historic structure report
administrative and historical data sections
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GULF ISLANDS

FORT ON SHIP ISLAND (FORT MASSACHUSETTS) 1857-1935

NATIONAL SEASHORE / MISSISSIPPI

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Historic Structure Report
Administrative and Historical Data Sections
Fort on Ship Island (Fort Massachusetts) 1857-1935
Gulf Islands National Seashore
Harrison County, Mississippi

by
Edwin C. Bearss

FOREWORD

This report has been prepared to provide the Service with the Administrative and Historical Data Sections for the Fort on Ship Island (Fort Massachusetts) Historic Structure Report. Raw data was ferreted out in Fiscal Year 1974 and made available to Architectural Historians John Garner and Fred Gjessing for evaluation and use in the Architectural Data Section of the Historic Structure Report.

Documentary data from which this report was prepared is found principally in Record Groups 77, 92, 156, and 393 at the National Archives, and Record Group 77 at the East Point, Georgia, Records Center. On a field trip to Mississippi, the James Stevens Collection and manuscripts at the Mississippi Department of Archives and History were examined. These documents were culled to provide a structural history of the fort which will be of use to management and interpreters, as well as architects.

Many persons have assisted in preparation of this report. At the Mississippi Unit, Gulf Islands National Seashore, Assistant Superintendent Noel J. Pachta and key members of his staff (William V. Westphal and Mike Brown) supported and encouraged our work. Besides providing transportation to the island, they cheerfully and promptly responded to our numerous questions. Park Chief of Interpretation Mary Jones, in cooperation with Regional and Denver Service Center programmers, secured funds for preparation of this report. Long-time friend and associate "Mr. History of the Gulf Coast," Jim Stevens, and his lovely and gracious wife--went out of their way to make our field trip to Harrison County profitable and enjoyable. Mr. Stevens permitted unlimited access to his incomparable and well organized library on local history.

Friends and associates at the National Archives: Dale Floyd, Mike Musick, John Matias, and Richard Cox of the Old Military Branch and

Raymond Cotton and Mike Stanchie of the Center for Cartographic Architectural Archives diligently searched the stacks in response to our seemingly never ending requests and copied hundreds of documents and plans. At the East Point, Georgia, Record Center S.A. Rayden graciously handled my requests, a number of which were made by telephone.

Architectural Historians John Garner and Henry Judd formerly of the National Park Service toured the fort, read the fabric, and made valuable suggestions as to what, in the way of documents, was required to facilitate their mission. By sharing their vast knowledge of the builders' arts, they enabled us to understand better and explain details of the fort's structural history, especially those on which the documents were vague or silent.

As always, in researching and preparing a study of a United States fort built under supervision of the Corps of Engineers, a debt is owed Dr. E. Raymond Lewis of Washington, D.C., author of that outstanding introduction to the subject, Seacoast Fortifications of the United States, for sharing his encyclopedic knowledge of the subject.

Collegues and associates--former Assistant Superintendent Noel Pachta of Gulf Islands National Seashore, Drs. Harry Pfanz and Harry Butowsky of the Washington Office's Cultural Resources Management; Jim Stevens, President of the Mississippi Historical Society; and John Garner, former Chief, Cultural Preservation Branch, Southeast Region, and Regional Historian Lenard Brown, Southeast Region--read the manuscript in draft and made valuable suggestions, saving us from future embarassments. Last, but by no means least, Darlene K. Geist, Alaska/Pacific Northwest/Western Team and Beverly A. Ritchey, Mid-Atlantic/North Atlantic Team, had the most challenging task of all--converting our scrawl into a typed manuscript.

Edwin C. Bearss

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I. ADMINISTRATIVE DATA

A. Name and Number of Structure

Fort Massachusetts (Fort on Ship Island), structure M-1, Mississippi Unit, Gulf Islands National Seashore, Harrison County, Mississippi. Fort Massachusetts is classified as a structure of 1st Order of Significance.

B. Proposed Use of Structure

The masonry Third System fort, essentially completed in the years 1859-66, was the object of a major stabilization and preservation project in 1975-76. The fort is used to interpret the construction, occupation, and defense of a Third System masonry fort. A secondary theme is the use of the partially completed fort for military purposes by first Confederate and then Union forces during the Civil War.

C. Justification for Such Use as Shown in the Master Plan

Public Law 91-660, enacted January 8, 1971, establishing Gulf Islands National Seashore, provides that "Fort Massachusetts in Mississippi" shall be administered "so as to recognize, preserve, and interpret . . . [its] national historical significance in accordance with the Act of August 21, 1935."

D. Provision for Operating Structure

Fort Massachusetts will be used as a historic structure museum and exhibit in place.

E. Cooperative Agreement, if any, Executed or Proposed for Operating the Structure

No cooperative agreement(s) will be required to operate the structure.

F. Brief Description of 1975-76 Stabilization/Preservation Project

Completion Report Narrative Stabilization of Fort Massachusetts Gulf Islands National Seashore, Mississippi Unit, Contract No. CX-50005024.

Contract No. CX-50005024 was issued on May 27, 1975, by the Contracting and Property Management Division of the Southeast Regional Office, to rehabilitate impaired finishes and structural elements that posed a hazard to the continued preservation of the fortification.

Description of the Work

Work under this contract consisted of the following:

1. Repairing damaged corbelling of cordon
2. Resetting granite cap stones
3. Waterproofing of the terrplein
4. Rebuilding damaged arches of interior
5. Grouting failure cracks
6. Repointing of exterior and interior walls

Contract drawings No. 635/80067 totaled 9 sheets. The drawing sheets which apply to this contract are sheets No. 1, 2, 3, 4, 6, and 7.

Bids were received and opened June 23, 1975. The lowest bidder was J.O. Collins, Contractor, P.O. Box 1205, Biloxi, Mississippi 39533, for the bid schedule (items 1 thru 6) of contract No. 500050224 in the amount of $285,415.00. The architect's estimated price range for bidding purposes was $300,000.00 to $400,000.00.

A preconstruction conference was held in mid-August 1975 to review contract documents and provisions with the contractor.

The Notice to Proceed was issued August 27, 1975, and August 30, 1975, was recorded as the first day of the contract period. September 9, 1975, was the first day of work. Scaffolding and masonry sand were delivered to Ship Island via the Park Service work boat "Elsie M."

On September 11, 1975, the contractor started excavating the terreplein at gun position 24, to locate the arched culvert and drain that was shown on the original Corps of Engineers' drawings. The original drawings failed to show the massive concrete footings under the traverse stones.

On September 30, Architects John Garner and Fred Gjessing visited the site to view the situation, it was determined not to remove these footings and that an alternate method of waterproofing the fort would be developed. The new method of waterproofing was to excavate to a minimum of six inches below grade, lay a bed of 30 lb. roofing paper, plastic window screen and cover with 60 mils of sikaflex liquid membrane. A test area was prepared on December 12. On January 5, 1976, Mr. Gjessing made a visit to the site to inspect. This method eliminated Sections A, C, D, E, F, G and J of Bid Item 2, and reduced the quantity of Sections B and H. A change order was negotiated with the contractor to incorporate the new method into the contract. Change Order No. 1, also included additional areas to be waterproofed (11,240 S.F.), sodding (1,200 S.Y.), fill dirt and top soil (470 c.y.), relaying the brick and cobble stone pavement in the sallyport (285 sq. ft.), repair of concrete pavement (200 sq. ft.), and additional grouting of the capstones on the east side of the fort. This change order resulted in a net reduction to the contract of $8,250.50.

On October 21, 1975, architects Garner and Gjessing made a visit to the site at the request of the contractor and Project Supervisor, to review the brick and mortar samples. The color range, size, and composition of the red-orange brick samples from the St. Joe Brick Works, Slidell, LA, were approved. The color and mixture of the mortar sample was approved. The mixture consisted of one part TXI buff, Type 1, Portland Cement, 4 parts lime, and ten parts sand. This mixture was used for repointing and resetting masonry units.

Repointing of the interior walls resulted in a sizable overrun. When the masons began raking out the mortar joints, close inspection of the interior and vaulted ceilings revealed that the mortar had deteriated much more than originally thought. At least 95 percent of this area had to be repointed, resulting in an overrun of $81,376.24.

