration will be given to providing visitor access to all (or most) of the battery at some time in the future, as well. Also of concern is the current deteriorated appearance of the battery—with its collapsed walkways, spalled concrete, and corroded steel—enclosed within the chain link fence that presently surrounds the structure. The battery and its surrounding fence are within view as visitors enter the site via Fort Pickens Road. The park has noted a specific goal of removing the chain-link fence so that visitors can see and experience the battery, and expanding interpretation to reflect access to the battery itself.[162]

Once stabilization measures are implemented and conditions of concern addressed to provide for safe visitor access to a selected portion of the battery, it will be possible to remove the perimeter fence in some locations; if more extensive repairs are undertaken, the entire perimeter fence can be removed. Barriers can then also be installed within the battery to limit visitor access to a selected part of the battery.

Immediate structural issues should be addressed by selective removal, access restrictions, and shoring (e.g., partially collapsed walkways). After immediate structural issues are addressed, consideration should be given to safety issues related to future visitor access to selected areas of the battery. Existing conditions, such as railings at stairs, unprotected drop-offs, etc., do not meet code-mandated requirements for non-historic or

162. The authors participated in a conference call with NPS SERO and park personnel on August 27, 2018, during which park goals and treatment issues were discussed. Outcomes of that discussion have been incorporated in this section of the HSR.

new construction. However, the National Park Service is not required by code to implement modifications to address these conditions in historic structures such as Battery Cullum-Sevier unless the National Park Service itself determines that such changes are warranted and appropriate. Chapter 12–Historic Buildings of the 2012 *International Existing Building Code* provides general guidance on repair, alteration, relocation, and change of occupancy of historic structures. The code generally defers to the code official—in this case, the National Park Service—to determine whether specific conditions are acceptable or are considered to require modification. Consistent with our experience with similar structures at other National Park sites, including other fortifications within the NPS Southeast Region, we anticipate that code-related changes that are physically or visually intrusive to the historic structure will not be made. However, based on discussion with NPS SERO and park personnel, we understand that the use of railings will be considered as part of future repairs, to permit visitor access to selected areas of the battery that would otherwise not be safely accessible.[163]

Based on the findings of this assessment, and assuming removal/shoring of collapsed walkways and other structural stabilization and repair, areas of the battery that appear most appropriate for near-term visitor access include the following:

- The east end of Battery Cullum and a portion of Battery Trueman, at the east gun emplacement
- The power station located to the north, where Battery Cullum and Battery Sevier meet
- The roof level at the west end of Battery Sevier, and the multi-level harbor defense system station

These areas of the battery are shown in Figure 202, and are suggested here based on feasibility given existing conditions, significance, and interpretive potential. Two approaches are illustrated to stabilization/repair and visitor access are illustrated: the upper drawing indicates access following minimal intervention, and the lower drawing indicates access following more extensive intervention. The minimal intervention drawing also indicates suggested locations for railings within the battery for visitor safety, as well as a new perimeter fence. The fence would restrict visitors to only those areas of the battery determined to be safely accessible after stabilization measures and initial repairs are completed. It should be visually unobtrusive and sufficiently transparent to allow views of the battery, as well as views from the battery into the surrounding landscape. New fencing should also be compatible with the historic setting and cultural landscape.

In terms of prioritization of recommended stabilization work, debris from collapsed areas throughout the structure should be removed as an initial step. This will remove material that is not suitable for repair and will permit further assessment of existing conditions in the collapsed areas. Material in compromised areas in Battery Cullum that are outside the suggested location of the perimeter fence should also be removed. In general, compromised areas inside the suggested location of the perimeter fence that do not pose a risk to visitors should be shored whenever possible. It is possible that a partial collapse may still occur in these shored areas; the partial collapses, however, would not affect visitors outside the suggested location of the perimeter fence.

Access to additional areas can be considered when additional portions of the battery are stabilized and preserved. The lower drawing in Figure 202 indicates more extensive treatment to stabilize and restore larger areas of the battery than illustrated in the previous drawing. This additional work would allow visitors to access much of the battery, and would also permit removal of the perimeter fence. Similar to the approach described above for more limited intervention, railings would be added to selected locations within the battery for visitor safety.

163. Conference call with NPS SERO and park personnel, August 27, 2018.

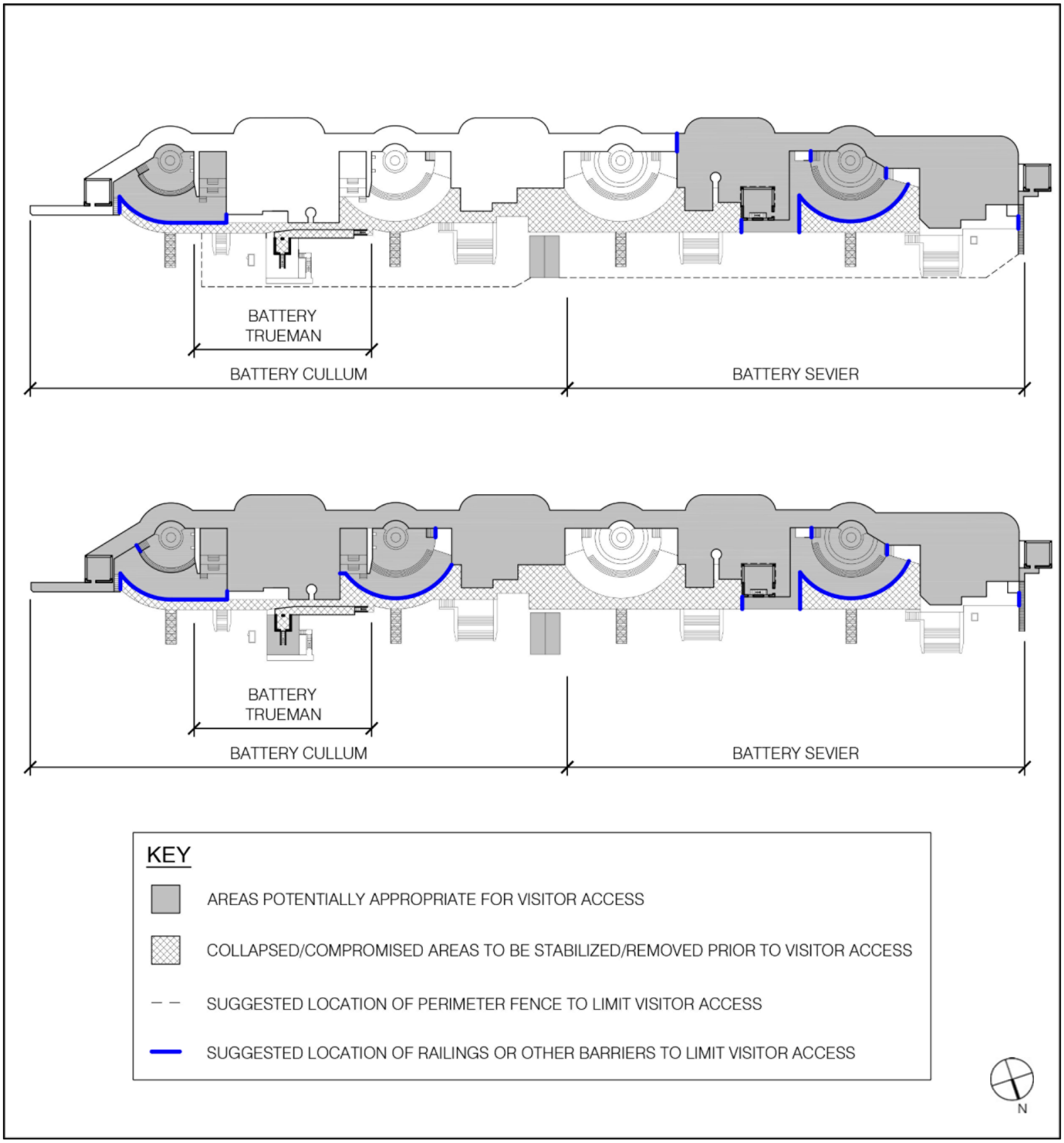

FIGURE 202. Diagram showing portions of Battery Cullum-Sevier potentially appropriate for visitor access following limited intervention (top) and following more extensive intervention (bottom).

Many areas of the 1920s-era elevated walkway in Battery Cullum are severely deteriorated and where collapsed or in a state of imminent collapse, the walkway should be removed. Assessment conducted for this study indicates that these areas of 1920s-era walkway are too severely deteriorated to be repaired; however, it may be possible (pending further investigation) to stabilize portions of the walkway that have not collapsed. Further study is needed to confirm whether it is feasible to repair surviving severely deteriorated portions of the walkway. Where the walkway is removed, it should be documented through annotations on drawings, photographs, and retrieval of materials samples for archival purposes.

Consideration can also be given to reconstruction of the 1920s-era walkway in future, based on available archival drawings and photographic documentation. As noted, the 1920s construction is much more severely deteriorated than older and new construction at Battery Cullum-Sevier, primarily due to the character of the concrete and reinforcement. Should the walkway be reconstructed, the new walkway would match the appearance of the historic walkway but would be constructed of properly designed reinforced concrete with protected steel, air-entrained concrete, and adequate cover for embedded reinforcement, to provide for durability and maintainability of the structure.

Conceptual repairs associated with the different construction materials found within the batteries are described in the sections that follow. All repairs should be designed and implemented in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties.

Concrete

- Recommended concrete repairs are described below. Properly implemented concrete repairs, designed with consideration of the character of existing construction as well as the harsh marine environment, would be expected to have good long-term serviceability. For example, recommended treatment includes proper preparation of exposed steel and coating with a protective system appropriate to existing conditions; the use of formed concrete repairs rather than trowel applied patches at spalls; and other measures to provide durable repairs that are appropriate to the historic character of the structure. In addition, repair recommendations take into consideration future maintainability of the repairs and the overall structure.[164] Vegetation growth should be removed where present on concrete surfaces, as existing vegetation can hold moisture against the concrete. Removal and possible replacement (e.g., with coastal grasses) can be considered for cover over the battery and berm, and should be based on further assessment of landscape features.
- Areas with evidence of moisture movement through cracks or moisture staining should be further investigated to determine source of moisture and required 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. Cleaners containing strong acids (hydrofluoric acid, hydrochloric acid, ammonium bifluoride) should not be used. (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

164. Conference call with NPS SERO and park personnel, August 27, 2018. A structural assessment of the battery, including laboratory materials studies, is being conducted in 2018–2019, which will permit further development and refinement of treatment recommendations.

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 has occurred, the structure 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 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 inch 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. (Note that abrasive blasting, while not appropriate for use on historic masonry, is considered appropriate for preparation of steel in historic structures as preparation for recoating. This preparation is needed to provide for removal of corrosion product and proper adhesion of the prime coat. Within the concrete repair area, roughening the surface permits bond of the patch material to the substrate. Concrete outside the patch area should be protected during this preparation.)
    - 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.
    - Consideration should be given to the corrosion cell that is created at the transition of existing chloride-laden concrete and relatively chloride-free repair concrete. This corrosion cell, referred to as anode ring effect, can result in premature failure of repairs. Depending on the chloride content of the existing concrete, measures such as localized cathodic protection could be implemented to address this issue.
    - 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.

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

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

- Cracks that need to accommodate movement should be identified through monitoring. In addition, these cracks should be reviewed to confirm that moisture is not entering the structure at these locations. Moving cracks should be repaired by installation of sealant. Cementitious crack repairs (i.e., concrete or mortar) will not accommodate movement; sealant repairs will accommodate movement at cracks, but are more difficult to make visually unobtrusive. Careful color matching and proper installation will help conceal these repairs. Techniques to make the sealant less visually apparent, such as broadcasting sand into the sealant before curing, should be evaluated through trial repairs.

- Localized spalls were observed in the cementitious parge coat in the magazine, which has been scored to resemble tile. The spalled areas of parge coat should be carefully removed and replaced with a compatible render, matching the original surface appearance in color, texture, and finish. The repairs should then be scored to match the original pattern. Very fine crazing and hairline cracks may be left unrepaired.

- Painted signage was not observed in areas of the battery that could be safely accessed for this assessment. During future stabilization and repairs, if painted signage is observed it should be carefully documented, retained, and protected during repairs. Preservation measures should be determined based on specific conditions observed.

- Consideration could be given to removal of deteriorated bituminous waterproofing at roof areas, and installation of new bituminous waterproofing to protect the concrete below. The bituminous membrane should be covered with gravel, which will protect the waterproofing from ultraviolet (UV) exposure. (Installation of a cementitious parge coat would not be expected to provide long-term waterproofing on the horizontal roof surfaces due to anticipated cracking over time. Other modern waterproofing membrane types are not considered suitable for use on the historic structure, as they would be visually intrusive through color, texture, additional thickness, or termination details require for performance reasons.)

- A site drainage plan should be developed in consideration of the suggested location of the fence. Upon removal of collapsed and compromised areas of the structure, local drainage issues for the structure and the site should be evaluated and addressed as necessary. Evaluation of drainage issues should include review of existing drains and consideration of areas of ponding water observed after heavy rainfall.

Clear, Penetrating Surface Sealers. The use of a surface treatment to provide protection against moisture penetration into the concrete overall (e.g., a silane-based treatment) does not appear to be warranted, given the very thick concrete of the structure and the fact that the battery is partially enclosed and covered by berms. Use of clear, penetrating sealers is generally avoided on historic concrete surfaces unless explicitly needed to improve resistance to moisture penetration, primarily because these penetrating sealers are a non-reversible treatment—although the sealers do lose effectiveness over time. (See further discussion of clear sealers used in graffiti mitigation, below.)

Graffiti Mitigation. Graffiti can occur in many forms, with the most typical being applied coatings such as ink, indelible marker, wax markings, and paint. Graffiti can also occur in the form of abrasive markings.

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

The selection of a cleaning method to remove graffiti must take into consideration both the type of graffiti to be removed and the nature and condition of the substrate. In regard to removal of painted graffiti, the sooner a cleaning product can be applied, the more likely it is to be successful.[165] As with other treatments, the graffiti removal method selected should be based on successful trials and should follow the Secretary of the Interior's Standards for the Treatment of Historic Properties, which states that the gentlest most effective cleaning methods should be selected. Methods and materials that result in damage to the substrate or that are harmful to humans, animals, and the environment should not be used.

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

Overpainting—covering the graffiti with paint instead of removing it—may be appropriate for substrates that were painted historically; however, this treatment is not an appropriate means to address graffiti on a historic structure such as Battery Cullum-Sevier, where the concrete was not originally painted.

Various clear film-forming protective coatings (also known as sacrificial or barrier coatings) have been developed in an attempt to protect the underlying substrate from the graffiti application, and facilitate the removal of the graffiti. In accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties, treatments applied to historic buildings 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 the battery remains limited, the use of clear protective treatments for this purpose is likely not warranted.

Once the battery is made accessible to visitor use, it is hoped that visitors respect the historic structure. However, should graffiti become an ongoing problem, prompt removal of graffiti (should it occur) will improve the effectiveness of removal efforts and may also tend to discourage repetition of this vandalism.

Steel

The steel elements of Battery Cullum-Sevier, include steel I-beams embedded in concrete ceilings, doors and door frames, steel reinforcement in concrete (discussed above), and other steel accessories and fixtures. Steel elements

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165. 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 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).

of the battery are vulnerable to corrosion due to the coastal marine environment. As such, the battery exposed to chloride salts in the air that are deposited on the steel and coated steel surfaces and have the potential to accelerate corrosion.

Steel repairs should be designed and implemented in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. Recommended steel repairs include the following:

- The existing surface coating and rust scale should be removed to bare steel using abrasive blasting in preparation for a new coating system. (Note that abrasive blasting, while not appropriate for use on historic masonry, is considered appropriate for preparation of steel in historic structures prior to priming and coating. This preparation is needed to provide for removal of corrosion product and proper adhesion of the prime coat.) Containment will be necessary during the surface coating removal and preparation process and new coating application. Prior to paint removal, the existing coatings should be sampled to check for potentially hazardous materials such as existing lead-containing paints. If hazardous materials are present, it may be necessary to first use chemical paint strippers and/or water blasting to remove the coating, followed by abrasive blasting to prepare the steel surface to receive the new coating system.
- The steel surfaces should be pressure washed to remove chloride contamination.
- Where previously coated, exposed steel surfaces should be prepared and coated with a zinc-rich primer and high performance coating system. Mock-ups of coating removal, surface preparation, and application of the new coating system should be performed to evaluate work processes and to serve as a standard for the overall work.
- Where severely deteriorated, steel structural elements will likely require replacement. The replacement elements should be able to withstand the aggressive exposure conditions with respect to corrosion. This should be achieved by material selection and/or corrosion mitigation measures. Replacement materials could include stainless steel or anodized aluminum. Existing elements should be coated with protective coating systems suitable for marine exposure.

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

Concrete Unit Masonry

The concrete unit masonry walls of the magazines are generally in fair condition. In the future, consideration could be given to cleaning the concrete unit masonry if desired for aesthetic reasons (see discussion of cleaning for concrete, above), and repointing open joints with a compatible mortar similar to the existing historic mortar. Deteriorated areas of the parge coat provided at door jambs in concrete unit masonry walls should also be repaired (see discussion of concrete repairs, above.)

Wood

There are few wood elements remaining as part of Battery Cullum-Sevier. Existing wood elements include window sash and frames, which are deteriorated or missing in some locations. Consideration should be given to retaining and repairing the wood elements where possible. At locations of missing wood components, selective replacement should be implemented using similar wood to replicate the historic appearance of the window units.

Recommendations for Further Research

- Consideration should be given to preparing a cultural landscape study for Battery Cullum-Sevier, its immediate environs, and the area encompassed by viewsheds from and toward Battery Cullum-Sevier. The study should include the beach and pond, as well as other site features. Information developed for a cultural landscape study would inform future planning and treatment for the site.

Alternately, consideration can be given to 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.

Development of a cultural landscape study should be conducted in coordination with planning to address climate change. For example, approaches to protect of Battery Cullum-Sevier and other site resources against storm surges and flooding should be considered in the context of assessment and treatment of cultural as well as natural resources. (See further discussion below.)

Resilience to Natural Hazards

Battery Cullum-Sevier is part of the Pensacola Harbor Defense Project, located on western Santa Rosa Island and part of the Gulf Islands National Seashore. The Gulf Islands are narrow, low-lying barrier islands that extend from Florida to Mississippi. Santa Rosa Island, located south of Pensacola, Florida, is separated from the mainland by Santa Rosa Sound; its southern shoreline borders the Gulf of Mexico.

Throughout recorded history, the Gulf Islands have been vulnerable to hurricanes and storms, with reoccurring damage to natural resources and infrastructure. Notably, the hurricane of 1906, which made landfall in Pascagoula, Mississippi, on September 27 with 95 mile per hour winds, created substantial damage in Pensacola and at Fort Pickens. Correspondence from the Secretary of War noted a storm surge of 10 feet above normal and damage to "most of the batteries, wharf, and fire-control stations." Damage was reported to Batteries Cullum, Van Swearingen, Pensacola, Payne, Trueman, Slemmer, Center, Cooper, and Worth, as well as to the wharf, boathouse, railroad, loading room, torpedo storehouse, and lighting and power infrastructure. Total costs of the damage were initially estimated at $87,255. Most of the magazines in the batteries were flooded, leading Captain Cavanaugh, District Engineer, to request an additional $22,100 in funding to construct retaining walls to enclose the magazines of many of the batteries.[166]

On December 22, 1906, Secretary of War William Howard Taft noted ". . . the urgent matter of building a sea wall of sufficient height and width to sustain impacts from events of this nature and protect lives within the fort."[167] In response to the effects of the 1906 hurricane, the sea wall surrounding Fort Pickens was constructed in 1910.

Fort Pickens was again damaged during the cyclone of October 18, 1916, while repairs to damage from the 1906 hurricane were still in progress.[168] The fort and its batteries and infrastructure were also damaged during the hurricane of September 28, 1917, and resultant storm surge.[169] Damage and flooding once again occurred during the hurricane of September 20, 1926, after which the sea wall was noted to have served "admirably" as a "buffer against the force of the waves."[170] However, although the sea wall afforded protection to the fortifications, storms surges overtopped the wall, leaving the areas within the wall flooded for extended periods. After the hurricane of September 1926, a fire engine was brought from the mainland to Fort Pickens to help drain the flooded magazines.[171]

In recent decades, significant damage has occurred to Fort Pickens and Santa Rosa Island during

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166. Bearss, *Pensacola Harbor Defense Project,* 230.
167 "1906 Hurricane," Digital Humanities Lab, Department of History, University of West Florida, accessed February 2018, https://archives.uwf.edu/Public DH/?page_id=1193. The narrative cites, L.M. Shaw, "Sea walls at Pensacola Harbor, Florida. Letter from the Secretary of the Treasury, transmitting a copy of a communication from the Secretary of War submitting an estimate of appropriations for defenses at Pensacola." January 3, 1907. Serial Set Volume Number 5154, Session Volume Number 51. US Congressional Serial Set 59th Congress House, 2nd Session. H. Document 360. US Department of the Treasury, accessed April 10, 2017.
168. Bearss, *Pensacola Harbor Defense Project,* 249.
169. Ibid.
170. Ibid., 251.
171. Ibid.

several hurricanes. Hurricane Ivan, a Category 3 storm, made landfall at Gulf Shores, Alabama, on September 16, 2004. The storm formed a breach across Santa Rosa Island, dividing the road leading to Fort Pickens.[172] Five miles of park road and dunes on western Santa Rosa Island between Pensacola Beach and Fort Pickens were destroyed. Soon after repairs were completed, a portion of the park road was damaged during Tropical Storm Arlene on June 11, 2005. On July 10, 2005, Hurricane Dennis made landfall at Navarre Beach on Santa Rosa Island as a Category 3 storm. The storm surge was more than 10 feet in height, resulting in overwash of sand from the Gulf of Mexico across the island, and into Santa Rosa Sound, with associated beach and dune erosion.[173] Hurricane Dennis destroyed much of the new park road, covering the roadway with sand overwash.

During the hurricanes that occurred in 2005, the road to Fort Pickens was particularly vulnerable because of erosion of the protective barrier dunes during the past several decades, beginning with Hurricane Frederic in 1979. Although no dune restoration was conducted, the dunes naturally recovered over several years; however, Hurricane Opal completely destroyed the dunes as well as the park road in 1995. After another period of natural recovery, the low barrier dunes were again destroyed by Hurricane Ivan. Without the protective dunes in place, overwash of sand and water flowed across the island during the storms, covering or destroying the roadway.

172. US Geological Survey, St. Petersburg Coastal and Marine Science Center, *Coastal Change Hazards: Hurricanes and Extreme Storms, Hurricane Ivan*, accessed February 2018, https://coastal.er.usgs.gov/hurricanes/ivan/photos/florida.html.
173. Florida Department of Environmental Protections, Division of Water Resource Management, Bureau of Beaches and Coastal Systems, "Hurricane Dennis & Hurricane Katrina: Final Report on 205 Hurricane Season Impacts to Northwest Florida," April 2006, 20–22, accessed February 2018, https://floridadep.gov/sites/default/files/HurricaneDennis-Hurricane Katrina.pdf.

Further damage occurred during Hurricane Wilma, a Category 5 hurricane in October 2005, a season that also saw Hurricane Katrina and several other major storms.

Although less severely damaged than other parks in Florida and the Caribbean, Gulf Islands National Seashore was affected by Hurricane Irma, a Category 4 hurricane in September 2017. In October of the same year, the road leading to Fort Pickens was damaged during Hurricane Nate, with areas covered by overwash, sand and flooding, and debris, as well as sections of collapsed paving. The road was closed through December 2017 for repairs.

Increasingly frequent strong storms and heavy rainfall have been noted for several years in the southeastern United States, with particularly severe impacts on coastal areas such as Gulf Islands National Seashore. Periodic strong storms and hurricanes will continue to damage and possibly destroy the road along the island, unless a barrier beach and dune system is restored.[174] Repair and reconstruction of the road after severe weather events is funded by the Federal Highway Administration (FHWA) and Congress, and in the future it is possible the federal government may determine not to rebuild the road should it be severely damaged by another storm. The park's General Management Plan notes:

> The intent of the national seashore is to reconstruct the [Fort Pickens' road after major storms, if feasible . . . but there are situations that may arise in the future where conditions become so altered that it is no longer feasible to build or maintain the road.

The park has begun providing ferry service from Pensacola as alternative access, should that occur.[175]

The National Park Service has studied recent environmental conditions at Gulf Islands National Seashore, comparing average temperatures and

174. Ibid., 20–22.
175. See also, 100 percent draft report for the *Pensacola Bay Ferry Service – Ferry and Shuttle Transportation Feasibility Study,* June 2014.

precipitation for intervals from 1901 through 2012, and for the most recent ten, twenty, and thirty-year intervals preceding the study (i.e., through 2012).[176] Findings of this assessment indicated that recent conditions are already shifting beyond the historical range of variability, and that changes to temperature and precipitation, as well as the likelihood of strong storms, floods, and droughts, will affect the condition of park resources. The authors note that the study can inform adaptation and assist park personnel in understanding how mitigation measures can be undertaken to improve resiliency. Specifically, they suggest that study findings may be used to characterize park exposure in a vulnerability assessment; development guidance for planning workshops; support preparation of resource stewardship strategies or other NPS management plans, and create interpretive materials for communicating with local communities and park visitors.[177]

As noted, and as further discussed below with reference to a recently completed study of sea-level rise and storm-surge projections, consideration of these issues is particularly relevant for coastal parks such as Gulf Islands National Seashore. For this park in particular, reference to the effects of prior severe storms is useful in illustrating the potential for damage to resources and opportunities for adaptation and mitigation, as hurricanes, storm surges, and flooding have affected its natural and cultural resources—and occupants—throughout recorded history.

A 2018 study of sea-level rise and storm-surge projections, conducted by the University of Colorado in partnership with the National Park Service, notes that one-quarter of the units of the National Park System occur along ocean coastlines. The authors consider ongoing changes in relative sea levels and the potential for increasing storm surges, and the challenges posed to managing the national parks. The analysis provides sea-level rise projections for 118 park units and storm-surge projections for seventy-nine of those units, in a variety of scenarios and under several time horizons.[178]

Findings of the 2018 study reveal that within the National Park Service, the National Capital Region is projected to experience the highest average rate of sea-level change by 2100; parks along the Outer Banks are projected to experience the highest sea-level rise; and the Southeast Region is projected to experience the highest storm surges based on historical data and National Oceanographic and Aeronautical Agency (NOAA) storm-surge models.[179] The authors note:

> These results are intended to inform park planning and adaptation strategies for resources managed by the National Park Service. Sea level change and storm surge pose considerable risks to infrastructure, archeological sites, lighthouses, forts, and other historic structures in coastal units of the national park system. Understanding projections for continued change can better guide protection of such resources for the benefit of long-term visitor enjoyment and safety.[180]

The sea-level rise and storm-surge projections study recommends several actions, including preparing sea-level projections over multiple time horizons for each park unit; estimating potential exposure to storm surge using NOAA models; and

176. Bill Monahan and Nicholas Fischelli, "Recent Climate Change Exposure of Gulf Islands National Seashore," *Climate Change Resource Brief* (U.S. Department of the Interior, National Park Service, Natural Resource Stewardship & Science, August 1, 2014).
177. Ibid.

178. Maria A. Caffrey, Rebecca L. Beavers, and Cat Hawkins Hoffman, *Sea Level Rise and Storm Surge Projections for the National Park Service, Natural Resource Report Series NPS/NRSS/NRR—2018/1648* (Fort Collins, Colorado: U.S. Department of the Interior, National Park Service, Natural Resources Stewardship and Science, May 2018). The study is the first to analyze information from the United Nations Intergovernmental Panel on Climate Change (IPCC) and NOAA models. This research is the first to analyze IPCC and NOAA projections of sea level and storm surge under climate change for US national parks.
179. Ibid.
180. Ibid., viii.

creating wayside exhibits about the impacts of these environmental factors in coastal zones for three NPS units.[181] Wayside exhibits have already been prepared for Gulf Islands National Seashore, as well as for several other coastal National Park units.

A study of sea level and storm trends at Gulf Islands National Seashore was prepared in 2015 by the authors of the aforementioned *Sea Level Rise and Storm Surge Projections* study.[182] The Gulf Islands study noted that historical tide gauge data from Pensacola, Florida, indicate that sea level around the national seashore is rising, and that the potential for a Category 4 hurricane should be anticipated in the area by 2100. The study also noted the following vulnerabilities related to sea level change and storm surge at Gulf Islands National Seashore:

- Increasing sea levels may lead to loss of land and critical habitat.
- Increased erosion and/or accretion across the coastline by storms coupled with shorelines adjusting to new mean sea levels.
- Rising groundwater tables and possible salt water intrusion due to rising sea levels.
- Increased risk of high intensity storm events.
- Potential loss of nearby freshwater ecosystems as sea levels rise.[183]

In addition to understanding potential threats such as sea level rise and storm surges, also critical for coastal historic sites is the identification of the resources anticipated to be threatened—both buildings and landscapes—and planning for protection as well as mitigation and documentation in the face of severe storms. Although secondary to protection and preservation of natural and cultural resources, National Park Service research has also considered how visitation patterns are likely to be affected by severe weather events.[184] For example, damage to infrastructure after hurricanes and other severe storms is likely to result in loss of visitation over extended periods.

Efforts conducted for Gulf Islands National Seashore will benefit from coordination with other planning and documentation projects under consideration or in the process of being implemented by the National Park Service in the Southeast Region. At this writing, a series of workshops to help inform adaptation planning for cultural resources is being undertaken at Gulf Islands National Seashore, following the completion of a pilot study conducted at Cape Lookout National Seashore. The Cape Lookout study was conducted by North Carolina State University for the National Park Service, and funded by the US Geological Survey, Southeast Climate Science Center. Cape Lookout National Seashore is a 56-mile-long chain of low-lying barrier islands along the North Carolina coast, similar to Gulf Islands National Seashore. The study addressed selected historic buildings representing different conditions, uses, and physical exposures to environmental hazards, within the Portsmouth Village and Cape Lookout Village historic sites at Cape Lookout.

The Cape Lookout study notes that the National Park Service has estimated that over $40 billion of coastal cultural resources and park infrastructure

181. Ibid., 5. The first two actions are addressed in the cited 2018 study, which notes that storm surge protections were based on the NOAA Sea, Lake, and Overland Surge from Hurricanes (SLOSH) Model and Tebaldi et al. (2012).

182 Maria A. Caffrey and Rebecca L. Beavers, *Sea Level and Trends, Gulf Islands National Seashore* (Boulder, Colorado: University of Colorado, Department of Geological Sciences, June 16, 2015).

183. Ibid.

184. Bill Monahan and Nicholas Fischelli, "Gulf Islands National Seashore: How might future warming alter visitation?" *Park Visitation and Climate Change: Park-specific Brief* (U.S. Department of the Interior, National Park Service, Natural Resource Stewardship & Science, June 20, 2015).

are at high risk from sea level rise.[185] The study also notes:

> It is unlikely that the NPS will be able to preserve all of these assets into the future due to the vulnerability and financial constraints that have resulted in a backlog of deferred maintenance. As a result, managers will need to make informed decisions about which cultural resources to prioritize.[186]

NPS policy guidance indicates that managers prioritize the most vulnerable and the most significant resources. The pilot study was implemented to develop a measurement framework for evaluating and assessing the relative historical significance and use potential of historic buildings, and to determine how to assess the impact of specific adaptation actions on resources of historical significance.[187]

The study evaluated historical significance and use potential, describing and weighting attributes such as association to fundamental purposes, condition, character, National Register listing, and character, and uniqueness to the park, as well as operational, third-party, visitor, interpretive, and scientific use. The authors of the study and their project collaborators are currently developing a decision support tool that takes into account annual budget allocations, measures of risk from coastal flooding, measures of historical significance and use potential, and treatment costs for various adaptation actions, to help select the best adaptation actions over a thirty-year planning horizon with the goal of retaining as much significance across a park's landscape as possible.[188]

As loss of historic resource integrity may occur, suddenly or slowly, from environmental conditions and other threats, documentation is an important part of the response to mitigate anticipated loss or diminishment. This Historic Structure Report, including the historical narrative, condition assessment, and recommendations, together with photographs and measured drawings, is an example of the relevant documentation that can be prepared. As part of future efforts to build on and update the documentation provided in this Historic Structures Report, the National Park Service should consider such approaches as more detailed documentation resulting from new three-dimensional scanning technology. Monitoring of weather-related deterioration is also important in understanding what protection and repairs may be needed in response to ongoing and specific weather events. Future severe weather events, rising sea levels, and other impacts should be anticipated and considered in planning for protection and maintenance of the site and its resources.

Throughout its history, Battery Cullum-Sevier has been subjected to flooding and damage that have occurred during and after severe storms. As noted above, flooding in particular has been a problem at Fort Pickens and throughout western Santa Rosa Island, although wind, windborne debris, and overwash also pose particular threats. In future, similar threats are anticipated at the site and, in response to its mission of historic preservation and

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185. Sandra Fatorić and Erin Seekamp, North Carolina State University College of Natural Resources, Department of the Interior Southeast Climate Science Center, *Assessing Historical Significance and Use Potential of Buildings within Historic Districts: An Overview of a Measurement Framework Developed for Climate Adaptation Planning, AG-832* (Raleigh: North Carolina State Extension, 2017), citing Katie M Peek., Robert S. Young, Rebecca L. Beavers, Cat H. Hoffman, Brian T. Diethorn, and Shawn Norton, *Adapting to Climate Change in Coastal Parks: Estimating the Exposure of Park Assets to 1 m of Sea-Level Rise," Natural Resource Report NPS/NRSS/GRD/NRR—2015/961* (Fort Collins, Colorado: National Park Service, 2015), accessed at www.nature.nps.gov/geology/coastal/coastal_assets_report.cfm. See also National Park Service., "Policy Memorandum 14-02: Climate Change and Stewardship of Cultural Resources" 2014, accessed at www.nps.gov/policy/ PolMemos/PM-14-02.htm.
186. Fatorić and Seekamp.
187. Ibid.
188. Ibid.

sustainability, the NPS seeks to understand potential effects on the resilience of historic structures to natural hazards and environmental variability, and assess how these factors may contribute to deterioration of the resource. Mitigation of adverse effects of natural hazards is also a key component of planning for preservation of the historic resources.[189] In planning for future stabilization, repair, protection, and maintenance of Battery Cullum-Sevier, it is important to consider the vulnerabilities inherent in the structure and how it may be affected by environmental factors. For example, repair of the concrete and steel components of the structure should incorporate materials and methods that will withstand conditions such as exposure to flooding and salt spray. Existing drainage systems should be made operable to ensure that water on horizontal surfaces is drained as promptly as possible. Following storm events, inspection of the battery—as well as other historic resources on site—should be conducted as soon as possible, to ensure that stabilization (if needed) is undertaken promptly and so that needed repairs can be understood. Finally, cyclical inspection and maintenance are important to ensure that the battery is best able to withstand environmental threats as they occur.

In addition to the effects of increasingly strong and frequent severe storms, Gulf Islands National Seashore and its fragile natural resources are also vulnerable to damage from other disasters. On April 20, 2010, the explosion and subsequent sinking of the *Deepwater Horizon* offshore drilling facility, which, as noted in a resource assessment:

> . . . resulted in eleven (11) deaths and an estimated 4.9 million barrels (779,038 cubic meters) of unrefined light crude oil being released into the Gulf of Mexico over 84 days. The well was not successfully capped until July 16, 2010. The U.S. Coast Guard determined the incident to be a Spill of National Significance (40 C.F.R. 300.323) and America's largest oil spill in terms of volume of oil discharged and the geographic scope of effect. At the peak of the disaster, over 47,000 people and 9,700 vessels responded. In addition to the oil, as part of the response effort, some 1.8 million gallons (6,814 cubic meters) of chemical dispersants were discharged into the Gulf's waters via deepwater injection at the wellhead and aerial surface spraying. The long-term fate of the oil, dispersants and oil-dispersant compounds was a point of scientific and societal concern.[190]

In a speech on June 15, 2010, President Barack Obama said, "This oil spill is the worst environmental disaster America has ever faced."[191]

Gulf Islands National Seashore is located approximately 81 miles (70 nautical miles) due north of the wellhead on which the Deepwater Horizon rig operated. The barrier islands overall encompass nearly 140,000 acres of protected terrestrial and submerged habitat and significant cultural resources. The National Seashore protects terrestrial habitats including uplands, freshwater wetlands, maritime forests, fragile dune ecosystems, and white sand beaches, as well as submerged natural and cultural resources, including the coastal fortifications of Fort Pickens and other nearby sites. The oil spill threatened many of these resources, especially the beaches, waters, and the plants and animals that live therein.[192]

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189. The NPS has defined resilience as the ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structures and functions. In addition, the NPS has defined mitigation is the lessening of the potential adverse impacts of natural hazards through actions that reduce hazard, exposure, and vulnerability. Correspondence with NPS SERO, August, 2018.

190. NOAA on behalf of the Deepwater Horizon Natural Resource Damage Assessment Trustees, "Gulf Spill Restoration," http://www.gulfspillrestoration.noaa.gov/sites/default/files/wp-content/uploads/Chapter-2_Incident-Overview_508.pdf. See also "Florida (Pensacola Beach) Dune Restoration Project" in the above.
191. Ibid.
192. Ibid.

The National Park Service, Environmental Protection Agency, NOAA, and other federal and state agencies, and others participated in the response to the disaster. Gulf Islands National Seashore staff began to assess the shorelines in advance of the arrival of the oil on beaches within the park, and treatment procedures for oil on shorelines across the northern Gulf of Mexico, including within Gulf Islands National Seashore, were implemented beginning in 2010. Initial cleanup of oil used hand tools and mechanized sand-sifting equipment, with sampling conducted to identify areas of buried oil. The 5.75 miles of park recreational beaches were cleaned to a depth of 18 inches where auguring identified buried oil, while the 100.25 miles of park non-recreational beaches were surface cleaned, including the top six inches.[193] Sampling was also conducted to identify sunken oil offshore and at the beaches—including Pensacola Bay near Fort Pickens, as well as Perdido Key and other locations—to coordinate clean-up.[194]

Closing

As they have been throughout their history, Battery Cullum-Sevier and the other resources of Gulf Islands National Seashore are threatened by severe storms and flooding, as well as vulnerable to environmental disasters such as the above-mentioned oil spill. In addition, although the battery retains integrity, portions of the structure are in poor condition and some areas are in a state of collapse. Repairs recommended above to address deterioration should be coordinated with planning for site restoration, improved site drainage, and resiliency. Lessons learned from historical storms and responses, notably the initial construction of the sea wall and its potential to entrap water within the enclosed area, provide valuable insights for current planning and are also helpful for interpretation. Responses such as the park's recent implementation of ferry service as an alternative to ongoing reconstruction of the Fort Pickens access road offer potential for faster and more effective storm recovery in the future. Also, the study currently in progress to help determine the significance of cultural resources, and how adaptation may impact their significance, will provide useful context for the further development of specific repairs to Battery Cullum-Sevier and the park's other resources.