Repointing of the exterior wall was within 10 percent of original estimate, resulting in an overrun of $8,900.

The shot furnace was repaired under change order No. 2. This change order also included resetting 200 s.f. of blue stone pavement located in casemate No. 29 and the removal of the concrete covering the original pavement at the foot of the steps in the two stairtowers east of the parade. This change order resulted in a net increase of $10,330 to the contract.

Change Order No. 3 was issued on June 17, 1976. This order included the lowering of the existing grade of the parade. By removing the sod and fill, swales were created on both side of brick walk from the sallyport to the west stairtower which was resodding with existing sod. The change order also included the repair of 21 cannon embrasures, and fabrication and installation of frames and shutters for the embrasures. The shutters were fabricated by Vero's Polly-wood Arts, of New Orleans, LA. This change order resulted in a net increase of $68,055.00 to the contract.

G. Additional Work Required

(1) In 1976 funds were exhausted before all areas of the terreplein and parapet were waterproofed, and there is still seepage into some of the casemates. Measures should be taken to correct their situation.

(2) Efforts should be made to secure for emplacement in one of the casemates a ten-inch Rodman cannon and its iron casemate carriage. This will enable the visitor to see and compare the two types of cannon mounted in the fort in the period 1872-1901.

(3) Steps have been taken to repair the chassis and carriage of the fort's 15-inch Rodman. This project, provided it is funded, will be completed before this report is final typed and distributed.

(4) Increased visitation during the summers has mandated discontinuation of guided tours during rush periods. At these times, an interpreter is stationed in the fort. To facilitate this practice and enrich the visitor's experience, one of the guardrooms should be refinished as an ordnance storeroom, a purpose for which it was employed from the late 1860s until 1901.

II. THE 21-YEAR CAMPAIGN TO INCLUDE SHIP ISLAND IN THE NATION'S DEFENSE SCHEME

A. Board of Engineers and America's Third System of Coastal Defense

The United States, following the War of 1812, commenced construction of a Third System of fortifications to guard its seacoasts. Unlike the works of the First and Second Systems, which were hastily erected in response to grave threats from abroad arising out of the French Revolution and the Napoleonic Wars, the Third System was begun in 1817, when Europe was at peace. "Immediacy," as Dr. E. Raymond Lewis has pointed out in his thought-provoking monograph Seacoast Fortifications of the United States, "was no longer an overriding consideration and attention could be directed at last to the creation of a permanent and truly integrated system of harbor defenses."

Until 1817, specific plans and designs had been prepared by engineers working independently of each other under general instructions issued by the Secretary of War and the Chief Engineer. There was no professional board in the War Department during this period "to coordinate planning, to determine project standards, or to supervise actual construction."

The First System, as Dr. Lewis has written, was therefore not "a true system with regard to the nature of its components, which were neither uniform nor durable." The Second System, "though it included several substantial works, was marked by a dissimilarity among its elements." Neither of the first two systems was "viewed as systematic (in the sense of constituting a cohesive and mutually supporting body of defenses) by the special board of officers convened expressly to create a third, 'permanent,' and genuine system of defense under a long-term program of construction that was to continue until the Civil War."[1]

Organized in 1816, the Board of Engineers was delegated responsibility for identifying sites to be fortified, establishing priorties,

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1. E. Raymond Lewis, Seacoast Fortifications of the United States: An Introductory History (Washington, 1970), p. 37.

determining design characteristics, and "reviewing the specific site selections and actual plans of the project engineer." "For the first time," as Dr. Lewis observes, "a professionally competent authority had been established to direct virtually all aspects of seacoast fortification design and construction."

From 1816 until 1831, the Board was headed by a French military engineer, Simon Bernard, who had been a brigadier general in the armies of Napoleon Boneparte. Recommended by the Marquis de Lafayette, Bernard arrived in the United States, following Waterloo, and was commissioned a brevet brigadier general in the Corps of Engineers. This was done despite vigorous protests by Chief Engineer J.G. Swift, who complained against the employment of a foreign engineer to aid in arranging the Nation's defense. But, as would be subsequently observed by a senior member of the Corps of Engineers, the general acquiescence of the officers of the Corps in Bernard's appointment, "if not amounting to approval, led Congress and the authorities to suppose that no serious disapproval of the measures adopted were entertained by them." Thus, negatively endorsed, "it was considered that a good arrangement had been made by the government, by which a lack of skill in the native officers, unfitting them for the task of designing the grand scheme of defense, might be supplied by an importation from abroad."[2]

Another member of the original Board was Maj. Joseph G. Totten, who was to devote the next 48 years of his life to the development and construction of seacoast fortifications.

The Board, as constituted, had as its responsibilities the comprehensive task of coping with seacoast defense in "its broadest terms, as an activity involving the efforts of several interrelated elements--a navy, fortifications, avenues of communication in the interior, and a regular army and well-organized militia."

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2. Ibid., pp. 37-38; W.H. Chase, "National Defenses," May 7, 1851, a copy of which is found with Chase's letter to Totten, June 26, 1852, NA, RG 77, Ltrs. Recd., Chief Engineer.

The members were employed from the beginning with reconnaissances and studies of the coast, as well as overland communications and navigable waterways. Members traveled extensively, conferred with project engineers, and examined dozens of sites in detail. Projects were evolved for protection of the various coastal frontiers.[3]

The Board's first detailed report was made to Congress in February 1821. Taking cognizance of the importance of the Navy in the defense of the Nation, the Board identified locations to be utilized for naval bases, repair yards, and anchorages. Next, it focused on the fortifications needed to protect these facilities and the commercial harbors, river mouths, and other important coastal locations. Specific recommendations were modest: "only 18 defensive works were listed in the first class, 'of the most urgent necessity,' but an additional 32 were projected for future consideration under two further catagories of lesser priority."

As Florida had not been acquired in February 1821, no consideration was given to fortifications required for protection of its 3,500 miles of coast line, scarred by numerous bays and inlets.[4]

In the 1820s, the Board studied the Florida coasts, and, in 1829, the Navy having established a base for its West India Squadron on Pensacola Bay, the Corps of Engineers broke ground for a large masonry fort at the western end of Santa Rosa Island.

This fort, which was designated Fort Pickens, along with a work subsequently laid out on Foster's Island commanded the channel leading into Pensacola Bay. By late 1835 Fort Pickens had been completed and work was proceeding as scheduled on the Foster's Island defense.

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3. Lewis, Seacoast Fortifications, pp. 37-38.

4. Ibid., p. 38.

B. Corps' Initial Study of the Feasibility of Fortifying Ship Island is Aborted

1. Difficulties with France and in Texas Cause Mississippians to Look to the Defense of the Gulf Coast

In the winter of 1835-36, a crisis in the Nation's relations with France caused Americans to look to their Navy and coastal defenses. This situation was precipitated by President Andrew Jackson's sabre rattling, as he moved vigorously to secure payment from the French for depredations upon United States commerce dating from the Napoleonic wars. Coincidentally, the Americans, who had been emigrating to Texas in increasing numbers since the early 1820s, rose against the Mexican Government. Taking the offensive, the Mexicans moved to ruthlessly crush the rebellion. Victories by the Mexicans at the Alamo and Goliad sent a chill through the Great Southwest, where many of the citizens had close family ties with the rebels.

Against this grim backdrop, the United States Senate, on April 8, 1836, received a report "on the Means and Measures necessary for the military and harbor defences of the country" prepared by the War and Navy Departments. The Mississippi congressional delegation was shocked to learn, on reviewing the report, that no fortifications were projected for protection of their state's Gulf Coast. Some 12 days later, the Senate goaded by Mississippi Senator John Black of Monroe passed a resolution directed to the War Department. Secretary of War Lewis Cass was to have a survey made of the "most eligible site" for a fortification

> on or near that portion of the coast of the state of Mississippi bordering on the Gulf of Mexico, or the islands in that vicinity, suitable for the defense of that section, and of the commerce which is carried on between New Orleans and Mobile, or between the Pearl River or Pascagoula.

Estimates would then be prepared of the costs of constructing and arming such a fort.5

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5. Senate Resolution of April 20, 1836.

2. The Crisis Passes

The crisis, however, soon passed. In Texas, at San Jacinto, on April 27, the Texans won a smashing victory, captured Mexican President Antonio Lopez de Santa Ana, and secured the independence of the "Lone Star Republic." Overseas, the United States and France were in a mood to accept the proffered mediation of Great Britain, whereupon, President Jackson soon had the satisfaction of announcing to the country that France had paid four installments promised under the 1831 treaty for settlement of the American claims.

3. The Chase Report

Secretary of War Cass accordingly waited nearly four months before taking action on the Senate resolution. When he did, he called upon Chief Engineer Charles Gratiot. The Chief Engineer, in turn, delegated the task of preparing plans and estimates to the Corps' Senior Engineer on the Gulf Coast, Capt. William H. Chase, and the survey to Maj. James D. Graham. Both officers were admonished to give priority to their assignment.[6]

Gratiot's communication found Chase at Pensacola, where he was supervising construction of the Foster's Island defense (Fort McRee). Being familiar with Mississippi Sound, Chase, before focusing his attention on the undertaking, wrote General Gratiot, informing him that there was "no one eligible site on that coast, or on the Islands in its vicinage, which can be occupied so as to attain the objects of the resolution." To accomplish the resolution's goals required that a number of points be occupied and fortified.

If the object of the resolution, although not so expressed, were to provide for the defense of the subject coast and to exclude enemy ships from Mississippi Sound, it necessitated that the passes between the barrier islands, as well as the islands themselves, be carefully surveyed. In any case, Chase was at a loss as to how to proceed to secure the data

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6. Gratiot to Chase, August 10, 1836, NA, RG 77, Ltrs. Sent, Chief Engineer.

called for by the resolution. If it were determined that he prepare "plans and estimates of works for the perfect defence of the whole coast," it was mandatory for him to have access to extensive and detailed surveys. A survey of a single locality, i.e., commanding the Pascagoula or Pearl Rivers, would enable him to present plans and estimates for local defense of these rivers, without reference to affording protection to commerce navigating Mississippi Sound. The scope of the survey was a subject that was the Department's to determine.

Captain Chase believed that the best and most economical form of defense for Mississippi Sound and the protection of commerce to be a fleet of steam batteries. Based at Forts Morgan and Pike, these craft could rush to the defense of any point threatened by a hostile fleet, and could forestall occupation of the Ship Island Anchorage by an invasion armada as had occurred in December 1814.[7]

The costs of the prerequisite surveys, provided the barrier islands and passes were included, Major Graham placed at $9,770. If the survey were limited to the Mississippi coast, the expense of the operation could be slashed to $4,415.[8]

Chief Engineer Gratiot, upon reviewing Chase's letter and Graham's estimates, informed Chase that the resolution appears to call for a survey of the subject coast

> for the purpose of ascertaining the most eligible site for a fortification, to attain the objects mentioned therein, or, such an examination of said coast as would be necessary to show, that anyone point was not more advantageous than another; or, that none were of such importance as would justify the erection of a permanent work which would promote the safety of its commerce more than can be now attained by those already constructed.

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7. Chase to Gratiot, August 27, 1836, NA, RG 77, Ltrs. Recd., Chief Engineer.

8. Graham to Chase, August 27, 1836, NA, RG 77, Ltrs. Recd., Chief Engineer.

The Chief of the Topographical Bureau had told Gratiot that none of his people could be detailed for the project. Accordingly, if Chase's knowledge of the Mississippi coast were "full and accurate," he might submit the desired report "in absence of the more specific information, required by the resolution."[9]

Captain Chase's "knowledge" of the area in question was insufficient to permit him "to express a positive and certain opinion as to the inexpediency of attempting" its defense. He was certain, however, that the views expressed in his August 27 letter would "be supported by facts obtained from a detailed and accurate examination" of the coast by Major Graham.

As soon as Graham commenced the survey, he would be asked to provide Chase with data needed by Chase to comply with the April 20 Senate Resolution.[10]

Outbreak of the Second Seminole War diverted the War Department's attention. Major Graham was ordered to report to the Army of Florida, and he was unable to begin his survey of the Mississippi coast.[11]

C. The Henderson Resolution and the Totten Report

On March 16, 1840, some 40 months later, Senator John Henderson of Pass Christian pressed his colleagues with a memorial from the Mississippi legislature, asking that Congress authorize "a survey of the coast and bays, sounds, and harbors" of the state. This would be the first step toward locating "such naval establishments and fortifications . . . as shall subserve the protection of the ports connected with these waters."

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9. Gratiot to Chase, September 19, 1836, NA, RG 77, Ltrs. Sent, Chief Engineer.

10. Chase to Gratiot, October 13, 1836, NA, RG 77, Ltrs. Recd., Chief Engineer.

11. Chase to Gratiot, November 26, 1836, NA, RG 77, Ltrs. Recd., Chief Engineer; American State Papers, Documents, Legislative and Executive, of the Congress of the United States. . ., Military Affairs, six vols. (Washington, 1861), Vol. VI, p. 856.

In support of the memorial, Senator Henderson traced the history of the area, and described its geographic, economic, and strategic significance. He referred to the 1839 survey of Mississippi Sound made by John Wheeler at the bequest of the Mississippi legislature.[12]

After listening to Henderson, his colleagues passed a resolution, instructing the Senate's Committee on Military Affairs "to inquire into the expediency of requiring forts to be erected on the western extremity of Ship Island, and on the bar or middle ground between Ships and Cat Island."

When called on to report on this resolution, Col. Joseph G. Totten, who had replaced General Gratiot as Chief Engineer in December 1838, poured cold water on the proposal. Such works, he observed, were not necessary for the security of New Orleans, because: (a) the defenses covering the water approaches to the Gulf Coast metropolis from the east had already been "provided at better positions"; and (b) "there would be no necessity for an enterprise against the city being at all impeded by those works, as it could, equally well, pursue routes passing through other channels."

In this latter respect, Totten warned, the subject fortifications would cover only one of the channels giving access from the Gulf into Mississippi Sound. Moreover, "considering the numerous very important points on the coast . . . that are nearly naked as regards defences," he did not deem it "politic" at this time to incur the expense of closing all these channels to defend less than all would be fruitless.[13]

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12. Speech by Henderson, on March 16, 1840, found in Congressional Globe, 26th Cong., 1st Sess. (Washington, 1840), Vol. VIII, pp. 801-03.

13. Totten to Poinsett, May 20, 1840 & Poinsett to Johnson, May 25, 1840, found in United States Senate Document No. 490, 26th Congress, 1st Session (Washington, 1840), Serial 360, pp. 1-3; Totten to Poinsett, July 8, 1840, found in United States Senate Document No. 618, 26th Congress, 1st Session (Washington, 1840), Serial pp. 1-2. R.M. Johnson was President of the Senate.

In view of Totten's report, neither the committee or Military Affairs nor the full Senate further pursued the subject during the 26th Congress.