193. Ibid.
194. Ibid.

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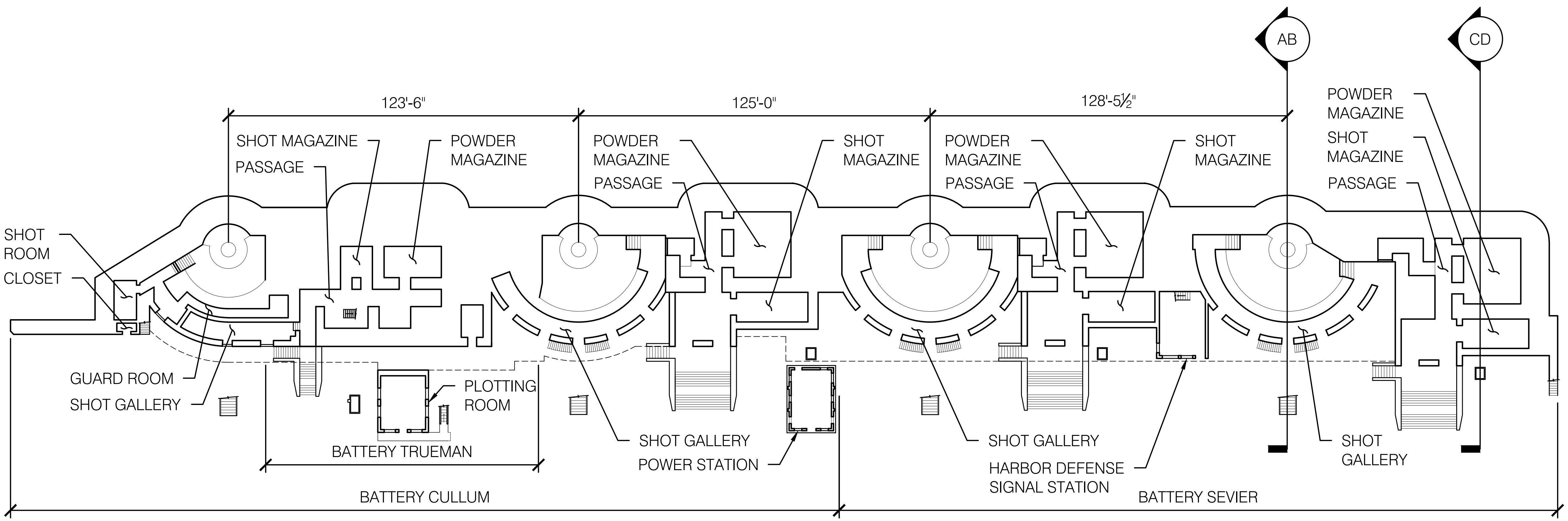
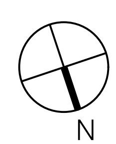
Appendix A: Measured Drawings



1 **1st Floor Plan**

Scale: 3/128" = 1'-0"



DRAWN BY: WISS, JANNEY, ELSTNER ASSOCIATES, INC., DECEMBER 2018

NATIONAL PARK SERVICE
U.S. DEPARTMENT OF THE INTERIOR
SOUTHEAST REGIONAL OFFICE

BATTERY CULLUM–SEVIER

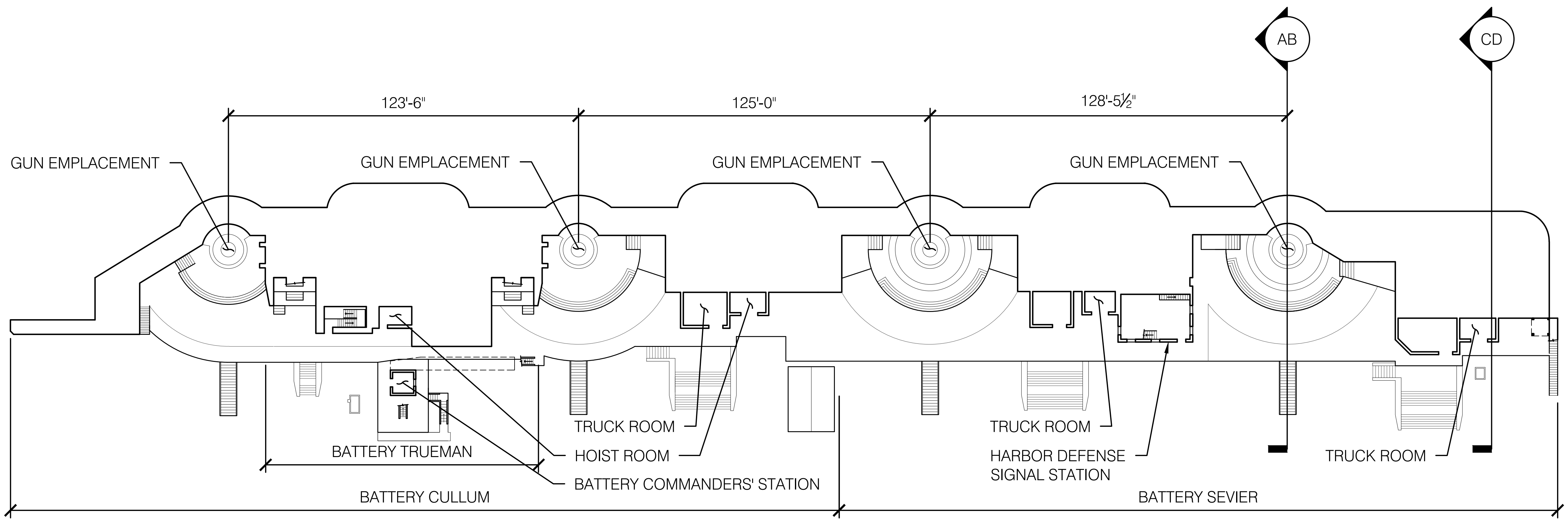
GULF ISLANDS NATIONAL SEASHORE

SANTA ROSA ISLAND

FLORIDA

HISTORIC STRUCTURE REPORT

SHEET 1 OF 5



1 **2nd Floor Plan**

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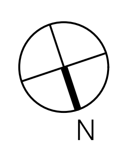

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SANTA ROSA ISLAND

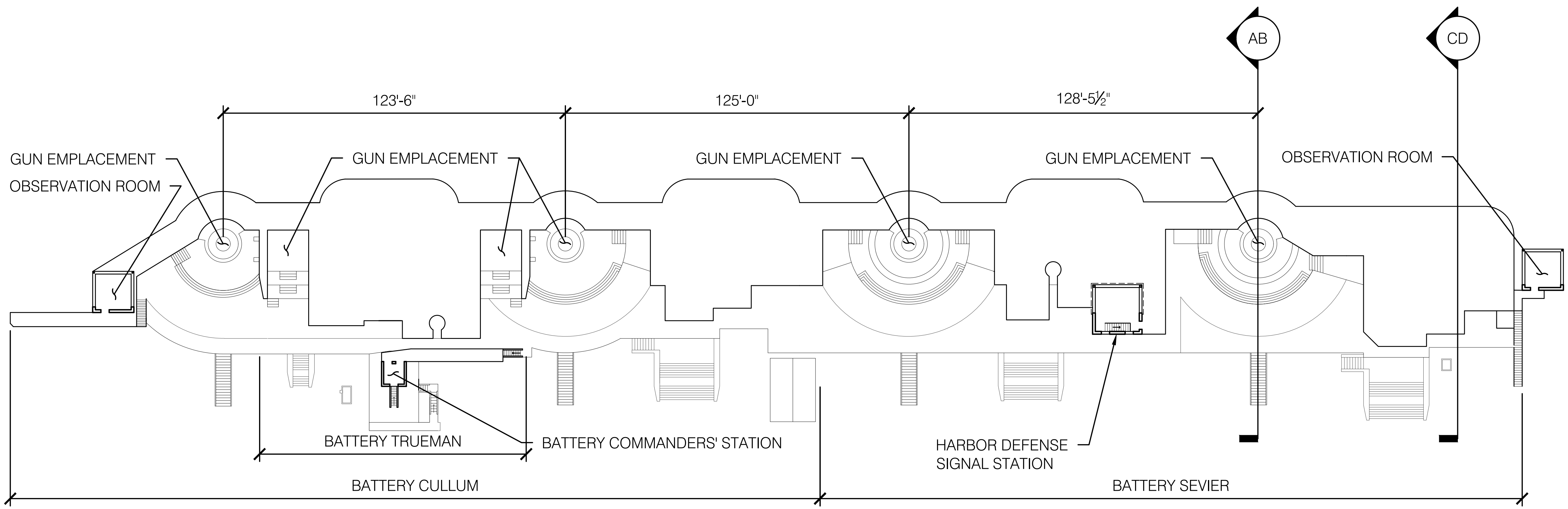
BATTERY CULLUM–SEVIER

GULF ISLANDS NATIONAL SEASHORE

FLORIDA

HISTORIC STRUCTURE REPORT

SHEET
2 OF 5



1 3rd Floor Plan

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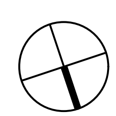

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SANTA ROSA ISLAND

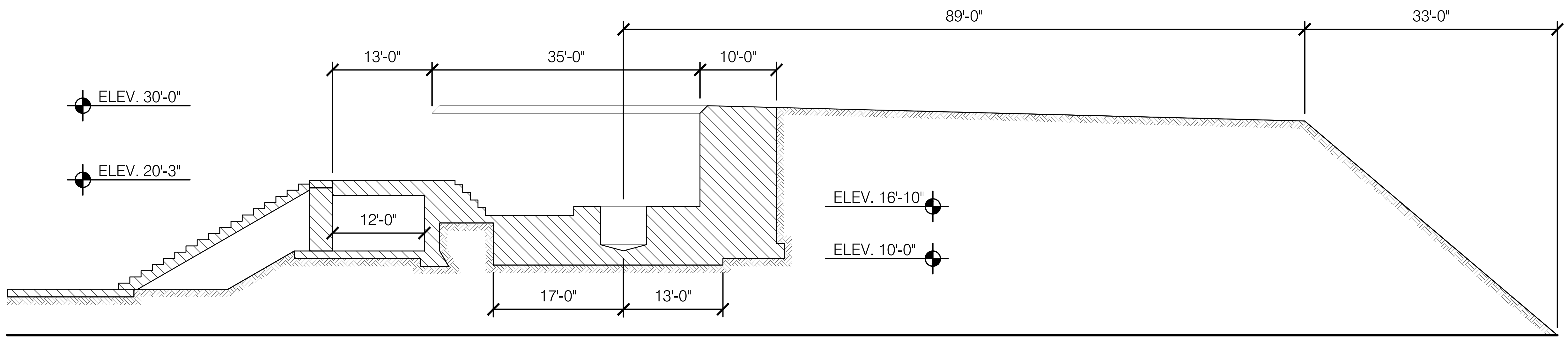
BATTERY CULLUM–SEVIER

GULF ISLANDS NATIONAL SEASHORE

FLORIDA

HISTORIC STRUCTURE REPORT

SHEET
3 OF 5



1 **Section AB**

Scale: 1/16" = 1'-0"

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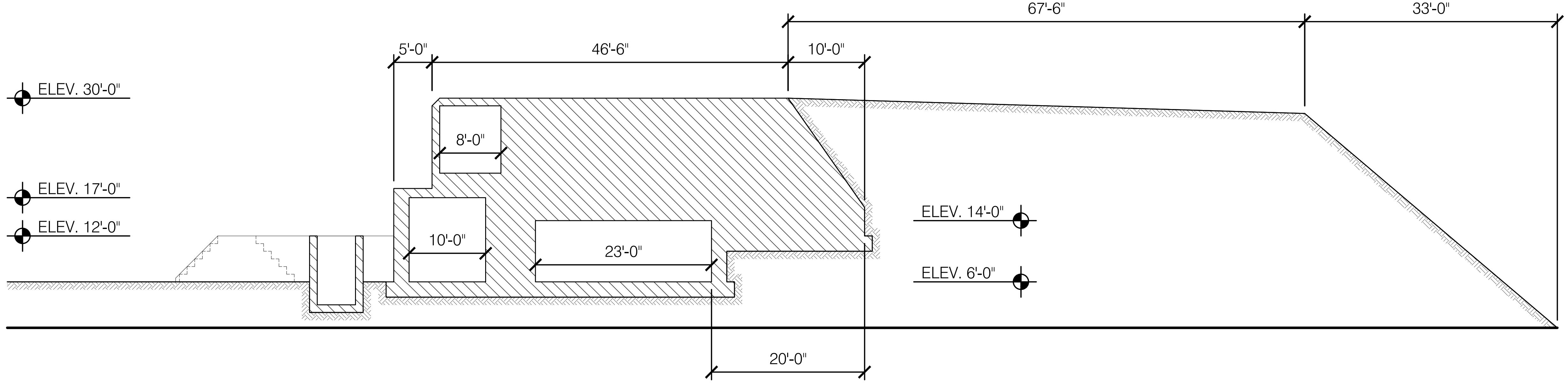
SANTA ROSA ISLAND
FLORIDA

HISTORIC STRUCTURE REPORT

SHEET
4 OF 5



1 Section CD

Scale: 1/16" = 1'-0"

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SANTA ROSA ISLAND

BATTERY CULLUM–SEVIER

GULF ISLANDS NATIONAL SEASHORE

FLORIDA

HISTORIC STRUCTURE REPORT

Appendix B

Excerpts from:

Edwin C. Bearrs, *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.

Contents

Excerpts related to Battery Cullum-Sevier

KEY:

= Battery Cullum-Sevier

= Battery Alexander Trueman

= hurricanes

TABLE OF CONTENTS

III. THE CONSTRUCTION HISTORY OF BATTERIES CULLUM AND SEVIER

A. Planning and Funding the Project

1. The site and plans are revised and approved

On August 15, 1894, Secretary of War Daniel S. Lamont allotted $100,000 from the appropriation for "Gun and Mortar Batteries," signed into law by President Cleveland on August 1, for construction at Pensacola of emplacements for two 10-inch guns mounted on disappearing carriages. Nearly a year slipped by before District Engineer Maj. Frederick A. Mahan prepared and submitted to the Board of Engineers working drawings of the ridge battery. On reviewing the plans, the Board remarked that the "outer face of the concrete of the parapet above the level of the ceiling of the magazine should be arranged with a slope in accordance" with recent designs. Chief Engineer Craighill's office, in turn, called attention to the need to limit the concrete cover in front and on the sides of the battery to 10 feet, and that the gun pintles were to be on the median lines of the emplacement.[1]

Meanwhile, Chief Engineer Craighill had been apprised of the project to deepen and change the channel into Pensacola Bay. This caused him to call for the Board of Engineers to review the situation and report whether it was desirable to relocate the projected 10-inch battery.[2]

Major Mahan was assisted by his immediate superior, Col. Peter C. Hains, in revising the plans and recommending another construction site. On reconnoitering Santa Rosa Island, Colonel Hains and Major Mahan proposed that the four-gun battery be constructed west of Fort Pickens. Here it would better command the harbor entrance and be more easily defended against an amphibious attack.[3]

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1. Mahan to Craighill, Dec. 21, 1895, N A, RG 77, Correspondence 1894-1923, Doc. 7383/28.

2. Craighill to Robert, Dec. 20, 1895, N A, RG 77, Correspondence 1894-1923, Doc. 7383/27. Col. H. M. Robert was president of the Board of Engineers.

3. Hains to Craighill, Jan. 11, 1896, N A, RG 77, Correspondence 1894-1923, Doc. 7383/29. A copy of a drawing illustrating the site proposed by Hains and Mahan for the battery, titled "General Project for Defense," Drawer 78, Sheet 86-1, is found in the files of the Florida Unit, GUIS.

Hains and Mahan argued that the battery, if not positioned on the sand ridge east of Pickens, should be placed to the westward of the fort: its left gun about 250 yards west of the south bastion, the battery facing "a little to the west of south." The thickness of the sand cover, they believed, could be reduced to 20 feet.[4]

By mid-January 1896, Mahan had prepared a revised tracing "showing the plan and two sections of the proposed battery," and a blueprint of the projected wharf to be built to facilitate construction of the emplacement. The plan of the battery had not been finalized, in compliance with ColonelHains' suggestion. Because of the time factor, Hains had urged that the "project be submitted as soon as practicable," without waiting to receive the drawings of the loading platforms, "as revised by the Board of Engineers." It was believed that the modification of the loading platforms was all that was necessary to complete the drawings.[5]

The review process was completed by February 1, when Chief Engineer Craighill approved the new site and the plans as submitted.[6]

2. Funding the project

On February 6, Major Mahan suggested to the Department that it would be economical to increase the allotment sufficiently to permit construction of the four emplacements during the year. This would not constitute a physical problem, because, during the summer of 1889, workmen, under his supervision, had laid 14,587 cubic yards of concrete in reconstructing the Buffalo, New York, breakwater. This was about equal to the amount of concrete in the four emplacements. Moreover, the Santa Rosa Island "plant," on arrival of the components from Connecticut and the Coosa River, would be equivalent to that employed at Buffalo.

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4. Hains to Chief Engineer, Jan. 23, 1896, N A, RG 77, Correspondence 1894-1923, Doc. 7383/30.

5. Mahan to Craighill, Jan. 17, 1896, N A, RG 77, Correspondence 1894-1923, Doc. 7383/33. A copy of the subject drawing titled, "Plan of Proposed Battery for 10-inch Guns Disappearing Carriage on Santa Rosa Island, Fla., near Fort Pickens," Drawer 78, Sheet 81-1, is found in the Florida Unit, GUIS.

6. Craighill to Mahan, Feb. 1, 1896, N A, RG 77, Correspondence 1894-1923, Doc. 7383/39.

If the battery were to be built in two increments, the plant would have to be dismantled and "transported back and forth again at an additional cost, and at double risk of injury."

To guide the Chief Engineer on his monetary needs, Mahan reported that on February 1, there was available in the account $98,048.68.[7]

General Craighill agreed with Mahan's position. Should Congress make additional money available for the Endicott Defenses, another allotment would be forthcoming.[8]

The situation improved slightly on February 28, when Secretary Lamont allotted $10,000 for platforms for the battery, and on July 1, $50,000 for a third emplacement from the act of June 6, 1896, for "Construction of Gun and Mortar Batteries." As of the date of the latter allotment, there had been spent on planning and site preparation $16,816.62.[9]

Secretary of War Lamont, on December 14, 1896, six weeks after ground was broken for the battery, allotted $20,000 for construction of emplacement No. 4. The money was charged to the appropriation for Gun and Mortar Batteries enacted in June. The McKinley administration having taken office on March 4, 1897, Secretary of War Russell A. Alger made two allotments for the battery before the end of Fiscal Year 1897. On May 13, he allotted $3,500 for sodding the sand slopes, and, on June 25, he earmarked another $8,000 for this purpose.[10]

By June 30, 1897, more than $180,000 of the $191,500 allotted for construction of the four emplacements had been obligated.[11]

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7. Mahan to Craighill, Feb. 6, 1896, N A, RG 77, Correspondence 1894-1923, Doc. 7383/49.

8. Beach to Mahan, Feb. 10, 1896, N A, RG 77, Correspondence 1894-1923, Doc. 7383/49.

9. Executive Documents of the House of Representatives for the 2d Session of the 54th Congress, 1896-97 (Washington, 1896), Serial 3479, p. 519.

10. Executive Documents of the House of Representatives for the 2d Session of the 55th Congress, 1897-98 (Washington, 1897), Serial 3631, p. 714.

11. Ibid.

3. Estimates are submitted and approved.

Major Mahan assigned supervision of the project to 2d Lt. James P. Jervey, his young assistant. Jervey had graduated from the U.S. Military Academy as No. 2 in the class of 1892, and had been commissioned a 2d lieutenant in the Corps of Engineers. His first assignment had been with the Engineer Battalion at Willetts Point, New York, from where he was ordered to Montgomery, Alabama, in October 1895.

In March 1896, the Corps of Engineers, having determined to build the battery by day-labor, circulated advertisements calling for proposals from interested parties for delivery of materials--broken stone, pebbles, cement, etc. They were to be opened and abstracted on April 29.[12]

Upon reviewing the bids, Lieutenant Jervey revised his estimates for construction of the two emplacements. They now read:

EMPLACEMENTS

6440 bbls cement at $2.28-7/10	$14,728.28
3584 cu. yds. broken stone at $2.73	9,784.32
3584 cu. yds. pebbles at $4.44-4/10	15,927.29
1192 cu. yds. sand at $0.30	357.60
400 cu. yds. granolithic broken stone at $2.92	1,168.00
Labor	13,000.00
TOTAL	$54,965.49

If 3,584 cubic yards of pebbles were replaced by an equal quantity of granolithic broken stone, there would be a saving of $1.52-4/10 per cubic yard, or $5,462.02 in all. This would reduce the cost of the concrete to $49,503.47.

FORMS FOR CONCRETE

117,000 ft. P.M. (sawed) at $20.00	$ 2,340.00
3,930 " (planed) at $30.00	117.90
50 kegs of nails at $3.00	150.00
Labor at $10.00 per M	1,209.30
TOTAL	$ 3,817.20

12. Mahan to Craighill, April 27, 1896, N A, RG 77, Correspondence 1894-1923, Doc. 7383/72.

BEAMS AND CONNECTIONS

13,000 lbs. B and Z beams at 3-1/2 cents	$ 455.00
82 lbs. angles at 3-1/2 cents	2.87
218 lbs. bolts at 3-1/2 cents	6.54
Labor	300.00
TOTAL	$ 764.41

SAND FILLING

26,114 cubic yards at 30 cents	$ 7,834.20

TOTAL COST OF EMPLACEMENTS

Concrete	$54,965.49
Forms for concrete	3,817.20
Iron, beams, etc.	764.41
Sand Filling	7,834.20
TOTAL	$67,381.30
or reducing by saving in granolithic stone over pebbles	5,462.02
	$61,919.28

PLANT

RAILROAD

3,700 crossties at 27 cts	$ 999.00
66-2160/2240 tons 30-lb. rails at $34	2,276.78
2 steel frogs	40.00
500 pairs splice bars at 24-1/2 cts	122.50
6,000 lbs. spikes at 2-2/10 cts	132.00
3-1600/2240 tons 16-lb. rails at $34	104.41
52 pairs splice bars at 23 cts	11.96
4 turn tables at $60	240.00
200 lbs. spikes at 2-1/2	5.00
	$ 3,931.65
Labor, grading and laying track	1,025.00
TOTAL	$ 4,956.65

ROLLING STOCK

Locomotive	$ 3,300.00
20 dump cars	1,150.00
6 flat cars	16.68
TOTAL	$ 4,466.68

MISCELLANEOUS ARTICLES

1 Trolley hoist	$ 400.00
1 Travelling derrick	1,400.00
1 Fixed derrick	40.67
6 Charging carts at $33	198.00
3 Charging carts at $33	99.00
6 Unloading skips at $48	288.00
5 Concrete buckets at $80	400.00
2 Barges at $1850	3,700.00
1 Hoisting engine	800.00
1 Horizontal driving engine	600.00
Lines for barges	100.00
TOTAL	$ 8,025.67

TOOLS

2 Doz. wheelbarrows at $21.00	$ 42.00
6 Doz. shovels at $18.00	108.00
Blacksmith's, machinist & tools	250.00
TOTAL	$ 400.00

WATER SUPPLY

2 Pumps at $165	$ 330.00
Piping	700.00
Tanks	250.00
TOTAL	$ 1,280.00

TRESTLES AND INCLINED PLANE

30 M Feet timber at $20	$ 600.00
Framing at $10 per M	300.00
TOTAL	$ 900.00

The total of the plant is then:

Railroad	$ 3,931.65
Rolling stock	4,466.68
Miscellaneous articles	8,025.67
Tools	400.00
Water supply	1,280.00
Trestles and inclined plane	900.00
TOTAL	$19,004.00[13]

A depreciation allowance of five percent, or $950, would be charged against the plant. On the machinery to be shipped from Connecticut by way of Newport, Rhode Island, there was a transportation charge of $200 and on that from Wetumpka, Alabama, of $702.

A few rude frame structures to serve as an office, blacksmithy, toolhouse, etc., were to be erected at an estimated cost of $500. Doors, ventilators, drainpipes, and other small items would add another $500 to the estimates.

These items boosted the estimated cost of the two emplacements to:

Emplacements	$67,381.30
Grading and laying track	1,025.00
Plant, deterioration by wear and tear	950.20
Freight	902.90
Buildings	500.00
Doors, ventilators and drains	500.00
1/2 cost of wharf	5,505.00
	$76,764.40
Contingencies, 10 per cent	7,676.44
	$84,440.84

13. Mahan to Craighill, May 4, 1896, N A, RG 77, Correspondence 1894-1923, Doc. 7383/75.

PLATFORM

The cost of the platform is as follows:

330 cu. yds. concrete at $8.00	$ 2,640.00
16 2" steel bolts at $4.42	70.72
28 1-1/2" do. at $2.80	78.40
3475 lbs. steel beams at 3-1/2 cts	121.63
50 lbs. iron bolts at 3 cents	1.50
Forms and centres for concrete	400.00
Labor, transporting and placing iron-work, adjusting bolts, etc.	600.00
	$ 3,912.25
Contingencies, 10 per cent	391.23
Total for one platform	$ 4,303.48
Total for two platforms	$ 8,606.96

Adding together the cost of the emplacements and that of the platforms, we have:

Emplacements	$84,440.84
Platforms	8,606.96
TOTAL	$93,047.80[14]

The only other costs to be considered, Major Mahan informed the Department, were those for office expenses and supervision, which he placed at $5,000. No figures were given for demurrage, as it was impossible to foresee. This $5,000 increased the total to $98,047.70.

In estimating labor costs, Major Mahan had used those for workmen with whom he was familiar, i.e., "white labor of the north." Experience in the south, however, led him to conclude that "southern black labor will not do more than fourth-fifths of what northern labor" would accomplish in the same length of time. The cost of labor was listed at $23,600. One fourth of this was $5,900, which should be added to $98,047.80, thus increasing the projected cost to $104,000.

Major Mahan, however, did not believe it proper to charge the entire expense of the plant and wharf against these two emplacements.[15]

Major Mahan also addressed a confidential letter to his friend, Captain William M. Black, who was on duty in the Chief Engineer's Office. He explained to Captain Black that there was an element in the

14. Ibid.

15. Ibid.

labor cost that could not be mentioned in his official correspondence. This was the effect of the Navy Yard, "which has demoralized utterly everything connected with permanent work in this neighborhood." The wages commanded were as high as those paid at Buffalo, but the Pensacola work force had been corrupted by the Navy Yard, where large numbers merely put in time.

The new commandant, Captain William H. Whiting, was struggling to break up the old habits, but "interia and tolerence are strong factors against improvement." [16]

Chief Engineer Craighill, on approving the estimates, warned that no further allotment could be made for the project. He accordingly suggested that Maj. Mahan pare the $5,000 estimated for office expenses and supervision and the $1,280 for water. In reference to the latter, he observed that, at most sites along the coast, water for concrete and boilers was secured from well points. [17]

Major Mahan assured the Department that every effort will be made in the interest of economy. On Santa Rosa Island, he explained, water obtained from well points was too brackish for use in boilers. It was, therefore, mandatory to draw water from the Fort Pickens cisterns. The pumps, piping, and tanks could be used again, so they could be amortized against several projects. [18]

B. The "Plant" is Assembled and Positioned

1. The building of the Engineers' Wharf

Before work could begin on the Santa Rosa Island Endicott Batteries, it would be necessary to construct a new wharf to facilitate the receiving of materials. The Fort Pickens wharf, which in the years since 1829 had been periodically rebuilt, had deteriorated to where it would be more economical to erect a new structure.

The wharf's location was dependent on the selection of the site for the ridge battery. If the four-gun battery were erected southwest of Fort Pickens, rather than to the east of the Third System masonry work, a slight modification in the configuration of the structure would be necessary, but not in its construction.

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16. Mahan to Black, May 4, 1896, N A, RG 77, Correspondence 1894-1923, Doc. 7383/74.

17. Black to Mahan, May 18, 1896, N A, RG 77, Correspondence 1894-1923, Doc. 7383/75.

18. Mahan to Craighill, May 23, 1896, N A, RG 77, Correspondence 1894-1923, Doc. 7383/75.

As designed by Maj. Mahan's staff, the wharf was to consist, essentially, of a series of piles to the head of which were to be attached double stringers. A heavy floor would be laid on the stringers. The stringers would brace the piles in one direction and the floor in the other. The piles, to escape the ravages of teredoes, were to be encased in terra cotta pipes, driven at least 4 feet into the sand, which formed the bottom of the bay, and a foot above high tide mark. This form of construction had been employed with success in a number of trestles across brackish inlets on the main line of the Louisville & Nashville Railroad between Pensacola and New Orleans.

Major Mahan estimated the cost of construction at:

Lumber, in stringers, floor and guard timbers	$ 1,560.00
Pile driver	1,000.00
Terra cotta pipe for casing piles	3,750.00
Railway tracks on wharf and approach	500.00
Riprap to protect foot of piles against scouring	2,000.00
Labor	1,200.00
	$10,010.00
Contingencies, 10 per cent	1,000.00
TOTAL	$11,010.00 [19]

Division Engineer Hains gave permission to begin construction immediately. The ripraping was to be deferred until such time as the need for it was demonstrated.[20]

Preparatory to beginning construction, a Corps of Engineers pile driver and pile driving equipment were brought around from the Choctawhatchee River in January 1896. They were first taken to the Pensacola Navy Yard where they were thoroughly overhauled.

The pile driver had been positioned on the north shore of Santa Rosa Island by March 6, when construction started on the wharf.

Lieutenant Jervey watched as the wooden piles were driven into the muck. Next, a terra cotta pipe was slipped around the pile and hammered into position. The space between the pipe and pile was then filled with mortar consisting of 4 parts of sand to 1 part of cement. On the heads of the piles, separated by a tenon cut therein, were positioned

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19. Mahan to Craighill, Jan. 4, 1896, N A, RG 77, Correspondence 1894-1923, Doc. 7383/33.

20. Hains to Craighill, Jan. 11, 1896, N A, RG 77, Correspondence 1894-1923, Doc. 7383/33.

two 8 by 12 stringers, firmly bolted. Floor joists, 8 by 6 inches, were placed upon the stringers. Three-inch planking was secured to the joists. When completed, the Engineers' Wharf had a 100-foot front and a depth of 170 feet. It was protected in front by five groups of fender piles, three piles to the group. The depth of the water along the face of the wharf at mean ebb tide was about 21 feet. [21]

The first pile was driven on March 31, and the pile driving continued thereafter as rapidly as possible. Because of space limitation, Lieutenant Jervey found it necessary "to put the stringers on the piles so as to get a platform from which to handle the pile driver." This slowed progress. The piles were sunk by means of a water jet, a system pioneered at Pensacola almost 30 years before by Major Frederick E. Prime, and after they were set in place the casings were lowered over them, also by means of a water jet.[22]

Major Mahan spent May 1 at Fort Pickens, and he was surprised to see that the wharf was so far along. Assistant Engineer J. E. Turtle had experienced considerable difficulty getting timber. This caused Mahan to explode, "Damn these southern methods.... A man will promise anything under the sun in order to get a job and then go back on everything he promised to do." [23]

A raft of sawn timber broke adrift during a severe storm on May 31-June 1 and was driven against the wharf, breaking a score of terra cotta casings. These were repaired by means of a driver, and work on the casings was finished on June 23. The carpenters kept pace with the pile driving, and by the close of Fiscal Year 1896, the wharf, with the exception of the turntables, was completed. [24]

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21. Executive Documents, Serial 3479, p. 518. The cost of the fender piles, protected by a patent paint, was: piles per foot in place, 23¢; painting with patent paint per foot, 46¢. The cost of ordinary fender piles in place was 30¢ per foot; piles protected with sewer pipe filled with concrete, 62¢ per foot; sharpening piles, 34¢ per pile; and framing the tenon head, $1.20 per pile. The average number of hours needed to drive one pile was 31, and to case a pile, 25.

22. Ibid., pp. 518-19.

23. Mahan to Black, May 4, 1896, N A, RG 77, Correspondence 1894-1923, Doc. 7383/74.

24. Ibid.; Executive Documents, Serial 3631; Mahan to Craighill, Sept. 5, 1896, N A, RG 77, Correspondence 1894-1923, Doc. 7383/86.

The wharf, which was finished in July 1896, cost $9,947.94. This figure broke down as follows:

LABOR

	Hours	Cost	Total
Receiving piles	146	$ 27.62	
Sharpening piles	407	76.30	
Driving piles	7,303	1,591.40	
Painting and preparing fender piles	148	27.74	
Driving fender piles	462	89.62	
Receiving terra cotta casings for piles	234	45.93	
Mixing concrete for casings	1,578	300.72	
Putting on casings	3,584	727.59	
Tenons on heads of piles	1,010	241.25	
Scarfing stringers	624	155.78	
Framing and placing stringers	1,715	383.74	
Setting deck joists	742	147.16	
Laying decks and guard rails	2,939	637.36	
Track and turntables	770	200.90	
Granite piers on shore end	110	20.42	
TOTAL LABOR			$4,673.83

MATERIALS

Lumber	$1,832.95	
Piping, staples, etc.	1,555.54	
Iron and steel	228.86	
Nails and bolts	331.54	
Cement	612.75	
Sundries	712.47	
TOTAL MATERIALS		$5,274.11
TOTAL COST OF WHARF		$9,947.94[25]

2. Major Mahan secures a "plant"

To assemble the necessary "plant," Major Mahan called for transfer to Pensacola from Mason's Island, Connecticut, of a Ledgerwood engine and boiler, a sandpump boiler and engine, a sawmill engine and boiler, and three derricks; and from the Coosa River Lock No. 31 project, near Wetumpka, Alabama, of two concrete mixers and their engine, a locomotive and associated dump and

25. Executive Documents, Serial 3631, p. 715.

measuring cars, along with necessary rammers and shovels. Several heavy duty barges would have to be purchased for bringing freight down from Pensacola to Santa Rosa Island. [26]

Mahan planned to salvage and use as aggregate the large quantity of "good stone" lying about the island in "the shape of old traverse stones, pintle stones, etc." [27]

Colonel Hains approved the transfer of the equipment and the use of the stone as suggested, and urged that the project, in view of the delays, be pushed "with more vigor." [28]

Project Engineer Jervey, in March, secured authority to demolish two old dilapidated flea-infested engineer buildings near the landing. The site was needed as a storage area, and the materials were salvaged and used in construction of sand bins. [29]

3. A narrow gauge railroad comes to Santa Rosa Island

To expedite construction of the fortifications, 7,500 feet of narrow gauge railroad tracks were laid on Santa Rosa Island. Lt. Jervey laid out two spurs leading south from the Engineers' Wharf: one to the site of the emplacement for the four 10-inch guns, and the other toward the south beach, where there was plenty of clean white sand for mixing concrete. The line for grading was laid with a transit, with curves established either by deflection and chords or by tapeline and ordinates. The grade line was selected to equalize cutting and filling.

Wherever possible, the fill was put in with dump cars. The track, being laid on the ground surface, was leveled as fill was hauled in from the cuts. No pegs were set in laying and spiking the rails, the tangents and curves being eyeballed. In positioning guiding stakes for grading, a stake was set at the correct elevation wherever there was a change in slope. The foreman was then handed three wooden tees of equal height. Then, having a tee held on each peg at the extremities of a slope, he brought any intermediate point to a correct grade by excavating or filling until the top of the third tee, when held

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26. Mahan to Craighill, Jan 4, 1896, N A, RG 77, Correspondence 1894-1923, Doc. 7383/33.

27. Ibid.

28. Hains to Craighill, Jan. 11, 1896, N A, RG 77, Correspondence 1894-1923, Doc. 7383/33.

29. Jervey to Craighill, March 20, 1896, N A, RG 77, Correspondence 1894-1923, Doc. 7383/68. The Fort Pickens ordnance-sergeant had been allowed to keep hogs, and they were blamed for the palgue of fleas.

at that point, was in line with the tops of the other two. The 30-pound rail was spiked to sawn yellow pine ties, 6 by 8 inches by 6 feet, spaced 2 feet center to center.

All frogs and switches for the railroad were fabricated by the project blacksmith.[30]

Major Mahan broke down the cost of the railroad:

LABOR

	HOURS	COST	TOTAL
Unloading iron	988	$ 214.30	
Grading	13,155	2,811.53	
Laying cross-ties	394	72.74	
Laying rails, etc.	2,202	448.46	
Railroad in front of battery	536	100.50	
TOTAL LABOR			$3,647.53

MATERIALS

Iron and steel	$2,761.40	
Spikes and bolts	289.26	
Ties	389.93	
Towage	54.75	
TOTAL OF MATERIALS		$3,495.34
TOTAL COST OF RAILROAD		$7,142.87[31]

4. Erecting an incline and storage bins

In Fiscal Year 1896, an area convenient to the construction site was cleared and leveled. Here would be erected the storage bins for sand, pebbles, and cement. Timbers for the incline approach to the bins were framed and stored, ready for positioning as soon as the rolling stock was received.[32]

A locomotive and cars reached Santa Rosa Island from Wetumpka by way of Pensacola in August 1896. A large force was then turned to building

30. Executive Documents, Serial 3631, p. 715; Executive Documents Serial 3479, p. 519.

31. Executive Documents, Serial 3631, p. 715.

32. Executive Documents, Serial 3479, p. 519.

the storage bins and erecting the incline. The trestle bents were 10 by 10's, each having two posts and two braces. The bents were spaced 12 feet center to center. Each line of stringers consisted of two 3 by 12 inch timbers. Two-inch boards were employed as cross-ties. No mortising was used in the construction, all members being drift-bolted together. The extremities of the incline were connected with the horizontal portion and with the horizontal track at the foot by vertical curves.

In positioning the curves, the distances from the tops of the various bents to the tangents to the curves were first calculated from the drawing. A small wooden tee was then nailed to each bent, so the distance from the top of the bent to the top of the tee was equal to the tangent distance for that bent. Next, the bents were adjusted until the tops of the tees were in alignment. This brought the tops of the bents onto the curve.[33]

When completed, the 5-degree incline permitted dump cars to be spotted above the storage bins. The locomotive was able to handle ten cars, each loaded with 3 cubic yards of materials on this grade.[34]

Lieutenant Jervey placed the cost of the incline and storage bins at $2,270.21. This figure broke down:

Cost and Labor		
Labor		$849.09
Material		
Iron and steel work	$ 27.06	
Nails, etc.	128.42	
Lumber	1,265.64	
Total materials		$1,421.12
TOTAL COST		$2,270.21[35]

33. Executive Documents, Serial 3631, p. 716.

34. Ibid.

35. Ibid.

5. The mixer and its mode of operation

An "ordinary" 4-foot cubical mixer was used. The charges were measured in light handcarts. They were carried up and dumped into a large wooden iron-bound bucket resting in the charging hold. Next, the charge was hoisted vertically, and then run up to a 25 percent incline above the hopper. This operation was performed by one line, the car on the incline being held in position by a counterweight until the charge was hoisted. As soon as the sheave block on the bucket came in contact with the buffer on the car, the counterweight was raised and car and bucket ascended the incline. The maximum charges handled in an eight-hour day was 175.[36]

The cost of positioning the mixer, hoisting gear, and incline was:

Labor		
Framing		$749.19
Materials		
Hoisting buckets	$187.65	
Ropes	88.90	
Iron and steel	68.90	
Lumber	468.66	
Belting	32.15	
Piping	64.87	
Nails, etc.	7.05	
Sundries	11.55	
Total materials		$923.56
Total Cost		$1,672.75[37]

6. Providing water for the boilers

As Chief Engineer Craighill had feared and as Major Mahan had forecast, water was an expensive item. To avoid drawing brackish water from surface wells, a wooden tank was built and connected with one of the Fort Pickens cisterns. This supply was soon exhausted, and a second tank was constructed on the wharf. This tank was filled by pumping from tugboats.

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36. Ibid.

37. Ibid., p. 717.

A severe freeze in February 1897 burst nearly all the water pipes, necessitating extensive repairs.[38]

C. Lieutenant Jervey Builds a Battery

1. Additional delays cause the Chief Engineer to explode

As the months slipped by and no earth was moved at the battery site, the Chief Engineer's Office began to badger Major Mahan. Responding to these complaints about his failure to push the project, Major Mahan explained that, although Pensacola was "a great timber market," it had been difficult to find a mill to saw timber for the wharf because of the great backlog of orders for foreign buyers. It had taken Assistant Engineer Turtle six weeks to locate a sawmill willing to take such a small order. There had been similar problems in securing piles. The storm of July 6-7, besides damaging the wharf and barges, had swept away "a great deal of timber" intended for completing the structure.

It was mid-July before the wharf was ready for the receipt of materials. Lieutenant Jervey had called on the contractors for broken stones to commence making delivery. These contractors, in turn, dragged their feet, citing that the hurricane season was at hand. Another difficulty had arisen when the cement contractor seemed unable to understand that, according to law, only American manufactured cement was acceptable. When he persisted, his contract was annulled.