D. Corps of Engineers Re-examines the Situation

1. Annexation of Texas Causes Renewed Interest in a Ship Island Fort

The question of fortifying the Ship Island approach to Mississippi Sound again surfaced in the 1st session of the 29th Congress. In March 1845 Texas had been annexed by joint-resolution and Mexico threatened war. On December 3, Senator Jesse Speight of Plymouth, Mississippi, to capitalize on this situation introduced a resolution, requesting "that President James K. Polk communicate to the Senate, as soon as practical, "such information as he may possess, or may speedily obtain, with respect to the practicability and utility of a fort or forts on Ship Island, on the Coast of Mississippi, with a view to protection of said coast."[14]

2. Department Changes Its Position

Again, the War Department gave Chief Engineer Totten the task of responding to the Senate. After reviewing the Department's previous position, he pointed out that a hostile force approaching this coast would have these objects as its goal: (a) to occupy one of the harbors in lee of the barrier islands as a "point of concentration" from which to detach a squadron of light-drafts to operate against New Orleans, Mobile, or Pensacola; and (b) to intercept commerce playing the intercoastal waterway. Therefore, he continued, the Department had found its funds and energies engrossed in construction of works indispensable to covering such vital points as New Orleans, Mobile Bay, and the Pensacola Navy Yard. Now, however, the advance condition of these works, in conjunction with the Senate's interest, would permit him

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14. Congressional Globe, 29th Congress, 1st Session (Washington, 1846), Vol. III, p. 14.

to convene a Board of Engineers "to enter upon the necessary examination of the Mississippi Gulf Coast."[15]

3. Chase-Ogden-Barnard Study

The Board of Engineers convened by Totten included Majs. William H. Chase and C.A. Ogden and Capt. John G. Barnard. They were to reconnoiter the Mississippi coast and the offshore islands, "with a view to their defence and that of the inland navigation between New Orleans and Mobile Bay." The two senior members of the board met in New Orleans on April 15, 1846, and spent the next nine days examining Mississippi Sound from Bay St. Louis to Grant's Pass in the east. They then prepared their report, a copy of which was forwarded for review and comment to Captain Barnard.[16]

To protect the coast and the inland waterway commerce, they called for construction of six shallow-draft steam gunboats. Coaling depots were to be established at Fort Pike and on Dauphin Island, with a third fortified depot on Ship Island. Except during an international crisis or war, four of the steamers were to be laid-up in ordinary.

The board recommended that the passes between the Malheureaux Islands be protected by martello towers, while Cat Island Anchorage and South Pass were to be defended by the Navy.

Ship Island, they found, was about six miles east of Cat, with about 20 feet of water over the bar at ebb tide. Chase and Ogden located a "very good harbor and anchorage at the western end of the island." This point and its dependant harbor and roadstead were "susceptible of good defense." The distance between Ship and Cat Islands was too great to permit the channel to be closed by the fire of defensive works.

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15. Totten to Marcy, December 8, 1845, found in United States Senate Document, No. 9, 29th Congress, 1st Session (Washington, 1846), Serial 472, pp. 1-3.

16. Board to Totten, April 24, 1846, NA, RG 77, Ltrs. Recd., Chief Engineer.

The passes between Ships and Horn islands, Horn and Petit Bois, and Petit Bois and Dauphin islands, were too wide to be effectively closed by defensive fortifications. Finally, Grant's Pass and Pass au Heron were so shoal as to preclude their navigation by vessels drawing more than six feet of water. Majors Chase and Ogden were in agreement that the importance of commerce navigating Mississippi Sound mandated that some means be afforded for its security. Coincidentally, they pointed out, the powerful defenses already constructed on the Gulf Frontier, from Fort Livingston in the west to the Pensacola forts in the east, along with those soon to be commenced on the Florida Reef by which naval operations in the Gulf would be greatly facilitated, would make an enemy admiral hesitate before sending his ships deep into the Gulf of Mexico. But, in warfare, the unexpected must be guarded against. It was for this reason that they recommended construction of a fortified depot on the western end of Ship Island. Here, it would be possible to supply with coal, provisions, etc., both the shallow-draft gunboats of the proposed Mississippi Sound and the ocean-going vessels of the Home Squadron.

In closing, the board noted that the coast of Mississippi, between the Pearl River and Mobile Bay, afforded no "temptation to an enemy to land on it, either for occupation or plunder, so that the sole object of the proposed defence is to protect the commerce of the sound . . . and to act in reverse from Ship Island upon any flotilla attempting a passage in Lake Borgne."[17]

Before transmitting the Board's report to the Senate, Colonel Totten drafted a covering letter, agreeing that "a fortification on Ship Island would fulfill important objects." He, however, regarded construction of a work on Dauphin Island to be of higher priority than the proposed Ship Island fort for defense of the Mississippi Gulf Coast.[18]

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17. Ibid.

18. Totten to Marcy, May 15, 1846, found in United States Senate Document No. 352, 29th Congress, 1st Session (Washington, 1846), Serial 476, pp. 2-3.

4. President Polk's August 30, 1847, Executive Order

The war with Mexico, which had been declared the week before President Polk forwarded the subject report to the Senate, resulted in a drastic reduction in expenditures for coastal fortifications. Consequently, no monies were appropriated by Congress to implement the board's report. President Polk, however, took a necessary step to provide for the eventual fortification of the site. On August 30, 1847, by executive order he declared Ship Island a military reservation.[19]

E. Congress Funds Construction of a Ship Island Fort

1. Secretary of War Davis Supports the Proposal

The campaign by local interest groups to begin construction of a Ship Island fort ebbed until the latter years of the Franklin Pierce administration. Upon being inaugurated as 14th President, Pierce had selected Jefferson Davis of Mississippi as his Secretary of War. Davis was a vigorous, knowledgeable, and capable secretary. In his annual report to Congress, made on December 3, 1855, he recommended an appropriation to "commence the fortification of Ship Island."

He called attention to

> the importance of this work as connected with the defence of the approaches to New Orleans, and command of the inner channel of communication between the Mississippi river and Mobile harbor, [that] has been agumented both by the increased value of that navigation in times of peace, and by the introduction of light-draught war steamers, which would render this approach still more available for the operations of an enemy, than when, in 1814, it was selected as the line of a hostile descent.[20]

19. Executive Order of August 30, 1847, NA, RG 49, Abandoned Military Reservations File--Ship Island.

20. Annual Report of Secretary of War for Fiscal Year 1855, found in Executive Documents of the Senate for the 1st and 2d Sessions of the 34th Congress (Washington, 1856), Serial 811, p. 11.

2. The Mississippi Legislature's Resolution of February 26, 1856

Taking cognizance of the Secretary's views, the Mississippi legislature passed a resolution approved by Governor John J. McRae, on February 26, 1856, calling on the State's Congressional Delegation to "use their best efforts to carry into effect the recommendation of the Secretary of War." To support this resolution, it was pointed out that most of the "main channels" by which enemy warships could approach the Nation's Coasts had been fortified. A vital area not falling into this catagory was the Ship Island Pass into Mississippi Sound. Turning to history to reinforce their position, the legislators recalled that it was through this channel that the British invasion armada had entered Mississippi Sound in December 1814.[21]

3. Congress Appropriates $100,000

The time was propitious for the proponents. Congress, beginning in Fiscal Year 1853, had resumed making available large sums for construction of Third System coastal defenses. In Fiscal Year 1855, $50,000 had been voted to begin construction of Fort Gaines on Dauphin Island. Accordingly, on March 3, 1857, President Pierce signed into law the Fortifications Bill enacted by the 3d Session of the 34th Congress. This legislation appropriated $100,000 for construction of fortifications at Ship Island; $100,000 for fortifying the inner channels into Mobile Bay (Grant's Pass and Pass au Heron); and $80,000 for defense of the entrance to Galveston Harbor.[22]

F. The Leadbetter-Beauregard-Newton Study

1. The Mission

Chief Engineer Totten moved promptly to implement the congressional mandate. On April 13, he notified Bvt. Maj. P.G.T.

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21. February 26, 1856, Resolution of the Mississippi Legislature, found in Miscellaneous Documents of the Senate of the United States, 1st and 2d Sessions of the 34th Congress (Washington, 1856), Serial 836, Doc. No. 45.

22. Statutes at Large and Treaties of the United States of America from December 3, 1885, to March 3, 1859, and Proclamations Since 1791 (Boston, 1859), Vol. XI, p. 192.

Beauregard, superintending engineer at New Orleans; Capt. Danville Leadbetter, project engineer at Mobile; and Capt. John Newton, the engineer in charge at Pensacola Bay, that they were to constitute a Board of Engineers to select sites and prepare plans for the Gulf Frontier defenses recently authorized by the Congress. To assist them in their mission, the board was provided with these documents and charts:

(a) Copy of provisional report by Special Board, dated January 24, 1846;

(b) Copy of report by same board on the defense of the coast of Texas, dated, February 27, 1846;

(c) Copy of report of same board on the reconnaissance of the coast of the State of Mississippi with reference to its defense, dated April 24, 1846;

(d) Copy of letter from the commissioner of General Land Office, dated March 31, 1856, in reply to inquiries concerning ownership of Ship Island;

(e) Chart of entrance to Mobile Bay;

(f) Chart of Cat and Ship Island Harbors;

(g) Preliminary sketch of Galveston Bay;

(h) Chart of entrance to Galveston Bay; and

(i) Outline chart of the coasts of Alabama, Mississippi, and Louisiana.[23]

The board convened in Galveston on May 11, and adjourned on the 14th. The members reached Mobile by way of New

23. Totten to Beauregard, Leadbetter, and Newton, April 13, 1857, NA, RG 77, Ltrs. Sent, Chief Engineer. Lt. W.H. Stevens was to be the board's secretary.

Orleans on Tuesday, the 19th. There, Captain Leadbetter learned, to his disappointment, that the vessel he had previously chartered to take them to Ship Island and Grant's Pass would not be ready to sail until the 26th. Rather than cool his heels in Mobile, Captain Newton returned to Pensacola.[24]

2. The Board's Report

The Leadbetter board learned that the Ship Island Anchorage was formed by a channel to the north of the island and paralleling its shore. Soundings documented that its depth at low water was 3¼ fathoms, and the shore bounding the harbor on the north was covered by about 14 feet of water.

They found that a fortification on the west end of the island could not prevent passage through Ship Island Channel of warships drawing as much as 12 feet. Moreover, a "single work" could not adequately defend the anchorage nor could it secure merchantmen, lying under its guns, from bombardment. Even worse, "defending the flanks of a line of shipping," would still leave them exposed to attack. Three works, two on the island and the other on the north shoal, would likewise be of questionable value.

It was the board's opinion that the cost of affording a protected anchorage would be prohibitively expensive, because it was a "most exposed" position, destitute of those natural advantaged, "which usually suggest the selection of a site for permanent fortifications."

After considerable study, the board reached the conclusion that the "objects gained by the establishment of a harbor of refuge" at Ship Island "would be incommensurate with the cost and obstacles to be encountered." They accordingly recommended that no fortifications be erected on the island.

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24. Newton to Totten, June 10, 1857, NA, RG 77, Ltrs. Recd., Chief Engineer.

Among the conclusions reached by the board were that:

(a) In respect to "a naval defense of New Orleans," Ship Island was too far from Lake Borgne "to be an efficient base of operations, and its unfavorable military situation, disqualify it from performing this important function, without a costly expansion of works of defense."

(b) The shipping plying Mississippi Sound required for its protection a naval force even if Ship Island were fortified. Such a force of shallow-draft gunboats could be based on Pensacola and Mobile Bays and the passes into Lake Pontchartrain, which were already protected.

(c) Finally, a Ship Island fort could well be a source of weakness rather than strength, because its capture would give an enemy a "pont 'd appui for his navy, of which he might not soon be dispossessed." Such a base would enable an aggressive foe to blockade the Mississippi and Alabama coasts, neutralize the Pensacola Naval Base, and send landing parties to harass the nearby seashores.

Funds appropriated for the Ship Island project, the board urged could be better employed "to place in a state of perfect efficiency the works at Pensacola, Mobile, and along the eastern approaches to New Orleans," and adding to these if necessary.[25]

3. Totten Rejects the Report

General Totten exploded on reading the report. In a curt letter to Chairman Leadbetter, he pointed out that the tenor of the document was "so decidedly at variance with one of the objects of constituting the Board, namely providing for carrying out the intentions of Congress by selecting a site and preparing a project for the

25. Report of Leadbetter Board, September 4, 1857, NA, RG 77, Ltrs. Recd., Chief Engineer.

fortification of Ship Island, that the Department can not do otherwise than" release the Board from further consideration of that part of duty enjoined by the Engineer Order of April 9, 1857.[26]

G. The Thayer, De Russy, and Barnard Memoir

General Totten promptly organized a special board to consist of Lt. Cols. Slyvanus Thayer and René de Russy and Maj. John G. Barnard to report on the "propriety" of fortifying Ship Island and to prepare a project for same.

The Thayer board held that the $100,000 appropriated by Congress for construction of a fort on Ship Island made it necessary that "no false issues" be raised and elaborate arguments prepared "to prove that the fortification of Ship Island is not necessary for the defense of New Orleans."

Thayer and his colleagues held that the question was whether the fortification of Ship Island as put forth by the Chase Board of 1846 and the Department was a necessary auxiliary to the efficiency of a gunboat flotilla, or whether, as reported by the Leadbetter group, it was useless. Because the United States Navy could not guarantee control of the Gulf shipping lanes in event of war with Great Britain or France, measures must be taken to protect the intercoastal waterway between Mobile and New Orleans. A hostile naval power, the Board argued, excluded from the fortified harbors would certainly war on the Nation's maritime commerce.

To prey upon coastal shipping, such a foe must first occupy an undefended harbor or roadstead adjacent to the intercoastal waterway

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26. Totten to Leadbetter, September 16, 1857, NA, RG 77, Ltrs. Sent, Chief Engineer. Meanwhile, Captain Leadbetter had announced his intention of resigning from the Army. On September 22, his resignation was accepted to take effect on the last day of December. Totten to Leadbetter, September 22, 1857, NA, RG 77, Ltrs. Sent, Chief Engineer. Totten had been brevetted a brigadier general, on March 29, 1847, for gallant and meritorious conduct at the siege of Veracruz.

from which to send shallow-draft steamers to blockade the navigable channels. Such a key point was Ship Island, midway between New Orleans and Mobile and on the flank of the route between these cities. By its occupation, the Thayer group held, we exclude the foe. Its defense also called for a naval force of similar character. Such a site, the Board continued, was valuable to the Nation as a "Pont 'd appiu. It affords a place of concentration whence to watch an enemy and to sally forth against his offensive movements, and a most convenient place of deposit for coal and other supplies." Its anchorage would also serve as a harbor of refuge for "our pursued merchant vessels."

Thayer's group accordingly went on record that "fortification of Ship Island is an auxiliary necessary to the efficiency of our floating force and therefore to the defence of which this force is the immediate agent."

Turning to the projected fort, itself, the Board recommended construction of

> a work approximating in form to the Martello Tower--casemated throughout, and with a short bastioned front landward constituting the gorge, having flanks of just sufficiant length to contain, each, one casemate howitzer to flank gate-way, and having a scarp not less than 35 feet in height.

If practicable, the fort should have a wet ditch.

The drawbridge and sallyport were to be shielded by a small place of arms, while a glacis of sufficient height was to be provided "to protect the casemates from direct cannonade." Earth for the glacis would be provided by excavation from the wet ditch and levelling the site.

As for the "force in guns acting upon the water," the board established that "a force of 12 guns bearing upon every position in the surrounding waters which a enemy might assume" was the maximum number necessary.

The board proposed to arm the casemate tier with 8-inch columbiads, and the barbette tier was to mount 10-inch columbiads.

As to the location, the fort should "be placed at the North West end of the Island and as near the water as practicable." To enable Ship Island to serve as a fortified naval depot, the only additional structure necessary was a wharf at which deep-draft ships could tie-up while coaling and taking aboard supplies.[27]

H. Secretary of War Floyd Approves the Project

On October 24, 1857, Colonel Thayer mailed to the Department a plan of the fort prepared by the Special Board. After studying the drawing, Chief Engineer Totten transmitted it to Secretary of War John B. Floyd, with this notation:

> The drawing of the project, which at the request of the Engrs. Department was prepared hastily on account of the urgency, is therefore incomplete; but can in the Engrs. Department, be supplied with all the deficient details. These can be added, before it is put in hand for construction. In the mean time I recommend that there be substituted for the masonry parapet shown on the general profile A, the earthen parapet indicated on profile B, which I have caused to be added to the drawing.
>
> Masonry parapets are obligatory in some circumstances; but no reason is seen why this work may be exempt from their disadvantage.[28]

Secretary of War Floyd reviewed and approved the project on December 12, 1857.[29]

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27. Report of Special Board on Ship Island, October 21, 1857, and Thayer to Totten, October 26, 1857, NA, RG 77, Ltrs. Recd., Chief Engineer.

28. "Project for a fort on western end of Ship Island . . . prepared by a special board of Engrs. consisting of Col. Thayer, Lt. Col. De Russy and Major Barnard." A copy of this drawing, labelled Drawer 84, Sheet 5, is on file at the Mississippi Unit, GUIS.