On a recent visit to Santa Rosa Island, Major Mahan found that Lieutenant Jervey and his people were now making progress. A large quantity of sand had to be moved to "raise the bottom of the concrete parapet" to the required reference. The movement of the sand was slow because there was only one locomotive, and it was usually employed in transporting materials from the wharf to the construction site. By September 5, one-half the required pebbles for the aggregate had been received and stored.[39]

Capt. Joseph E. Kuhn of the Chief Engineer's Office spent September 24 on-site with Major Mahan. He saw that the excavations for the foundations of three magazines were completed and boxed. Sand fill for the foundations of the parapets, which were at a higher level, was being positioned. No concrete had been poured, and no work done by the

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38. Executive Documents, Serial 3479, p. 519; Executive Documents, Serial 3631, p. 717.

39. Mahan to Craighill, Sept. 5, 1896, N A, RG 77, Correspondence 1894-1923, Doc. 7383/86.

90 employees on the gun platforms. The "plant" for receiving and handling materials and for mixing and laying concrete was nearly ready to place in operation.

Lumber for concrete forms and about 2,000 cubic yards of gravel were on hand and stored. Neither cement nor broken stone had been received. Major Mahan, however, assured Captain Kuhn that shipments of both were expected to arrive at any time from the north.

So much time had already been lost, Captain Kuhn informed General Craighill, that it was useless to anticipate more than completion of the three platforms before December 1. Even then, it would require extraordinary efforts on the part of Major Mahan and Lieutenant Jervey. To accomplish this modest goal, he recommended that Major Mahan be directed

> to push work on the gun platforms, and, if necessary, to purchase limited quantities of cement in open market for immediate delivery and to make concrete with gravel alone, as is being done at Mobile and at New Orleans.

The Ordnance Department was to be called on to forward to Major Mahan, without delay, the templates required for setting out the platform bolts.

Captain Kuhn was unable to find any extenuating reasons for the lack of progress, beyond "faulty management in the beginning in arranging the time of delivery of materials." Although the wharf had been finished on July 20, 1896, more than eight weeks had passed and no concrete had been layed. The situation had seemingly improved, and Major Mahan was now making "an earnest effort to push matters." In this, he was being loyally assisted by Lieutenant Jervey.[40]

In mid-October, Major Mahan left Montgomery for New York and Washington. No gravel had yet been received, although the schooner John K. Souther had sailed from Washington on September 26. Recent storms off Cape Hatteras led to fears that the vessel had foundered with all hands. The first shipment of cement had finally cleared New York Harbor, as the Lawrenceville Cement Company had experienced difficulty in chartering shipping space because of the "great demand for wheat transportation." It would be the first of November before the Lawrenceville cement reached Pensacola.[41]

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40. Kuhn to Craighill, Oct. 8, 1896, N A, RG 77, Correspondence 1894-1923, Doc. 7383/92. For guidance in construction of the platform for emplacements Nos. 1-3, Lieutenant Jervey had this drawing: "Details of Platform for 10 in. Gun Battery on Santa Rosa Island, Fla.," Drawer 78, Sheet 81-4. A copy of this plan is on file at the Florida Unit, GUIS.

41. Mahan to Craighill, Oct. 21, 1896, N A, RG 77, Correspondence 1894-1923, Doc. 7383/94.

The letter in which Mahan conveyed this information to the Department should never have been written. After reading it, Chief Engineer Craighill fired off a communication chiding Major Mahan that the first allotment for the battery had been made two years ago. He pronounced the present situation as "inexcusable and discreditable" to the Corps. "Serious consequences" were promised for Mahan's career unless there was a prompt change for the better.[42]

2. Ground is broken and the first concrete layed

Major Mahan returned to the Gulf Coast in the last week of October. On his arrival in Montgomery from New York, he had written Lieutenant Jervey, urging him to expedite construction of the platforms. Though the weather had turned bad with frequent rains, Jervey and his men made good progress in the week ending on the 31st.

When Mahan visited the site on November 3, he was delighted to find the greater part of the forms for one of the gun platforms completed, "and the whole of the form for the foundation of the front and rear walls of the shell room, under the loading platform...done." Concrete was being laid on the foundations for the shellroom walls.

The schooner John K. Souther had finally tied up at Fort Pickens on October 29. She had been becalmed in the Straits of Florida. During one 72-hour period, she logged only 37 miles. Three days later, on November 2, a second schooner loaded with stone docked. She had made the passage around from Washington in 18 days.

Lieutenant Jervey was now working three shifts. To provide round-the-clock supervision, Major Mahan ordered Mr. Singleton, the overseer for Lock No. 4; Mr. Johnson, the overseer for Lock No. 31; and Fort Pickens master carpenter Kauser to report to Lieutenant Jervey. Assistant Engineer Turtle would hold himself ready to take charge of the project whenever called upon.[43]

Lieutenant Jervey, in response to the Department's telegram of October 23, had purchased foreign cement locally. Because of wind and rain, it was impossible for A. M. Avery to send a lighter loaded with 900 barrels of Louisville cement down Pensacola Bay until the 31st. On its arrival, the cement was unloaded and stored in two hours.[44]

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42. Craighill to Mahan, Oct. 24, 1896, N A, RG 77, Correspondence 1894-1923, Doc. 7383/93.

43. Singleton had had experience in concrete work on the New York batteries, Johnson had supervised construction of Lock No. 31, while Kauser has worked on the Pensacola jetties.

44. Mahan to Craighill, Nov. 4, 1896, N A, RG 77, Correspondence 1894-1923, Doc. 7383/95.

3. A change order involving air spaces

On November 9, 1896, Major Mahan requested authority to eliminate all air spaces around the magazines and in the walls of the shellrooms and loading platforms as shown in the drawings. His reasoning for recommending these changes was: (a) in the interest of economy; and (b) the extreme porosity of Santa Rosa Island. On a recent visit, he had water poured into a small hole in the sand at a rate of 165 gallons per minute. Although the hole was not more than 4 feet in diameter and only a few inches deep, the water leached out as rapidly as the pump poured it in.

Consequently, no moisture would remain for any length of time in any part of the concrete work, nor could dampness "penetrate toward the magazine from the outside." Any dampness collecting on the inside of the magazines, resulting from excessive moisture in the air, he argued, could not be "prevented from so forming by the air spaces" called for in the plans.[45]

Chief Engineer Craighill approved the change order as reccommended.[46]

4. The Department approves revetting the slopes with turf

Early in May, 1897, Major Mahan called attention to the need to provide some revetment for the battery. The nearby Fort Pickens glacis would be a good source of turf for the revetment. The sod, with its crop of Bermuda, could be selectively skimmed off in 6-inch thick sections.

The 1830's glacis, Mahan assured the Department, was of no use, except as a defense against an attacking force advancing westward along the island. As it was proposed to leave "a sufficient thickness of turf to support" the Bermuda, which would rejuvenate itself, he did not foresee any permanent damage to the glacis. But without this revetment, he warned, the sand parapet of the new 10-inch battery would quickly be blown away by the winds.[47]

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45. Mahan to Craighill, Nov. 9, 1896, N A, RG 77, Correspondence 1894-1923, Doc. 7383/103; "10 in. Gun Battery on Santa Rosa Island, Fla., Outline of Concrete Showing Proposed Change," Drawer 78, Sheet 81-5. A copy of the subject drawing is on file at the Florida Unit, GUIS.

46. Craighill to Mahan, Nov. 17, 1896, N A, RG 77, Correspondence 1894-1923, Doc. 7383/103.

47. Mahan to Wilson, May 3, 1897, N A, RG 77, Correspondence 1894-1923, Doc. 7383/125.

The Department, after reviewing the proposal, allotted $3,500 for its accomplishment.[48]

5. Work accomplished in Fiscal Year 1897

Once construction was started, Lieutenant Jervey kept his three shifts laying concrete until January 31, 1897, when the project was shut down because of lack of cement. A shipment was received in late February, and, on March 1, the furloughed workmen were recalled.

By March 29, all the masonry, except a few steps and the magazine paving, was completed. The plant was then dismantled and stored, the concrete for the steps and paving being mixed by hand.[49]

Lieutenant Jervey found on reviewing his books that the forms for the masonry had cost:

Labor	
Placing and removing boxes around anchor bolts	$ 66.84
Framing forms for platforms	1,765.30
Removing forms from platforms	76.11
Forms for paving	83.63
Framing forms for remainder of battery	4,237.29
Removing	500.79
Total Labor	$6,729.96
Materials	
Lumber	$3,035.98
Nails, etc.	205.90
Iron and steel	2.19
Total Materials	$3,244.07
Total Cost	$9,974.03

In removing the forms, the posts were forced off with jack-screws.[50]

48. Kuhn to Mahan, May 13, 1897, N A, RG 77, Correspondence 1894-1923, Doc. 7383/125.

49. Executive Documents, Serial 3631, p. 714.

50. Ibid., p. 717.

The cost of positioning a cubic yard of concrete was:

Rosendale Concrete

Forms	$ .71
15 cubic feet broken stone	1.88
15 cubic feet pebbles	1.71
5 cubic feet sand	.10
1-1/2 barrels cement	1.41
Supplying broken stone to mixer	.08
Supplying pebbles to mixer	.06
Supplying sand to mixer	.03
Supplying cement to mixer	.08
Supplying water to mixer	.01
Mixing	.17
Placing	.62
Total	$6.86

Where Portland concrete was employed, all items were the same as in the Rosendale concrete, except the Portland cement, which was $2.39, making the total cost $7.84 per cubic yard.

Where Louisville concrete was used the cost was $7.04 per cubic yard.

Labor costs for paving and steps, involving about 1,200 square yards of paving, was $409.87, or 34 cents per square yard.[51]

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51. Ibid., p. 719.

Costs of materials for concrete stored in the bins at the mixer were:

		Quantity	Cost per Yard	Total Cost
Pebbles	cubic yards	6,082	$3.09	$18,794.81
Broken stone	cubic yards	6,486	3.39	21,908.92
Rubblestone	cubic yards	2,000	5.58	11,168.60
Sand	cubic yards	2,500	.549	1,373.77
				$53,246.10
Portland cement	barrels	2,558	$2.393*	
Louisville cement	barrels	997	1.593*)	$22,001.92
Rosendale cement	barrels	12,580	1.143*)	
Total Cost				$75,248.02[52]

*Cost per barrel

Steel beams employed in construction of the four emplacements had cost $2,099.47, and the labor of placing them, $195.79.[53]

As the platforms were built concurrently with the other masonry, Lieutenant Jervey provided an approximate break down:

1,000 cubic yards of Portland concrete	$7,840.00
600 cubic yards of Louisville concrete	4,224.00
400 square yards of paving	616.00
Anchor bolts	540.00
Steel beams	500.00
Removing forms	76.11
Total cost of four platforms	$13,976.11

To this figure, which gave an average cost of $3,449.03 per platform, would have to be added charges for cranes, ammunition hoists and conveyors, and placing the base rings.[54]

52. Ibid., p. 718.

53. Ibid.

54. Ibid., p. 720.

Preparations for positioning the sand fill had been completed by mid-April 1897. Two months were required to complete the fill and trim the slopes to grade. By June 30, the slopes had been partially covered with muck and turf.[55]

The sand fill was put in partly by hired labor and partly by contract. The incline over the storage bins was used to position the sand, with a maximum day's work 1,000 cubic yards. Forty thousand cubic yards had been placed at a cost of $12,323.12.[56]

During the final 90 days of Fiscal Year 1897, all the battery's 21 doors were made and hung; a permanent water system installed; steps completed; plans prepared and approved and contracts awarded for construction of the ammunition service, lighting plant, and sewer system; and two disappearing gun carriages, Model 1894, received.[57]

Lieutenant Jervey listed the cost of these miscellaneous items and operating expenses:

Road in rear of battery	$ 199.16
Ladders (five)	143.50
Drainage	441.47
Speaking tubes	45.10
Doors (21)	595.94
Plastering, painting, and whitewashing magazines	262.81
Placing base rings	164.25
Retaining walls	213.14
Taking down and storing plant	223.05
Holidays	1,599.15
Fuels	994.95
Office expenses, including blue printing, telegrams, express charges, etc.	1,018.64
Mileage	723.71
Advertising	39.60
Subsistence	762.40
Testing cement	87.00
Surveys	28.50
TOTAL	$7,542.37[58]

55. Ibid., p. 714.

56. Ibid., p. 718.

57. Ibid., p. 714.

58. Ibid., pp. 718-19.

During the four months of round-the-clock operations (November-January and March), the four boilers and five plant engines had used 160 gallons of cylinder oil, 246 gallons of black oil, and 860 pounds of waste.

In operating the lighting plant, 11 gallons of lard oil, 324 gallons of kerosene, and 842 gallons of gasoline were burned. Fuel consumed measured 340 cords of wood and 57 barrels of coal.

Charged to maintenance and repairs by Lieutenant Jervey were:

Sundry materials	$ 390.65
General damage from storms	203.57
Wharf	558.96
Hoisting engine	16.80
Traveling derrick	61.50
Water supply	281.66
Rolling stock	274.90
Railroad	108.27
Locomotive	970.26
Lighters and boats	1,419.48
Mixer	202.48
General plant	409.48
TOTAL	$4,397.01[59]

59, Ibid.

Total expenditures on the battery as of June 30, 1897 were:

Wharf	$ 9,947.94	
Railroad	7,142.87	
Incline and storage bins	2,270.21	
Concrete mixer	1,672.75	
Water supply	1,714.08	
Miscellaneous "plant"	13,568.40	
Total "plant"		$36,316.25
Materials for concrete	$75,248.02	
Supplying materials to mixer	3,544.54	
Mixing concrete	2,229.33	
Depositing concrete	8,042.66	
Forms	9,974.03	
Total cost of concrete		$99,038.58
Steel beams	$ 2,099.47	
Sand filling	12,323.12	
Miscellaneous operating expenses	5,477.00	
Maintenance and repairs	4,397.01	
		$24,296.60
Clerical, superintendence, etc.		4,805.25
Miscellaneous items for battery		2,065.37
Expenses from Montgomery office before April 1896		2,142.21
TOTAL		$168,664.26 [60]

60. Ibid., p. 720.

6. Work accomplished in Fiscal Year 1898

During the summer and autumn of 1897, the electric light plant, ammunition conveyors, shot cranes and hoists were installed; the sewerage system positioned; and the covering of the sand slopes with muck and turf completed.[61]

Expenditures charged to construction of the battery in Fiscal Year 1898 were:

Classification	Labor	Material	Total
Conveyors (750 feet)	$ 436.04	$2,326.00	$2,762.04
Shot cranes (14)	164.68	660.00	824.68
Hoists (2)	170.05	940.00	1,110.05
Sewerage system		627.50	627.50
Muck on slopes	827.28	27.75	834.03
Mounting guns (4)	3,091.98	215.41	3,307.39
Setting traverse circles and base rings (4)	1,088.35	2.25	1,090.60
Concrete aprons	368.85	450.00	818.85
Manholes	176.12	4.95	181.07
Superintendence	318.31		318.31
Holidays	320.35		320.35
Road in rear of battery	446.41		446.41
Water supply		5.40	5.40
Railroad		11.92	11.92
Fuel		35.50	35.50
Tools and non-expendable items		13.50	13.50
Boats and lighters	224.43	415.87	640.30
Mileage		159.16	159.16
Advertising and printing		54.83	54.83
General purposes		23.60	23.60
Sundries	72.65	135.61	208.26
Operating mail boat	151.50		151.50
Waterproofing		700.00	700.00
Lighting plant	154.33	3,933.35	4,087.68
Subsistence		60.63	60.63
Platforms		263.52	263.52
Doors		25.22	25.22
TOTAL	$8,011.33	$11,094.97	$19,106.30[62]

61. Executive Documents, Serial 3746, p. 726.

62. Ibid.

7. Plans of the completed battery are drawn and forwarded

Plans of the battery as completed were prepared by R. A. Chapman of the district office and transmitted to the Department in the autumn of 1898.[63]

8. Arming the battery

War Department policy called for the artillery to mount the big guns and mortars in the fortifications. When the guns were to be emplaced in works in "whole or in part" in charge of the Corps of Engineers, the project engineer, after discussions with the artillery commander, would decide whether the mounting would be done under his supervision or that of the artillery.[64]

It was accordingly decided by Army headquarters to have the Fort Barrancas garrison mount the carriages and 10-inch guns. The first disappearing carriage was received by rail in Pensacola in late May, 1897. A contractor moved it by barge from the railroad wharf to Fort Pickens. When a base ring was taken to the emplacement, it was found "not adapted to the position." This information was relayed to the Chief Engineer by Lieutenant Jervey.

While awaiting receipt of a new base ring, Post Commander John Murray took steps to have his troops relieved of the responsibility for mounting the armament. It would be a mistake to do so, he pointed out, because about 15 percent of his men were on sick call, and the work would be arduous even during the winter. But, in the summer, his men would find the heat "overpowering" as they labored behind a parapet where there were no cooling sea breezes, no shade, and the "sun's rays are reflected on the three sides from the white concrete walls." To endure these conditions would severely tax acclimated blacks, but it could not be accomplished by his "unacclimated" artillerists without serious consequences to their health.[65]

Commenting on Captain Murray's request, Major Mahan felt certain that if the guns and carriages were to be mounted now, it should be the Engineers' responsibility. By the last week of June, two carriages were on hand, and a third, along with three guns, had been shipped. Until

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63. "Emplacement for Four 10 inch B. L. Rifles, Disappearing Carriages, Fort Pickens, Santa Rosa Island, Florida," Drawer 78, Sheet 81-16. Copies of the subject plan are on file at the Florida Unit, GUIS.

64. Circular No. 5, AGO, April 4, 1896.

65. Murray to Adj. Gen., May 28, 1897, N A, RG 77, Correspondence 1894-1923, Doc. 7383/140.

such time as the two carriages were off the wharf and out of the way, the landing was too encumbered to receive the en route ordnance.

If the Corps moved promptly, Mahan informed Chief Engineer John M. Wilson, the hoisting machinery still at the battery could be employed, at a great savings in labor. If General Wilson opted to wait until autumn and permit the garrison to mount the armament, it would be necessary to remove the carriages and guns to make space for the landing of materials to be used in construction of the mortar battery. To mount the armament would require a $2,500 allotment.[66]

Secretary of War Alger, at the request of the Chief Engineer, revoked the orders for the artillery to mount the armament. Funds were allotted, and Major Mahan was directed to see that the ordnance was immediately mounted.[67]

In October, the Philadelphia Quartermaster Depot was alerted to make arrangements for shipment to Pensacola, in mid-November, from South Bethlehem, Pennsylvania, of one 10-inch disappearing carriage. When Maj. Charles A. H. McCauley of the depot sought to arrange details for delivery of the carriage, he learned that Major Mahan had left Montgomery for New Jersey on the advice of his physician because of the outbreak of yellow fever in central Alabama. Mahan's clerk informed McCauley that, due to quarantine restrictions, it was impossible to communicate with Lieutenant Jervey in Pensacola. But, he noted, the Corps of Engineers would look after the carriage upon its arrival at the railroad freight yard, provided the Quartermaster Department funded the operation.[68]

On the 29th, the Department contacted Major Mahan at Elizabeth, New Jersey. He recommended that the shipment be deferred to avoid payment of demurrage on the flat cars should yellow fever spread to Pensacola. It was now at Flomaton, on the Alabama-Florida boundary, through which most of the railroad traffic from the north and west passed.[69]

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66. Mahan to Wilson, June 26, 1897, N A, RG 77, Correspondence 1894-1923, Doc. 7383/142. Brig. Gen. John M. Wilson had replaced General Craighill as Chief of Engineers on February 1, 1897.

67. Adj. Gen. to Commanding General, Dept. of the East, July 21, 1897, N A, RG 77, Correspondence 1894-1923, Doc. 7383/145.

68. McCauley to Quartermaster General, Oct. 20, 1897, N A, RG 77, Correspondence 1894-1923, Doc. 6273.

69. Mahan to Wilson, Oct. 29, 1897, N A, RG 77, Correspondence 1894-1923, Doc. 7383/160.

Early in November, Assistant Engineer Turtle called for another $300 to finish mounting guns Nos. 1-3. Unseasonably hot, humid weather in August and September had sapped the men's endurance. Day after day, he had watched them "perspire until their trousers were ringing wet." More men had been added to the payroll to keep the project moving.

If the Engineers were to mount the fourth gun and its carriage, another $900 in addition to the $300 were required.[70]

Chief Engineer Wilson allotted $1,200 from the appropriation for "Guns and Mortar Batteries" to finish mounting guns Nos. 1-3, and for positioning the carriage and gun in emplacement No. 4.[71]

By late January, 1898, emplacements Nos. 1-3 were completed, excepting the handrail around the loading platforms and marking the meridian lines. This railing could not be put up until the carriage and gun for emplacement No. 4 were received and mounted. In addition, the ammunition hoist for that emplacement was missing several parts.[72]

On February 15, Chief Engineer Wilson notified Secretary of War Alger that emplacements Nos. 1-3 had been completed and armed and were ready for transfer. Then, on the 24th, nine days after destruction of the battleship Maine in La Habana harbor, emplacements Nos. 1, 2, and 3 were inspected and transferred to the artillery.[73]

It was April 9 before the gun and carriage were mounted and ready for service in emplacement No. 4. This was only 11 days before the United States declared war on Spain.

The battery's electrical system was given a thorough test, as there was so "much receiving of material going on it is necessary to work all night long as well as all day." Ten electric lights had been purchased for use with the plant. Three of these had been positioned on the wharf, and the others would be put up when received.[74]

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70. Mahan to Wilson, Nov. 8, 1897, N A, RG 77, Correspondence 1894-1923, Doc. 7383/164.

71. Kuhn to Mahan, Nov. 12, 1897, N A, RG 77, Correspondence 1894-1923, Doc. 7383/164.

72. Mahan to Wilson, Feb. 10, 1898, N A, RG 77, Correspondence 1894-1923, Doc. 7383/178.

73. Wilson to Alger, Feb. 15, 1898, N A, RG 77, Correspondence 1894-1923, Doc. 7383/179; Executive Documents, Serial 3746, p. 726.

74. Mahan to Wilson, April 9, 1898, N.A, RG 77, Correspondence 1894-1923, Doc. 24949/1.

More than another two months passed before emplacement No. 4 was inspected and transferred to the artillery.[75]

Capt. William Crozier of the Ordnance Department had been at Santa Rosa Island in the second week of May to inspect the armament. He saw that three of the four carriages were Model 1894 and the other a Model 1896. One round was fired from each gun. Captain Crozier observed that all were in serviceable condition, although the Model 1894's did not work to his satisfaction. Without their counterweights, they did not "rise clear into battery and had to be punched in by the tripping bars." The recoil of Nos. 7 and 8 was from 8 to 12 inches short. Crozier, on checking, found this was caused by the binding of the top carriage upon the chassis rails.

He remained on the island an extra day. Assisted by a mechanic detailed by Major Mahan, he filed off a small amount of metal from the rail of carriage No. 7. This materially improved its operation. Crozier, before starting for Mobile, showed the post commander the method to be followed in filing down the other carriages.[76]

The guns and carriages mounted in the battery were:

GUNS

	Caliber	Length	Model	Serial No.	Manufacturer
No. 1	10-inch	367.25"	1888	25	Watervliet
No. 2	10-inch	367.25"	1888	42	Watervliet
No. 3	10-inch	367.25"	1888	44	Watervliet
No. 4	10-inch	367.25"	1888	30	Watervliet

CARRIAGES

	Type	Model	Serial No.	Manufacturer	Motor
No. 1	Disappearing	1894	6	Bethlehem Ironworks	8 h.p. 110V DC
No. 2	Disappearing	1894	7	Bethlehem Ironworks	8 h.p. 110V DC
No. 3	Disappearing	1894	8	Kilby Mfg. Co.	8 h.p. 110V DC
No. 4	Disappearing	1896	38	Bethlehem Ironworks	8 h.p. 110V DC[77]

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75. Executive Documents, Serial 3746, p. 726.

76. Crozier to Flagler, May 14, 1898, N A, RG 156, Doc. 20056.

77. Pitman to Chief of Ordnance, Dec. 2, 1899, N A, RG 156, Doc. 20056.

2. The Fiscal Year 1899 effort at waterproofing and improving drainage

Several October 1898 downpours caused water to back up into the magazines to a depth of several inches. To prevent reoccurance, gratings and drains were placed across each doorway. This was not enough, and it became necessary to drain the chert road in rear of the battery into the main sewer by gratings and connecting drains. To insure better results in the battery, District Engineer A. F. Flagler recommended construction of a cesspool to drain the counterweight well of emplacement No. 4. This well, he observed, was too low to drain directly into the sewer.

To combat overhead leakage, he urged that the superior slope above the magazines be covered with a "continuous sheet of asphalt." This was being done at emplacements Nos. 3 and 4, but additional funds were desired for extending the asphalting to emplacements Nos. 1 and 2.[80]

On December 1, Chief Engineer Wilson allotted $635 for asphalting emplacements Nos. 1 and 2, $55 for 4 gratings on roadway, and $45 for a cesspool at emplacement No. 4.[81]

These projects were implemented during the winter of 1898-1899.[82]

3. The Fiscal Year 1900 attempt to stop magazine seepage

This did not stop the seepage, however. In Fiscal Year 1900, Captain Flagler submitted to the Chief Engineer plans and estimates for prevention of dampness in the magazines by coating the exterior surfaces of concrete in front of the magazines with asphalt. Because of the high cost, General Wilson directed that only the magazines in which the situation was most acute be waterproofed. Two thousand one hundred and seventy-six dollars were allotted for the project.

The sandfill was accordingly removed from the front of emplacement No. 4; the concrete face coated with hot asphalt to below floor level; and a trench drain of broken brick laid against the asphalt, covered with a thin layer of gravel, and filled. The entrance was regraded with a fill to the rear, and two wing walls built to keep rain water from entering from the sides.

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80. Flagler to Wilson, Nov. 25, 1898, N A, RG 77, Correspondence 1894-1923, Doc. 7383/207.

81. Kuhn to Flagler, Dec. 1, 1898, N A, RG 77, Correspondence 1894-1923, Doc. 7383/207.

82. Executive Documents, Serial 3905, p. 922.

Although this checked dripping from the ceiling, the magazines were still damp.[83]

4. Two rooms are added to the battery

Because of cramped conditions in the electric light plant and the prevalence of water in the battery's dynamo room, Captain Flagler proposed to: (a) construct two additional rooms; (b) remove some of the sand covering; and (c) to improve the ventilation. Chief Engineer Wilson approved the proposal on May 25, 1900, and allotted $2,300 from the appropriation for "Gun and Mortar Batteries Act" of July 7, 1898, to implement it.

By June 30, most of the materials had been ordered and the cement stockpiled. The railroad track from the wharf to the battery had been overhauled and the locomotive repaired. A crew was then turned to, and the west entrance wing wall partially removed.[84]

The project was completed in Fiscal Year 1901. Two new chambers were built: one for the generator and one for the storage battery. The room formerly used for the plant was converted into a boiler room.[85]

5. General repairs and improvement for Fiscal Year 1900

In Fiscal Year 1900, District Engineer Flagler and his men made a number of maintenance-oriented repairs to Battery Cullum. These included:

(a) The scarred and eroded earthen shopes were repaired, and new sod and Bermuda sprouts placed where needed.

(b) Battery doors were repaired as needed, and several speaking tubes repaired, altered, and labeled.

(c) A broken ammunition lift was repaired.

(d) Steel hoods were positioned over exposed doors to prevent ingress of water.

(e) The plumbing was repaired, several pipes having burst during the subfreezing weather.

(f) Drainage holes were drilled in several places in the magazines and platforms to carry off surface water.

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83. Executive Documents, Serial 4089, pp. 941-42.

84. Ibid., p. 939.

85. Executive Documents, Serial 4279, pp. 27-28, 332.

(g) Several electrical instruments were repaired on the switchboards.

(h) Breaks in the concrete surface of the superior slopes were patched.[86]

6. The battery's platforms are extended

In Fiscal Year 1901, Chief Engineer George L. Gillespie allotted $1,600 for construction of a communication gallery (platform extension). Materials were stockpiled, and work commenced on a concrete-steel gallery connecting the four loading platforms.[87] The project was completed in Fiscal Year 1902.[88]

7. Magazines Nos. 3 and 4 are lined with brick and ceiled with lead

In Fiscal Year 1901, Capt. William V. Judson, who had relieved Captain Flagler as District Engineer in September 1900, reported Battery Cullum was in good condition except that magazines Nos. 3 and 4 and the storerooms of emplacement No. 4 were very damp; shellroom No. 4 was damp;

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86. Executive Documents, Serial 4089, p. 941; Kuhn to Flagler, May 31, 1899, N A, RG 77, Correspondence 1894-1923, Doc. 30969. One hundred and fifty dollars had been allotted for repair of the slopes.

87. Executive Documents, Serial 4279, pp. 28, 833; "Type Extension of Platform Extension for Batteries Cullum and Pensacola, Santa Rosa Island, Fla," Drawer 78, Sheets 94-1 and 94-2; "Sketch showing details of platform connection between emplacements of 10" Battery, at Ft. Pickens, Florida," Drawer 78, Sheet 94-3. Copies of these drawings are on file at the Florida Unit, GUIS.

88. Executive Documents, Serial 4444, p. 735.

and the dynamo room was rather damp. An allotment was made by Chief Engineer Gillespie to correct these faults through use of detached lead ceilings and brick walls, raised floors, double doors, etc.[89]

These magazines were relined with brick and ceiled with lead in Fiscal Year 1902. Moisture, which had formerly accumulated in the magazines, was led from the spaces between the old and new walls by drains.[90]

This treatment failed to solve the problem. Capt. J. B. Cavanaugh, who had replaced Capt. Robert R. Raymond as district engineer in June 1903, soon found that the linings in the magazines of emplacements No. 3 and 4 were failing. There was a small break in the brick wall of No. 3 powder magazine, the lead ceiling of No. 4 shotroom, and the small

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89. Executive Documents, Serial 4279, p. 28. An Indianan, Judson had graduated from the U.S. Military Academy as No. 3 in the class of 1888. He was commissioned a 2d lieutenant in the Corps of Engineers and assigned to the Engineer School at Willett's Point. In March 1891, he was ordered to duty on Lake Erie, where he remained until February 1893. From February 1893 to March 1894, Judson was an assistant to Lt. Col. A. Mackenzie and oversaw improvements to navigation on the Upper Mississippi. While there, he was promoted to 1st lieutenant.

Lt. Judson was assistant engineer for improvement of Galveston Harbor from November 1894 to February 1897, when he was ordered to duty with the Engineer Battalion at Willett's Point. Promoted to captain on July 5, 1898, Judson was named Recorder for the Board of Engineers, a position he held for 12 months. His next assignment was Chief Engineer, Department of Puerto Rico. In August 1900, he returned to the United States and relieved Capt. Flagler as district engineer. Cullum, Biographical Register, Vol. IV, p. 460; Vol. V, p. 416.

90. Executive Documents, Serial 4444, p. 739.

room in emplacement No. 3. It was apparent to him that the "ultimate failure of all these ceilings can be expected."[91]

8. The ironwork is repainted and the emplacements rewired

In Fiscal Year 1902, the battery's ironwork was repainted. About the same time, Chief Engineer Gillespie allotted $1,000 for replacement of the old wiring with new enclosed in a steam-tight nickel conduit system. District Engineer Raymond contacted a number of manufacturers of nickel pipe to secure data for preparation of specifications.[92]

By the spring of 1902, the battery had been rewired, although Signal Corps personnel had not yet connected the wiring and the switchboards.[93]

9. The floors of the magazines, shellrooms, etc., are raised

As built, the floors in the magazines, shellrooms, etc., of Batteries Cullum, Slemmer, Worth, Pensacola, etc., had no drains, and this contributed to their dampness. In 1900, District Engineer Flagler complained that the flooring in the magazines, shellrooms, etc., of Battery Cullum should be renewed to "give a fall to the rear," thus preventing

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91. Cavanaugh to Gillespie, June 24, 1903, N A, RG 77, Doc. 18957/9. James B. Cavanaugh was a classmate of Lt. Jervey's at West Point. Graduating No. 1 in the class of 1892, he had been commissioned a 2d lieutenant in the Corps of Engineers, and assigned to the Engineer School at Willett's Point. In August 1895, he was ordered to Detroit as assistant engineer for river and harbor improvements. Then, in 1898, he was sent to the Mobile District. He remained at Mobile until June 1900, when he was ordered to Philadelphia for a brief tour of duty. Cavanaugh was transferred to the Philappine Islands in September, as commander of a company of engineers in Luzon. He returned to the United States in December 1901, and was assigned to Jefferson Barrack. While in the Far East, Cavanaugh had been promoted to captain, and on June 1, 1903, relieved Raymond as district engineer. Cullum, Biographical Register, Vol. IV, p. 530.

92. Executive Documents, Serial 444, pp. 738-39.

93. Kinzie to Adj. Gen., Oct. 1, 1902, N A, RG 77, Correspondence 1894-1923, Doc. 35518/19.

water from entering from "whatever cause" and standing. Settlement had caused the floors in several of the magazines to be lower than the entrance doorway sills.[94]

During the next several years, the floors were raised and gutters installed. By July 1902, District Engineer Raymond could report that at the major batteries this program, along with lining magazine walls with brick and ceiling them with lead, had been carried out, and the magazines and rooms were, with few exceptions "remarkably dry at all times." Many floors, however, were still not drained. But as these were dry, he concluded that there was no urgency for installation of drains therein.

The remaining damp rooms, excepting the Battery Center magazines, could be made dry with available funds, while $75 was needed to eliminate the dampness in the centre magazines.[95]

In approving this expenditure, the Department authorized Lieutenant Raymond to consolidate the balances within several accounts and apply them to general repairs.[96]

10. <u>The aprons are repaired</u>

Col. David H. Kinzie, when he inspected the battery in the autumn of 1902, saw that the concrete aprons fronting the emplacements had been fractured in several places.[97]

The Department promptly allotted funds for repair of the aprons.

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94. <u>Executive Documents</u>, Serial 4089, p. 942. Robert R. Raymond, a son of Lt. Col. C. W. Raymond, had graduated from the U.S. Military Academy as No. 5 in the class of 1893. Commissioned a 2d lieutenant in the Corps of Engineers, he was ordered to Willett's Point for service with the Engineer Battalion. In July 1896, he reported to Maj. Milton B. Adams as assistant engineer at Forts Schuyler and Wadsworth and for the mine defense of the Narrows. Raymond was promoted 1st lieutenant in July 1898. Soon thereafter, he was sent to Boston Harbor for duty as assistant engineer on the fortifications and mine defenses. He remained there until October 31, 1901, when he was ordered to Montgomery to relieve Capt. Judson as district engineer. Cullum, <u>Biographical Register</u>, Vol. IV, p. 550; Vol. V, p. 500..

95. Raymond to Gillespie, July 5, 1902, N A, RG 77, Correspondence 1894-1923, Doc. 18957/5.

96. Abbot to Raymond, July 17, 1902, N A, RG 77, Correspondence 1894-1923, Doc. 18957/5.

97. Kinzie to Adj. Gen., Oct. 1, 1902, N A, RG 77, Correspondence 1894-1923, Doc. 35518/79.

11. The Fiscal Years 1904-05 improvements

In May 1903, District Engineer Raymond informed the Department that the loading platforms were too narrow for proper service of the guns. An extension similar to the connecting galleries between emplacements was required. When providing this, provision should be made for rooms for tools and armament chests, which now obstructed the shot galleries.

The latrines could not be maintained as presently sited, where they were wrecked by blasts from the guns.

All magazines and shellrooms should be lined and the upper concrete surfaces repaired. If necessary to stop seepages, the exterior slope of the concrete parapet must be uncovered down to the ceiling level, repaired, and the sand replaced.

Emplacements Nos. 1, 2, and 3 were equipped with old style hoists, by which the ammunition service was by means of trolleys and cranes. Emplacement No. 4 was more modern in that ammunition service was by means of trolleys, two balanced platform lifts, and ammunition cranes. Consequently, up-to-date chain hoists were required at the four emplacements.

The blast aprons were fragmented.

To underwrite several of these improvements and repairs, Captain Raymond called for:

Closing cracks in concrete	$ 60.
Handrail on one stairway	10.
Removal of old chimney from abandoned dynamo room, and closing aperture	16.
Gratings for drains	4.
Construction of new latrine	2,800.
New iron doors (15) at all openings	1,500.
Racks for rammers at all emplacements	25.
Extensions to loading platforms with iron stairs	4,432.
Toolroom chests	160.
Water supply and hydrants	350.
TOTAL	$9,357

In allotting funds for these projects, the Chief Engineer slashed the sum for a brick latrine from $2,800 to $40 for one built of wood.[98]

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98. Raymond to Gillespie, May 4, 1903 & Abbot to Cavanaugh, June 23, 1903, N A, RG 77, Correspondence 1894-1923, Doc. 18957/7.

By June 1904, workmen had completed all the projects for which the Department had allotted funds 12 months before, except the extension to the loading platforms. Plans for enlarging the platforms and "addition of shell and relocator rooms" had been prepared and submitted by District Engineer Cavanaugh.[99]

On preparing his program for Fiscal Year 1905, Captain Cavanaugh called for:

(a) 5 double and 2 single steel doors to close the shellrooms and outside openings to the battery, presently without doors or entered through wooden doors.

(b) The fragmented concrete blast aprons should be removed and the parapet and slopes refilled and sodded. Extensive filling and sodding was required at other places on the slopes.

(c) In emplacement No. 4, the oil r. m floor must be raised to provide proper drainage.

(d) A stairway should be cut between the gallery leading to the magazine and the shot gallery under the platforms.

(e) Finally, to prevent people walking across the sodded slopes, a concrete walk must be built from the chert roadway in rear of the battery to the steps giving access to the platform.

The Department, after reviewing the projects and estimates, allotted $1,610 for implementing them.[100]

12. Installation of the Taylor-Raymond hoists-

In 1903, plans were finalized for improvements to the ammunition ervice by replacement of the obsolete trolleys and cranes at emplacements Nos. 1-3 and the balanced platform lifts and crane at emplacement No. 4 by TaylorRaymond hoists. Consequently, on April 8, 1904, District Engineer Cavanaugh submitted plans and estimates for modifying substantially emplacement No. 4 by adding a layer of 16-ounce copper over the hoist shaft and truck recesses for waterproofing. The enlargement of and additions proposed to emplacements Nos. 1-3, he explained, were similar in detail to those depicted on the drawing of the supplement to mimeograph 78.

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99. "Proposed Enlargement of Loading Platforms and Addition of Shell and Relocator Rooms to Battery Cullum, Pensacola Harbor, Fla.," Drawer 78, Sheet 81-5. A copy of the subject drawing is on file at the Florida Unit, GUIS.

100. Cavanaugh to Mackenzie, June 3, 1904, & Abbot to Cavanaugh, July 7, 1904, N A,RG 77, Correspondence 1894-1923, Doc. 18957/11.

The platform enlargements and connecting galleries were to be of reinforced concrete, to conform to that of existing connecting galleries and the platform extensions currently under construction. He had reduced the thickness of the concrete to about 6 inches. The stairs were to be built of armored concrete. Thacker bars would be employed to provide necessary tensil strength.

The waterproofing layer over the shellrooms, hoist rooms, shafts, and truck recesses was to be copper. Air spaces were to drain directly into the sand. The porous brick lining of the shellroom side walls was to constitute part of these walls, and be thoroughly bonded into them. The porous lining of the ceiling was to be of flat arch tile, projecting below the ceiling beams and covering them to prevent condensation.

To fund the project, as outlined, Captain Cavanaugh needed a $29,300 allotment.

If this sum could not be made available, elimination of these elements would save the money indicated:

(a) The stairways and that part of the platform extensions and connecting galleries on the left of each platform from the axis of the platform to the prolongation of the right edge of the roof of the adjacent hoist room	$5,125
(b) The relocator room	1,110
(c) The shellrooms by employing hoist rooms for storage of a small number of projectiles	7,100
(d) The permanent galleries in rear of hoists and remainder of platform extensions, including those in angle of parapet on each side of guns, by constructing temporary wooden galleries in rear of hoists, including connection to loading platforms	3,750

This would reduce the $29,300 to $12,225, which Cavanaugh argued was the minimum figure for installation of four Taylor-Raymond hoists.[101]

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101. Cavanaugh to Chief Engineer, April 8, 1904, N A, RG 77, Correspondence 1894-1923, Doc. 47627/66; "Proposed Enlargement of Loading Platforms and Addition of Shell and Relocator Rooms to Battery Cullum, Pensacola Harbor, Fla.," Drawer 78, Sheet 81-15. A copy of this plan is on file at the Florida Unit, GUIS.

The Department, after reviewing Cavanaugh's plans and estimates and its nation-wide commitments, allotted $15,975 for the project. This would cover the minimum needs and those items listed under (d).[102]

Orders for the Taylor-Raymond hoists were placed, and on June 28, 1904, hoists Nos. 38-41 were turned over by the factory for shipment. It was now decided to defer shipment until workmen could make necessary alterations to the fabric of the emplacements. This was not done until the winter of 1905-06.

On March 6, 1906, Captain Cavanaugh notified the Department that he was ready to install the rheostats for the hoists' motors.[103]

Nine weeks later, Capt. Cavanaugh notified the Chief Engineer that the probable date for shipment of the hoists was needed, because this information was necessary in arranging for their installation so there would be minimal interference with service practice by the Coast Artillery.[104]

By early September, the hoists were in position and the controllers had been final tested and pronounced satisfactory.[105]

13. Installation of powder hoists at emplacements Nos. 1-3

On August 25, 1908, Capt. Harley B. Ferguson, who had replaced Captain Cavanaugh as district engineer on October 7, 1907, submitted to the Department drawings exhibiting the condition of the Battery Cullum and Battery Pensacola emplacements. To install one type "A" powder hoist for gun No. 4, the cost would be $160, and for a type "C" hoist at each of the other three Battery Cullum guns, $1,560.[106]

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102. Abbot to Cavanaugh, April 18, 1904, N A, RG 77, Correspondence 1894-1923, Doc. 47627/66.

103. Cavanaugh to Mackenzie, March 7, 1906, N A, RG 77, Correspondence 1894-1923, Doc. 47627/98.

104. Cavanaugh to Mackenzie, May 11, 1904, N A, RG 77, Correspondence 1894-1923, Doc. 47627.

105. Cavanaugh to Mackenzie, Sept. 6, 1906, N A, RG 77, Correspondence 1894-1923, Doc. 47627.

106. Ferguson to Chief Engineer, Aug. 25, 1908, N A, RG 77, Correspondence 1894-1923, Doc. 68422; "Proposed location of Powder Hoists Battery Cullum, Pensacola Harbor, Fla.," Drawer 78, Sheet 81-18. A copy of the subject drawing is on file at the Florida Unit, GUIS. Ferguson had graduated from West Point as No. 7 in the class of 1897. Commissioned a 2d lieutenant in the Corps of Engineers, he was ordered to Charleston, South Carolina, (continued)

After reviewing the plans and estimates and considering priorities, Chief Engineer Alexander Mackenzie allotted funds for purchase of and installation of type "C" hoists for emplacements Nos. 1-3. On February 4, 1909, Captain Ferguson transmitted to the Department a drawing of the type "C" hoists his workmen were positioning at Battery Cullum.[107]

14. The construction of a B.C. station and plotting room for emplacements Nos. 3 and 4

On January 22, 1914, Chief of Coast Artillery Erasmus M. Weaver called for division of Battery Cullum into two batteries, each to have its own fire control equipment. Because of the bleak funding situation, provision should be made for construction of one Battery Commander's Station and plotting room at this time. General Weaver suggested that priority be given to construction of these fire control facilities for guns Nos. 1 and 2.[108]

District Engineer Earl I. Brown accordingly submitted to the Chief Engineer drawings of the "Battery Commander's Station and Plotting Room," which were to be erected in rear of emplacements Nos. 1 and 2. After being reviewed by the Chief Engineer, orders were issued directing that "the B.C. station, plotting room, etc., shown" on these plans will be "built in rear of the traverse between loading platforms 3 and 4."[109]

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106. (continued) as assistant to the district engineer. After a brief tour of duty at Willett's Point, Lt. Ferguson was next sent to Cuba, in late April 1898, with Company E, Battalion of Engineers. In July 1899, he sailed for the Philippines. He was chief engineer with the China Relief Expedition from June 1900 to May 1901.

Lieutenant Ferguson returned to the United States in December 1901. Upon reaching Washington, he was assigned to the War Department's Information Bureau, a position he held until August 1903, when he reported for duty at the U.S. Military Academy, as instructor in Engineering. Promoted to captain, Ferguson was a student at the Fort Leavenworth Staff College from August 1904 to July 1905. Following two years as an instructor at the Infantry and Cavalry School, Ferguson was ordered to Montgomery, where on October 7, 1907, he relieved Capt. Cavanaugh. Cullum, Biographical Register, Vol. IV, p. 623; Vol. V, p. 574.

107. Ferguson to Chief Engineer, Feb. 4, 1909, N A, RG 77, Correspondence 1894-1923, Doc. 68422/171. The subject drawing is not on file at National Archives.

108. Weaver to Chief Engineer, Jan. 22, 1914, N A, RG 77, Correspondence 1894-1923, Doc. 35518/267.

109. "Fort Pickens, Fla., Proposed B.C. Station and Plotting Room for Battery Cullum," Drawer 78, Sheet 81-29. A copy of this drawing is found (continued)

Major Brown, upon resubmitting the drawings, provided the Department with two alternatives for the "proposed B.C. Sta. & Plotting Room" between emplacements Nos. 3 and 4. Upon reviewing the drawings, Secretary of War Lindley Garrison opted for alternative A. This would locate the plotting room as a first story under the Battery Commander's Station.[110]

The Department, in Fiscal Year 1915, allotted $2,310 for implementing the project. Construction proceeded smoothly, and on August 20, 1915, the Corps of Engineers transferred the recently completed and equipped concrete Battery Commander's Station and Plotting Room to the Coast Artillery.[111]

E. Emplacements Nos. 1 and 2 Become Battery Sevier

On April 25, 1916, the War Department, although no steps had been taken to fund construction of a B.C. Station and plotting room for emplacements Nos. 1 and 2, implemented General Weaver's proposal to divide the battery into separate fire units. General Order No. 15 was issued that day designating emplacements Nos. 1 and 2 Battery Sevier. Emplacements Nos. 3 and 4 would continue to be known as Battery Cullum.

The man honored by this action was John Sevier. A pioneer, soldier, and the first governor of Tennessee, Sevier was born near present-day New Market, Virginia, in September 1745. He emigrated from the Shenandoah Valley in 1773 to the remote frontier that is now East Tennessee.. There, he settled on the Holston River. He became a member of the local Committee of Safety in 1776. Four years later, in October 1780, he led 240 overmountain men against the British in the battle of Kings Mountain. During the ensuing months, he commanded a number of raids deep into Cherokee country.

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109. (continued) in files of the Florida Unit, GUIS. A Georgian, Brown had graduated from the U. S. Military Academy as No. 6 in the class of 1898. Commissioned a 2d lieutenant in the Corps of Engineers, he was ordered to Willett's Point for duty with the Engineer Battalion. In October, he reported to Fort Caswell, North Carolina, where he served until September 1899. After another assignment to Willett's Point, he was ordered to the Philippines in June 1901. Lt. Brown returned from the Far East in November 1903. After a tour of duty at the Washington Barracks, Brown, now a captain, was sent to Cuba in October 1906. He returned to the United States in May 1907, and was assigned to the Wilmington Engineer District. Captain Brown remained at Wilmington until July 1911, when he was named District Engineer at Galveston. Promoted major in October, Brown became district engineer for the Montgomery District on July 12, 1912. Cullum, Biographical Register, Vol. IV, p. 643; Vol. V, pp. 595-96; Vol. VI, p. 826.

110. "Proposed B.C. Sta. & Plotting Room, Between Emplacements 3 & 4, Battery Cullum, Fort Pickens, Fla.," Drawer 78, Sheet 81-32. A copy of this drawing is on file at the Florida Unit, GUIS. Vertical posts were to be substituted for the "leaning ones in Section A-B for Position A."

111. Emplacement Book, Battery Cullum, N A, RG 392.

During the "critical" years following the Revolutionary War, Sevier was elected governor of the short-lived State of Franklin. When Tennessee was admitted to the Union, he became its first governor, serving three successive terms from 1796 until 1801, and three more terms from 1803 to 1809. His choice was a natural for "he was a military hero, still a dashing figure, unaffectedly cordial in his manner, neither cultured nor illiterate, an experienced public officer, and bound by ties of blood and intimate friendship to many families throughout the state." In 1815, Sevier was appointed a commissioner to participate in a survey of the Creek cession. He died in Alabama while on this service.[112]

F. The Batteries from World War I Through World War II

1. The construction of the reinforced concrete power station

In 1922-23, a new power station was constructed, to service Batteries Cullum and Sevier. The 23'8" by 15' (interior dimensions) reinforced concrete structure was built adjacent to the exterior slope of Battery Cullum, near the division point between the two batteries. A wooden partition divided the structure into two rooms--a radiator and engine room. Positioned in the structure were two 25-kilowatt gasoline-powered 115-volt, 2-way generators, GM-13, complete with all standard accessories (2 oil pressure gauges, 2 radiators, 2 boxes with tools, 2 boxes of spare parts, 2 thermometers, and 2 cylinders); 2 buried gasoline tanks; 1 switchboard, 3-panel, Type N, complete (with 1 voltmeter, 1 ammeter, 2 wattourmeters, 2 circuit breakers, and other standard accessories); 2 switches (DPST); 1 transformer (SRW); and interior lighting system.[113]

2. The batteries are removed from the project and the armament salvaged

Fatigue parties from the 13th Coast Artillery, during the period September 1November 30, 1930, repaired the aprons and earthen parapets of Batteries Cullum and Sevier.[114]

Some 30 months later, the War Department, recognizing that a number of its coastal defenses had become obsolete and in the interest of economy, listed Batteries Cullum and Sevier as no longer required.

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112. GO 15, April 25, 1916.

113. Fort Pickens Historical Record Book, N A, RG 392; "Defenses of Pensacola, Fla., Power Station for Batteries Cullum-Sevier," Drawer 78, Sheet 81-39; "Defenses of Pensacola, Fla., Switchboard, Power Station--Batteries Cullum-Sevier," Drawer 78, Sheet 81-40. Copies of these plans are on file at the Florida Unit, GUIS.

114. Coast Artillery Journal, Vol. 74, p. 66.

Upon receipt of this order, dated June 16, 1933, the four 10-inch guns had their breech mechanisms removed and were given a heavy coat of cosmoline.[115]

The post's correspondent for the Coast Artillery Journal, taking note of this, wrote:

> Old friends of Barrancas will shed a tear--or cheer, as the case may be, to learn that old Batteries Cullum, Sevier, and Pensacola have succumbed to the modern age and are now resting in heavy dope--out of service. All of a sudden, somebody went modern and signed the death warrant, or should we say they decided to save money, and lay the old hands off. But no one knows the future. General [Hugh S.] Johnson may force the War Department to join the NRA and put these old employees back on the payroll again![116]

Although the batteries had been withdrawn from the Harbor Defense Project, the guns and carriages were not removed and salvaged until November 1942, 11 months after Pearl Harbor.[117]

G. World War II Modifications

In 1943, the Coast Artillery, "to provide better coverage of the beach and water areas within its range, relocated Battery Trueman to Battery Cullum. The two 3-inch rapid-fire guns were emplaced on concrete platforms between emplacements Nos. 1 and 2. A Battery Commander's and Coincidence Range-Finder Station was erected at the easternmost point of the battery. At the same time, the signal and meteorological stations were relocated to Battery Sevier.[118]

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115. Emplacement Book, Battery Cullum, N A, RG 392. In May 1918, Battery Cullum's two 10-inch rifles were dismounted and shipped on June 15 to the Watervliet Army Gun Factory, the battery having been declared surplus to the Army's needs. On March 18, 1919, the battery was listed by the War Department to be retained. In December 1919, the Gun Factory shipped two Model 1895 guns to Fort Pickens -- Nos. 48 and 49 -- as replacements for Nos. 30 and 44. They were mounted by the garrison in May 1921, No. 48 in emplacement No. 1 and No. 49 in emplacement No. 2.

116. Coast Artillery Journal, Vol. 76, p. 380. Johnson, a retired general, headed the NRA.

117. Annexes to Harbor Defense Project, Harbor Defenses of Pensacola, Jan. 22, 1943, N A, RG 407.

118. Ibid.; Annexes to Harbor Defense Project, Harbor Defenses of Pensacola, July 1, 1945, N A, RG 407.

In the summer of 1903, $180 was allotted to convert into a coal shed for the central power station the casemate on the left of the sally port, next to the tracks. To accomplish this, the casemate was ceiled and floored.[5]

C. The 1905 Expansion and Improvement of the System

On August 12, 1904, Captain Cavanaugh submitted estimates for repairs and additions required to place the electric plants in good condition:

1. Battery Pensacola--The platform lighting was in conduit and was complete. Necessary conduit had been installed for all interior wiring except in magazines and shellrooms. There, the work had been delayed, pending a decision regarding these rooms' lining. To complete the installation, there would be required "erection of conduits and boxes in the magazines and shellrooms, purchase of the necessary wire and other materials, "and wiring all the conduit in these rooms." Cost of this work was placed at $698.50.

2. Battery Cullum--The platform lighting was conduit throughout, with exception of connections to mains. All interior lighting was open work and in such bad condition it would have to be replaced. The current for the battery was supplied from the central plant through a single feeder consisting of a twin conductor lead-covered cable, having a length of 1,600 feet from the switchboard to the distribution center in rear of the battery.

To supply the ammunition hoist motors from the central plant with "a drop not exceeding 10 percent will require feeders having a cross section not less than 400,000 c.m." To provide this current would require installation of an additional generating unit. This unit should be designed for future use in a permanent central plant. A boiler of sufficient power to operate a 50-kilowatt generator had been recently installed in a temporary plant, and there were plans to relocate it in a permanent unit.

5. Post Engineer to Post Adj., June 22, 1903, N A, RG 77, Correspondence 1894-1923, Doc. 36261.

Captain Cavanaugh estimated the cost of necessary work on the battery's electrical system at:

Material	$ 245.00
Labor	420.00
Lead-covered cable for distributing mains for motors and lights, installed in ducts, including necessary man-holes	1,600.00
Lead-covered cable for feeder for motor circuits installed in trench	2,400.00
One 50 k.w., 125 volt, D.C. generator, installed	1,250.00
One 75 H.P. automatic high-speed engine	2,000.00
One switchboard	200.00
	$8,115.00
Incidentals and superintendence--10%	811.50
TOTAL	$8,926.50

Turning to Battery Slemmer, Cavanaugh reminded the Department that its platforms were unlighted while the lighting system in the magazines and rooms was carried in "open wiring." To light the platforms and place the open wiring in conduit would cost $1,457.50.

Neither Battery Van Swearingen nor Battery Center had an electrical system. To light the platforms and rooms of the former was estimated at $654.50, and the latter at $1,457.50.[6]

On March 12, 1905, the Chief Engineer allotted $12,925 from the appropriation for "Modernizing Older Emplacements," March 3, 1905, to fund these projects.[7]

D. The Central Power Station is Phased Out

By 1916, the central powerhouse was leaking badly. Its boiler room was in a "very delapidated structure," which should be replaced. The commander of the defenses had recommended that commercial power be supplied to the post and that each battery be provided with a gasoline-driven electric generator. If this were done, the central power plant, with its smoke-belching chimney, could be removed and the boiler room and chimney razed.[8]

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6. Cavanaugh to Mackenzie, Aug. 12, 1904, N A, RG 77, Correspondence 1894-1923, Doc. 18957/12.

7. Abbot to Cavanaugh, March 22, 1905, N A, RG 77, Correspondence 1894-1923, Doc. 18957/12.

8. Boggs to Cnief Engineer, April 21, 1916, N A, RG 77, Correspondence 1894-1923, Doc. 95520/17-20.

The 1903 powerhouse became superflous in the early 1920's, following completion of the Batteries Pensacola and Cullum powerhouses. In 1925, the equipment was surveyed and sold and the boiler house demolished.[9]

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9. Fort Barrancas Historical Record, N A, RG 392, Coast Artillery Districts and Commands.

1,800 feet Duplex, L.C. cable 150,000 C.M. at $550.00 per M	$ 990.00
4,100 feet, same, No. 5 at $130.00 per M	533.00
300 feet, same, No. 12 at $100.00 per M	30.00
7,900 feet, same, No. 6 at $125.00 per M	937.50
6,930 feet, same, No. 5 at $130.00 per M	900.90
1,200 feet submarine cable, No. 6, at $300.00 per M	360.00
Freight	200.00
Expert Labor	200.00
	$4,201.40
Contingencies, 10 percent	420.14
TOTAL	$4,621.54

To this must be added the cost of wiring the stations for lighting, viz:

54 lights at $2.00--$108.00, plus 10 percent	118.80
Making a total of	$4,740.34

It was, however, unclear whether the small storage batteries for the system were to be supplied by the Engineers or Signal Corps. If by the former, another $1,320 must be added to the allotment.[25]

Chief Engineer Gillespie allotted $4,740 to fund the project on the assumption the Chief Signal Officer would provide for the storage batteries.[26]

In the autumn of 1902, steps were taken to cut telautograph niches, 20 inches deep and 30 inches wide, in the side walls of the loading platforms in the Batteries Pensacola, Cullum, and Slemmer emplacements.[27] Two hundred dollars were allotted, but another $100 had to be programmed for cutting niches for installation of the telautograph and firing wires.[28]

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25. Raymond to Gillespie, June 21, 1902, N A, RG 77, Correspondence 1894-1923, Doc. 35518/65.

26. Gillespie to Raymond, June 28, 1902, N A, RG 77, Correspondence 1894-1923, Doc. 35518/65.

27. Whistler to Randolph, Oct. 20, 1902, N A, RG 77, Correspondence 1894-1923, Doc. 35518/72.

28. Raymond to Gillespie, Nov. 10, 1902, N A, RG 77, Correspondence 1894-1923, Doc. 35518/72. Details of the telautograph booths are found on these drawings: "Defenses of Pensacola Harbor, Fla., Details of Telautograph (continued)

D. The April 1903 Test

1. The firing plan

By April 1, 1903, preparations for the test were completed, and Col. Samuel M. Mills issued necessary orders. Battery commanders were to make all arrangements for firing and to assure themselves that the ammunition was on hand and properly used. As only one gun in each battery was to be fired for any single division of the test, except in case of salvo fire, the spare trucks should be used with the gun to be fired, and a projectile placed on each one.

For the various phases of the second division of the test, 15 rounds would be fired from Batteries Pensacola and Slemmer and 17 rounds from Battery Cullum, including sighting shots. During this division of the test, as all firing was supposed to be at vessels underway, no two shots from the same gun were to be fired at an interval of less than 2 minutes.

During the test's third division, each battery was to fire ten rounds, inclusive of sighting shots.

A sighting shot was authorized, preparatory to the daily firing. To eliminate wind effects as much as possible, this shot was to be fired as nearly as practicable at right angles to the wind direction, and at a range of 5,500 yards.

The point selected would be carefully relocated for the primary and secondary stations and each instrument set accurately on azimuth before the gun was fired.

Since the firing was to be controlled from a distant station, the battery officers were to be particularly careful that no shot endangered any vessel.[29]

2. The guns roar

On April 18, the Board (Cols. Charles R. Suter and Amos Stickney, Lt. Col. William R. Livermore, and Majs. Rogers Bernie and Sedgwick Pratt) arrived at Pensacola and spent the next two days inspecting the batteries and the proposed fire control system. The test, which included

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28. (continued) Booths and Niches," and "Defenses of Pensacola Harbor, Fla., Locations of Telautograph Booths and Niches." Copies of these plans--numbered Drawer 78, Sheet 90-13, and Drawer 78, Sheet 90-14--are on file at the Florida Unit,

29. General Order 21, Fort Barrancas, April 1, 1903, N A, RG 77, Correspondence 1894-1923, Doc. 35518/99.

Batteries Pensacola, Cullum, Worth, and Slemmer, began on the 21st. The Board took position at the Fort Barrancas Fire Commander's Station, where they were joined by Major Whistler.

Major Whistler by telephone gave the fire commanders at Forts Pickens and McRee their targets and orders for trial shots, and the guns opened fire after an average lapse of 4 minutes 26 seconds. A second service began. Grass fires in front of Batteries Pensacola and Cullum caused a two-minute delay to extinguish.

That afternoon, the Board took position in the FC and BC stations at Fort Pickens to witness the fire of Battery Worth's eight 12-inch mortars at "a constant angle of elevation of 45 degrees at moving targets."

On April 22, the Board again took station at Forts Barrancas and Pickens to watch further tests of the guns at moving targets and the firing of the mortars at 52 degrees elevation. Because of the atmospheric haze, the day's tests were cancelled. The Board then dispersed.[30]

3. Evaluating the results

After the firing ceased, District Engineer Raymond carefully examined each emplacement and range station. No damage had been done to the platforms or other masonry of the emplacements, except at Battery Pensacola. There, the brick lining of magazine No. 1 was badly cracked, several bricks from the top course having been dislodged. Mortar that had been shaken down behind the lining had obstructed the drains of the airspace, causing water to flow across the floor of the magazine, which had heretofore been dry. The lining walls of the adjacent shellroom were fractured but not displaced. No damage had been done to the lead ceilings.

At Battery Cullum, the blast aprons had been shattered by previous firings. No further damage had occurred, except for one 200-pound fragment being lifted and overturned.

Batteries Slemmer and Pensacola did not have blast aprons. There, the sand under the muzzles had been only slightly disturbed, although 25 rounds had been fired from Battery Pensacola. Thus, it seemed that sod protection was ample, and not only were aprons non-essential, but they constituted a danger from a shell burst hurling fragments about the emplacements.

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30. Suter to Gillespie, July 31, 1903, N A, RG 77, Correspondence 1894-1923, Doc. 35518/104; "Map of Entrance to Pensacola Harbor, Fla., showing Installation of Experimental Fire control System, Tested April 20-23, 1903," Drawer 77, Sheet 31-10. A copy of this drawing is on file at the Florida Unit, GUIS.

Little damage had been suffered by the fire control stations, except at Fort McRee. At this station, on the right flank of Battery Slemmer, a Type A instrument had been knocked out of adjustment, one window sash in the switchboard room smashed, several lights dislodged or broken, and the telautograph thrown to the floor.[31]

Meanwhile, the Army's Chief Signal Officer, Brig. Gen. Adolphus W. Greely, had complimented Chief Engineer Gillespie on the success that had attended the operation of the telautographs and telephones in the recessed booths during the test of the experimental horizontal base range finding system, although the shock of firing with service charges had been "so great as to affect the face of concrete in place, yet the telephones and telautographs withstood the concussion admirably." In no case was any of the electrical apparatus protected by the recessed booths disturbed.[32]

The War Department, after reviewing and evaluating Whistler's experimental system, found that the long horizontal base for indirect position-finding had proved itself. In Fiscal Year 1904, it was adopted by the Army for installation at the Nation's coastal defense fortifications.[33]

E. The Fire Control System Becomes Highly Sophisticated

1. Improvements to the system--1903-06

In October 1903, the post engineer called for an allotment to build a box over each of the Battery Worth telautograph receivers to prevent deterioration of instruments because of moisture in the rooms.[34] These coverings were to be light pine doors, similar to those already hung at Batteries Cullum, Pensacola, and Slemmer.[35]

The project was promptly approved and implemented.

Early in May 1906, the post commander, in accordance with G.O. 72, April 11, 1906, called for installation of circular benches for

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31. Ibid.

32. Greely to Gillespie, May 5, 1903, N A, RG 77, Correspondence 1894-1923, Doc. 35518/102.

33. Executive Documents, Serial 4444, pp. 11-12; Serial 4636, p. 12.

34. Sheen to Post Adj., October 2, 1903, N A, RG 77, Correspondence 1894-1923, Doc. 35518/117.

35. Cavanaugh to Adams, Oct. 14, 1903, N A, RG 77, Correspondence 1894-1923, Doc. 35518/117. Lt. Col. Henry M. Adams was division engineer for the Gulf Division, with headquarters at New Orleans. He had succeeded Colonel Hains as Division Engineer in July 1901.

observing the instruments and plotting boards in the fire commander's and battery commander's stations, and for corrugated rubber floor cloth.[36] The latter was to cover the floors in the plotting and observing rooms, and the connecting stairs where it would deaden noise.[37]

The Department allotted $500 for the corrugated rubber flooring and $170 for circular benches. This work was undertaken under Captain Cavanaugh's supervision.[38]

2. <u>The BC stations are relocated and the towers proliferate</u>

To improve the efficiency of its indirect range finding system for seacoast batteries, the Army, beginning in 1904, began relocating the Battery Commander's stations by placing them at the emplacements. In 1904, a BC station for Battery Worth was constructed on top of the parapet between pits A and B.

In 1908, upon completion of the splinter-proof BC station for Battery Pensacola at the emplacements, the frame 1902 station was listed as obsolete. It was destroyed by fire on February 24, 1911. Splinter-proof BC stations were built at Battery Cullum in 1914-15 and Battery Slemmer in 1908.[39]

In the early 1920's, three steel fire control towers were built at Barrancas Beach to house secondary stations for Batteries Langdon, Worth, and Pensacola. When Battery Pensacola was disarmed in 1934, its B"S" was reassigned and performed a similar mission for Battery GPF.[40]

The September 20, 1926, hurricane destroyed the 1902 secondary stations (B"S") on the marge of the bay, 1,000 yards east of Battery Worth. At this time, these stations served Batteries Cullum and Worth. Also wrecked

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36. Cavanaugh to Mackenzie, May 24, 1906, N A, RG 77, Correspondence 1894-1923, Doc. 35518/159.

37. Abbot to Cavanaugh, May 29, 1906, N A, RG 77, Correspondence 1894-1923, Doc. 35518/159.

38. Abbot to Cavanaugh, June 23, 1906, N A, RG 77, Correspondence 1894-1923, Doc. 35518/159.

39. Fort Pickens, Fort Record Book, N A, RG 392.

40. "Defense of Pensacola, Fla., Fire Control Structure, Secondary Station Pensacola," Drawer 78, Sheet 90-28; Annexes to Harbor Defense Project, Harbor Defenses of Pensacola, July 15, 1936, N A, RG 407.

by this storm was the secondary station for Battery Sevier housed at Fort McRee, in the structure formerly employed as the Battery Slemmer BC station.[41]

In 1930, the Engineers erected three steel frame towers, supported on concrete piers, near the beach 800 yards northwest of Battery Langdon. Positioned on these towers, which cost $3,996 each, were 10- by 10-foot, interior dimensions, fire control stations. Atop each station was an observation platform with a pipe handrail. From west to east, these stations, designated the Butler Group, served as secondary stations for Batteries Sevier, Cullum, and Langdon. In 1933, after Batteries Sevier and Cullum were withdrawn from the Defense Project, the westernmost station was assigned to Battery GPF and the middle one to Fire Group II.[42]

By the 1930's, another trio of towers, known as the Davis Group, had been erected about 300 yards west of Battery Langdon. The middle tower served as Battery Worth's secondary station, while the one to the west was assigned to the Harbor Defenses and the eastern structure was for auxiliary purposes.[43]

3. World War II brings radar and an increase in base lines

During World War II, the fire control system became more complex. Battery Langdon was provided with one primary and four secondary stations. The station B'S' in the Butler Group was retained; the B"S" tower at Barrancas Beach was replaced by a double tier station; double tier towers B""S""and B""S"" were erected, the former near Deer Point and the latter at Red Bluff; and a tower B""'S""' at Bald Point. The primary station (B'S') for construction No. 233 was on the lower tier of the Barrancas Beach fire control tower, its B"S" in one of the Butler Group towers and its B"'S"' in the lower tier of the Red Bluff tower. The primary station (B'S') for construction No. 234 was at the Butler Group; its secondary station B"S" was at Barrancas Beach; and its secondary station (B"'S"') was in the lower tier of the Deer Point tower.

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41. Fort Pickens Historical Record Book, N A, RG 392.

42. Annexes to Harbor Defense Project, Harbor Defense of Pensacola, July 15, 1936, N A, RG 407; Fort Pickens Historical Record Book, N A, RG 392; "Final Relocation of Three New Steel Towers--Old Secondary Group, Replacing Wooden Towers Destroyed in 1926," Drawer 78, Sheet 106-30.

43. Ibid.

This change order, Colonel Fitch explained to the Chief Engineer, would "extend the apron feature practically the entire length of the north seawall, and with the walk and curbs, would form an apron 34 feet wide."[36]

Chief Engineer William H. Bixby, on May 21, reviewed and approved the change order.[37]

4. Major Brown completes the landscaping

Maj. Earl I. Brown relieved Colonel Fitch as District Engineer in July 1912. On December 6, he submitted, in response to a telegram from the Department, a report on the cost of work still required under the approved project for "Repair and Protection of Defenses." All projects, he noted, had been completed except:

(a) Placing of "fertile earth and bermuda roots" at Forts Pickens and McRee;

(b) Repairing the jetty at Fort McRee;

(c) Protection of the magazines at Batteries Cullum, Van Swearingen, Pensacola, Slemmer, and Center; and

(d) Completing the roadway.

The estimated cost of these undertakings was:

Fertile earth to be positioned, including placing Bermuda roots:	
Fort Pickens--45,000 cubic yards @ $5	$225,000
Fort McRee--5,000 cubic yards @ $5	25,000
Repairs to jetty at Fort McRee	1,000
Protecting magazines	29,000
Completing roadway	15,000
Contingencies	10,000
TOTAL	$305,000

36. Fitch to Chief Engineer, May 16, 1912, N A, RG 77, Correspondence 1894-1923, Doc. 61026/114.

37. Ralston to Fitch, May 21, 1917, N A, RG 77, Correspondence 1894-1923, Doc. 61026/114.

E. The October 18, 1916, Cyclone

Before most of the damage had been repaired, a cyclone struck the area on the morning of October 18, bringing with it 114-mile-per-hour winds. At Fort Pickens, the Quartermaster wharf was again smashed; the mine defense boathouse wrecked; and one mining yawl crushed and a second badly damaged. The tide-gauge on the Engineers' Wharf was flattened; the housing for searchlight No. 3 was blown against the engine; the recently repaired stairways, giving access to the secondary stations, were damaged; and several hundred feet of cable near the secondary stations ruined.

At Fort McRee, a cable terminal box near the wharf was thrown to the ground; the foundations of the water tower undermined, causing it to lean 30 degrees; the pumping plant wrecked; the Ordnance storehouse badly battered; and the caretaker detachment quarters further damaged.

Several chimneys were toppled at Barrancas Barracks; slate roofs damaged; many shade trees uprooted; and the frame building used as a messhall in conjunction with the 1840's brick barracks blown down.[53]

F. The September 28, 1917, Hurricane

The September 28, 1917, hurricane sent surf sweeping across the area occupied by the construction plant for the 12-inch battery. This was east of the area protected by the Fort Pickens seawall and the high ground at Battery Worth. The roof of the cement shed was torn loose, and more than $4,000 worth of cement ruined. The derrick, water tank, lighting tower, and electric pole line were blown down. The railroad track was undercut, and the rails thrown out of alignment. Engines were clogged with sand and had to be overhauled. Lumber was scattered. Two large barges, anchored in the cove, were driven aground, and the rudder stack of Santa Rosa jammed. District Engineer Sturdevant estimated the cost of repairing this damage at $9,231.[54]

The old Engineers' Wharf was swept away, leaving only the pilings.

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53. Fort Barrancas Historical Record Book, N A, RG 392.

54. Sturdevant to Black, Nov. 19, 1917, N A, RG 77, Correspondence 1894-1923, Doc. 18957/55.

Damage to the fortifications had been repaired at a cost of:

Battery Worth secondary station--replacement of shutters	$ 5.00
Battery Pensacola secondary station--repair of pier foundation and stairs	150.00
Battery Cullum secondary station--repair of foundations and stairs	175.00
Mine defense secondary station--repair of window lights and roof	25.00
Battery Worth--repair of storehouse roof and window lights	25.00
Battery Worth primary station -- repair of roof and 4 shutters	25.00
Battery Pensacola primary station--repair of roof, shutters, and door	35.00
Battery Cullum primary station--repairs to roof and shutters, walkway and steps in rear of station	70.00
Mine defense primary station--repairs to roof and windows	35.00
Battery Pensacola--repairs to hoods on time range boards	25.00
Searchlight No. 4--shelter blown down	250.00
Battery Payne--slight repairs	10.00
Battery Trueman--slight repairs	10.00
Mine loading room--slight repairs	6.00
Torpedo Storehouse--repairs to roof	35.00
Cable Tank--repairs to roof	15.00
Searchlight No. 5--repairs to roof and door of shelter	20.00

Battery Slemmer Powerhouse--renewing window lights	15.00
Engineer Quarters and Storehouse--repairs	300.00
TOTAL	$1,230.00

At Battery Cooper, the sand exterior slope had been badly washed. As this was the third time this had occurred, the foot of the slope would be protected by a concrete apron.[55]

G. The September 20, 1926, Hurricane

The hurricane of September 20, 1926, caused severe damage to military installations, shipping, crops, and the property of civilians. Winds, which registered gusts up to 130 miles per hour, left a medium sized steamer high and dry near Battery Langdon; an oil tanker stranded in the bay north of Fort Pickens; the Navy's tug Allegheny ashore; and a number of Naval Air Station subchasers, patrol boats, etc., "strewn through the woods adjoining Bayou Chico." The Naval Air Station lost nearly all its seaplanes. All bridges on the main highway between the Barrancas and Pensacola were down. The Navy, however, hoped to have the bridge across Bayou Grande reopened to traffic within 48 hours. The trolley line between Pensacola and Barrancas was shut down, its bridges, tracks, and power lines seriously damaged.

Forts McRee and Pickens were flooded by the surf and surging flood tides, and at times, were "completely submerged." At Fort Pickens, most of the buildings suffered damage. In some instances, it was slight, amounting to only a few dollars. It consisted of overturned chimneys, damaged roofs, broken window lights, and sagging plaster. The corrugated iron roof had been ripped off the torpedo storehouse; the Engineers' Office and storehouse were seriously damaged; and three of the 1902 secondary stations were down and the instruments in two of them destroyed. All power stations were flooded, and, in several instances, the 25-kilowatt generators entirely submerged. The magazines of Batteries Cullum, Sevier, Payne, and Trueman, three days after the blow, still had 4 feet of water, and it was impossible for Maj. Walter Singles, the post commander, to estimate the damage to the ammunition stored within. Much of it, however, was in hermetically sealed cases. Both the Engineers' and the Quartermaster wharves were severely damaged, the decking and boathouses carried away.[56]

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55. Sturdevant to Chief Engineer, Nov. 21, 1917, N A, RG 77, Correspondence 1894-1923, Doc. 18957/82.

56. Singles to Adj. Gen., Sept. 23, 1926, N A, RG 77, Harbor Defense File, Doc. 600.913.

At Fort McRee, the old unserviceable wharf was further damaged, while at Fort Barrancas, nearly all the structures had suffered damage in varying degrees. Miraculously, no Army personnel had been killed or injured. Major Singles placed the damage to War Department property at between $50,000 and $100,000.

After reassessing the situation, Major Singles concluded that the seawalls at Forts Pickens and McRee had served their purpose "admirably" as "a buffer against the force of the waves." But, he continued, they had also served as reservoirs. When constructed, floodgates had been installed to allow trapped water to escape into the bay. But, when the area within the walls was sandfilled and sodded, the floodgates became inoperable. In addition, the magazines of Batteries Cullum and Sevier had "been converted into enormous reservoirs by their construction,...for the prevention of ingress of water...in case of storm." The construction was excellent, provided water did not spill over the seawall. But, when it did, as in the September 20 hurricane, the magazines became huge cisterns. To drain them, a fire engine had to be transferred from the mainland to Fort Pickens.[57]

57. Singles to Adj. Gen., Oct. 6, 1926, N A, RG 77, Harbor Defense File, Doc. 600.913.

XVII. IMPROVEMENTS TO AND REPAIR AND MAINTENANCE OF HARBOR DEFENSE PROJECT FACILITIES: FISCAL YEARS 1906-1917

A. Fiscal Year 1906 Brings Limited Funds for Repair and Maintenance

1. Captain Cavanaugh submits his program

During this 11-year period, improvements were made to the four seacoast batteries (Cullum, Worth, Pensacola, and Slemmer) designed to make them more effective. Maintenance and repair of the various elements of the Harbor Defense Project were a constant drain on available resources. These charges, which could not be foreseen and programmed for, included the heavy costs required to repair damages inflicted on the Pensacola Defenses by the killer hurricanes of 1906 and 1916. This chapter details the improvements, repairs, and maintenance items covered by annual programs and funded from the appropriations for "Preservation and Repair of Fortifications."

On March 9, 1905, the Chief Engineer called on his district engineers for estimates of funds necessary for "Preservation and Repair of Fortifications" in Fiscal Year 1906. In view of the small sum ($300,000) appropriated by the Congress, only the most urgent needs could be considered.

When he submitted his estimates, Captain Cavanaugh arranged under each battery, in order of their urgency, first class defects. Of these, those required to "put the electric installations of batteries Pensacola and Cullum in serviceable condition, and to provide the current required for lights and ammunition service" were believed of first importance.[1]

His program called for:

BATTERY WORTH

Cleaning and painting doors and other iron work	$ 70	
Whitewashing interior of rooms and galleries	25	
Darkening concrete surfaces	25	
Resurfacing pavements in galleries to facilitate movement of ammunition trucks	360	
Repairs to guardroom	150	$630

BATTERY PENSACOLA

Completing repairs to electric light installation including new feeder for lighting circuit, installed in trench	$710	
Cleaning and painting doors and other iron work	90	
Whitewashing interior	25	
Darkening concrete surfaces	50	875

1. Cavanaugh to Mackenzie, Mar. 22, 1905, N A, RG 77, Correspondence 1894-1923, Doc. 18957/13.

BATTERY CULLUM

Repairing electric light installation	$750	
Lead covered cable for distributing mains for motors and lights, installed in ducts including necessary manholes (This cable is necessary to complete installation at battery; much of the material required for the installation proper is on hand and not included in this estimate.)	1,760	
Cleaning and painting doors, platform extension, and other iron work	300	
Repairing slopes	100	
Darkening concrete surfaces	50	
Whitewashing interior	50	
New steel doors for tool room	100	
Wooden steps at flanks to prevent sentry walking on slopes	25	3,135

BATTERY VAN SWEARINGEN

Cleaning and painting doors	$ 10	10

BATTERY SLEMMER

Cleaning and painting doors and other iron work	$ 80	
Repairs to slopes	50	
Repairing Lidgerwood boiler in electric plant	120	
Installing condensing plant to correct trouble with feed water	150	
Repairing Case engine	200	
Repairs to electric light installation adding platform lights and placing all wires in conduit	1,600	2,200

BATTERY CENTER

Cleaning and painting steel doors and beams	$ 10	
Repairing latrines and removing obstruction from sewer	45	55

CENTRAL POWER PLANT

Repairs to engine and dynamo of 15 k.w. generating set	$375	
Repairs to engines of 10 k.w. and 8 k.w. generating sets	150	525

MISCELLANEOUS

The salary of the civilian electrician should be provided for during the entire fiscal year

An allotment should be made available for general repairs to the machinery, including minor ones not specifically provided for in the above estimates, and others, the necessity for which may arise from time to time, as the possession of such an allotment greatly facilities the work of the Engineer Department in making repairs called for by the Artillery from time to time.