29. Floyd to Totten, December 12, 1857, NA, RG 77, Ltrs. Recd., Chief Engineer.

III. LIEUTENANT ALEXANDER'S 11 MONTHS AS SUPERINTENDING ENGINEER: NOVEMBER 1857-OCTOBER 1858

A. Alexander's Background

On November 13, 1857, the Department selected 2d Lt. Newton F. Alexander to be superintending engineer of the fort to be constructed on Ship Island. A 28-year-old Tennessean, Alexander had entered the United States Military Academy on July 1, 1848, and had graduated No. 2 in the class of 1852. Commissioned a brevet 2d lieutenant of Engineers, he joined the West Point faculty as Assistant Professor of Engineering. In June 1853, he was named assistant engineer at Fort Point, California, a post he held until August 6, 1857, when he was ordered to West Point as Assistant Professor of Engineering. He was promoted to 2d lieutenant on August 1, 1854.[1]

B. He Receives His Instructions From Colonel Thayer

Alexander reached New Orleans on December 19. Notifying the Department of his arrival on the Gulf Frontier, he wrote that he was anxiously awaiting the "special instruction" referred to in the orders announcing his assignment.[2]

General Totten was on extended leave, and the Corps' next senior officer--Bvt. Col. Slyvanus Thayer--was acting as Chief Engineer. Thayer accordingly informed Alexander that, before beginning construction, a "more detailed survey" of the site was needed than that currently available. Such a survey must be one of the first projects undertaken. As soon as he completed preparations, Alexander was to proceed from New Orleans to Ship Island, make a survey of the west end of the island to a distance of one mile from its extremity with contours, to guide preparation of two maps--one to be scaled 1:1,760 and the other of 1:600. On the latter would be included "such hydrographic" information as necessary for determining the best position for a wharf.

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1. George W. Cullum, Biographical Register of the Officers and Graduates of the U.S. Military Academy, from 1802 to 1867 (New York, 1879), Volume II, p. 305.

2. Alexander to Totten, December 23, 1857, NA, RG 77, Ltrs. Recd., Chief Engineer.

Alexander was to draw up and forward for approval projects and estimates for construction of a wharf and such storehouses, workshops, and quarters as deemed necessary.

An estimate of the cost of the fort, based on available information concerning prices of materials, labor, etc., was to be furnished, as soon as it could be formulated without interference with the survey.

In connection with the survey, Alexander was to make a series of test borings on and around the probable fort site for the purpose of ascertaining the character of "the substrata and their reliability for supporting foundations." The subject borings should be carried to a depth of 30 feet. A drill for this purpose might be secured from Fort Gaines. An accurate record of the borings, along with specimens of materials brought up, was to be transmitted to the Department.

Lieutenant Alexander, to facilitate discharge of his mission, was to procure with the $5,000 deposited to his credit in New Orleans such instruments as required and a boat.[3]

As yet, Colonel Thayer continued, no cession of jurisdiction over Ship Island by the State of Mississippi to the United States had been received. In March 1856, Major Beauregard had been instructed to procure an act of cession, but the Mississippi legislature had adjourned before action could be taken. It, therefore, became Alexander's duty to

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3. Thayer to Alexander, January 8, 1858, NA, RG 77, Ltrs. Sent, Chief Engineer. Totten was on leave from December 1, 1857, through the summer of 1859.

make necessary application for an act of cession. For his guidance, Alexander was provided with a draft of the proposed legislation.[4]

In his haste to get this letter off Colonel Thayer, who was in Boston, neglected to alert Capt. Horatio G. Wright, in the Washington office, to mail Alexander, under separate cover, copies of certain charts and documents outlining the project's scope. Upon being apprised of this, Captain Wright, on February 11, mailed to Alexander: (a) a copy of the project for the Ship Island Fort as approved by Secretary of War John B. Floyd on December 12, 1857, (b) a tracing from a Coast Survey chart of the "Topography of Ship Island" surveyed in 1848; (c) a Coast Survey preliminary chart of the coasts of Alabama and Mississippi; and (d) a Coast Survey chart of Cat and Ship Island Harbors.5

C. Alexander Takes Post at Biloxi

It soon became apparent to Alexander that efficiency and economy would be promoted by transfer of his duty station from New

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4. Ibid. The draft read that "for the purpose of enabling the United States to carry into effect an Act of Congress of March 3, 1857, providing for the fortification of Ship Island . . . by building and maintaining such forts, magazines, arsenals, dockyards, wharves, and other structures with their appendages as may be necessary for the object aforesaid, jurisdiction is hereby deeded to the United States over . . . Ship Island" to include all of said Island above and within the low water mark, and over all the contiguous shores, flats and waters within _____ hundred yards from the low water mark; and all right, title and claim which the State "may have in or to the said island are hereby granted to the United States, provided the State shall retain a concurrent jurisdiction with the United States, "in and over all the premises aforesaid, so far that all civil processes, and such criminal processes, as may issue under the authority" of the state against "any person or persons charged with crimes committed without the premises aforesaid, may be excuted therein the same way and manner as if jurisdiction has not been ceded."

The premises over which jurisdiction is ceded of all structures thereon shall be "exonerated and discharged from all taxes and assessments which may be laid or imposed under the authority" of the State of Mississippi, while Mississippi remains the property of the United States. This act was to take effect on its passage by the Mississippi legislature.

5. Alexander to Thayer, January 25 and Wright to Alexander, February 11, 1858, NA, RG 77, Ltrs. Recd. and Sent, Chief Engineer.

Orleans. The Department was agreeable, and in mid-April Alexander moved to Biloxi.[6]

D. Surveying and Mapping the Site

1. Project Secures a Boat

Among the first details attended to by Superintending Engineer Alexander were requests for authority to employ a "competent surveyor" at a salary of $2.50 to $3.00 per day, and to purchase a schooner, displacing 15 to 20 tons and costing about $1,000, to provide transportation for employees and freight between the mainland and the island.[7]

The Department sanctioned the first of these requests but placed a damper on the second. On doing so, Captain Wright pointed out that there would be little use for a schooner at present beyond the survey. Consequently, it was desirable that the expenditure for a vessel "be the least possible." The Department wondered whether a large sailboat could meet present needs, or perhaps a large lighter, with proper sails and centerboard, capable of carrying a considerable quantity of materials or a number of workmen. Such a lighter had been successfully employed by Lt. William H.C. Whiting at Fort Clinch, Florida. A craft of this description would not cost more than $500, and maintenance charges would be much less than for a schooner.[8]

Alexander agreed that a large sailboat, which he could purchase at Biloxi for $200, would suffice. But, when heavy construction commenced, he forecast that maintenance costs for a sloop or brig would be considerably less than on a lighter.[9]

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6. Alexander to Thayer, March 25 and Thayer to Alexander, April 8, 1858, NA, RG 77, Ltrs. Recd. and Sent, Chief Engineer.

7. Alexander to Thayer, March 16, 1858, NA, RG 77, Ltrs. Recd., Chief Engineer.

8. Wright to Alexander, February 27 and April 7, 1858, NA, RG 77, Ltrs. Sent, Chief Engineer.

9. Alexander to Wright, April 17, 1858, NA, RG 77, Ltrs. Recd., Chief Engineer.

2. Two Ship Island Maps are Prepared and Submitted

A boat was purchased, and during the late spring and early summer the survey of the western end of the island was pushed. On June 23, Alexander transmitted to the Department a "Map of West End of Ship Island," showing the terrain to a distance of 800 yards from the point. At the lower right hand corner of the drawing was an insert, detailing the "profile of Borings at No. 1, No. 2, etc."

The western end of the island, Alexander noted in an attached memoir, was composed of "clean nearly white sand, and with the exception of grass is destitute of vegetation." Water was everywhere found at a depth of several feet.