Salary of civilian electrician	$1,200	
General repairs machinery, electric plant, etc.--Fort Pickens	500	
General repairs machinery, etc.--Fort McRee	200	
Repairing and painting roof torpedo storehouse	75	1,975
TOTAL		$9,405

Captain Cavanaugh then listed the more expensive items of "general repair" that were deemed more urgent:

Purchase and installation of new generating set in central plant	$ 3,750
Feeder cable for motors of chain hoists--Battery Cullum, installed in trench	2,640
Purchase and installation of new boiler for electric plant--Battery Slemmer	1,350
Widening loading platforms--Battery Pensacola	3,500
Repairing waterproof lining in magazine, emplacement No. 1, Battery Pensacola	550
Waterproofing top of traverse--Battery Worth	1,400
Completion of three shell rooms, relocator room, and platform extensions, in connection with the installation of chain ammunition hoists at Battery Cullum	15,500
Installation of electric lighting plant--Battery Van Swearingen	710
Installation of electric lighting plant--Battery Center	1,260
TOTAL	$30,660

Commenting on these, Captain Cavanaugh noted that repair of the magazine lining in Battery Pensacola's emplacement No. 1 and waterproofing the traverse of Battery Worth would "remove the greatest causes of complaint due to leakage and make serviceable parts" of these two batteries, which could not now be used.[2]

2. The Department pares the program to $2,500

Chief Engineer Mackenzie, on reviewing the proposals and evaluating the Corps' nationwide responsibilities, allotted $2,500 to fund those projects indicated by a checkmark (✓) on the estimates. For the more expensive entries, it was unlikely there would be any money before Fiscal Year 1907.[3]

3. Major Rowan's January-February 1906 inspection

Maj. Hamilton Rowan of the Inspector-General's Department spent the week of January 29-February 5, 1906, at the Pensacola forts.

As he walked through Battery Cullum, he pointed out to District Engineer Cavanaugh that, except in emplacement No. 4, the shot trolleys did not lead to the ammunition hoists. At No. 4, the room at the foot of the stairs was too wet for any use.

In explanation, Captain Cavanaugh replied that the shellroom in emplacement No. 3 had been modified, and the trolley rails erected for the new ammunition service. As soon as the new trolleys, adapted to the I-beam rail, were received, its ammunition service would be satisfactory.

At emplacements Nos. 1 and 2, the trolley rails had been installed in the hoist-room, and it was believed that by storage of a limited amount of ammunition in this room, a satisfactory ammunition service could be had, pending the completion of new shellrooms. The extension of the existing trolley system from the old shellrooms to deliver ammunition to the recently installed Taylor-Raymond hoists was not recommended. Cavanaugh anticipated that the new trolleys would be installed by July 1.

Captain Cavanaugh then explained that the Department had been unable to allot any funds for remodeling the shellrooms for emplacements Nos. 1 and 2.

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2. Cavanaugh to Mackenzie, Mar. 22, 1905, N A, RG 77, Correspondence 1894-1923, Doc. 18957/13.

3. Abbot to Cavanaugh, May 10, 1905, N A, RG 77, Correspondence 1894-1923, Doc. 18957/13.

The storeroom, the wetness to which Rowan had called attention, was of slight use and importance.[4]

Major Rowan also complained that the shot hoist gallery of Battery Pensacola's emplacement No. 1 was very damp, while magazine No. 1 was "too wet for use."

Repair of these rooms, Captain Cavanaugh cautioned, would be expensive. Heretofore, he had believed it best to budget the small sums allotted by the Chief Engineer for this work to other batteries where a number of damp rooms had been waterproofed at a modest expense.[5]

B. The 1907 Fiscal Year Program Sees Major Improvements to Batteries Cullum and Pensacola

1. Captain Cavanaugh calls for $26,250

Major Rowan's criticisms were fresh in Captain Cavanaugh's mind when Chief Engineer Mackenzie called on his district engineers for estimates of money "considered necessary for Preservation and Repair of Fortifications" in Fiscal Year 1907. Captain Cavanaugh submitted his program in mid-June.

To correct minor existing defects and those that may, from time to time, occur, he asked for $3,000. This sum would be utilized for painting, whitewashing, darkening concrete surfaces, repair of slopes and sodding, general repairs, etc.

Larger sums were required to fund these improvements:

For completing shellroom and galleries in connection with installation of new ammunition hoists at Battery Cullum	$12,500
For relining magazines of Battery Pensacola's emplacement No. 1, repair of shellroom lining, and other necessary work to combat leakage	2,500
For repair of railroad tracks connecting batteries	1,000
For stopping seepage into Battery Worth	2,000

4. Cavanaugh to Mackenzie, May 5, 1906, N A, RG 77, Correspondence 1894-1923, Doc. 59177.

5. Ibid.

For extension of Battery Pensacola's loading platforms	4,000
For repair and painting fire control stations	400
For reconstructing boardwalk between Fort Pickens and Battery Cullum	400
For sodding around mining casemate and loading room	350
For painting mine defense structures	100
TOTAL	$23,250

To justify his requests, Captain Cavanaugh pointed out that the "condition of the defenses of Pensacola is so far from satisfactory" that he wished "to emphasize the necessity for the most liberal allotment possible." If allotments could be made upon need alone, the harbor "would receive much larger ones than many other more important harbors."

Battery Pensacola, the most important element in the defenses, he reminded the Department, had been a constant source of complaint because of leakage and its narrow loading platforms.[6]

2. <u>The Department allots more than $25,000 for improvements and repairs</u>

The Department, taking cognizance of Cavanaugh's remarks, allotted $16,500 from the appropriation for "Gun and Mortar Batteries" for completing the shellroom and galleries at Battery Cullum and exending the Battery Pensacola loading platforms; $450 from the account for "Preservation and Repair of Torpedo Structures" for maintenance of features belonging to the mine defense and $8,300 from "Preservation and Repair of Fortifications" for the remainder of the enumerated projects, except the one involving the railroad tracks. This the Chief Engineer declined to do because the work pertaining to his Department at Santa Rosa Island was nearly completed. When it was, the railroad system would be transferred to the Quartermaster Department.[7]

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6. Cavanaugh to Mackenzie, June 15, 1906, N A, RG 77, Correspondence 1894-1923, Doc. 18957/14.

7. Abbot to Cavanaugh, July 31, 1906, N A, RG 77, Correspondence 1894-1923, Doc. 18957/14.

3. Cavanaugh implements the program

Before turning his men to work on the two major projects for which the Chief Engineer had made allotments, Captain Cavanaugh had his staff prepare two sets of drawings, "Plans and Details for Modernizing Battery Cullum" and "Plans and Details of Platform Extensions, etc., Battery Pensacola." As soon as the Chief Engineer had approved the subject drawings, in the spring of 1907, construction began.[8]

One aspect of the program, the construction of a Battery Commander's station at Battery Cullum, ran into difficulty. Captain Cavanaugh on May 29, 1907, raised the question whether one or two BC stations should be built. In a letter to Chief Engineer Mackenzie, he explained that the battery was armed with four 10-inch guns on disappearing carriages, and, in drills, was divided into two-gun commands, each manned by a company of Coast Artillery. Officers stationed at Fort Barrancas had argued that Battery Cullum, to reflect this situation, ought to be provided with two BC stations--one for emplacements Nos. 1 and 2 and the other for emplacements Nos. 3 and 4.[9]

The Department approved the proposal to construct two BC stations at Battery Cullum in conjunction with the project for completion of shellrooms and galleries. Although drawings were prepared, the Department lacked funds to implement this change order, and it was deferred until Fiscal Year 1915.[10]

C. The Fiscal Year 1908 Program Focuses on Batteries Slemmer and Pensacola

1. Captain Cavanaugh asks for $12,255

On March 2, 1907, the Department called for estimates for preservation and repair of fortifications in Fiscal Year 1908. Captain Cavanaugh accordingly formulated a program calling for:

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8. "Fort Pickens, Fla., Plans and Details for Modernizing Battery Cullum," Drawer 78, Sheet 81-17, and "Fort Pickens, Fla., Plans and Details of Platform Extensions, etc., Battery Pensacola," Drawer 78, Sheet 90-15. Copies of these drawings are on file at the Florida Unit, GUIS.

9. Cavanaugh to Mackenzie, May 29, 1907, N A, RG 77, Correspondence 1894-1923, Doc. 35518/168.

10. Abbot to Cavanaugh, June 4, 1907, N A, RG 77, Correspondence 1894-1923, Doc. 35518/168.

(a)	Repair of minor existing defects and repair of similar ones which might from time to time occur	$4,000
(b)	Correcting leakage in Battery Worth	2,250
(c)	Addition of Battery Commander's station and splinter-proof roofs over delivery tables in connection with installation of Taylor-Raymond ammunition hoists at Battery Slemmer	1,880
(d)	Construction of Battery Commander's station and splinter-proof roofs over delivery tables of ammunition hoists of platform level in conjunction with extension of the Battery Pensacola loading platforms	2,500
(e)	Reconstruction of boardwalk between Fort Pickens and Battery Cullum	780
(f)	Painting fire command stations	600
(g)	Beach protection near secondary stations	120
(h)	Repainting cable tank building, iron doors and windows of torpedo storehouse, and iron work of mining casemate	125
TOTAL		$12,255[11]

2. <u>The Department allots $11,550</u>

The Chief Engineer approved the program, except the $750 for the boardwalk which would have to be funded by the Quartermaster Department.[12]

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11. Cavanaugh to Mackenzie, Mar. 22, 1907, N A, RG 77, Correspondence 1894-1923, Doc. 18957/15.

12. Abbot to Cavanaugh, Mar. 22, 1907, N A, RG 77, Correspondence 1894-1923, Doc. 18957/15.

(a)	For painting ironwork of batteries, whitewashing, repairs to machinery, and such minor defects as may arise	$5,000
(b)	For painting fire control stations	600
(c)	For painting Engineer buildings	120
(d)	For purchase of and installation of new cable for lighting mining casemate	250
(e)	For construction of stairway from mining casemate to M-station	375
TOTAL		$6,345[19]

2. <u>The Department funds selected maintenance and repairs</u>

Chief Engineer Marshall, after reviewing the correspondence, allotted most of the funds requested, but eliminated the $720 for repainting the fire control stations and the Engineer buildings.[20]

3. <u>Funds are allotted to combat seepage into Battery Cullum's magazines</u>

In the spring of 1909, the district artillery commander asked Captain Ferguson to stop the seepage which made the magazines at Battery Cullum, except magazine No. 4, too damp for storage of powder. One way to correct this situation, Captain Ferguson pointed out, was to line the powder magazines with brick, leaving an air space. This, however, would considerably reduce their size.

After studying the problem, he recommended that the old shellroom and present powder magazine be made into one room by removing the wall separating them, except for about one foot on either end. This projection would act as a pillar for support of an I-beam that was to replace the present wall. The enlarged room would be lined with brick, leaving an air space behind, and the ceiling sheeted with copper to conduct seepage

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19. Ferguson to Chief Engineer, March 13, 1909, N A, RG 77, Correspondence 1894-1923, Doc. 18957/19.

20. Abbot to Ferguson, April 21, 1909, N A, RG 77, Correspondence 1894-1923, Doc. 18957/19.

into the space between the brick wall and the concrete. From there, it could be led out of the magazine by drains. Ferguson estimated the cost of his proposal to be $2,000.[21]

The Chief Engineer, on approving and funding the project, cautioned Ferguson to leave ample space for the lower terminals of the Type C powder hoists which were scheduled for early installation.[22]

4. Ventilating shafts are opened at three of the batteries

Captain Ferguson, responding to a call from the Department, prepared and submitted drawings of shafts for ventilating the shellrooms and powder magazines of Batteries Slemmer, Pensacola, and Cullum. Involved were one ventilating shaft at Slemmer and four each at Pensacola and Cullum.[23]

5. The relocation of and improvements to the Battery Pensacola plotting room

During the winder of 1909-10, the Battery Pensacola plotting room was removed from the primary station to the battery, and a self-contained horizontal base range finder issued. District Engineer Fitch, in the autumn of 1911, had the speaking tubes removed from the primary station and installed in the battery plotting room.[24]

F. The Corps Limits Its Maintenance-Oriented Projects in Fiscal Year 1911

1. Captain Ferguson's third program

To fund maintenance and repair of the Pensacola Harbor defenses in Fiscal Year 1911, Captain Ferguson requested:

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21. Ferguson to Chief Engineer, June 2, 1909, N A, RG 77, Correspondence 1894-1923, Doc. 18957/20; "Battery Cullum, Pensacola Harbor, Florida, Showing Proposed Alteration of Powder Magazine," Drawer 78, Sheet 81-22. A copy of the subject drawing is on file at the Florida Unit, GUIS.

22. Acting Chief Engineer to Ferguson, June 10, 1909, N A, RG 77, Correspondence 1894-1923, Doc. 18957/20.

23. "Sketch of Ventilating Shafts as Per Mimeograph No. 117," Drawer 78, Sheet 90-16. A copy of this drawing is on file at the Florida Unit, GUIS.

24. Allen to Fitch, June 16, 1911, N A, RG 77, Correspondence 1894-1923, Doc. 35518/207.

(a)	For pay and subsistence of one mechanic and one or two laborers	$2,000
(b)	For material	1,000
(c)	For renewing sills, where defective, in primary and secondary stations, and painting stations	350
(d)	For painting roof and sides of cable tank storehouse and roof of torpedo storehouse, and repair of window shutters	200
TOTAL		$3,550[25]

2. The Department allots $2,150

Because of the limited sum ($300,000) appropriated by Congress for "Preservation and Repair," the Department only allotted $2,150 for maintenance in Fiscal Year 1911. Two hundred dollars, the sum requested, was made available from the appropriation for "Preservation and Repair of Torpedo Structures" for improvements to the cable tank and torpedo storehouse.[26]

G. The 1912-13 Improvements

1. Colonel Fitch employs a surplus for improvements to Batteries Slemmer, Center, and Cullum

Colonel Fitch, who had replaced Ferguson as district engineer, found on reviewing the books that there was a $13,223.67 balance in the "Repair and Preservation" account. If the Department were agreeable, which it was, he proposed to employ this sum to:

25. Ferguson to Chief Engineer, April 18, 1910, N A, RG 77, Correspondence 1894-1923, Doc. 18957/22.

26. Chief Engineer to Ferguson, July 20, 1910, N A, RG 77, Correspondence 1894-1923, Doc. 18957/22.

(a)	Cover slopes of Batteries Slemmer and Center with sod and to plant Bermuda	$6,500.00
(b)	Complete placing of vitrified conduit from the central powerhouse to Battery Cullum, including manholes	260.00
(c)	Contingencies	676.00
TOTAL		$7,436.00
BALANCE		$5,787.67[27]

2. <u>Truck recesses are provided for Battery Cullum</u>

On October 23, 1912, District Commander Ridgeway called for three brick recesses to be provided at each of Battery Cullum's emplacements Nos. 1, 2, and 3. This was necessitated by the Type C powder hoists being so placed as to make the old truck recesses useless.

At emplacement No. 4, the two ammunition hoists no longer in use should, in the interest of safety, be floored over to provide additional truck recesses.[28]

District Engineer Brown, on recommending the project, estimated its cost at $800.[29]

Chief Engineer Bixby, on reviewing the plans submitted by Major Brown, allotted $800 from the appropriation for "Preservation and Repair of Fortifications" to cover cost of the truck recesses.[30]

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27. Fitch to Chief Engineer, May 27, 1911, N A, RG 77, Correspondence 1894-1923, Doc. 61026/98.

28. Ridgeway to Brown, October 23, 1912, N A, RG 77, Correspondence 1894-1923, Doc. 18957/23.

29. Brown to Chief Engineer, Oct. 26, 1912, N A, RG 77, Correspondence 1894-1923, Doc. 18957/23.

30. Chief Engineer to Brown, Mar. 12, 1913, N A, RG 77, Correspondence 1894-1923, Doc. 18957/23.

H. The 1911 Theft and the Rewiring of the Seacoast Batteries

1. The theft of an important cable to the secondary stations

On May 1, 1911, the Battery Worth power station was closed down for repairs. The brick boiler settings were taken down, the chimney reset, and the brickwork rebuilt. These details were completed by June 27, but other repairs kept the station shut down until mid-August. It was the outdoor season, so the plant was fired up at weekly intervals.

During the last week of September, Master Electrician Geltz discovered that the lead covered, twin conductor cable connecting the power-house with the secondary stations had been stolen. District Artillery Officer J.A. Berry began an intensive investigation. He found that a Corps of Engineers' employee had recently seen a pile of short pieces of cable on the beach near the secondary stations. This had not aroused his suspicion because Signal Corps personnel had been working along the cable lines.

Captain Berry visited the Santa Rosa Island Life-Saving Station, but the lifesavers had not seen anything unusual. The Warrington and Pensacola junk shops were searched and the manifests of the steamers Manteo and Tarpon examined. No clues, however, were found to the whereabouts of the missing cable.[31]

On December 19, Col. Samuel E. Allen, commanding the Pensacola Artillery District, called on the Engineers to replace the cable which had provided current for instrumental and station lights in the isolated secondary stations.[32]

As sufficient power for the instrumental lights was provided by the serviceable conductors in "the old 7-conductor mine cable," it was determined to defer replacing the missing cable until installation of the standard fire control system.[33]

2. Battery Cullum is rewired

In 1915, Colonel Ridgeway complained that the electric lighting circuits in Battery Cullum were rapidly deteriorating, and unless measures were taken to rewire the structure, there would soon be no lights.

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31. Berry to Post Adj., Feb. 12, 1912, N A, RG 77, Correspondence 1894-1923, Doc. 35499/253.

32. Allen to Adj. Gen., Eastern Division, Dec. 19, 1911, N A, RG 77, Correspondence 1894-1923, Doc. 35499/250.

33. Adj. Gen., to C.O., Pensacola, Feb. 26, 1912, N A, RG 77, Correspondence 1894-1923, Doc. 35499/250.

It had been hoped that by replacing some of the bad wire with new temporary relief would be afforded. Little success, however, attended these efforts because the fixtures were "so impregnated with salts from the concrete that they readily grounded one or both sides of the circuit, even when new wire is pulled into the conduit."

The wiring at Batteries Van Swearingen and Worth was nearly as bad.[34]

On examining the battery, Major Brown saw that the old wiring consisted of rubber insulated wire pulled through brass tubing. He recommended that it be "torn out" and new wiring installed. To rewire the battery, he called for:

4 switch panel boxes (4-circuit)
3 switch panel boxes (6-circuit)
19 junction boxes
4 plug-in boxes
363 outlet couplings, type X
4 portable lamps
81 ceiling lamp fixtures
76 wall lamp fixtures
1,205 cable hangers for No. 12 armored cable
2,400 feet of No. 12 armored cable

Major Brown estimated the labor cost of taking out the old and installing a new system at $1,100.[35]

Chief Engineer Kingman approved the project and allotted $1,250 for material and $1,100 for labor.[36]

By late winter of 1916, the battery had been rewired "in accordance with instructions of the Board for Standardization." Estimates, in the meantime, were submitted for rewiring Batteries Pensacola, Worth, and Slemmer.[37]

The estimates were reviewed by the Department, and, in Fiscal Year 1917, the three batteries were rewired.

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34. Ridgeway to District Engineer, Jan. 30, 1915, N A, RG 77, Correspondence 1894-1923, Doc. 18957/28.

35. Brown to Chief Engineer, Feb. 2, 1915, N A, RG 77, Correspondence 1894-1923, Doc. 18957/28.

36. Chief Engineer to Brown, Mar. 9, 1915, N A, RG 77, Correspondence 1894-1923, Doc. 18957/28.

37. Keller to Chief Engineer, Feb. 17, 1916, N A, RG 77, Correspondence 1894-1923, Doc. 94520/6.

APPENDIX

BATTERY FACT SHEETS

HARBOR DEFENSE PROJECT

PENSACOLA BAY
1896-1923

BATTERY CULLUM

corrected to November 1, 1920

1.	Battery commenced.	1895
2.	Battery completed.	June 29, 1898
3.	Date of transfer	#1 1896 #2 1898
4.	Material of construction	concrete
5.	Portland or Rosendale.	both
6.	Cost to date of transfer	$94,460.12
7.	Connected to water supply.	Yes
8.	Connected to sewer	No
9.	Type of latrine.	No latrine
10.	Type of data transmission.	Telephone
11.	Trunnion elevation in battery. . . .	30.73'
12.	Datum plane.	M.L.W.
1.	Sources of electric current.	Central power plant, Fort Pickens
2.	Max. Kw. required for lights	5.8 Kw.
3.	Max. Kw. required for motors	25 Kw.
4.	Present condition of battery	good: grating doors deemed necessary
5.	Rooms wet or dry	Shot galley, dry; shell room No.2, floor wet; shell room No.2, dry; magazines, ceilings and side walls, dry; floors, damp.
6.	How ventilated	Magazines and shell rooms by vertical shafts, 20" in diameter; shafts provided with covers to exclude rain.
7.	Remarks.	Guns Nos. 48 & 49 removed during World War I.

Guns

	Caliber	Length	Model	Serial No.	Manufactured	Mounted
1.	10-inch	367.25"	1888	48	Watervliet	No
2.	10-inch	367.25"	1888	49	Watervliet	No

Carriages

	Type	Model	Serial No.	Manufactured	Motor
1.	Dis.	1894	8	Kilby Mfg.	8 H.P. 110 V.D.C.
2.	Dis.	1896	38	Bethlehem Iron Works	do

Ammunition Delivery

	Type	Delivery	Serial No.	Maker	Horsepower	Volts
1.	Chain, Taylor & Raymond	back	91662	General Electric	5	110
2.	do	back	91167	General Electric	5	110

	RMP	Type of control	Date of control	Remodeled for long points
1.	1540	street car	1903	1918
2.	1540	street car	1903	1918

BATTERY SEVIER

corrected to November 1, 1920

1. Battery commenced 1895
2. Battery completed . . . . June 29, 1898
3. Date of transfer. . . . . #1 1896
   #2 1898
4. Material of construction. . . . . . . concrete
5. Portland or Rosendale . . . . both
6. Cost to date of transfer. $94,460.12
7. Connected to water supply . . . . . . Yes
8. Connected to sewer . . . . No
9. Type of latrine. . . . . No latrine
10. Type of data transmission. . . . . . Telephone
11. Trunnion elevation in battery. . . . 30.5'
12. Datum plane. . . . . M.L.W.

1. Sources of electric current. . . . . Central Power Plant, Fort Pickens
2. Max. Kw. required for lights . . . . 3.8 Kw.
3. Max. Kw. required for motors . . . . 25 Kw.
4. Present condition of battery . . . . good
5. Rooms wet or dry . . . . Shell room, magazines, ceilings and side walls dry; floors damp
6. How ventilated . . . . Magazines and shell rooms by vertical shafts, 20 inches in diameter, with covers to exclude water.
7. Remarks. . . . . Grated doors deemed necessary.

Guns

	Caliber	Length	Model	Serial No.	Manufactured	Mounted
1.	10-inch	367.25"	1888	25	Watervliet	Mounted
2.	10-inch	367.25"	1888	42	Watervliet	Mounted

Carriages

	Type	Model	Serial No.	Manufactured	Motor
1.	Dis.	1894	6	Bethlehem Iron Works	8 H.P. 110 V.D.C.
2.	Dis.	1894	7	do	do

Ammunition Delivery

	Type	Delivery	Serial No.	Manufactured	Horsepower	Volts
1.	Chain, Taylor & Raymond	back	91970	General Electric	5	110
2.	do	back	91677	General Electric	5	110

	RMP	Type of control	Date of control	Remodeled for long points
1.	1540	street car	1903	1918
2.	1540	street car	1903	1918

Excerpts related to Battery Trueman

KEY:

= Battery Cullum-Sevier

= Battery Alexander Trueman

= hurricanes

TABLE OF CONTENTS

X. THE CONSTRUCTION HISTORY OF BATTERIES MATTHEW PAYNE & ALEXANDER TRUEMAN

A. The Batteries are Built and Turned Over to the Troops

1. Plans are prepared, rejected, revised, and approved

On June 27, 1902, the Department called on District Engineer Raymond to prepare plans and estimates for construction of emplacements for four 15pounder rapid-fire guns on pedestal mounts. More than three months slipped by before Lieutenant Raymond submitted the requested documents.

Calling attention to the site plan, in an accompanying letter, Raymond noted that the proposed location gave a good field of fire and permitted the magazine floors to be placed above "the reach of the highest tides without placing them on made ground." The area consisted of sand, he cautioned, and, unless protected from the surf, would be subject to erosion.

The design of the battery was "nearly identical with that of similar emplacements constructed by Col. Charles Suter and Captain Harry Taylor...at Fort Standish, Boston Harbor, where it was found to be very satisfactory." It would provide 360-degree fire, but was protected on the flanks and in front. Low traverses separated the guns, although the rear would be subject to fire from any ship or ships that ran the gantlet and found their way into Pensacola Bay. It would, if desired, be protected by parados. The details for ventilation, drainage, and lighting were not shown on the enclosed plan.[1]

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1. Raymond to Gillespie, Oct. 9, 1902, N A, RG 77, Correspondence 1894-1923, Doc. 43494/2.

Lieutenant Raymond's estimate called for:

Excavation--100 cubic yards at 25¢	$ 25.00
Fill--2,557 cubic yards at 25¢	589.25
Concrete--1,114 cubic yards at $10.00	11,140.00
Forms--1,114 cubic yards at $1.80 per cu. yd	2,005.20
Doors--11 at $50.00	550.00
Ammunition doors--4 at $40.00	160.00
Electric lighting system--40 outlets at $7.50	300.00
Drainage	175.00
Fixation of sand slopes--3,000 yards at 50¢	1,500.00
Brick lining of magazine, etc.--4,200 sq. ft. @ 17¢	714.00
Steel beams	200.00
Superintendence	600.00
Installing plant	1,500.00
Railroad track to site	1,100.00
	$20,558.45
Contingencies, etc.--10 percent	2,055.84
TOTAL	$22,614.29[2]

The Chief Engineer rejected and returned the plans and estimates as submitted. His reasons for this were:

(a) The plans were for balanced-pillar mounts, not the pedestal mounts called for.

(b) The magazines were protected by only 3 feet of concrete in front and flanks, and were exposed to fire from warships whose projectiles were passing in front of Batteries Cullum and Van Swearingen.

(c) The cover of the magazines against frontal fire consisted of only 6 feet of sand and 3 feet of concrete, while the type plan prescribed a minimum of 8 feet of concrete.

(d) The ramps in rear of the gun platforms occupied space which could better afford cover for the gun detachment.

(e) It was deemed unwise to group more than two rapid-fire guns in one battery because of the dust, smoke, and noise.[3]

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2. Ibid.

3. Abbot to Raymond, Oct. 27, 1902, N A, RG 77, Correspondence 1894-1923, Doc. 43494/2.

Lieutenant Raymond took less than a month to revise the plans. On November 22, he mailed to the Department a drawing for a battery of two rapid-fire guns on pedestal mounts. It was based upon the Fourth Supplement to Mimeograph No. 30. As a 360-degree fire was necessary, the parapets had been drawn to permit servicing the guns when pointed to the rear. About 2 degrees depression was provided for, the site being 6 feet above mean low water.

Personal experience had satisfied Raymond that the interval between guns must be increased beyond that shown in the type plan, and that a screen was a prerequisite between guns to lessen the blast whenever a gun was fired in the direction of the other. "To extend the interval, provide the screen and make the battery compact, both magazines" had been placed in a central traverse, together with a storeroom. This would prevent the artillerists from employing a magazine as a storeroom as was frequently done where there was no storage facility.

The sides of the traverse were inclined to deflect projectiles. The top of the traverse was placed at a reference that would give better protection than that provided in the mimeograph sheet. Being a rounded mass, it would deflect shot better than a square edge. The form of the traverse enabled the ceilings of the magazines to be inclined, thus increasing head room, improving ventilation, and preventing the drip of condensation. Moisture would run along an inclined ceiling and be dripped near the wall, not down its face, by a small groove in the ceiling so as to fall into a gutter at the foot of the wall. The magazines could be ventilated through the storeroom.

The rear of the battery was protected by parados low enough to permit fire to the rear and "high enough to give good cover to the magazines." The top of the retaining wall would be low to avoid exploding shells coming from the channel.

The steps had been placed in rear of the emplacements instead of near the magazines to avoid filling the terreplein.[4]

The Chief Engineer's Office reviewed and approved the plan. On doing so, they called on Raymond to submit a site plan and estimates.[5]

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4. Raymond to Gillespie, Nov. 22, 1902, N A, RG 77, Correspondence 1894-1923, Doc. 43494/5. A copy of the "Preliminary Design for Battery of 2-15 pdr. Rapid Fire Guns on Pedestal Mounts," Drawer 78, Sheet 102-1, is found in the files of the Florida Unit, GUIS.

5. Abbot to Adams, Dec. 2, 1902, N A, RG 77, Correspondence 1894-1923, Doc. 43494/5.

In preparing the former, Lieutenant Raymond took into consideration the emplacements' location in relation to Battery Van Swearingen. As the central traverse of the planned batteries resulted in a dead angle at each side on which only one gun could bear, Battery No. 2 had been positioned so that the dead angle at the left would "fall upon and to the rear" of Battery Van Swearingen. The dead angle on its right unavoidably fell upon a reach of the channel, but in rear of the minefield. The battery proposed for site No. 3 was situated so both its guns could sweep the bay's interior waters while covering the minefield and channel, except for one dead angle. This angle slightly overlapped the corresponding angle of Battery No. 2.[6]

Raymond, before entering the estimates, explained that the reference for the crests, determined by the elevation of the magazine floors, had been placed at 6 feet above mean low water. The two batteries had been placed well apart to reduce the effect of their blast upon each other, and on "elevated portions of the beach" to facilitate construction of foundations.

The addition of cover from reverse fire and the separation of the guns into pairs would boost construction costs considerably above that for a single battery of four guns. Lieutenant Raymond's revised estimate for one two-gun battery called for:

Excavation--150 cubic yards at 25¢	$ 37.50
Fill--3,600 cubic yards at 25¢	900.00
Concrete--820 cubic yards at $10	8,200.00
Forms for concrete at $1.80 per cubic yard	1,476.00
Doors--3 at $50	150.00
Electric lighting system--15 outlets at $8	120.00
Drainage	75.00
Fixation of sand slopes--2,000 yds. at 50¢	1,000.00
Brick lining of magazines, etc.--1,850 sq ft @ 17¢	314.50
Waterproofing	318.00
Steel work for ceilings	200.00
Superintendence	600.00
	$13,391.00
Installing plant	1,500.00
Railroad to site	1,400.00
	$16,291.00
Contingencies--10 percent	1,629.10
TOTAL COST OF BATTERY	$17,920.10

To build both batteries would mandate an allotment of $32,000.

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6. Raymond to Gillespie, Jan. 2, 1903, N A, RG 77, Correspondence 1894-1923, Doc. 43494/5. A copy of the site plan, "Proposed Location for Two Batteries of 2-15 pdr. Rapid Fire Guns on Santa Rosa Island, Fla.," Drawer 78, Sheet 102-2, is found in the files of the Florida Unit, GUIS.

Moreover, to prevent the sites from being "washed away or damaged" by hurricanes, they must be shielded by groins made of riprap from the debris of the Fort Pickens bastion wrecked by the June 20, 1899, explosion.[7]

Chief Engineer Gillespie approved the sites selected and allotted the requested funds to underwrite the project.

2. <u>Work is delayed to combat beach erosion</u>

Before ground was broken, a late winter storm seriously eroded the beach fronting the site designated for Battery No. 3. Reporting this to Chief Engineer Gillespie, Captain Raymond noted that the surf had so encroached on the site that it would be unwise to begin construction until the shore was protected by riprap. To accomplish this, he asked for and was given a $10,000 allotment.[8]

The riprapping (bricks from the blasted bastion) was too little and too late. Storms during the winter of 1903-04 hammered the area, and the beach fronting site No. 3 was badly washed. If constructed on the approved site, the battery would extend into the surf at flood tide. Moreover, Captain Cavanaugh (who had replaced Captain Raymond as District Engineer) reported, the high ground between sites Nos. 2 and 3 has been swallowed by the sea. The surf, driven by howling gales, had swept across the strand and into the pond beyond. Sections of the railroad track on the elevated terrain used in conjunction with positioning the riprap had been washed out.

Because of this, Cavanaugh asked authority to relocate the site for Battery No. 3, 120 feet to the northeast of the area pinpointed on the approved tracing. In addition, with Battery No. 2 nearly completed, he desired permission to begin construction of Battery No. 3, as it could be conveniently and cheaply built while the plant was in its present location.[9]

Chief Engineer Mackenzie approved Captain Cavanaugh's proposal on February 15.[10]

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7. Ibid.

8. Raymond to Chief Engineer, March 12, 1903, N A, RG 77, Correspondence 1894-1923, Doc. 43494/9.

9. Cavanaugh to Mackenzie, Feb. 6, 1904, N A, RG 77, Correspondence 1894-1923, Doc. 43494/11. The ponds would be filled at the same time.

10. Abbot to Cavanaugh, Feb. 15, 1904, N A, RG 77, Correspondence 1894-1923, Doc. 43494/11.

3. Captain Cavanaugh modifies the plans for Battery No. 3

Before turning a force to clearing the site for Battery No. 3, Captain Cavanaugh requested authority to modify the approved plan to conform to a drawing of the "type published as Supplement 6 to Mimeograph No. 30." His reasons for this request were:

(a) The type plan had several advantages--the magazines and storeroom were larger and the distance between guns had been increased by 13 feet.

(b) Construction had been simplified and the brick lining of rooms and waterproofing layer could be more "readily applied."

(c) Platform details for this type plan included the "latest ideas on ammunition service for 3-inch batteries as determined from experience of the artillery."

(d) Finally, it was presumed that certain economies introduced into the latest type plan would compensate for the "increase in quantities of sandfill and concrete" and the cost of the emplacements would not be correspondingly increased.[11]

This change order, Cavanaugh reminded the Department, would not delay the project because work could not be started until the riprap was in position and the beach secure.[12]

The Department promptly reviewed and approved the change order.[13]

4. The project accrues a $7,000 arrearage

On June 4, 1904, Captain Cavanaugh notified Chief Engineer Mackenzie that he needed a $7,000 allotment to complete Battery No. 3. It had cost $21,000 to build Battery No. 2 which had been estimated by Captain Raymond at $17,920.

This arrearage was attributed to:

(a) The high cost of moving the plant from Fort McRee to Santa Rosa Island and of repairs to machinery, railroad tracks, and wharf.

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11. Cavanaugh to Mackenzie, March 5, 1904, N A, RG 77, Correspondence 1894-1923, Doc. 43494/12.

12. Ibid.

13. Abbot to Cavanaugh, March 12. 1904, N A, RG 77, Correspondence 1894-1923, Doc. 43494/12.

(b) The charge for support of the engineering force.

(c) Certain modifications to the structure. Among these were the addition of an interior layer of copper in the traverse over the three rooms for waterproofing and an increase in width and depth of the rear retaining wall.

In addition, it was believed that in some respects Captain Raymond's estimates had been below the actual cost of construction at Fort Pickens. For example, forms for concrete, with the large number of thin walls and many curved surfaces, could not be erected for less than $1.80 per cubic yard of concrete. Of the 1,800 barrels of Portland cement purchased for the two batteries, 1,386 barrels had been employed in Battery No. 2. This was due to the large amount of pavements, steps, and finished surfaces.[14]

The Chief Engineer's Office was understandably dismayed by this information. The national average cost of a 3-inch emplacement was a little under $7,500, General Mackenzie chided. Heretofore, the Chief Engineer had not sought to induce his officers to reduce their estimates of the cost of new batteries, although they exceeded this norm. But, after an allotment had been made, it was assumed that the district engineer could complete the project for the estimate. When there was an arrearage, it could make "it impossible to emplace a gun already ordered from the Ordnance Department." But, in view of the urgency at Pensacola, General Mackenzie was allotting $7,000 from the March 2, 1903, appropriation for "Gun and Mortar Batteries."[15]

5. <u>The emplacements are completed</u>

Battery No. 3 was completed by the winter of 1904. Some 26 months later, Captain Cavanaugh, in accordance with procedures, transmitted to the Department plans showing the batteries' electric wiring, water supply, and drainage. Coast Artillerists assigned to Battery No. 2 (Matthew Payne) were to inspect the drains weekly and see that they were free of obstructions and, after each hard rain, were to examine the earthen slopes for washes. Minor damages were to be repaired by the troops, while serious erosions were to be reported to the district engineer.

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14. Cavanaugh to Mackenzie, June 4, 1904, N A, RG 77, Correspondence 1894-1923, Doc. 43494/14. Copies of the "Sketch of Waterproofing on 3 inch Battery" and "Sketch of Brick Lining," Drawer 78, Sheet 102-3, are on file at the Florida Unit, GUIS.

15. Abbot to Cavanaugh, June 11, 1904, N A, RG 77, Correspondence 1894-1923, Doc. 43494/14.

The current for lighting the battery was obtained from the post's central plant through a lead cable which extended from a manhole in rear of Battery Van Swearingen to the storeroom in center of the traverse. All electric wiring was carried in conduit embedded in masonry. The lights (16-candlepower, 110-volt) were controlled by snap switches.

All hydrants were non-freezing and were connected to the post water supply system.[16]

Maintenance instructions for the artillerists assigned to Battery No. 3 (Alexander Trueman) were more complex. In addition to those accruing to Battery No. 2, they were to see that all switches on the switchboard were kept open except when the lights were burning. The main switch was to be closed before the feeder switches were shut.

Current for lighting the battery was drawn from the central plant over the post lighting system's mains. There was a temporary pole line and a lead cable from the east pole of this line to the switchboard in the battery storeroom. The remainder of the electrical and water systems were identical to those found at Battery No. 2.[17]

At the time the batteries were transferred to the garrison in January 1908, District Engineer Ferguson (Captain Cavanaugh's replacement) reported that 6-inch terra cotta pipes carried the electrical wiring and water pipes. They were of sufficient size to also handle telephone lines, if required. These conduits had their outlet in the storeroom of each of the batteries. At No. 3, there was a conduit leading from the switchboard niche to a point in the side wall where a telephone, if desired, could be installed.

The only remedy to correct the concrete traverse of Battery No. 2 would be its removal and its replacement by a sand traverse. This would be expensive and of questionable value.

At Battery No. 3, the sand around its entrance had been removed. If it continued to accummulate, Captain Ferguson proposed to remedy it by building a small concrete ramp at this entrance.[18]

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16. Plan "Battery Matthew Payne, Two 3-inch Rapid-Fire Guns, Santa Rosa Island, Pensacola Harbor, Fla., Showing Electric Wiring, Water Supply and Drainage," Drawer 78, Sheet 102-4. A copy of this plan is on file at the Florida Unit, GUIS.

17. Plan "Battery Alexander Trueman, Two 3-inch Rapid-Fire Guns, Santa Rosa Island, Pensacola Harbor, Fla.," Drawer 78, Sheet 102-5. A copy of the subject plan is found in files of the Florida Unit, GUIS.

18. Ferguson to Mackenzie, Feb. 25, 1908, N A, RG 77, Correspondence 1894-1923, Doc. 43494/25.

6. The batteries are armed

On May 11, 1904, Captain Cavanaugh reported that Battery No. 2 was ready for its armament.[19]

Chief of Ordnance Crozier, upon being alerted, assured General Mackenzie that two pedestal carriages and their guns, Model 1902, would be shipped to Pensacola from South Bethlehem, Pennsylvania, as soon as a satisfactory design for a telescopic sight had been perfected.[20]

One 3-inch gun and its pedestal carriage, Model 1902, No. 17, left South Bethlehem for Santa Rosa Island in late April 1905.[21] By the end of May, the gun and carriage had been received and hauled to Battery No. 2 preparatory to being mounted by the artillery.[22]

Soon, thereafter, two 3-inch rifles and their carriages were transferred to Fort Pickens from Galveston, Texas. The three pieces were mounted in July, two in Battery No. 2 and one in Battery No. 3. The work was accomplished by the Engineer force under the supervision of an Ordnance mechanic. Relaying this information to the Chief Engineer, Captain Cavanaugh explained that it had been done because the derrick employed for the sandfilling was about to be removed. Any delay would have resulted in increased costs and difficulty in getting the guns and mounts into position.[23]

Eighteen months later, on February 5, 1907, Captain Cavanaugh notified the Department that Batteries Nos. 2 and 3 were ready for transfer to the Coast Artillery, although emplacement No. 2 of Battery No. 3 was still missing a gun and carriage.

The sand slopes of both batteries had been injured by the hurricane of September 26-27, 1906. These slopes, however, could not be repaired until additional funds were appropriated by Congress.[24]

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19. Cavanaugh to Mackenzie, May 11, 1904, N A, RG 77, Correspondence 1894-1923, Doc. 43494/13.

20. Crozier to Chief Engineer, May 20, 1904, N A, RG 156, Ltrs. Sent.

21. Carpenter to Abbot, May 3, 1905, N A, RG 77, Correspondence 1894-1923, Doc. 43494/15.

22. Cavanaugh to Mackenzie, May 31, 1905, N A, RG 77, Correspondence 1894-1923, Doc. 43494/16.

23. Cavanaugh to Mackenzie, Aug. 1, 1905, N A, RG 77, Correspondence 1894-1923, Doc. 43494/18.

24. Cavanaugh to Mackenzie, Feb. 5, 1907, N A, RG 77, Correspondence 1894-1923, Doc. 93494/19.

the parapets.[25] The Chief Engineer vetoed the transfer, pending repair of the parapets.

It was December 1907 before the repairs were effected and the fourth gun and carriage received and mounted. On January 7, 1908, the two batteries were inspected and transferred by Captain Ferguson to the Coast Artillery.[26]

The guns and carriages were mounted:

BATTERY MATTHEW PAYNE (BATTERY NO. 2)

GUNS

EMPLACEMENT	CALIBER	MODEL	SERIAL NO.	MANUFACTURER
No. 1	3-inch	1902	16	Bethlehem Steel
No. 2	3-inch	1902	17	Bethlehem Steel

CARRIAGES

EMPLACEMENT	TYPE	MODEL	SERIAL NO.	MANUFACTURER
No. 1	Pedestal	1902	16	Bethlehem Steel
No. 2	Pedestal	1902	17	Bethlehem Steel

BATTERY ALEXANDER TRUEMAN (BATTERY NO. 3)

GUNS

EMPLACEMENT	CALIBER	MODEL	SERIAL NO.	MANUFACTURER
No. 1	3-inch	1902	25	Bethlehem Steel
No. 2	3-inch	1902	24	Bethlehem Steel

CARRIAGES

EMPLACEMENT	TYPE	MODEL	SERIAL NO.	MANUFACTURER
No. 1	Pedestal	1902	25	Bethlehem Steel
No. 2	Pedestal	1902	24	Bethlehem Steel

25. Abbot to Cavanaugh, March 7, 1907, N A, RG 77, Correspondence 1894-1923.

26. Ferguson to Chief Engineer, Jan. 25, 1908, N A, RG 77, Correspondence 1894-1923, Doc. 93494/26.

7. The batteries are named

Although the batteries had not been armed nor turned over to the artillery, the War Department decided to give them names. On December 27, 1904, General Order No. 194 was issued designating Battery No. 2 Battery Matthew Payne, and Battery No. 3 Battery Alexander Trueman.[27]

The first of the soldiers commemorated, Matthew M. Payne of Virgina, had entered the U.S. Army as a 1st lieutenant in the 20th Infantry on March 12, 1812. He was promoted captain in March 1814 and was mustered out on June 15, 1815. He re-entered the Army as a captain in the Artillery Corps 11 months later. On June 1, 1821, Captain Payne was transferred to the 4th U.S. Artillery. He was promoted major of the 2d U.S. Artillery to rank from December 17, 1836, and to lieutenant colonel June 27, 1843. Payne was breveted colonel for gallantry and meritorious service at Palo Alto and Resaca de la Palma and was promoted colonel of the 2d Artillery on November 11, 1851.

Colonel Payne resigned his commission in 1861 and died August 1, 1862.[28]

Alexander Trueman of Maryland, the other officer, was commissioned a captain of the U.S. Infantry Regiment on June 3, 1790, and was transferred to the 1st Regiment on the Army's reorganization in March 1791. He was promoted major on April 11, 1792, and died of wounds received in action with the Indians near Fort Recovery on June 2, 1792.[29]

8. The batteries are identified

To identify the batteries, white wooden sign boards, the names spelled in block six-inch letters painted in black, were erected. The locations were left to the local commander.[30]

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27. G. O. No. 194, Dec. 27, 1904, War Department

28. Francis B. Heitman, Historical Register of the United States Army, From Its Organization September 29, 1789, to September 29, 1889 (Washington, 1890), p. 512.

29. Ibid., p. 651.

30. Chief Engineer to Adams, Aug. 1, 1903, N A, RG 77, Correspondence 1894-1923, Doc. 42146.

B. The Mission and Emplacements are Modified

1. The saga of gun No. 16

In the spring of 1913, there was a relocation of the armament. Gun No. 16 and its carriage were dismounted from Battery Payne and shipped to the Sandy Hook Proving Ground for experimental purposes. The transfer of the 163d Company (Mine) Coast Artillery from Battery Van Swearingen to Battery Payne complicated the situation. To enable the artillerists to be responsible for a two-gun battery, Colonel Ridgeway requested authority to shift a 3-inch gun and its carriage from Battery Trueman to Battery Payne.[31]

Chief Engineer William H. Bixby approved the transfer and, in August, the artillerists removed gun No. 29 and its carriage from Battery Trueman and mounted them in Battery Payne's emplacement No. 1.[32]

In the summer of 1916, the Ordnance Department returned the gun and carriage. While at the Proving Ground, the piece had been fired 241 times. On their arrival, the gun and carriage were mounted in Battery Trueman's emplacement No. 2.[33]

2. The Battery Trueman coincidence range-finder station

In the early 1920's, the three extant rapid-fire batteries (Payne, Trueman, and Center) were programmed to receive coincidence range-finder stations. The subject station for Payne was built on the abandoned platform of Battery Van Swearingen's No. 1 emplacement, while Center's was erected on the abandoned platform of Battery Slemmer's No. 2 emplacement. Trueman's range-finder station was sited about 100 feet northeast of the battery.

The 10-by-10-foot interior dimensions, reinforced concrete shelter was supported by foundation walls and a platform which raised its floor 6 feet above ground surface. To provide the structure with a low silhouette, sand and earth were embanked against three of its elevations to within 6 inches of the observation slit. Access to the southeast elevation and doorway was provided by a concrete stairway.

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31. Ridgeway to Adj. Gen., May 27, 1913, N A, RG 77, Correspondence 1894-1923, Doc. 93494/30.

32. Bixby to Crozier, July 3, 1913, N A, RG 77, Correspondence 1894-1923, Doc. 93494/30.

33. Ruggles to Ordnance Officer, Pensacola, July 14, 1916, N A,RG 77, Correspondence 1894-1923, Doc. 93494/31.

The range-finder station was equipped with an azimuth instrument, 3 wall telephones, 3 telephone headsets, 3 telephone terminal blocks, and a terminal box.

On February 9, 1923, the coincidence range-finder station was inspected and transferred by the Corps of Engineers to the Coast Artillery.[34]

3. The July 18, 1922 accident at Battery Payne

On July 18, 1922, a detail from the Coast Artillery Officers' Reserve Corps attending the summer camp was at Battery Payne. On the seventh shot from gun No. 24, the recoil tore the piece loose from its cradle and hurled it down the emplacement steps, bowling over Pvt. Hugo W. Paap of the 163d Company who was acting as the gun detachment's No. 1. Paap was rushed to the Fort Barrancas hospital where he died.

An investigation divulged that "the excessive air space in the recoil cylinder during the functioning of the first few shots caused excessive oil hammering which caused the throttling ring to become displaced from its position."[35]

4. The rapid-fire batteries in the 30's and 40's

The Harbor Defense Project during the 1930's found Batteries Payne and Trueman, along with Battery GPF, assigned to Fire Group I. Battery Payne was sited to cover the outer channel and entrance to Pensacola Bay, and Battery Trueman to command the entrance to the bay. The war reserve of ammunition for each battery was 432 rounds.[36]

One month after Pearl Harbor and simultaneously with the arrival of the first German U-boats off the Atlantic coast, the War Department approved a proposal to relocate Battery Trueman. When built more than 30 years before, the battery had been sited to provide maximum protection to the inner submarine minefield. But in the 1920's, the minefield had

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34. Fort Pickens Historical Record Book, N A, RG 392: "Defenses of Pensacola, Fla., Coincidence Range-Finder Station at Battery Trueman," Drawer 78, Sheet 102-8. A copy of the subject drawing is on file at the Florida Unit, GUIS.

35. Fort Barrancas Historical Record, N A, RG 392, Coast Artillery Districts and Commanders.

36. Annexes to Harbor Defense Project, Harbor Defenses of Pensacola, June 11, 1936, N A, RG 407.

been eliminated from the project. It was proposed to move the battery to the southeast, on the eastern end of Battery Cullum, to provide better coverage by its 3-inch guns of the beach and water areas.[37] The battery was shifted in 1943.

For details regarding its relocation, the reader is referred to Chapter III of this study focusing on the "Construction History of Batteries Cullum and Sevier."

In 1943, a combined splinter-proof Battle Commander's and CRF Station was built for Battery Payne. It replaced the coincidence range-finder station that had been constructed for the battery in the early 1920's at Battery Van Swearingen. The new station was between Batteries Cullum and Sevier.

On June 27, 1946, 10 months after V-J Day, the two 3-inch rapid-fire guns and carriages (Nos. 16 and 25) in Battery Trueman and the two 3-inch rapid-fire guns and carriages (Nos. 17 and 25) in Battery Payne were dismounted. They were turned over to the post salvage officer for disposal.[38]

Note: The location of the Battery Payne CRF station is incorrectly noted here; it is actually located at the west end of Battery Sevier.

37. Annexes to Harbor Defense Project, Harbor Defenses of Pensacola, Jan. 22, 1943, N A, RG 407.

38. Fort Pickens Historical Record Book, N A, RG 392.

To begin salvage operations, Captain Flagler called for $1,000.[3]

C. The Department Allots $1,000 for Salvage

The Department promptly allotted $1,000 from the appropriation for "Preservation and Repair of Fortifications" to be applied to the recovery and preservation of Engineer property.

Captain Flagler was to submit plans and estimates for reconstruction of the cable tank shed and torpedo storehouse. Salvaged property was to be stored in uninjured casemates and buildings.[4]

D. Captain Flagler Seeks to Ascertain the Cause

Captain Flagler, on investigating the cause of the explosion, offered three suggestions:

(a) Spontaneous combustion in the cotton waste left in Ordnance-Sergeant O'Riely's storeroom.

(b) The casemate containing the blocking had been opened to get blocking for mounting the 12-inch carriages. In passing to and fro, one of the men may have dropped a match or emptied his pipe.

(c) The soldiers had been in the habit of congregating in one of the nearby passages to play cards and talk, with pieces of paper scattered about the floor.[5]

Funds were soon forthcoming to finance reconstruction of the torpedo storehouse and the cable tank superstructure. Details of this operation are found in the chapter covering the Submarine Mine Defense System. The rubble (brickbats, etc.) from the shattered bastion and adjoining north curtain casemates was used for riprap to stabilize the shoreline fronting battery No. 3 (Alexander Trueman) in 1904-05.

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3. Flagler to Wilson, June 21 & 22, 1899, N A, RG 77, Correspondence 1894-1923, Doc. 31566/4; "Plan showing planes of explosion, August 30, 1899," Drawer 78, Sheet 93-1. A copy of this plan is on file at the Florida Unit,

4. Kuhn to Flagler, June 24, 1899, N A, RG 77, Correspondence 1894-1923, Doc. 31566/2.

5. Flagler to Wilson, Aug. 31, 1899, N A, RG 77, Correspondence 1894-1923, Doc. 31566/17.

(b.2) To construct a concrete walk 6 feet in width along the north face of the wall, and a suitable roadway along and inside of this. The roadway to be of brick or other suitable material.

(c) To construct retaining walls, and other additional protection to magazines of Battery Cullum; also retaining walls as may be necessary in rear of Batteries Van Swearingen, Pensacola, Slemmer, and Center.

(d) To repair the engineer dock at Fort Pickens at an estimated cost of $6,000. This dock was used continuously during the erection of the seawall, and it is necessary to repair it to the extent estimated in order to place it in approximately the same condition in which it was prior to use during construction of the seawall.

Colonel Fitch placed the cost of this work at $400,000. His proposal to contract for the sandfill and to accomplish the other projects by hired labor was approved by the Department.[31]

On June 21, Colonel Fitch submitted estimates for the concrete walk and roadway:

WALKWAY ALONG NORTH SIDE OF SEAWALL

Preparing sub-foundation	$ 120
Concrete--258 yards @ $7.50	1,935
Contingencies	300
TOTAL	$2,355

30-FOOT ROADWAY PARALLELING NORTH SEAWALL

Preparing sub-foundation	$ 360
Concrete pavement--1,249 yards @ $7.50	2,664
Contingencies	2,000
TOTAL	$5,024

Upon further study, Colonel Fitch determined to recommend construction of a 12-foot concrete roadway from Battery Alexander Trueman along the western and southern portion of the reservation to connect with the 30-foot roadway in rear of Fort Pickens near the torpedo storehouse. Such a road was necessary for communication about the post. Without it, the only utility of the 30-foot roadway paralleling the seawall would be protection against breakers washing over the barrier. He placed the expense of the 12-foot roadway at:

31. Fitch to Chief Engineer, May 27, 1911, N A, RG 77, Correspondence 1894

XXII. DARKENING THE CONCRETE SURFACES AND CAMOUFLAGING THE BATTERIES

A. Darkening the Concrete Surfaces with Lampblack

For a number of years, the exposed concrete surfaces of the batteries were darkened to reduce glare. This treatment called for a wash of 30 parts Portland cement and 1 part lampblack, by weight, mixed when dry, and sufficient water added to bring the mixture to a consistency of whitewash.

It was applied while "fresh" with an ordinary whitewash brush, "the mixture being constantly stirred to prevent settling." The treatment, applied to all battery exterior concrete surfaces, gave a "soft, dark color, very grateful to the eye." It lasted for several years with "little loss of color" and could "be renewed yearly for a very small fraction of the cost of oil paint or other similar mixtures."[1]

B. Protective Concealment in World War II

In the years immediately before and during World War II, the Army adopted tone-down painting for the "old fortifications" and installations such as Batteries Payne and Trueman and the searchlight and radar installations. Included in this scheme was erection of "frames supporting properly garnished nets, pattern planting (on small scale) of indigenous vegetation to simulate nature."

Camouflage of Battery Langdon and Construction Nos. 233 and 234, except at Construction No. 233's mount No. 2, included only such "planting and topsoiling" as was necessary to safeguard sand slopes of the fortifications against erosion by wind and water. A dummy house, designed to roll on a track, was constructed over mount No. 2.[2]

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1. Executive Documents, Serial 4788, p. 3727.

2. Supplement to the Harbor Defense Project, Harbor Defense of Pensacola, N A, RG 407.

BATTERY ALEXANDER TRUEMAN

corrected to November 1, 1920

1. Battery commenced 1905
2. Battery completed 1905
3. Date of transfer. . . . . January 7, 1908
4. Material of construction. . . . . . . Concrete
5. Portland or Rosendale . . . . Portland
6. Cost to date of transfer. $28,332.50
7. Connected to water supply . . . . . . Yes
8. Connected to sewer. . . . . No
9. Type of latrine . . . . No latrine
10. Type of data transmission . . . . . Telephone
11. Trunnion elevation in battery . . . . #1 19.91'
#2 19.25'
12. Datum plane . . . . M.L.W.

1. Sources of electric current . . . . . Central Power Plant, Fort Pickens
2. Max. Kw. required for lights. . . . . 2 Kw.
3. Max. Kw. required for motors. . . . . None
4. Present condition of battery. . . . . Good
5. Rooms wet or dry. . . . . Dry
6. How ventilated. . . . . Not ventilated

BATTERY ALEXANDER TRUEMAN

(continued)

Guns

	Caliber	Length	Model	Serial No.	Manufactured	Mounted
1.	3-inch	154.35"	1902	25	Bethlehem Steel Co.	Yes
2.	3-inch	154.35"	1902	16	Bethlehem Steel Co.	Yes

Carriages

	Type	Model	Serial No.	Manufactured	Motor
1.	Pedestal	1902	25	Bethlehem Steel Co.	None
2.	Pedestal	1902	16	Bethlehem Steel Co.	None

Excerpts related to hurricanes

KEY:

= Battery Cullum-Sevier

= Battery Alexander Trueman

= hurricanes

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E. The Submarine Mine Defense System is Phased Out

In 1926, as an aftermath of the year's killer hurricane, the submarine mine defense system was eliminated from the Army's Harbor Defense Project for Pensacola Bay. Responsibility for underwater defense of the area was assumed by the Navy.

The badly damaged double primary and double secondary stations were salvaged in the early 1930's, and the frame cable tank house on August 11, 1941. The remains of the concrete cable tanks are distinguishable after more than 35 years. The corrugated iron roof of the torpedo storehouse, ripped off by the hurricane, was replaced by one of cypress shingles.

In the 1930's, responsibility for maintenance and repair of the torpedo storehouse and loading room was transferred from the Corps of Engineers to the Quartermaster Department. The structures were assigned new numbers, the former becoming No. 24 and the latter No. 25, and given new missions. Building No. 24 henceforth served as an automotive maintenance area and No. 25 as a carpenter's shop. The mining casement was retained by the Harbor Defense Project, becoming the Fire Control Switchboard Room.[45]

45. Completion Reports, Fort Pickens, Nov. 27, 1943, N A, RG 77; Fort Pickens Historical Record Book, N A, RG 392; telephone call Castellina-Dudley ith Bearss, July 18, 1977.

In late September, Captain Harris learned that the inside measurements of the station to be placed on top of the tower to house the Type A DPF were 10 by 10 feet. This troubled him because the DPF must of necessity occupy the mid-point of the area, and the distance from the vertical axis of the instrument to a vertical line tanget to the posterior position of an observer at the DPF was 4 feet 6 inches. From this, it was apparent that there would be little space available for other persons or material.[4]

Chief Engineer Wilson, on reviewing the subject, found that the question of fire control at seacoast defenses had been the subject of reports by three boards. The first had been convened by Special Order No. 236, October 6, 1898, and consisted of Maj. J. P. Story and Capt. Henry L. Harris. It had defined the location and height of several fire commander's and battery commander's stations. Their report called for erection of numerous skeleton towers of considerable height at low lying sites.

A tower was subsequently designed and erected by the Corps of Engineers at Fort Hancock in 1899. This tower had been tested by a board convened by Special Order No. 148, June 26, 1899, and chaired by Col. H. C. Hasbrouck. Shots were fired and tests conducted and the board concluded, "It is believed that the tower is admirably suited to its purposes in every respect." Where range finder towers were to be built, the Hasbrouck Board recommended that they be of the Fort Hancock type.

The third board had merely reported in regard to the necessary harbor charts for fire control purposes.

Although the Chief Engineer had at no time looked with favor on "the general principle involved in the erection of high towers on low sites, for the purpose of installing the delicate and complicated instruments known as range and position finders," he had been ready to adapt these towers to the wishes and convenience of the Artillery officers. The Hasbrouck Board's report had been accepted by the Corps as the expression of mature judgment of the Artillery arm, and that type of tower station had been repeated in many places without any complaint until Harris'.

If the Corps could ascertain the current desire of the Artillery, provided it was sanctioned by the Secretary of War, General Wilson would modify this plan to the extent permitted by the appropriations. To enlarge the station room would necessitate new plans "to make the structure safe" in the hurricanes encountered on the Gulf and South Atlantic coasts.[5]

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4. Harris to Adj., Fort Barrancas, Oct. 6, 1900, N A, RG 77, Correspondence 1894-1923, Doc. 35518/10.

5. Wilson to Adj. Gen., Oct. 27, 1900, N A, RG 77, Correspondence 1894-1923, Doc. 35518/10.

XVI. PROTECTING THE DEFENSES AGAINST THE SEA AND WINDS

A. The Turn of the Century Efforts to Check the Sea's Encroachments

The Pensacola Endicott fortifications would have to be protected from encroachments by the sea and the surging surf and flood tides that accompanied the feared Gulf Coast hurricanes. Also, along this section of coast, there is a gradual migration of the offshore barrier islands from east to west. In the 1860's, this phenomenon had doomed masonry Fort McRee, and had seen an accretion to the shoreline of Santa Rosa Island west of Fort Pickens.

As a harbinger of what to expect, a late winter storm hammered the Florida panhandle in 1899. On the morning of February 23, the tug Menefee passed the navy yard en route to Fosters Bank. She had in tow the gravel-laden barge Clyde. Buffeted by high waves, the barge collided with the monitor Passaic, starting a bad leak. When they reached the Fort McRee wharf, the barge was anchored, while workmen unloaded the tug's deck load of cement. Before they were finished, the barge was driven hard aground on a shoal fronting the lagoon.

As soon as Menefee was unloaded, Assistant Engineer Turtle told the captain to return to the yard and pick up one of the Army's barges to lighten Clyde.It was mid-afternoon before she returned, and, by then, the surf was running too strong to lash the barges together. The next morning, the gravel was transferred from Clyde to the other barge.

During the night of the 24th, the storm worsened, and Clyde, dragging her anchor, was driven aground and pounded to pieces. A contractor's barge loaded with gravel was also lost during the blow.[1]

Consequently, during the late 1890's and the first 5 years of the 20th century, the Corps of Engineers spent small sums to protect from the sea Battery Center on Fosters Bank and the site of battery No. 3 (Alexander Trueman) on Santa Rosa Island. For details on these projects, the reader is referred to the chapters describing the construction history of Batteries Center and Alexander Trueman.

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1. Flagler to Wilson, June 23, 1899, N A, RG 77, Correspondence 1894-1923, Doc. 31614.

Expenditures for this activity increased sharply in 1904. In that year, District Engineer Cavanaugh called for repair of the north groin of Fort McRee to cost $2,750, and for this work at Fort Pickens:

Purchase of 1,500 tons of riprap	$4,500
Placing 4,750 tons of stone in jetties	4,750
Collecting and placing old masonry from ditch of Fort Pickens and from Battery Cullum	1,000
Superintendence	500
TOTAL	$10,750[2]

The Department promptly allotted the requested sum, and by winter the subject improvements had been completed.[3]

B. The September 1906 Hurricane

1. A hurricane roars in from the Gulf

The riprapping and groins were tested and found wanting by the killer hurricane of 1906. On the night of September 26, the eye of the hurricane that had stormed into the Gulf of Mexico through the Yucatan Channel ripped into the area. At this time, the 22d Company Coast Artillery (1st Lt. L.S. Edwards commanding) was posted at Fort McRee; the 15th Company (Capt. W.F. Stewart) at Fort Pickens; and the 7th, 9th, and 20th Companies, and the 8th Band, Coast Artillery Corps, at Fort Barrancas.

For several days before the hurricane arrived, there had been strong winds out of the south. At flood tide, on the morning of the 26th, the surf lapped into the ruins of old Fort McRee, which was being used as a guardhouse. Most people now concluded that the storm had climaxed. But during the night, the winds became stronger, registering a velocity of 85 miles per hour, and changed directions several times. This caused the water to "pile up" in Pensacola Bay, and it reached a depth of 10 feet above normal high tide at Fort Pickens and 12 feet at Fort McRee.

Captain Stewart and his men of the 15th Company fled their frame quarters and barracks for the safety afforded by Fort Pickens. To

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2. Cavanaugh to Mackenzie, May 16, 1904, N A, RG 77, Correspondence 1894-1923, Doc. 51148.

3. Abbot to Adams, May 23, 1904, N A, RG 77, Correspondence 1894-1923, Doc. 51148.

keep from being swept away by the surf as they crossed the island to the old masonry fort, the soldiers lashed themselves together with rope safety lines.

The situation on low lying Fosters Bank was worse. There, the sea tide surged over the post with little warning from the Gulf side. Lieutenant Edwards and most of the men of the 22d Company fought their way through the inky blackness to Battery Slemmer, where they spent the remainder of the night. About 20 people were isolated at the quarters when the sea flooded the railroad embankment leading from the post housing to Battery Slemmer. Many of these people sought refuge on the roof of the ordnance storehose. There, they remained with difficulty till morning. Among this group was Electrician-Sergeant Paul Crank and his wife. The storehouse was washed off its bearings, but the field guns stored within kept it from being swept away.

The remainder of the people cut off at the quarters fled from building to building as they felt them giving away. Ordnance-Sergeant Lewis H. Prentice watched in helpless horror as his wife and son were carried to their death. Several took refuge on an "overground cistern." When it started to disintegrate, three soldiers sought to swim to the Barrancas side of the lagoon. By utilizing drift timbers, two of them struggled to safety. Quartermaster-Sergeant Morris G. Oberlander, however, was swept out to sea and never seen again.

Most of the isolated soldiers and dependents finally made it to the water tank to which they clung. Before morning, Pvt. Roy A. Jordan lost his grip and was washed to his death.

At the Barrancas, no lives were lost, although all buildings were damaged. As soon as it was light, Capt. L.S. Miller called for volunteers to rescue the people cut off on storm-battered Fosters Bank. Because of the wind and waves, this was a hazardous undertaking. Finally, a boat manned by Capt. Fred L. Austin, 2d. Lt. Lawrence C. Crawford, and eight enlisted men succeeded. Their courage and self-sacrifice was recognized by the Army in General Orders.[4]

2. Captain Cavanaugh submits estimates for repair of damages to the fortifications and Engineer property

District Engineer Cavanaugh rushed from Montgomery to Pensacola to survey the damage and direct salvage. All telegraph lines were down so Cavanaugh sent his chief clerk, William L. Campbell, back to Montgomery to apprise Washington of the extent of damage to Engineer property. On September 30, Campbell reported:

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4. Fort Barrancas Historical Record, N A, RG 392, Coast Artillery Districts and Commands; General Order No. 42, Nov. 12, 1906, Department of the Gulf.

> Slemmer--slopes one-half gone, concrete uninjured; Center--slopes gone, concrete badly injured; Trueman--slopes gone, concrete uninjured; Payne--slopes gone, concrete uninjured; Van Swearingen--slopes half-gone, concrete uninjured; Cullum--slopes one-third gone, concrete uninjured; Pensacola--no injury; Worth--no injury; Cooper--slopes one-third gone, concrete uninjured; launch Arrow and boathouse destroyed; all electrical installations more or less injured; wharf somewhat damaged; dredge Cucus all right; much wreckage will have to b removed.
>
> To meet emergency needs, $10,000 was required immediately.[5]

No funds, however, were available from "Preservation and Repair," as the appropriation for Fiscal Year 1907 had already been allotted. But Chief Engineer Mackenzie was agreeable to employing such funds as were already in the District Engineer's hands and unobligated to "prevent present damages leading to worse conditions."[6]

By early November, Captain Cavanaugh was able to submit estimates of the costs of repairing the batteries and Engineer property at Forts Pickens and McRee. The repair of the battery slopes would be very expensive because the "supply" of sand nearby had been "exhausted by the construction program or swept away" by the hurricane. Henceforth, all sod and soil would have to be transported from the mainland. As the snd parapet of Battery Cullum had been excessive, Cavanaugh proposed to restore it "only so far as may be necessary to make it conform to present practice."

The cost of repairs to the wharf, fire control stations, and other structures requiring lumber would be unusually high because of the great loss of standing timber during the storm, followed by escalating prices.

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5. Campbell to Chief Engineer, Sept. 30, 1906, N A, RG77, Correspondence 1894-1923, Doc. 61026.

6. Abbot to Campbell, Oct. 1, 1906, N A, RG 77, Correspondence 1894-1923, Doc. 61026.

The estimates called for:

FORT PICKENS

BATTERY PAYNE

Plant and railroad track	$ 600.00	
Cleaning away debris	250.00	
Sand filling	4,000.00	
Sodding and top soil	2,500.00	
	$7,350.00	
Superintendence and contingencies (15%)	1,102.50	$8,452.50

BATTERY TRUEMAN

Plant and railroad track	$ 750.00	
Cleaning away debris	50.00	
Sand filling	4,250.00	
Sodding and top soil	2,500.00	
	$7,550.00	
Superintendence and contingencies (15%)	1,132.50	$8,682.50

BATTERY COOPER

Plant and railroad track	$1,000.00	
Sand filling	3,200.00	
Sodding and top soil	3,500.00	
	$7,700.00	
Superintendence and contingencies (15%)	1,155.00	$8,855.00

BATTERY CULLUM

Sand filling and repairing slopes	$1,600.00	
Sodding and top soil	7,000.00	
Cleaning up debris and minor repairs	300.00	
	$8,900.00	
Superintendence and contingencies (15%)	1,335.00	$10,235.00

BATTERY VAN SWEARINGEN

Sand filling	$1,250.00	
Sodding and top soil	1,400.00	
Cleaning up debris and minor repairs	400.00	
	$3,050.00	
Superintendence and contingencies (15%)	457.50	$3,507.50

FORT McREE

BATTERY CENTER

Plant and railroad track	$ 900.00	
Removing damaged concrete and repairing masonry of battery, including entire reconstruction of Emplacement No. 4	6,500.00	
Sodding and top soil	1,800.00	
Other minor repairs	250.00	
	$12,250.00	
Superintendence and contingencies (15%)	1,837.50	$14,087.50

BATTERY SLEMMER

Plant and railroad track	$2,400.00	
Sand filling	7,500.00	
Sodding and top soil	4,500.00	
Repairs to power house	250.00	
New workshop	700.00	
	$15,350.00	
Superintendence and contingencies (15%)	2,302.50	$17,652.50

MISCELLANEOUS

Wharf at Fort Pickns	$1,800.00	
Boathouse	1,200.00	
Office	1,800.00	
Repairing track system	1,500.00	
Repairing fire-control stations, including reconstruction of two secondary stations	2,400.00	
Repairing loading room	100.00	
Repairing torpedo storehouse	250.00	
Repairs to electric lighting and power installations and lines	1,500.00	
Cleaning up debris left by storm and moving quarters back to original locality	1,000.00	
	$11,550.00	
Superintendence and contingencies (15%)	1,732.50	$13,282.50
Purchase of new launch		2,000.00
Replacing lumber carried away		500.00
TOTAL		$87,255.00

During the storm, Captain Cavanaugh continued, the surf had surged across Santa Rosa Island and Fosters Bank to a depth of 10 feet above mean low water, flooding most of the magazines. Some provisions would have to be made to prevent a reoccurrence. One solution was to construct retaining walls to enclose the parades of the batteries where this had occurred. At Batteries Cooper and Worth, where the references of the magazine floors were respectively 10 and 12, no such protection was essential.

The cost of retaining walls Cavanaugh placed at:

Batteries Cullum and Van Swearingen	$11,000
Battery Pensacola	2,750
Battery Payne	300
Battery Trueman	300
Battery Slemmer	4,750
Battery Center	3,000
TOTAL	$22,100[7]

The Department, on reviewing the estimates, decided to forego construction of the retaining walls in favor of far more expensive seawalls. The seawalls, however, were mandated by the need to protect the defenses from another hurricane of similar severity. In any event, an allotment for funding these estimates would have to await action by the next session of Congress.

3. Repairing the damage

On March 2, 1907, President Theodore Roosevelt signed into law an act appropriating $200,000 for "Preservation and Repair of Fortifications." Whereupon, the Department called on Captain Cavanaugh to submit a program for expenditure of $50,000 for "repair and restoration of batteries and other structures appurtenant to the defenses of Pensacola." On doing so, he called for spending "practically" all this money at Fort Pickens because the batteries there were more important and "no work can be economically arried on at Fort McRee prior to the reconstruction of the wharf at that place by the Quartermaster" people. His recommended distribution called for:

7. Cavanaugh to Mackenzie, Nov. 6, 1906, N A, RG 77, Correspondence 1894-1923, Doc. 61026/27.

Battery Matthew Payne	$ 8,452.50
Battery Alexander Trueman	8,682.50
Battery George Cooper	8,855.00
Battery Cullum	10,235.00
Battery Van Swearingen	3,507.50
Miscellaneous:	
Repairing track systems	1,500.00
Repairing fire control stations	1,200.00
Repairing electric lighting and power installations and lines	1,500.00
Repairs and additions to wharf	1,200.00
Purchase of new lighting cables to connect Batteries Pensacola and Cullum with the central plant, replacing cables which have become unserviceable since the storm	3,500.00
Minor repairs at Batteries Slemmer and Center, and Fort McRee	1,367.50
TOTAL	$50,000.00

The work would be done by day-labor and the Government plant. It was expected to purchase the soil and sod required by contract after proposals were solicited.[8]

Chief Engineer Mackenzie promptly approved the program and allotted the $50,000.00.[9]

Captain Cavanaugh soon had the plant on-site and a large force at work. Before all the funds were expended or the project completed, Captain Cavanaugh was transferred and replaced as District Engineer by Captain Ferguson.

On May 27, 1908, President Roosevelt signed an act appropriating $225,000 for "Preservation and Repair of Fortifications." The Chief Engineer's office accordingly notified Captain Ferguson to prepare a program for expenditure of $59,355 "to complete the repair and restoration of batteries and other structures" at Pensacola. On doing so, Ferguson asked for:

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8. Cavanaugh to Mackenzie, Mar. 22, 1907, N A, RG 77, Correspondence 1894-1923, Doc. 61026/68.

9. Abbot to Cavanaugh, Mar. 29, 1907, N A, RG 77, Correspondence 1894-1923, Doc. 61026/68.

FORT PICKENS

BATTERY COOPER		
Completing sandfilling, sodding and top soil	$3,000	
BATTERY CULLUM		
Completing sandfilling, sodding and top soil	2,000	$5,000

FORT McREE

BATTERY SLEMMER		
Plant and railroad track	$2,400	
Sandfilling	7,500	
Sodding and top soil	4,500	
	$14,400	
Contingencies (15%)	2,160	$16,560
TOTAL		$21,560

A project for expenditure of the remainder of the appropriation would be submitted in the near future. This partial program was forwarded because funds for the repair of Batteries Cooper and Cullum were nearly exhausted, and Ferguson did not want to lay off his experienced force.[10]

4. Battery Center is enlarged and rebuilt

Within 2 weeks, Captain Ferguson had prepared and transmitted a program for expenditure of the remainder of the $59,355 allotment. Most of it would be disbursed in rebuilding Battery Center. When constructed, the distance between gun centers had been 29 feet. The latest Ordnance Department drawing for 15-pounder rapid-fire battery emplacements called for 62 feet between gun centers. Consequently, the simultaneous fire of these guns covered a 110-degree arc instead of an arc of 140 degrees, as planned. Moreover, the District Artillery Officer had complained repeatedly of the magazines' small size.

Captain Ferguson proposed to repair the battery by removing emplacements No.2 and 4 and repairing emplacements No. 1 and 3 which, when repaired, would constitute emplacements No. 1 and 2. Emplacement No. 1 was to be served from present magazines No. 1 and 2, and emplacement No. 2 to be serviced from present magazines No. 3 and 4.

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10. Ferguson to Marshall, July 11, 1908, N A, RG 77, Correspondence 1894-1923, Doc. 61026/74.

Emplacement No. 4, he explained, had been destroyed by the 1906 hurricane, while emplacement No. 2 had been badly undermined. They would be replaced by two emplacements to the left of emplacement No. 3. This would make the distance between gun centers 58 feet, 62 feet, and 62 feet, respectively.

To prevent a reoccurrence of the damage wrought by the 1906 hurricane, the section of seawall designed to protect the battery's left flank would be built before the battery was extended.

Captain Ferguson estimated the cost of rebuilding the battery at:

Plant and railroad track		$ 1,800	
Restoring old emplacements 1 and 3:			
New steps and alterations	$1,000		
Sandfilling	2,500		
Sodding and top soil	2,700	6,200	
Building two emplacements to left of old emplacement No. 3		24,000	
		$32,000	
Contingencies (about 15%)		5,195	$37,195

The remainder of the $59,355 appropriation, $600, would be employed for construction of retaining walls at Batteries Trueman and Payne.[11]

The Department approved the project as outlined.[12]

The District Artillery Officer, on learning that Battery Center was to be rebuilt, was disappointed to learn that the Driggs-Seabury balanced-pillar mounts were to be retained. He and his officers considered these carriages defective and extremely troublesome. He urged that pedestal mounts be substituted for the balanced-pillar mounts.[13]

When this subject was referred to the Chief of Artillery, he had bad news--there were no surplus 3-inch pedestal mounts to replace the Model 1898 carriages. The Ordnance Department, however, was remodeling

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11. Ferguson to Chief Engineer, July 28, 1908, N A, RG 77, Correspondence 1894-1923, Doc. 61026/76.

12. Abbot to Ferguson, July 24 & Aug. 13, 1908, N A, RG 77, Correspondence 1894-1923, Doc. 61026/74 and 61026/76.

13. Dist. Art'y. Officer to Adj. Gen., Dept. of the Gulf, Dec. 11, 1908, N A, RG 156, Doc. 5506/12.

the balanced-pillar mounts as funds permitted. This would not cause any delay in rebuilding the battery because these changes would not dictate any alterations in the concrete of the emplacements.[14]

In 1910, District Engineer Ferguson turned a large force out, and the battery was rebuilt.[15]

C. The Construction of the Seawalls and Roadways and Landscaping the Enclosed Areas

1. Captain Cavanaugh's plan is submitted and approved

The heavy damage caused by the hurricane, along with past beach erosion problems, led the Chief Engineer to conclude that the only way to protect the Endicott defenses was by seawalls. District Engineer Cavanaugh was called on to prepare a project for protection of Forts Pickens and McRee against future hurricanes.

To shield Fort Pickens, Cavanaugh proposed to construct a seawall to enclose all the Quartermaster structures and all the batteries, except Worth and Cooper. The glacis of the Third System fort would be utilized as a part of this protection--one end of the projected wall was to abut on the 1830's counterscarp while the other end extended into the glacis slope.

On Fosters Bank, a seawall enclosing Batteries Slemmer and Center would meet all requirements because it was understood that the Quartermaster Department did not plan to rebuild its structures at Fort McRee.

Cavanaugh recommended a concrete wall 5 feet wide on top, 13 feet wide at the base, and 11 feet in height. The foundations were to be at reference (2). To prevent it being undercut by the surf, two rows of interlocking sheet piling 12 feet long were to be employed, reinforced by riprap positioned on the slopes in front and in rear of the wall. This protection to be heaviest along the north and west beaches "where the exposure is greatest."

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14. Murray to Marshall, Dec. 28, 1908, & Crozier to Adj. Gen., Jan. 9, 1909, N A, RG 156, Doc. 5506/12.

15. Fort McRee Historical Record Book, N A, RG 392.

E. The October 18, 1916, Cyclone

Before most of the damage had been repaired, a cyclone struck the area on the morning of October 18, bringing with it 114-mile-per-hour winds. At Fort Pickens, the Quartermaster wharf was again smashed; the mine defense boathouse wrecked; and one mining yawl crushed and a second badly damaged. The tide-gauge on the Engineers' Wharf was flattened; the housing for searchlight No. 3 was blown against the engine; the recently repaired stairways, giving access to the secondary stations, were damaged; and several hundred feet of cable near the secondary stations ruined.

At Fort McRee, a cable terminal box near the wharf was thrown to the ground; the foundations of the water tower undermined, causing it to lean 30 degrees; the pumping plant wrecked; the Ordnance storehouse badly battered; and the caretaker detachment quarters further damaged.

Several chimneys were toppled at Barrancas Barracks; slate roofs damaged; many shade trees uprooted; and the frame building used as a messhall in conjunction with the 1840's brick barracks blown down.[53]

F. The September 28, 1917, Hurricane

The September 28, 1917, hurricane sent surf sweeping across the area occupied by the construction plant for the 12-inch battery. This was east of the area protected by the Fort Pickens seawall and the high ground at Battery Worth. The roof of the cement shed was torn loose, and more than $4,000 worth of cement ruined. The derrick, water tank, lighting tower, and electric pole line were blown down. The railroad track was undercut, and the rails thrown out of alignment. Engines were clogged with sand and had to be overhauled. Lumber was scattered. Two large barges, anchored in the cove, were driven aground, and the rudder stack of *Santa Rosa* jammed. District Engineer Sturdevant estimated the cost of repairing this damage at $9,231.[54]

The old Engineers' Wharf was swept away, leaving only the pilings.

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53. Fort Barrancas Historical Record Book, N A, RG 392.