The greatest depths of any of the nine borings was 42 feet. Nothing was revealed by these borings, but sand having "the same appearance as that found on the surface."[10]

Some three weeks later, on July 10, Alexander forwarded the second local drawing called for by his instructions, a "Map of the West End of Ship Island," its scale was 1:1760.[11]

E. Alexander's Loose Interpretation of His Instructions Cause Grave Difficulties

1. Department Rules that Construction of Any Improvements is Illegal

On February 23, 1858, Alexander mailed to the Department, for review and comment, sketches and estimates of the nine frame temporary buildings needed to support construction of the fort. These structures, to cost about $3,330, included: two 50- by 20-foot quarters for mechanics and laborers, and one each of the following:

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10. Alexander to Wright, June 23, 1858, NA, RG 77, Ltrs. Recd., Chief Engineer. A copy of the subject drawing is on file at the Mississippi Unit, GUIS.

11. Alexander to Wright, July 10, 1858, NA, RG 77, Ltrs. Recd., Chief Engineer. A copy of the subject map is on file at the Mississippi Unit, GUIS.

office, officers' quarters, and clerk's quarters; overseer's and mater mechanics' quarters; messhall and kitchen; storehouse; carpenter's shop; blacksmithy; and stable.[12]

Acting Chief Engineer Thayer was unable to approve this program, because it was illegal to erect any improvements on Ship Island until such time as jurisdiction had been ceded to the United States by the State of Mississippi.[13]

2. Alexander Jumps the Gun

Meanwhile, Alexander, satisfied that his proposal would be approved, took cognizance of the isolated situation of the island. Too promptly for his own welfare, he purchased all the tools, materials, and machinery needed to erect these structures and to commence the fort. To avoid excessive freight charges between New Orleans and Ship Island on single items, he arranged to have them transported in several shipments.

Because it was necessary to have a trustworthy person to select, receive, and ship these purchases from New Orleans and to take charge of them at Ship Island, Alexander hired an overseer. This man was then retained on the payroll to supervise construction of the sheds and the borings associated with the survey. A teamster was hired to tend the two mules, and a clerk to keep the books.[14]

3. Department Questions His Judgment

As was to be expected, the Department challenged the need to hire an overseer, clerk, and teamster, and to make "other

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12. Alexander to Thayer, February 23, 1858, NA, RG 77, Ltrs. Recd., Chief Engineer.

13. Thayer to Wright, March 8, 1858, NA, RG 77, Ltrs. Recd., Chief Engineer.

14. Alexander to Wright, May 15, 1858, NA, RG 77, Ltrs. Recd., Chief Engineer.

expenditures than those absolutely necessary for making a survey of Ship Island," in view of Colonel Thayer's orders to the contrary.[15]

Upon receipt of the Department's letter, Alexander laid-off these three men. Coincidentally, he called for and received authority to reemploy the clerk to man the Biloxi office and assist in drafting maps and plans.[16]

4. Alexander Defends His Actions

The Department was dissatisfied with this explanation and asked for additional information on the expenditures. Alexander responded that he deemed the Department's orders of November 13, 1857, in conjunction with Thayer's January 8 instructions, to seemingly imply that construction of the fort was to begin as soon as the survey was finished and a site agreed upon. Nowhere was it indicated in his guidelines that expenditures were to be restricted to those necessary for a survey. Moreover, the monies placed in his hands seemed to indicate that expenses other than those for the survey were intended. In regard to purchase of the large order of lumber, he had entered into a contract for its delivery before receipt of Colonel Thayer's letter prohibiting construction of any improvements until the transfer of jurisdiction. The contractor was unwilling to rescind the agreement, and Alexander was unable to refuse delivery without being charged with "a breach of good faith." As for the expenditures incurred in erecting sheds for accommodation of the surveying party, Alexander confessed, they "were injudicious and were contrary" to Colonel Thayer's instructions. If disapproved, he would refund to the United States the monies paid for services and board of employees engaged in this project and replace the materials expended.

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15. Wright to Alexander, April 24, 1858, NA, RG 77, Ltrs. Sent, Chief Engineer.

16. Alexander to Wright, May 15 and August 1, 1858, NA, RG 77, Ltrs. Recd., Chief Engineer.

Disappointed by the turn of events, compounded by the many blunders and misconceptions, Alexander announced that, as "soon as my accounts can be settled," I will submit my resignation and leave the Army.[17]

Alexander, however, did not follow-up on his threat to resign from the Army.[18]

F. Alexander's Program for Fiscal Years 1859 and 1960

During the year ending June 30, 1858, work had been limited to: (a) preparing drawings and estimates for the temporary buildings; (b) contracting for and receiving lumber and other materials; (c) purchasing and receiving mules, carts, tools, implements, etc.; and (d) making surveys and erecting sheds.

The cost of the survey, including sheds, was. .	$ 1,455.11
Total expenditures during year.	$ 5,381.95
Remaining in treasury, July 1, 1858 . . .	$94,618.05

In Fiscal Year 1859, Alexander proposed to: (a) construct temporary wharf and buildings; (b) excavate for and lay foundations of scarp and parade walls and piers; (c) raise the subject walls and piers to the height of the embrasure soles; and (d) procure materials for embrasures. He estimated the cost of this program at $44,618.05. The $50,000 remaining from the appropriation would be disbursed in Fiscal Year 1860 in: (a) constructing the embrasures and laying the traverse circles for the casemate gun; (b) raising the scarp and parade walls and piers to the height of the arch spring lines; and (c) turning the arches of the gunrooms, storerooms, and magazines.

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17. Alexander to Wright, June 17 and July 26, 1858, NA, RG 77, Ltrs. Recd., Chief Engineer.

18. A review of the letters received by the Adjutant General for this time frame failed to turn up any from Lieutenant Alexander on this subject.

The fort would then be ready to receive about one-third its armament, and could "afford good protection, from an enemy's force, to a corresponding garrison and its supplies."

To complete the fort, Alexander estimated, would require another $65,000 appropriation.[19]

G. Project is Shut Down and the Public Property Secured

On July 31, 1858, the Department called on its superintending engineer to submit a report on his plans of providing for safe keeping of the public property until the legal problems with the state were resolved. If no arrangements had been made for its preservation, it was suggested that he contact the Ship Island lighthouse keeper with whom an agreement might be perfected.[20]

Alexander assured the Department that he had devined its wishes. The office furniture, books, oars, and surveying instruments were stored in his Biloxi quarters. The boat had been hauled up onto the beach. Over on Ship Island, the forage, tools, etc., had been placed in one of the sheds erected to facilitate the survey, while the wagon and carts had been parked in lee of a shed and shielded by hurdles. The mules had been turned out to pasture.

Lighthouse Keeper John Reed had agreed to look after the Ship Island property at no cost to the Department.[21]

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19. Annual Report of Operations at Ship Island for Fiscal Year 1858, NA, RG 77, Ltrs. Recd., Chief Engineer.

20. Wright to Alexander, July 31, 1858, NA, RG 77, Ltrs. Sent, Chief Engineer.

21. Alexander to Wright, August 1, 1858, NA, RG 77, Ltrs. Recd., Chief Engineer.

H. Alexander Seeks to Prepare Detailed Estimates and Plans

After the survey was completed and the property secured, Superintending Engineer Alexander focused his energy on preparation of detailed estimates and plans.

To do so, he asked the Department to provide him with a copy of the Thayer-De Russy-Barnard Report and supplementary drawings.[22]

Replying, the Department promptly mailed to Alexander a copy of the subject report.[23]

Alexander, on September 19, complained to the Department that the Thayer board's drawing in his possession was incomplete. Until these gaps were filled, it would be impossible for him to prepare detailed cost estimates.[24]

Acting Chief Engineer Thayer was out of the city, so Captain Wright handled this correspondence. He informed Alexander that all the project drawings had been forwarded. Alexander's letter, however, would be shown to Colonel Thayer for "such further action . . . as he may deem proper." The Thayer board, Wright added, had not submitted any estimates.[25]

I. Plans and Estimates are Prepared and Submitted for a Temporary Wharf

On September 9, 1858, Alexander submitted for review and approval drawings and estimates prepared for construction of a temporary

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22. Alexander to Wright, September 7, 1858, NA, RG 77, Ltrs. Recd., Chief Engineer.