54. Sturdevant to Black, Nov. 19, 1917, N A, RG 77, Correspondence 1894-1923, Doc. 18957/55.

Damage to the fortifications had been repaired at a cost of:

Battery Worth secondary station--replacement of shutters	$ 5.00
Battery Pensacola secondary station--repair of pier foundation and stairs	150.00
Battery Cullum secondary station--repair of foundations and stairs	175.00
Mine defense secondary station--repair of window lights and roof	25.00
Battery Worth--repair of storehouse roof and window lights	25.00
Battery Worth primary station -- repair of roof and 4 shutters	25.00
Battery Pensacola primary station--repair of roof, shutters, and door	35.00
Battery Cullum primary station--repairs to roof and shutters, walkway and steps in rear of station	70.00
Mine defense primary station--repairs to roof and windows	35.00
Battery Pensacola--repairs to hoods on time range boards	25.00
Searchlight No. 4--shelter blown down	250.00
Battery Payne--slight repairs	10.00
Battery Trueman--slight repairs	10.00
Mine loading room--slight repairs	6.00
Torpedo Storehouse--repairs to roof	35.00
Cable Tank--repairs to roof	15.00
Searchlight No. 5--repairs to roof and door of shelter	20.00

Battery Slemmer Powerhouse--renewing window lights	15.00
Engineer Quarters and Storehouse--repairs	300.00
TOTAL	$1,230.00

At Battery Cooper, the sand exterior slope had been badly washed. As this was the third time this had occurred, the foot of the slope would be protected by a concrete apron.[55]

G. The September 20, 1926, Hurricane

The hurricane of September 20, 1926, caused severe damage to military installations, shipping, crops, and the property of civilians. Winds, which registered gusts up to 130 miles per hour, left a medium sized steamer high and dry near Battery Langdon; an oil tanker stranded in the bay north of Fort Pickens; the Navy's tug Allegheny ashore; and a number of Naval Air Station subchasers, patrol boats, etc., "strewn through the woods adjoining Bayou Chico." The Naval Air Station lost nearly all its seaplanes. All bridges on the main highway between the Barrancas and Pensacola were down. The Navy, however, hoped to have the bridge across Bayou Grande reopened to traffic within 48 hours. The trolley line between Pensacola and Barrancas was shut down, its bridges, tracks, and power lines seriously damaged.

Forts McRee and Pickens were flooded by the surf and surging flood tides, and at times, were "completely submerged." At Fort Pickens, most of the buildings suffered damage. In some instances, it was slight, amounting to only a few dollars. It consisted of overturned chimneys, damaged roofs, broken window lights, and sagging plaster. The corrugated iron roof had been ripped off the torpedo storehouse; the Engineers' Office and storehouse were seriously damaged; and three of the 1902 secondary stations were down and the instruments in two of them destroyed. All power stations were flooded, and, in several instances, the 25-kilowatt generators entirely submerged. The magazines of Batteries Cullum, Sevier, Payne, and Trueman, three days after the blow, still had 4 feet of water, and it was impossible for Maj. Walter Singles, the post commander, to estimate the damage to the ammunition stored within. Much of it, however, was in hermetically sealed cases. Both the Engineers' and the Quartermaster wharves were severely damaged, the decking and boathouses carried away.[56]

55. Sturdevant to Chief Engineer, Nov. 21, 1917, N A, RG 77, Correspondence 1894-1923, Doc. 18957/82.

56. Singles to Adj. Gen., Sept. 23, 1926, N A, RG 77, Harbor Defense File, Doc. 600.913.

At Fort McRee, the old unserviceable wharf was further damaged, while at Fort Barrancas, nearly all the structures had suffered damage in varying degrees. Miraculously, no Army personnel had been killed or injured. Major Singles placed the damage to War Department property at between $50,000 and $100,000.

After reassessing the situation, Major Singles concluded that the seawalls at Forts Pickens and McRee had served their purpose "admirably" as "a buffer against the force of the waves." But, he continued, they had also served as reservoirs. When constructed, floodgates had been installed to allow trapped water to escape into the bay. But, when the area within the walls was sandfilled and sodded, the floodgates became inoperable. In addition, the magazines of Batteries Cullum and Sevier had "been converted into enormous reservoirs by their construction,...for the prevention of ingress of water...in case of storm." The construction was excellent, provided water did not spill over the seawall. But, when it did, as in the September 20 hurricane, the magazines became huge cisterns. To drain them, a fire engine had to be transferred from the mainland to Fort Pickens.[57]

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57. Singles to Adj. Gen., Oct. 6, 1926, N A, RG 77, Harbor Defense File, Doc. 600.913.

XVII. IMPROVEMENTS TO AND REPAIR AND MAINTENANCE OF HARBOR DEFENSE PROJECT FACILITIES: FISCAL YEARS 1906-1917

A. Fiscal Year 1906 Brings Limited Funds for Repair and Maintenance

1. Captain Cavanaugh submits his program

During this 11-year period, improvements were made to the four seacoast batteries (Cullum, Worth, Pensacola, and Slemmer) designed to make them more effective. Maintenance and repair of the various elements of the Harbor Defense Project were a constant drain on available resources. These charges, which could not be foreseen and programmed for, included the heavy costs required to repair damages inflicted on the Pensacola Defenses by the killer hurricanes of 1906 and 1916. This chapter details the improvements, repairs, and maintenance items covered by annual programs and funded from the appropriations for "Preservation and Repair of Fortifications."

On March 9, 1905, the Chief Engineer called on his district engineers for estimates of funds necessary for "Preservation and Repair of Fortifications" in Fiscal Year 1906. In view of the small sum ($300,000) appropriated by the Congress, only the most urgent needs could be considered.

When he submitted his estimates, Captain Cavanaugh arranged under each battery, in order of their urgency, first class defects. Of these, those required to "put the electric installations of batteries Pensacola and Cullum in serviceable condition, and to provide the current required for lights and ammunition service" were believed of first importance.[1]

His program called for:

BATTERY WORTH

Cleaning and painting doors and other iron work	$ 70	
Whitewashing interior of rooms and galleries	25	
Darkening concrete surfaces	25	
Resurfacing pavements in galleries to facilitate movement of ammunition trucks	360	
Repairs to guardroom	150	$630

BATTERY PENSACOLA

Completing repairs to electric light installation including new feeder for lighting circuit, installed in trench	$710	
Cleaning and painting doors and other iron work	90	
Whitewashing interior	25	
Darkening concrete surfaces	50	875

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1. Cavanaugh to Mackenzie, Mar. 22, 1905, N A, RG 77, Correspondence 1894-1923, Doc. 18957/13.

Appendix C

Reports of Completed Works, 1896–1944
Harbor Defenses of Pensacola, Battery Cullum-Sevier
From the NARA College Park Repository

These twenty-five documents from NARA were collected by the U.S. Army Corps of Engineers in the course of research relating to the Formerly Used Defense Sites/Defense Environmental Remediation Program (FUDS/DERP) for Fort Pickens in 2007.

They were donated to the park in that year along with numerous other NARA documents and accepted by Cultural Resources Program Manager David Ogden.

Reports of Completed Works, 1896–1944
Harbor Defenses of Pensacola, Battery Cullum-Sevier

Index

COAST DEFENSES OF *PENSACOLA HARBOR, FLA.*

FORT *PICKENS* BATTERY *CULLUM* NO. OF GUNS: *4* CALIBER: *10"*

	EMPLACEMENT NUMBER 1.	EMPLACEMENT NUMBER 2.	EMPLACEMENT NUMBER 3.	EMPLACEMENT NUMBER 4.
1-a. Azimuth.	328°. 27'. 51"	288°. 37'. 46.3"	288°. 22'. 09.1"	288°. 05'. 40.7"
b. Distance.	2706.47 Yds.	128.576 Ft.	126.811 Ft.	123.224 Ft.
2-a. Model of Gun.	1888. M.I.	1888. M.I.	1888. M.I.	1888. M.I.
b. " " Carriage	1894. M.I.	1894. M.I.	1894. M.I.	1896
c. Type of "	DIS.	DIS.	DIS.	DIS.
3- Elevations of.				
a. Gun trunnions (in battery.)	30.50 Ft.	30.50 Ft.	30.73 Ft.	31.06 Ft.
b. Interior crest.	29.00 Ft.	29.08 Ft.	29.96 Ft.	29.33 Ft.
c. Loading platform.	19.42 Ft.	19.42 Ft.	19.42 Ft.	19.42 Ft.
4- Angle of depression.	0°-11'	0°-11'	0°-14'	0°-1'

	Emp. 1 FROM. ° '	Emp. 1 TO. ° '	Emp. 2 FROM. ° '	Emp. 2 TO. ° '	Emp. 3 FROM. ° '	Emp. 3 TO. ° '	Emp. 4 FROM. ° '	Emp. 4 TO. ° '
5- Limiting azimuths of field of fire as determined by:								
a. Construction of emplacement.	320°.05'	102°.03'	310°.06'	86°.15'	310°.45'	86°.40'	289°.65'	78°.75'
b. Interference by adjacent emplacements.	None		None		None		None	
c. Interference of other obstacles external to emplacement.	"		"		"		"	
d. Position of Ordnance stops.	Not marked	319°.00'	Not marked	309°.30'	309°.00'	125°.00'	None	

NOTES.

1. Azimuth and distance of emplacement No. 2 are given with reference to No. 1; of No. 3, with reference to No. 2, etc. Azimuth and distance of No. 1, are given with reference to *Pensacola Light.*

3. Above plane of *M. L. W.*

5-c. Nature of obstacles: ______

2-c. Use one of following abbreviations or designations: Dis., Nondis., Alt. gun-lift; Turret; Casemate; Ped.; B.P.

Note: When the wheels strike stops, the limiting azs. of field of fire are as given above.

REPORT OF COMPLETED WORKS - SEACOAST FORTIFICATIONS
(Gun and Mortar Batteries)

COAST DEFENSES OF PENSACOLA, FLA.
FORT PICKENS.
* BATTERY ALEXANDER TRUEMAN.
No. of guns, 2; Caliber, 3"; Carriage, Ped. Mt.

Form 1 Corrected to November 1, 1920

Battery commenced	1905	Sources of electric current	Central Power Plant, Ft. Pickens.
Battery completed	1905	Maximum k.w. required for lights	2-k.w.
Date of transfer	Jan. 7, 1908	Maximum k.w. required for motors	None.
Material of construction	Concrete	Present condition of battery	Good.
Portland or Rosendale cement	Portland	Rooms wet or dry	Dry.
Cost to date of transfer	$28,332.50	How ventilated	Not ventilated.
Connected to water supply	Yes	Remarks	----------
Connected to sewer	No		
Type of latrine	No latrine		
Type of data transmission	Telephone		
Trunnion elevation in battery	#1 - 19.91' #2 - 19.95'		
Datum plane	M.L.W.		

ARMAMENT.

Emplacement or mortar No.	Guns or Mortars. Cal.	length	model	Serial No.	Manufacturer	mounted	Carriages. Type	model	Serial No.	Manufacturer	Motor
1	3"	154.35"	1902	25	Bethlehem Steel Co.	Mounted	Ped. Mt.	1902	25	Bethlehem Steel Co.	None
2	3"	154.35"	1902	16	-do-	-do	-do	1902	16	-do-	-do-

HOISTS.

None.

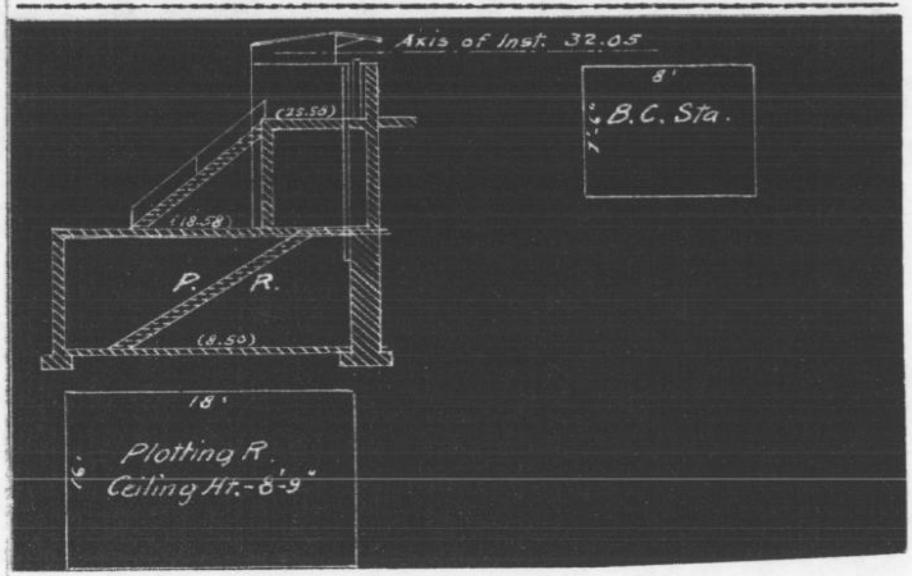
* This Battery to be relocated on East flank of old Battery Callum.

REPORT OF COMPLETED WORKS - SEACOAST FORTIFICATIONS
(Fire control or Torpedo Structures)

Form 2 Corrected to November 1, 1920

COAST DEFENSES OF PENSACOLA, FLA.
FORT PICKENS.
STRUCTURE: B.C. STATION, BATTERIES CULLUM AND SEVIER.

Location	Rear center of Battery Cullum.
Date of transfer	August 20, 1915.
Cost to that date	$2,310.84, including plotting room.
Type of construction	
(a) Roof	Metal frame for canvas.
(b) Remainder of bld	Concrete.
How concealed	Partly by battery.
How protected	Partly by battery.
Height above concealment	4.'-4".
Height above protection	4'-4".
Conspicuous at......yards	Inconspicuous.
Source of electric current	Central Power Plant.
Kilowatts required	0.12-k.w.
Type of lighting fixtures	Engineer standard.
How heated	Not heated.
Connected to water mains	No.
Connected to sewer	No.
Type of latrine	None.
Permanent or temporary installation	Permanent.
Present condition	Good.
Reference of site	8 ft. above M.L.W.
Reference of instrumental axis	32.05 ft. above M.L.W.
Type of observing inst.	Whistler & Hearn, Az.Inst., Model 1900.
Type of plotting board	None.
Type and capacity of crane	None.
Max.dimensions of reel handled	None.
Type of data transmission	Telephone.
Date of transfer	Unknown; installed by Artillery.
Cost of data transmission equipment	Unknown; installed by Artillery.
For tide stations give description of tide gauge	Float in emersed pipe; reads direct.
For datum points give Forts from which visible	Forts Pickens and McRee.
For domitories give stations served	No dormitories.
For cable hut give S. C. type	None.
Remarks	B.C. Station and plotting room in same structure.



WAR DEPARTMENT, CORPS OF ENGINEERS, U.S. ARMY

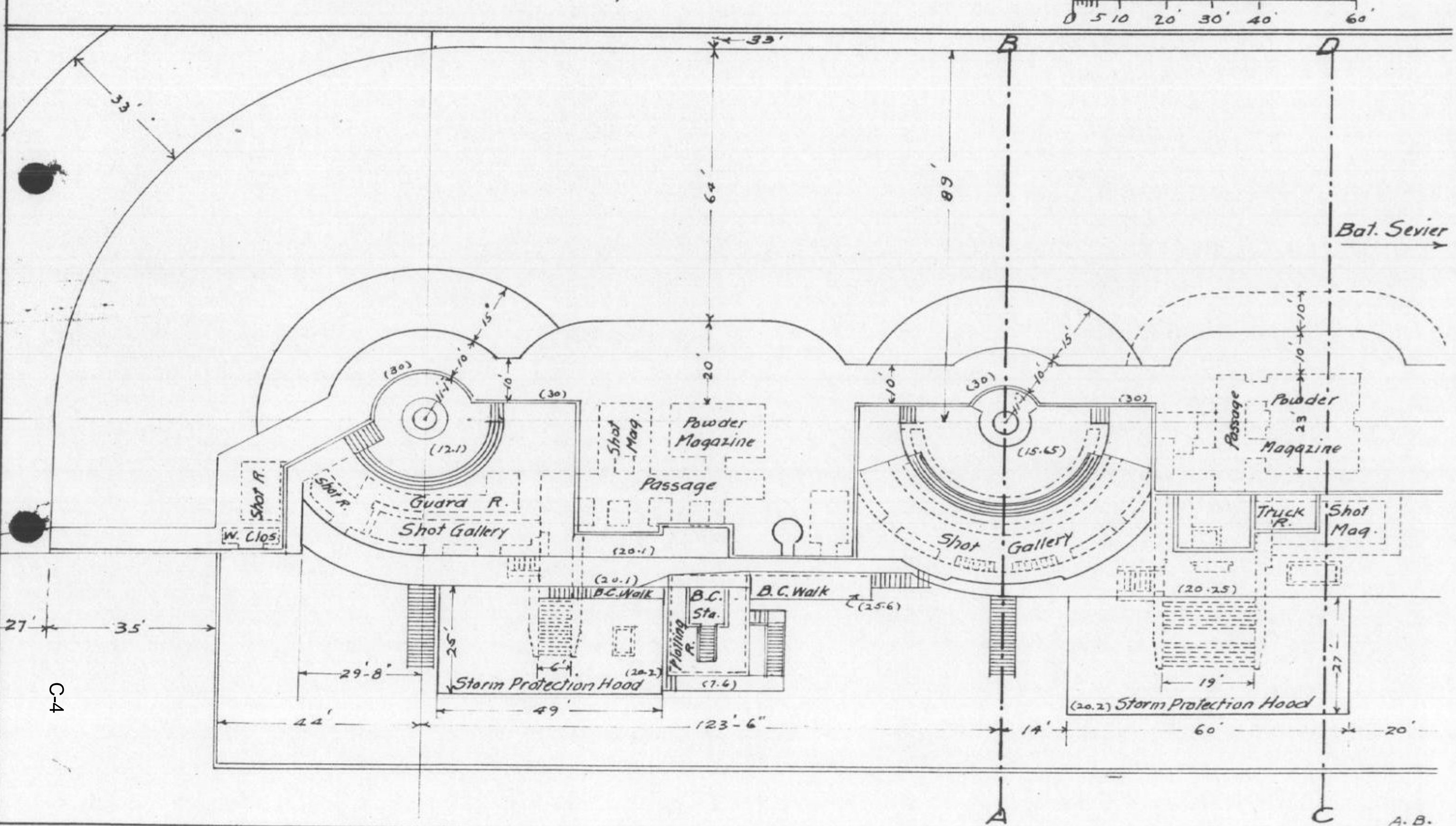
Sheet No. 1

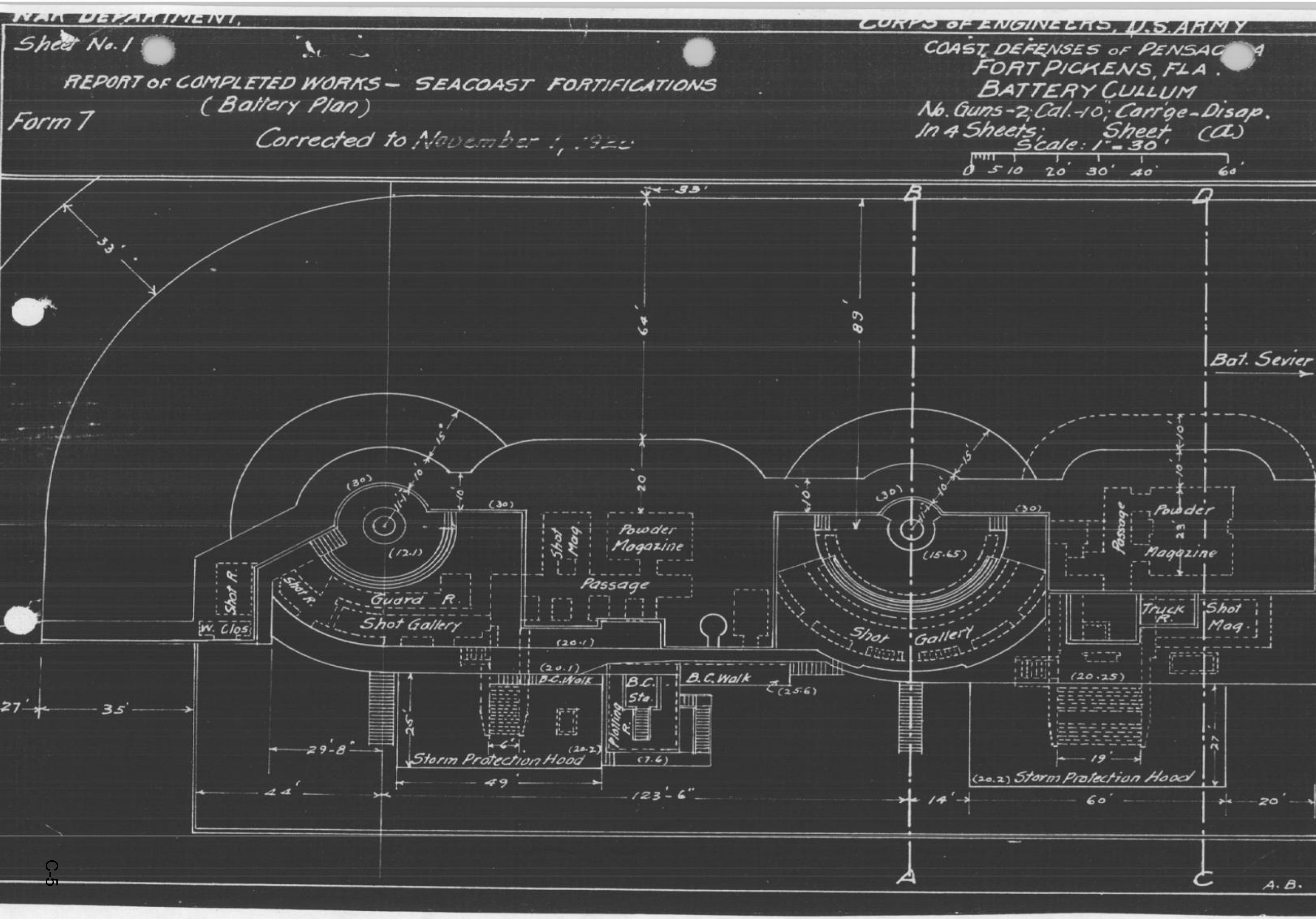
REPORT of COMPLETED WORKS — SEACOAST FORTIFICATIONS
(Battery Plan)

Form 7

Corrected to November 1, 192[illegible]

COAST DEFENSES of PENSACOLA
FORT PICKENS, FLA.
BATTERY CULLUM
No. Guns - 2; Cal. - 10"; Carrge - Disap.
In 4 Sheets; Sheet (a)
Scale: 1" = 30'




WAR DEPARTMENT,
CORPS OF ENGINEERS, U.S. ARMY
Sheet No. 1
REPORT OF COMPLETED WORKS - SEACOAST FORTIFICATIONS
(Battery Plan)
Form 7
Corrected to November 1, 1920
COAST DEFENSES OF PENSACOLA
FORT PICKENS, FLA.
BATTERY CULLUM
No. Guns-2; Cal.-10; Carrge-Disap.
In 4 Sheets; Sheet (a)
Scale: 1" = 30'
0 5 10 20' 30' 40' 60'
Bat. Sevier
Powder Magazine
Shot Mag
Passage
Guard R.
Shot Gallery
Shot R.
W. Clos.
Truck R.
Shot Mag.
B.C. Walk
B.C. Sta.
Plotting R.
Storm Protection Hood
(20.2) Storm Protection Hood
123'-6"
A
B
C
D
A.B.

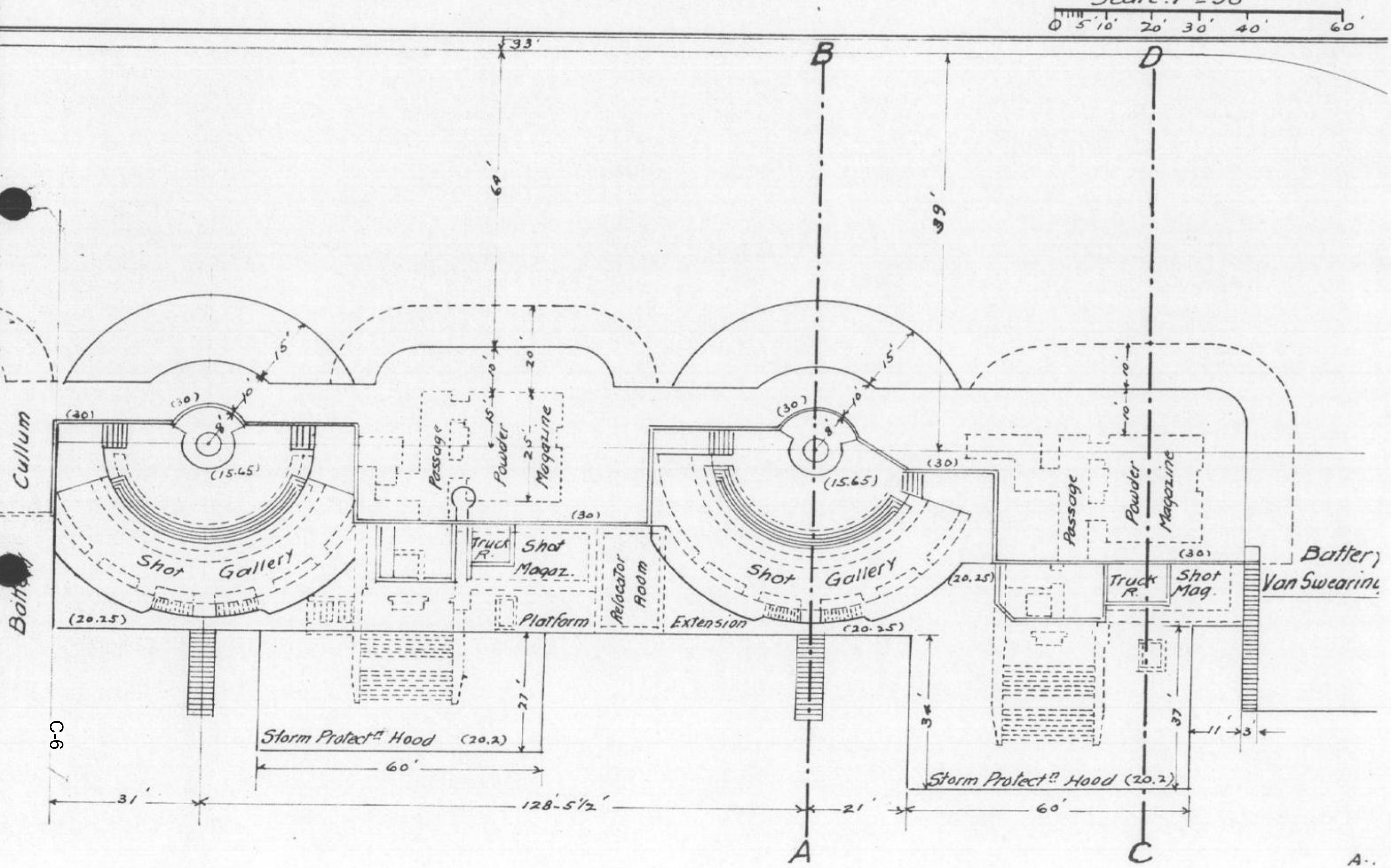
Sheet No. 1

REPORT of COMPLETED WORKS – SEACOAST FORTIFICATIONS
(Battery Plan)

Form 7

Corrected to [illegible]

COAST DEFENSES of PENSACOLA
FORT PICKENS, FLA.
BATTERY SEVIER –
No. Guns-2; Cal-10"; Carr'ge-Disap.
In 4 Sheets; Sheet (a)
Scale: 1" = 30'



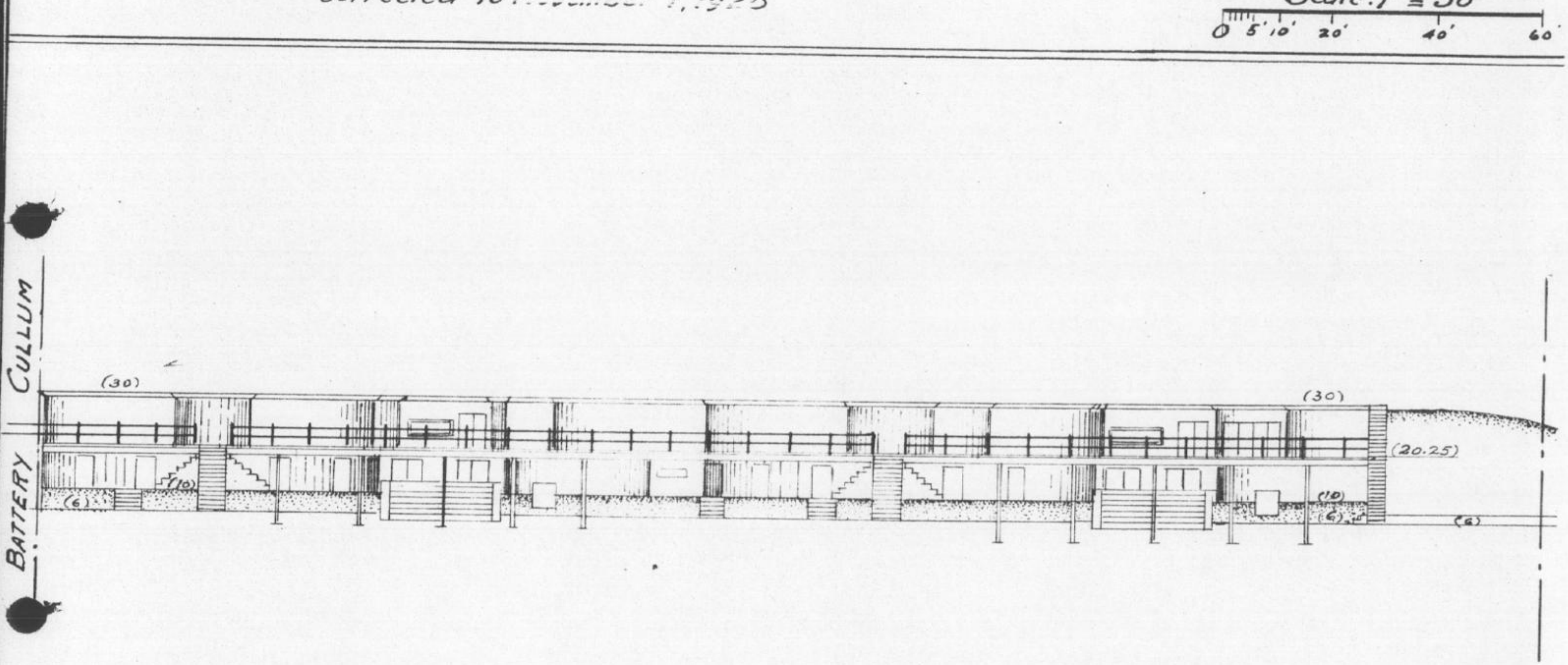
Sheet No. 2

REPORT OF COMPLETED WORKS - SEACOAST FORTIFICATIONS
(Rear Elevation)

Form 7

Corrected to November 1, 1920

COAST DEFENSES OF PENSACOL
FORT PICKENS, FLA.
BATTERY SEVIER.
No. Guns - 2; Cal. 10"; Disap. Carr's
In 4 Sheets: Sheet (b)
Scale: 1" = 30'



July, 1919 - A. E

Sheet No. 2

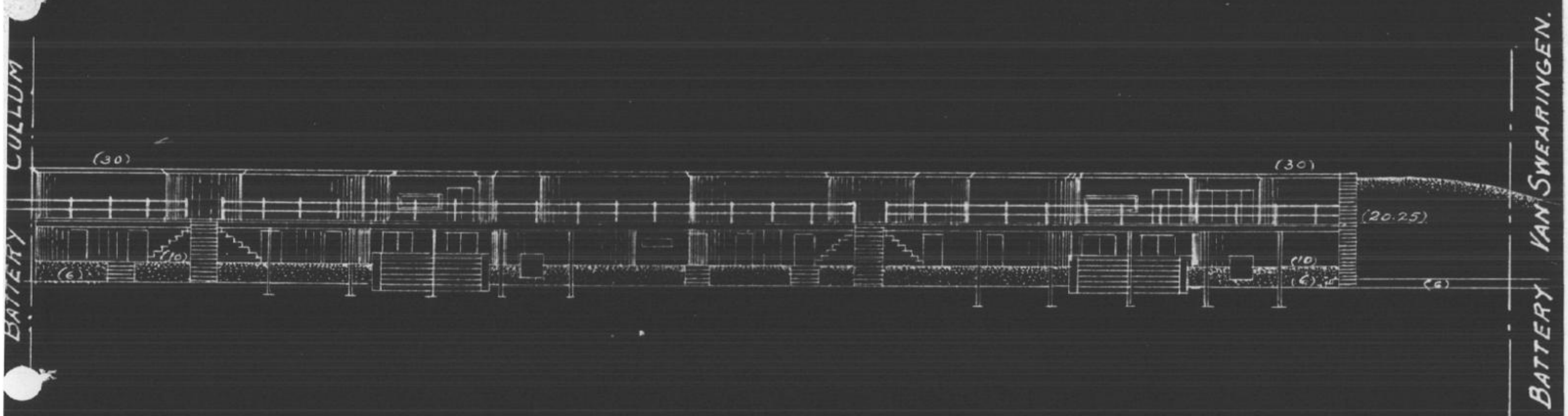
REPORT OF COMPLETED WORKS - SEACOAST FORTIFICATIONS
(Rear Elevation)

Form 7

Corrected to November 1, 1920

COAST DEFENSES OF PENSACOLA
FORT PICKENS, FLA.
BATTERY SEVIER.
No. Guns-2; Cal.-10"; Disap. Carr'ge.
In 4 Sheets: Sheet (b)
Scale: 1" = 30'

0 5' 10' 20' 40' 60'



July, 1919 - A. B

WAR DEPARTMENT,

CORPS of ENGINEERS, U.S.ARMY

Sheet No. 2

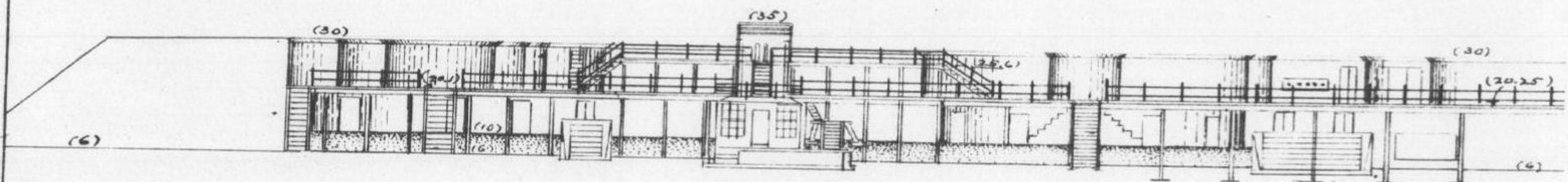
REPORT of COMPLETED WORKS — SEACOAST FORTIFICATIONS
(Rear Elevation)

Form 7

Corrected to November 1, 1920

COAST DEFENSES of PENSACOLA
FORT PICKENS, FLA.
BATTERY CULLUM.
No. Guns - 2; Cal. - 10; Disap. Carr'ge
In 4 Sheets: Sheet (b)
Scale: 1" = 30'
0 5 10' 20' 30' 40' 60'

Guns Removed.



July, 1919 — A. B.

WAR DEPARTMENT,

CORPS OF ENGINEERS, U.S. ARMY.

Sheet No.

REPORT OF COMPLETED WORKS — SEACOAST FORTIFICATIONS

(Rear Elevation)

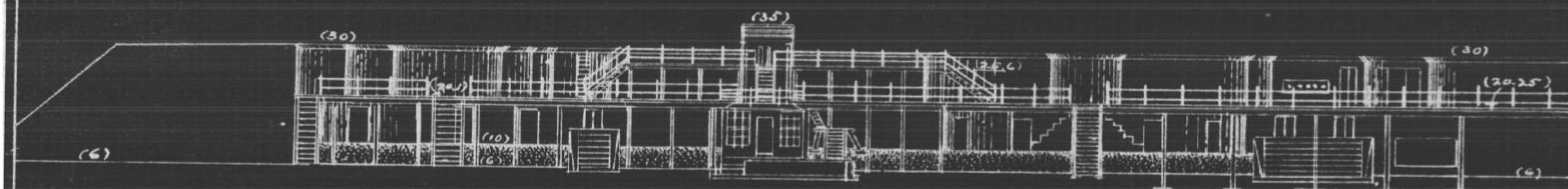
Form 7

Corrected to November 1, 1920

COAST DEFENSES OF PENSACOLA.
FORT PICKENS, FLA.
BATTERY CULLUM.
No. Guns-2; Cal.-10"; Disap. Carr'ge.
In 4 Sheets: Sheet (b)
Scale: 1" = 30'

0 5' 10' 20' 30' 40' 60'

Guns Removed.



July, 1919 — A. B.

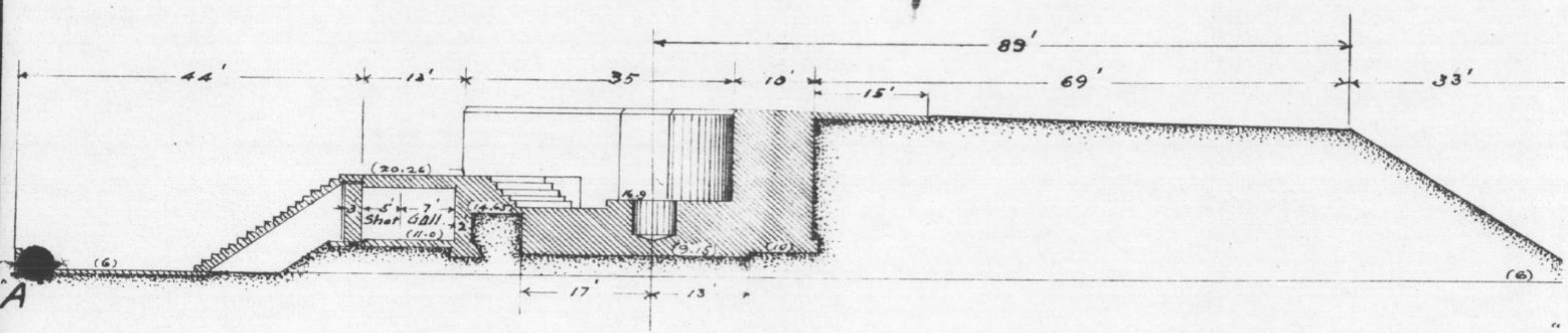
Sheet No 3

Form 7

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

Corrected to November 1, 1920

COAST DEFENSES of PENSACOLA
FORT PICKENS, FLA.
BATTERY SEVIER.—
No. Guns-2; Cal.-10"; Disap. Carr's
In 4 Sheets; Sheet (C)
Scale: 1" 20'
0 5 10' 20' 40'



July 1919 — A. E

WAR DEPARTMENT. CORPS OF ENGINEERS, U.S. ARMY.

Sheet No. ↄ

Form 7

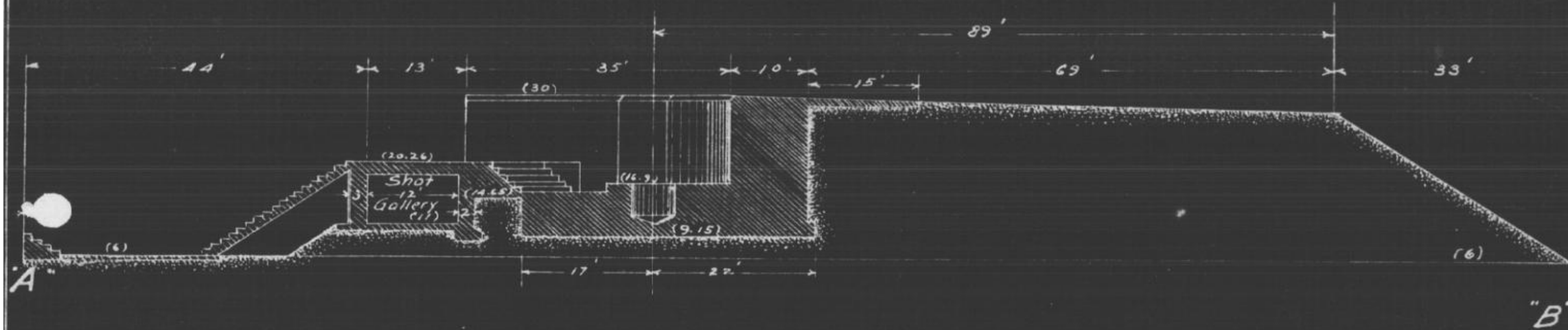
REPORT OF COMPLETED WORKS – SEACOAST FORTIFICATIONS
(Cross Section thru No. 1 Gun parallel to capital of battery)

Corrected to November 1, 192[illegible]

COAST DEFENSES OF PENSACOLA,
FORT PICKENS, FLA.
BATTERY CULLUM.
No. Guns - 2; Cal. - 10"; Disap. Carr'ge.
In 4 Sheets; Sheet (C)
Scale, 1" = 20'

0 5 10 20 40

Guns Removed.



July, 1919 – A.B.

WAR DEPARTMENT. CORPS OF ENGINEERS, U.S. ARMY.

Sheet No. 3

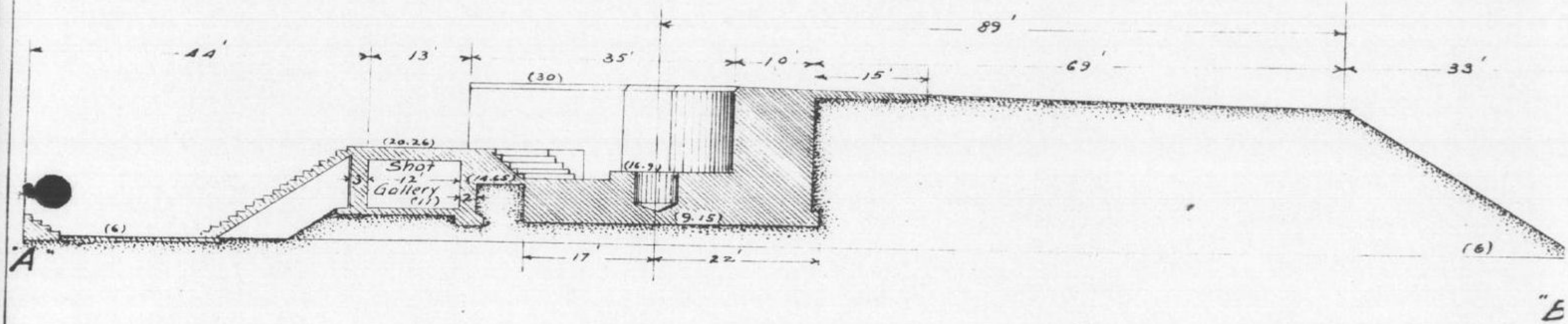
Form 7

REPORT OF COMPLETED WORKS – SEACOAST FORTIFICATIONS
(Cross Section thru No. 1 Gun parallel to capital of battery)

Corrected to November 1, 192[illegible]

COAST DEFENSES OF PENSACOLA,
FORT PICKENS, FLA.
BATTERY CULLUM.
No. Guns – 2; Cal. – 10"; Disap. Carr'g
In 4 Sheets; Sheet (C)
Scale, 1" = 20'

Guns Removed.



July, 1919 – A.B.

Sheet No. 4

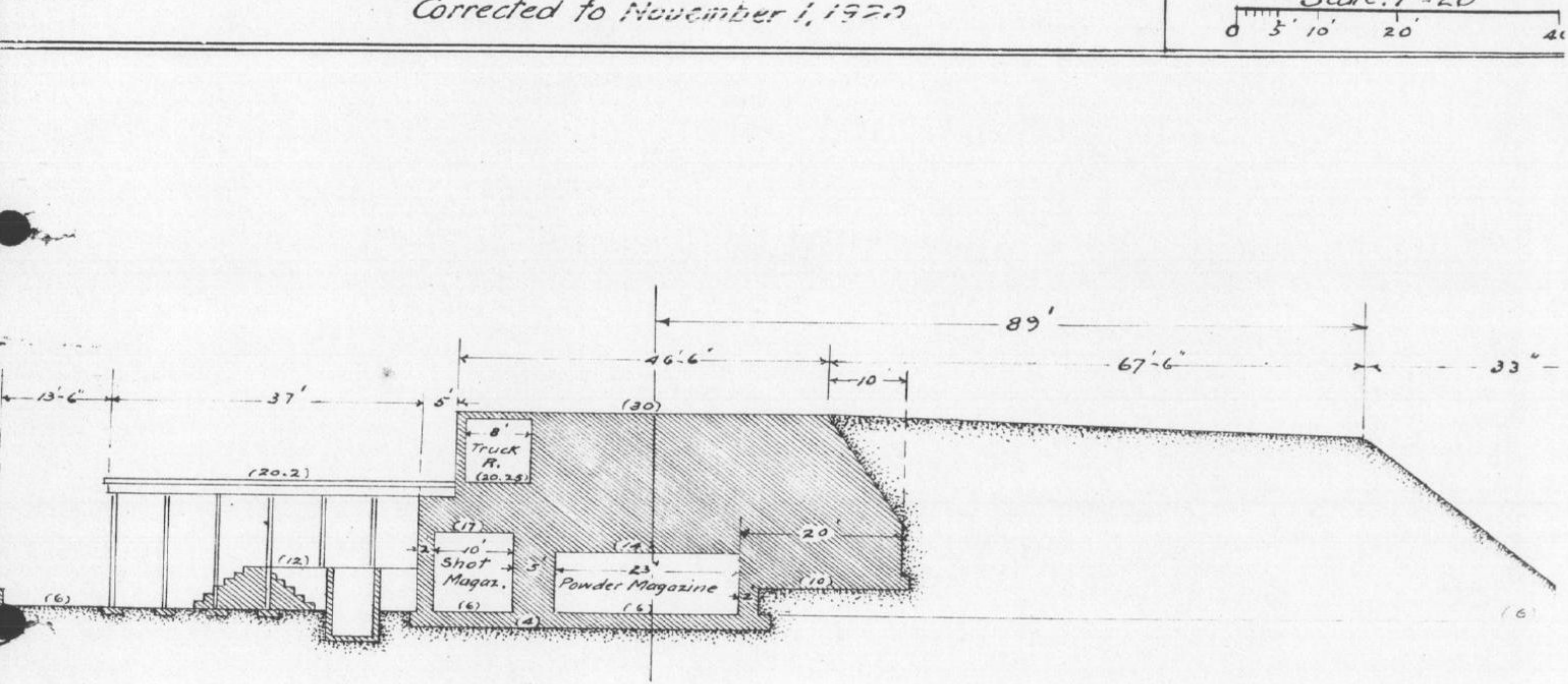
Form 7

REPORT OF COMPLETED WORKS - SEACOAST FORTIFICATIONS

(Cross section thru Powder Magazine of No. 1 Gun parallel to capital of battery)

Corrected to November 1, 1920

COAST DEFENSES of PENSACO.
FORT PICKENS, FLA.
BATTERY SEVIER.
No. Guns - 2; Cal. - 10"; Disap. Carr.
In 4 Sheets: Sheet (d
Scale: 1" = 20'



July. 1919 - A.

W[illegible] DEPARTMENT, CORPS of ENGINEER[illegible] U.S. ARMY.

Sheet No. 4

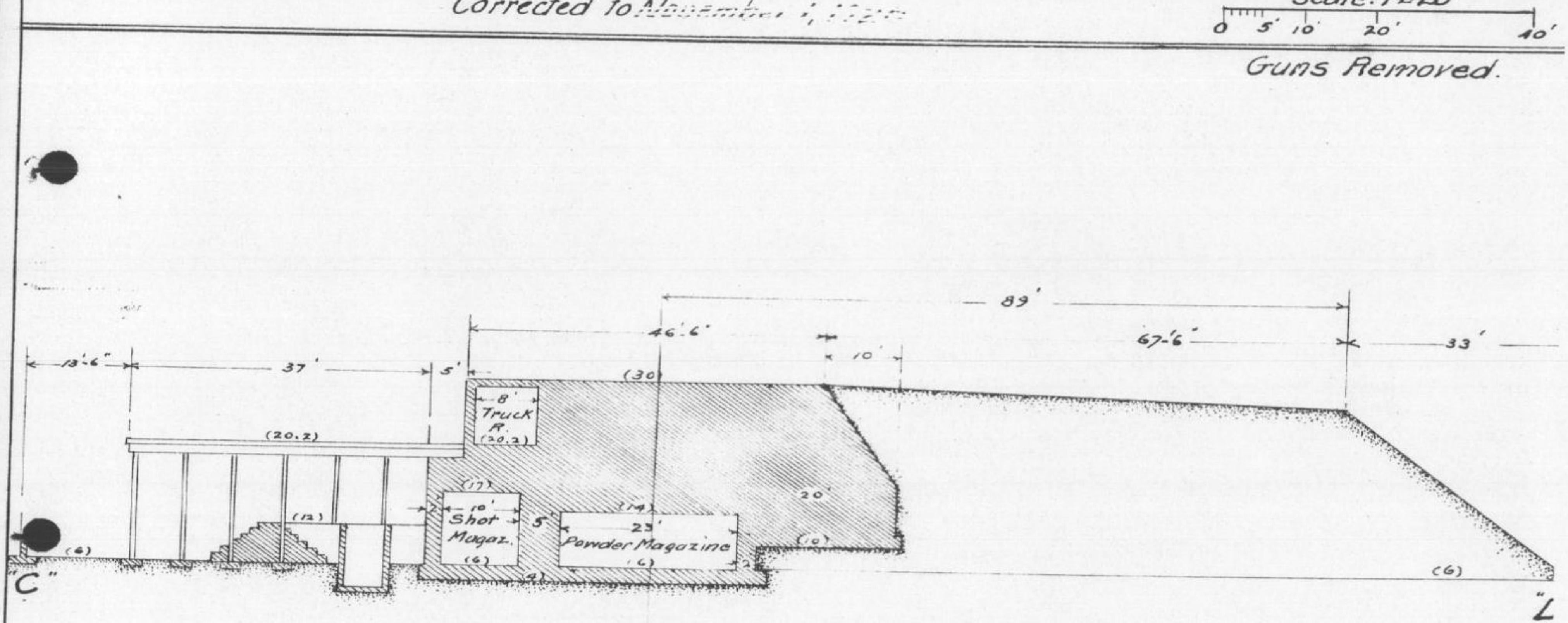
Form 7

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

Corrected to [illegible]

COAST DEFENSES of PENSACOLA
FORT PICKENS, FLA.
BATTERY CULLUM.
No. Guns-2. Cal.-10"; Disap. Carr'g.
In 4 Sheets; Sheet (d)
Scale: 1"=20'

Guns Removed.



July, 1919 - A.B

WAR DEPARTMENT, CORPS of ENGINEERS, U.S. ARMY.

Sheet No.

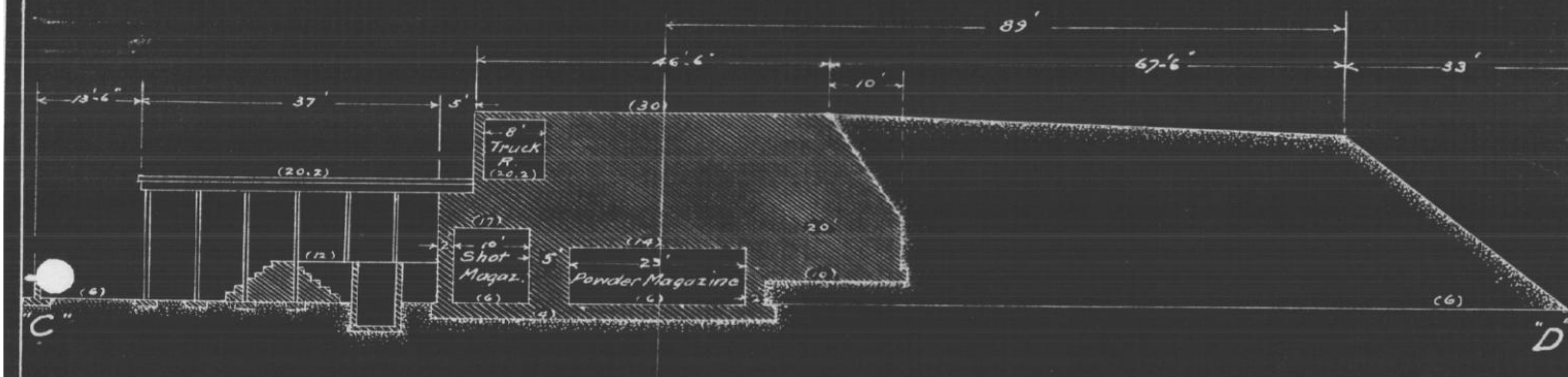
Form 7

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

Corrected to

COAST DEFENSES of PENSACOLA,
FORT PICKENS, FLA.
BATTERY CULLUM.
No. Guns - 2, Cal. - 10"; Disap. Carr'ge.
In 4 Sheets; Sheet (d)
Scale: 1" = 20'

Guns Removed.



July, 1919 - A.B.

Btry. Trueman to be relocated on east flank of this battery

REPORT OF COMPLETED WORKS - SEACOAST FORTIFICATIONS
/GUN AND MORTAR BATTERIES/

~~COAST~~ Harbor DEFENSES OF Pensacola, Fla.
FORT.............. Pickens, Fla.
* BATTERY.......... Cullum.
NO. OF GUNS 2 CALIBER 10" CARRIAGE

FORM 1 CORRECTED TO- January 21, 1929.

1. BATTERY COMMENCED...........	1895	1. SOURCES OF ELECTRIC CURRENT	⊛ Two 25 KW Gasoline Sets, and A.C.Commercial from Pensacola.
2. BATTERY COMPLETED...........	6/29/1898		
3. DATE OF TRANSFER........	#1-1896-#2 1989.	2. MAX.KW. REQUIRED FOR LIGHTS	5.8
4. MATERIAL OF CONSTRUCTION.....	Concrete	3. MAX.KW. REQUIRED FOR MOTORS	25.0
5. PORTLAND OR ROSENDALE CEMENT.	Rosendale		
6. COST TO DATE OF TRANSFER.....	$94,460.12		
7. CONNECTED TO WATER SUPPLY....	Yes	4. PRESENT CONDITION OF BATTERY	Good
8. CONNECTED TO SEWER..........	No	5. ROOMS WET OR DRY............	Ceiling and walls dry; floors damp.
9. TYPE OF LATRINE.............	None		
10. TYPE OF DATA TRANSMISSION....	Telephone	6. HOW VENTILATED..............	Vertical shafts and grating doors
11. TRUNNION ELEVATION IN BATTERY	30.73	7. REMARKS	
12 DATUM PLANE.................	M.L.W.		

ARMAMENT

See Index Plat Rec of Dec 5, 1934 "Guns dismantled"

EMPLACEMENT OR MORTAR NO.	GUNS OR MORTARS CAL.	LENGTH	MODEL	SERIAL NO.	MANUFACTURER	MOUNTED	CARRIAGES TYPE	MODEL	SERIAL NO.	MANUFACTURER	MOTOR
1.	10"	~~1888-MII~~	1888-MII	48	Watervliet	Yes	Dis.	1894-M-1	8	Kilby Mfg.Co.	Yes
2.	10"		1888-MII	49	"	"	"	1986	38	Bethelehem	"
3.											
4.											
5.											
6.											
7.											
8.											

See 660.2-16, 4th Ind. Remove breech mechanisms and report them to Chief of Ordnance for shipping instructions. Sell tubes as surplus. Gun #48 fired 172 rounds, and gun #49 fired 210 rounds.

See 660.2-16, 4th Ind. To be sold as scrap, retaining sufficient parts for maintenance of the 4 carriages of this type being retained in the Fourth Corps Area.

See 660.2-16, 4th Ind. To be sold as scrap. No parts to be retained.

HOISTS

EMPLACEMENT NUMBER.	TYPE	DELIVERY	MOTOR SERIAL NO.	MAKER	H.P.	VOLTS	RPM	TYPE OF CONTROL	DATE OF TRANSFER	REMODELED FOR LONG POINTS
1.	Chain-Taylor	Raymond. Back	102076	GE Co.	5	110	1560	Streetcar		Yes -1918.
2.	"	"	102148	"	5	110	1560	" "		Yes - 1918.
3.										
4.										

⊛ Two portable cradle racks w/provisions for eye-bolt cemented in wall to be used w/block & tackle in order to place generators above "High Water Mark" (Rept of Operations for Aug 1934)

* 662B (Pensacola) 75 states that guns & mounts are present. Grants authority for removal & storage of Signal & Engr. equipment. Disposition of armament deferred. 10/17/41.

REPORT OF COMPLETED WORKS - SEACOAST FORTIFICATIONS
/GUN AND MORTAR BATTERIES/

HARBOR ~~COAST~~ DEFENSES OF PENSACOLA, FLA.
FORT............. Pickens.
* BATTERY.......... SEVIER
NO. OF GUNS 2 CALIBER 10" CARRIAGE DISAP.

FORM 1 CORRECTED TO- June 30, 1925.

1. BATTERY COMMENCED............	1895	1. SOURCES OF ELECTRIC CURRENT	2 - 25 k.w.G.E.Co.,gasoline electric generating sets; A.C. commercial from Pensacola, Fla.
2. BATTERY COMPLETED............	6/29/1898	2. MAX.KW. REQUIRED FOR LIGHTS	5.8 k.w.
3. DATE OF TRANSFER............	#1, '96; #2,	3. MAX.KW. REQUIRED FOR MOTORS	25 k.w.
4. MATERIAL OF CONSTRUCTION.....	Concrete/'98		
5. PORTLAND OR ROSENDALE CEMENT.	Both		
6. COST TO DATE OF TRANSFER.....	$94,460.12		
7. CONNECTED TO WATER SUPPLY....	Yes	4. PRESENT CONDITION OF BATTERY	Good
8. CONNECTED TO SEWER...........	No	5. ROOMS WET OR DRY............	Ceilings and side walls dry, floors damp.
9. TYPE OF LATRINE..............	No latrine		
10. TYPE OF DATA TRANSMISSION....	Telephone	6. HOW VENTILATED..............	Vertical shafts and metal grating doors.
11. TRUNNION ELEVATION IN BATTERY	30.73'	7. REMARKS	
12 DATUM PLANE.................	M.L.W.		

A R M A M E N T

See Index Plat Rev. of Dec. 5, 1934 "Guns Dismantled"

EMPLACEMENT OR MORTAR NO.	GUNS OR MORTARS						CARRIAGES				
	CAL.	LENGTH	MODEL	SERIAL NO.	MANUFACTURER	MOUNTED	TYPE	MODEL	SERIAL NO.	MANUFACTURER	MOTOR
1.											
2.	10"	367.25"	1888	25	Watervliet	Yes	Dis.	1894	6	Bethlehem	8 H.P.
3.	10"	367.25"	1888	42	do	Yes	Dis.	1894	7	Iron Works.	110 V.D.C.
4.	See 660.2 - 16, 4th Ind.. Remove breech mechanisms and report them to the Chief of Ordnance for shipping instructions. Sell tubes as surplus. Gun #25 fired 210 rounds, and gun #42 fired 235 rounds.						See 660.2 - 16, 4th Ind. To be sold as scrap. No parts to be retained.				
5.											
6.											
7.											
8.											

H O I S T S

EMPLACEMENT NUMBER.	TYPE	DELIVERY	MOTOR						DATE OF TRANSFER	REMODELED FOR LONG POINTS
			SERIAL NO.	MAKER	H.P.	VOLTS	RPM	TYPE OF CONTROL		
1.										
2.	Chain, Taylor & Raymond.	Back	91970	G.E.Co.	5	110	1540	Street car	1903	1918
3.		do	91677	do	5	110	1540	do	1903	1918
4.										

* 6628 (Pensacola) 75 states that guns & mounts are present. Grants authority for removal & storage of Signal & Engr. equipment. Disposition of armament to be deferred. 10/14/41.

COAST DEFENSES OF *PENSACOLA HARBOR, FLA.*

FORT *Pickens* BATTERY *Truman* NO. OF GUNS: *2* CALIBER: *3"*

	EMPLACEMENT NUMBER 1.	EMPLACEMENT NUMBER 2.	EMPLACEMENT NUMBER 3.	EMPLACEMENT NUMBER 4.
1-a. Azimuth.	324° 30′ 51″	313° 54′ 51″		
b. Distance.	2300.66 yds.	61.58 Ft.		
2-a. Model of Gun.	1902	None mtd.		
b. " " Carriage.	1902	" "		
c. Type of "	Ped.	" "		
3- Elevations of.				
a. Gun trunnions (in battery.)	19.91 Ft.	" "		
b. Interior crest.	19.35 Ft.	19.35 Ft.		
c. Loading platform.	15.93 Ft.	15.93 Ft.		
4- Angle of depression.	−3°	−3°		

	FROM. ° ′	TO. ° ′	FROM. ° ′	TO. ° ′	FROM. ° ′	TO. ° ′	FROM. ° ′	TO. ° ′
5- Limiting azimuths of field of fire as determined by:								
a. Construction of emplacement.	All		All					
b. Interference by adjacent emplacements.	313° 54′ 51″	359° 54′ 51″						
c. Interference of other obstacles external to emplacement.								
d. Position of Ordnance stops.	No	Stops						

NOTES.

1. Azimuth and distance of emplacement No. 2 are given with reference to No. 1; of No. 3, with reference to No. 2, etc. Azimuth and distance of No. 1, are given with reference to *Pensacola Light.*

3. Above plane of *M. L. W.*

5-c. Nature of obstacles: *SEARCH LIGHT No. 4, BATTERY PAYNE, and Right Flank of VAN SWEARINGEN.*

2-c. Use one of following abbreviations or designations: Dis.; Nondis.; Alt. gun-lift; Turret; Casemate; Ped.; B.P.

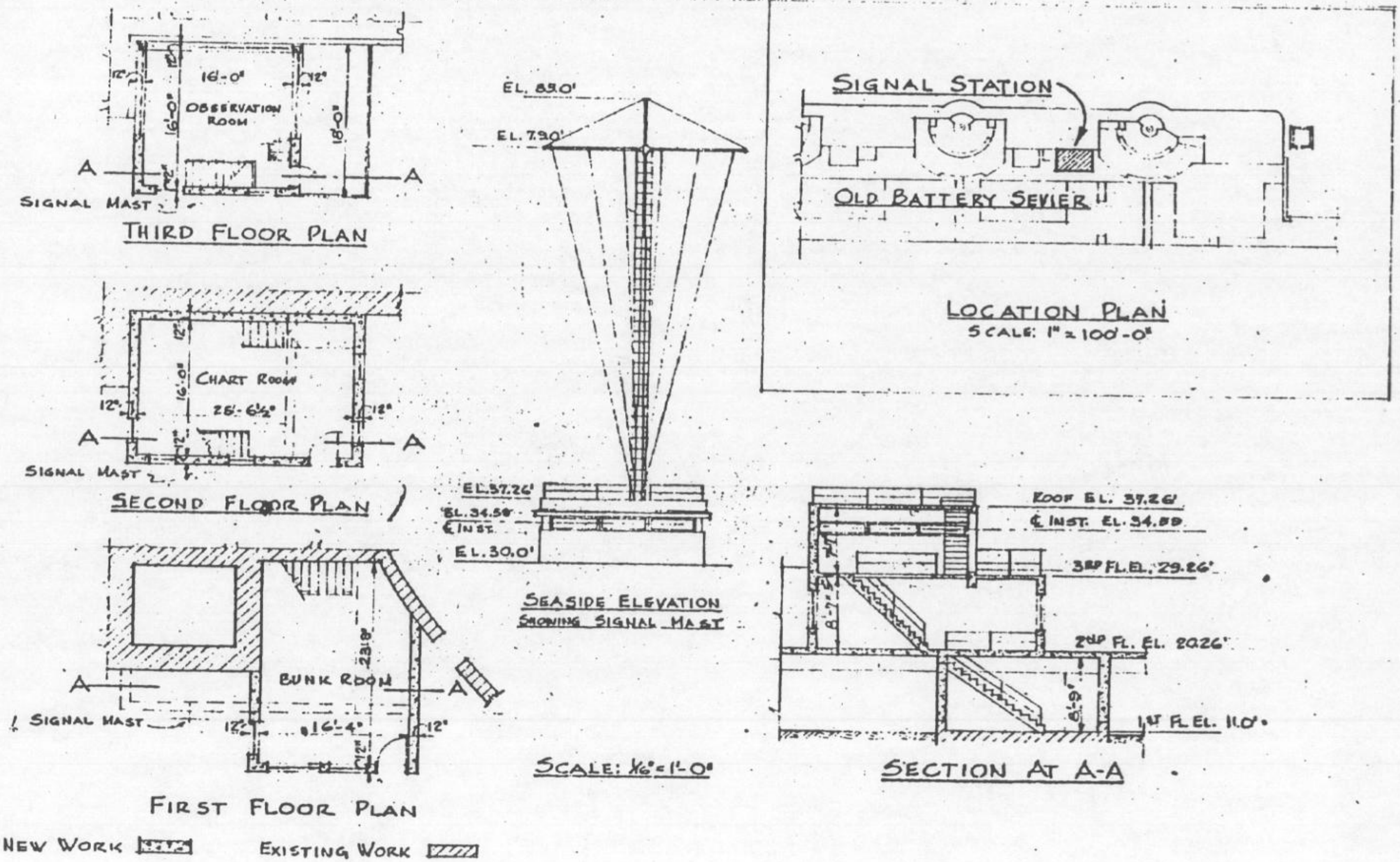
SECRET

REPORT OF COMPLETED WORKS - SEACOAST FORTIFICATIONS
(FIRE CONTROL OR SUBMARINE MINE STRUCTURES)

HARBOR DEFENSES OF PENSACOLA, FLORIDA
FORT PICKENS

STRUCTURE: HARBOR DEFENSE SIGNAL STATION

PART II CORRECTED TO 27 MAY 1944



L.C.W.

Control Approval Symbol SPEKM -1

REPORT OF COMPLETED WORKS - SEACOAST FORTIFICATIONS SECRET
(Batteries)

DECLASSIFIED
E.O. 11652, Sec. 3(E) and 5(D) or (E)
735036
By 7 NARS, Date 3/21/78

HARBOR DEFENSES OF .... Pensacola ....
FORT .. Pickens, Florida ....
BATTERY Trueman .... No. of Guns 2 ....
Caliber 3-inch ..... Carriage Pedestal Mt..

132975

Part I Corrected to June 1944

GENERAL:
Battery commenced .. March 1942 ....
Battery completed .. December 1942 ....
Date of transfer ... May 1944 ....
Cost to date of transfer .. $20,330.00 ....
Materials of construction .. Reinforced concrete & steel
Battery new or modernized Relocated (see remarks)...
(If modernized give detailed statement on reverse side)
Trunnion elevation in btry. ... 31.91' ....
Datum plane .... M.L.W. ....

UTILITIES:
WATER SUPPLY
Source of ... Post Distribution System ....
Alternate source .... None ....
Size of Main .... 6" ....
SEWER
Connected to sewer ..... No ....
Type of Disposal .... None ....
Type of Latrine .... None ....

UTILITIES (Cont'd.)
ELECTRIC POWER
Sources of ..... Post Power System ....
Procured & installed by (OCE or ORD) .. OCE ....
Characteristics: Voltage 110 ac ~~or DC~~...Phase. Single
No. of units and capacity .. - ....
Max. K.W. required for utilities .. 2 ....
Max. K.W. required for non-battle conditions. 2 .....
Commercial power provided (yes ~~or no~~)...Capacity 5 KVA
Auxiliary power unit provided(~~yes or~~ no)..Capacity..
Type of lighting fixtures .. SF Vaportight ....
Dehumidifying Unit No..Make and capacity .. - ....
Rooms Wet or Dry ... Dry ....
How ventilated Vertical shafts & grating doors ......
How heated ..... No heat ....
DATA TRANSMISSION
Type .... Signal Corps telephone ....

REMARKS Guns mounted on emplacements built in gun wells of Old Battery Cullum (10" D.C.). Existing magazines rehabilitated.

ARMAMENT

Emplacement No.	Cal.	Length	Model	Guns Serial No.	Manufacturer	Mounted	Type	Model	Carriages Serial No.	Manufacturer	Motor
1 2	3"	154.35"	1902	25	Bethlehem Steel Co.	Yes	Ped.	1902	25	Bethlehem Steel Co.	None
3	3"	do	1902	16	do	do	Ped.	1902	16	do	do

92-4882

SECRET

Form A-162A
16 Sept. 1943.

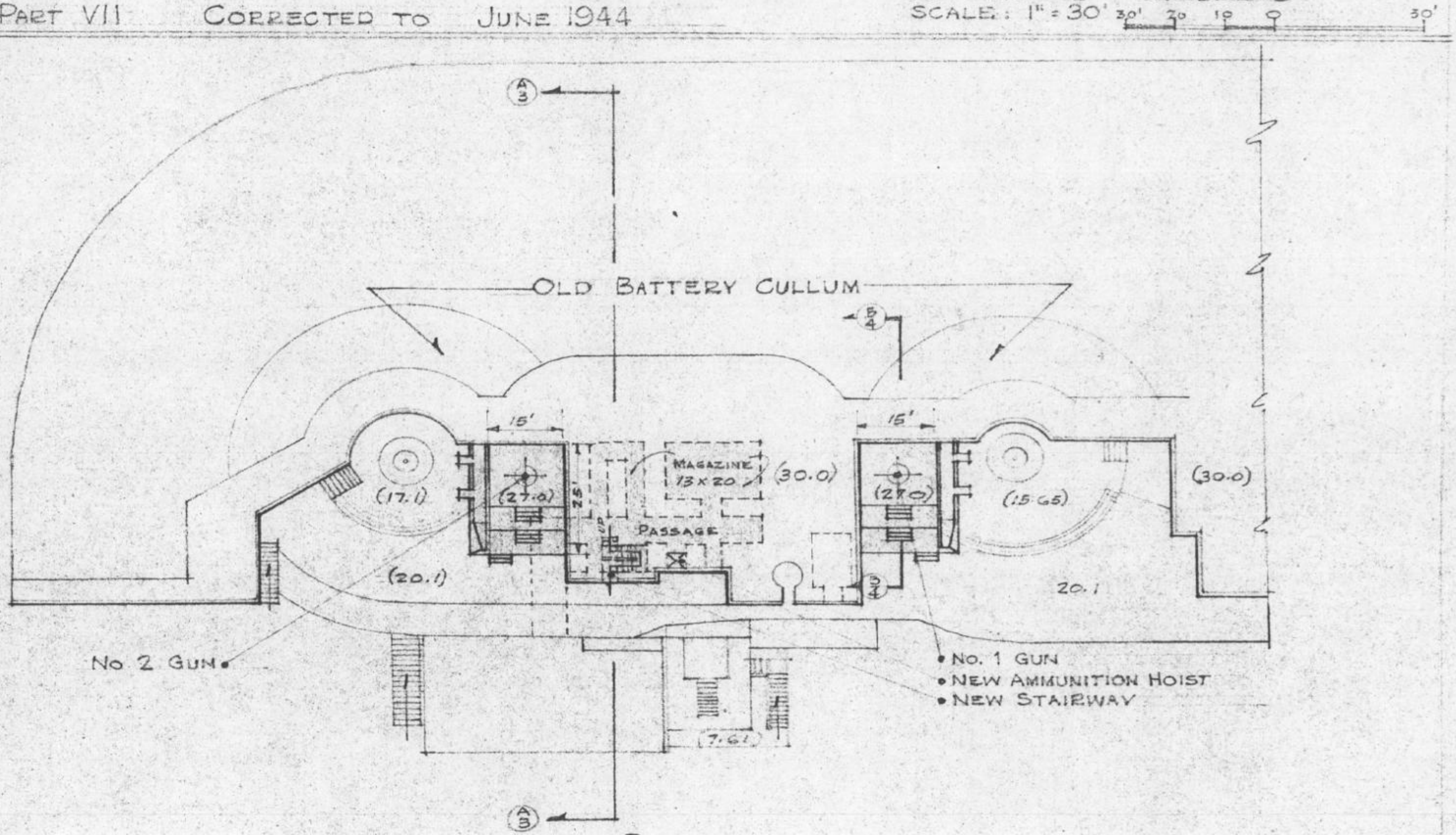
C-21

SECRET

REPORT OF COMPLETED WORKS- SEACOAST FORTIFICATIONS
(BATTERIES)
SHEET 1 OF 4

HARBOR DEFENSES OF PENSACOLA
FORT PICKENS, FLORIDA
BATTERY TRUEMAN
NO. GUNS - 2 CALIBRE - 3"
SCALE: 1" = 30'

PART VII CORRECTED TO JUNE 1944



PLAN

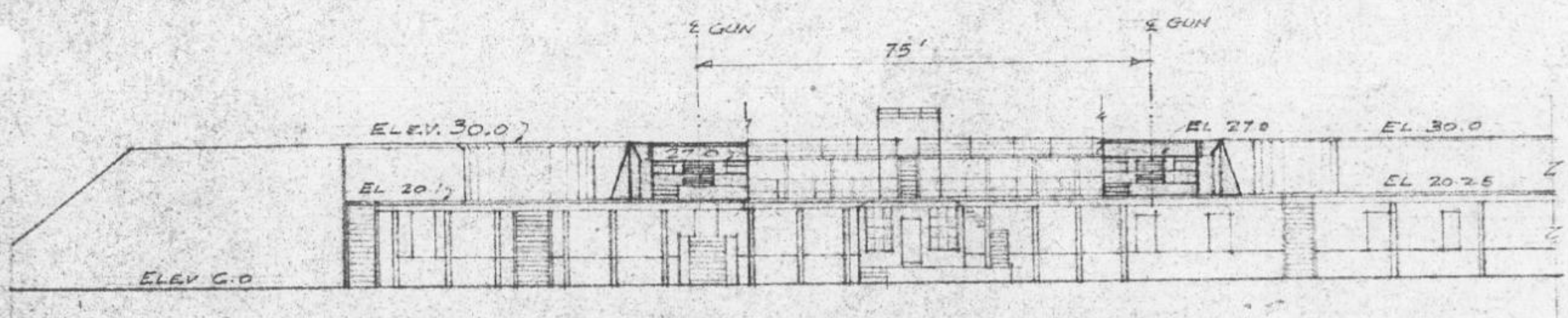
SECRET

SECRET

REPORT OF COMPLETED WORKS - SEACOAST FORTIFICATIONS
(BATTERIES)
SHEET 2 OF 4

PART VII CORRECTED TO JUNE 1944

HARBOR DEFENSES OF PENSACOLA
FORT PICKENS, FLORIDA
BATTERY TRUEMAN
NO. GUNS - 2 CALIBRE - 3"
SCALE: 1" = 30'



BACKSIDE ELEVATION

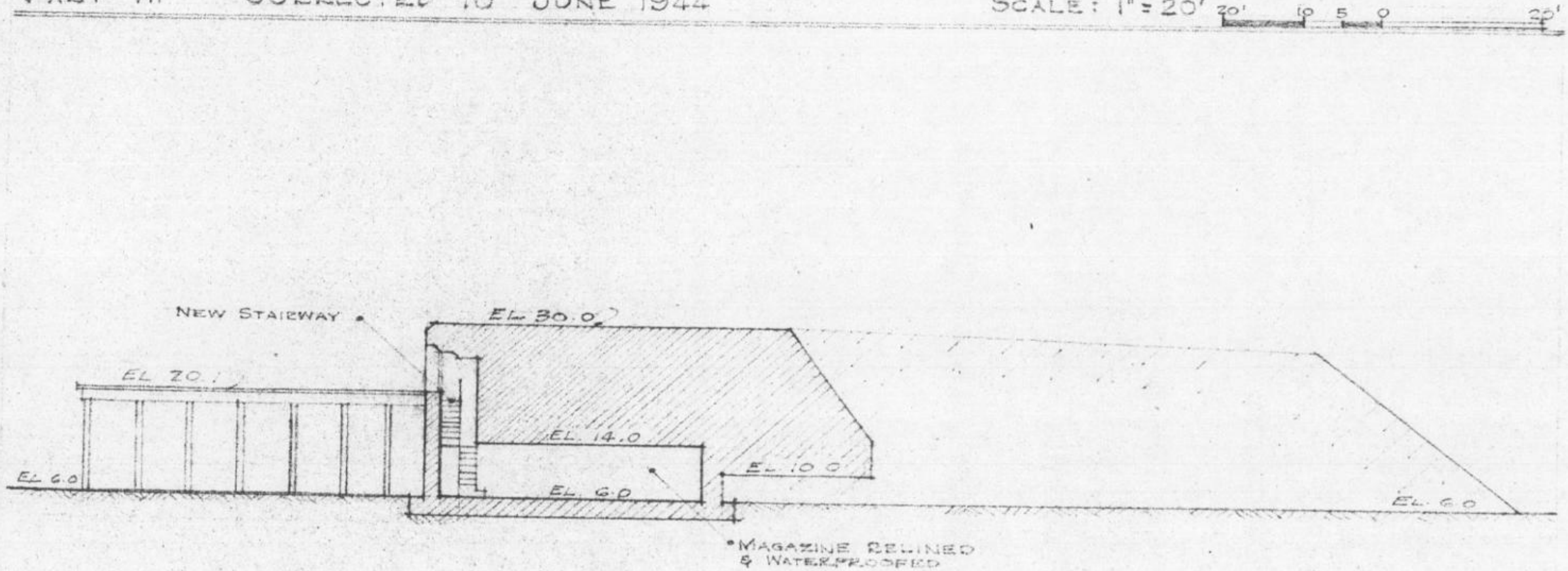
SECRET

~~SECRET~~

REPORT OF COMPLETED WORKS - SEACOAST FORTIFICATIONS
(BATTERIES)
SHEET 3 OF 4

PART VII CORRECTED TO JUNE 1944

HARBOR DEFENSES OF PENSACOLA
FORT PICKENS, FLORIDA
BATTERY TRUEMAN
NO GUNS - 2 CALIBRE - 3'
SCALE: 1" = 20'



SECTION A/1

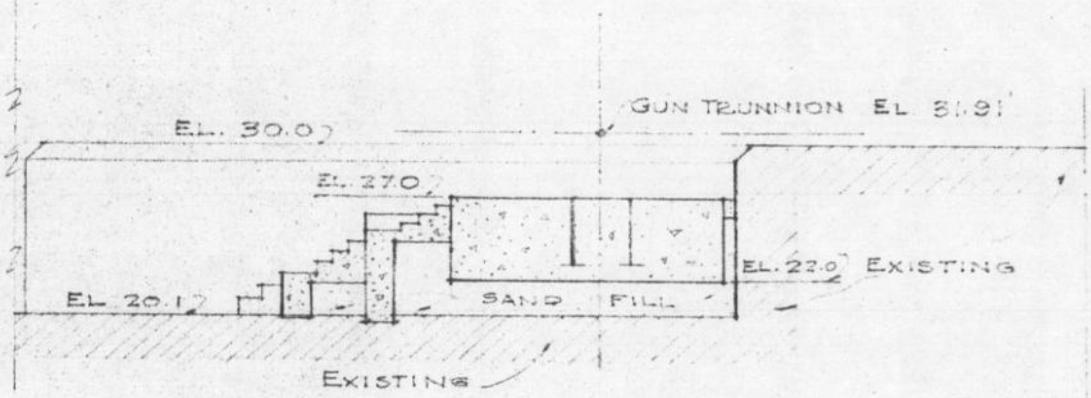
~~SECRET~~

~~SECRET~~

REPORT OF COMPLETED WORKS - SEACOAST FORTIFICATIONS
(BATTERIES)
SHEET 4 OF 4

HARBOR DEFENSES OF PENSACOLA
FORT PICKENS, FLORIDA
BATTERY TRUEMAN
NO. GUNS - 2 CALIBRE - 3"
SCALE: 1" = 10'

PART VII CORRECTED TO JUNE 1944



SECTION B/1

~~SECRET~~

National Park Service
U.S. Department of the Interior

Battery Cullum-Sevier
Gulf Islands National Seashore
1801 Gulf Breeze Parkway
Gulf Breeze, Florida 32563

www.nps.gov/guis

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