23. Wright to Alexander, September 15 and 18, 1858, NA, RG 77, Ltrs. Sent, Chief Engineer.

24. Alexander to Wright, September 19, 1858, NA, RG 77, Ltrs. Recd., Chief Engineer.

25. Wright to Alexander, October 8, 1858, NA, RG 77, Ltrs. Sent, Chief Engineer.

wharf to cost $916.93. Soon thereafter, he discovered that an error in the measurements would result in the wharf being much longer than required. He accordingly asked the Department to return his drawing and estimates to be corrected.

Whereupon, Captain Wright recommended that a new plan and estimate be prepared, particularly as the former had been submitted to Acting Chief Engineer Thayer. The revised project should include a map of as much of the island as will identify the location of the wharf.[26]

By October 2, Alexander had prepared a new plan, a location map, and had revised the estimates. The cost of a pile wharf 300' 6" long; 15' wide, with a 41' by 22' head was placed at $884.14. This sum broke down:

Materials and Labor	Price	Amount
88 piles for support	@ 4.50	$400.00
1,629' 6 X 6s for capping piles	@15.00 per m	24.43
3,550' 3 X 6s for sleepers	@15.00 per m	53.25
890' 4 X 4s for wheel guards	@15.00 per m	13.75
10,158' 2" plank for roadway	@15.00 per m	152.37
500 lbs. nails & spikes	@ .04 per lb.	20.00
200 days labor	@ 1.75 per day	350.00
50 days carpentry	@ 3.00 per day	150.00
	Total	$807.40
Contingencies		80.74
	Grand Total	$888.14.[27]

26. Alexander to Wright, September 9 and Wright to Alexander, September 25, 1858, NA, RG 77, Ltrs. Recd. and Sent, Chief Engineer.

27. Alexander to Wright, October 2, 1858, NA, RG 77, Ltrs. Recd., Chief Engineer.

J. Yellow Fever Cuts Down Lieutenant Alexander

Early in October, Lieutenant Alexander advised the Department that the Mississippi legislature was to convene on the first day of November. He accordingly requested and was granted authority to travel to Jackson to lobby for passage of legislation ceding jurisdiction over Ship Island to the United States.[28]

Alexander never made the trip. Felled by yellow fever, he died at Biloxi at 10:00 a.m., on October 10, 1858.[29]

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28. Alexander to Wright, October 2 and Wright to Alexander, October 16, 1858, NA, RG 77, Ltrs. Recd. and Sent, Chief Engineer.

29. Levere to Chief Engineer, October 10, 1858, NA, RG 77, Ltrs. Recd., Chief Engineer. Edward Levere was the Biloxi Postmaster.

IV. THE FORT TAKES SHAPE UNDER LIEUTENANT PRIME'S SUPERINTENDENCY: 1859-61

A. Prime Becomes Project Engineer

1. Mississippi Cedes Jurisdiction

The War Department waited more than four months before it named an officer to replace Lieutenant Alexander. Meanwhile the Mississippi General Assembly, on November 15, 1858, enacted legislation ceding jurisdiction to the United States over all of Ship Island "above and within low-water mark, and over all the contiguous shores, flats, and waters within" as far as the low water mark. The state would share concurrent jurisdiction with the United States:

> in and over all premisis aforesaid so far that all civil process and such criminal process as may issue under authority of this state against any person or persons charged with crimes committed without the premises aforesaid may be executed therein the same manner as if jurisdiction had not been ceded.

The lands and improvements thereon, while they remained the property of the United States, were to be exonerated and discharged from all taxes and assessments "levied and imposed by the state of Mississippi."[1]

2. Prime is Named Project Engineer

On February 22, 1859, 1st Lt. Frederick E. Prime was directed to assume, in addition to his other duties, the position of superintending engineer for the Ship Island fort. He had been on the Gulf Frontier since February 26, 1858, as project engineer for the defenses of Pensacola and Mobile Bays.

Prime had excellent credentials. Born in Italy to United States citizens, he was appointed to the U.S. Military Academy from New

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1. Laws of the State of Mississippi, Passed in a Called Session of the Mississippi Legislature, 1858 (Jackson, 1859), Chapter 4, Section 1-3.

York. He graduated No. 1 in the Class of 1850, and was commissioned a brevet 2d lieutenant in the Corps of Engineers. From 1850 to 1852, he was assistant engineer for repair of Fort Wood in New York Harbor; in 1852 he helped oversee construction of Fort Schuyler; and in 1853 he supervised navigational improvements on the Hudson River. He was promoted to 2d lieutenant on September 13, 1853, and ordered to California, where he spent the next four years as assistant engineer at Alcatraz. In 1857, Prime became superintending engineer on the Alcatraz project. His next assignment took him to the Gulf Coast.[2]

Acting Chief Engineer René De Russy directed Prime to contact Major Beauregard, in New Orleans, to secure such papers and property pertaining to the proposed work as might be in Beauregard's possession.

At the time of Alexander's death, De Russy continued, the Department had taken no action on the plans and estimates submitted by the deceased for construction of a wharf and temporary buildings. Lieutenant Prime was to review these plans and estimates and resubmit them with any modification deemed necessary. He would also prepare and forward for approval an operating program, along with a list of needed employees and suggested wages. He would look to Major Beauregard for funds, making requisitions for whatever money was needed.

Prime would take post at either Biloxi or Ship Island, and proceed with "an active prosecution of operations." He was admonished "to leave nothing undone for the accomplishment of as much as possible during the present season."[3]

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2. Cullum, Biographical Register, Vol. 11, p. 255.

3. De Russy to Prime, February 22, 1859, NA, RG 77, Ltrs. Sent, Chief Engineer. Colonel De Russy had been designated Acting Chief Engineer by General Totten in December 1858.

Prime lost no time in traveling from Mobile to New Orleans and securing the Ship Island papers and books from Major Beauregard. On March 8, he left New Orleans for Biloxi, where he established his headquarters.[4]

3. Prime Hires a Clerk and a Physician

To facilitate the construction program, Prime proposed to hire some administrative personnel. In late March 1859, he requested and was granted authority to hire a clerk at a salary not to exceed $130 per month.[5]

Then, on June 13, Prime sought permission to employ a physician at $80 per month and his board during the sickly season. Already, he explained, a number of the employees were complaining about sore eyes, and he feared the situation would worsen, because many of the men were obliged to "work in the water under a warm sun."[6]

The Department, on approving this expenditure, charged Prime with exercising the "most rigid economy," and asked him to investigate the possibility of combining the duties of clerk and physician in the same individual as had been done at Fort Jefferson.[7]

Prime, however, was unable to engage a physican also willing to work as a clerk. Consequently, he was unable to reduce this overhead expense.

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4. Prime to De Russy, March 7, 1859, NA, RG 77, Ltrs. Recd., Chief Engineer.

5. Prime to De Russy, March 20 and De Russy to Prime, March 29, 1859, NA, RG 77, Ltrs. Recd. and Sent, Chief Engineer.

6. Prime to De Russy, June 13, 1859, NA, RG 77, Ltrs. Recd., Chief Engineer.

7. De Russy to Prime, June 20, 1859, NA, RG 77, Ltrs. Sent, Chief Engineer.

B. Department Approves the Site

Upon examining the maps in the files, Lieutenant Prime saw that a fort site had been delineated on both by his predecessor, but there was nothing to indicate whether the Department had given its approval. As he saw no reason to change the location, he called on the Department for a decision.8

On March 22, Acting Chief Engineer De Russy responded and approved the Alexander site.9

C. Planning and Programming with Lieutenant Prime

1. Prime Estimates the Cost of Completing the Fort

On March 16, 1859, Prime transmitted to the Department for review an estimate of the cost of completing the Ship Island fort. The figures cited reflected the situation as of January 1, 1859, and were based on data compiled by Lieutenant Alexander. The estimates for the masonry had been projected on the assumption that the "scarp and other heavy walls" would have a concrete core faced with bricks. As submitted the estimates read:

No. 1. Excavating ditch and foundations	
14,328 cubic yds. exc. @ 0.48 per cyd.	$ 6,877.44
30,000 ft. lumber for sheetpiling @ $12	360.00
1 steam engine, pump and fixtures	1,260.00
1 engineer 6 mos. @ $100 per month	600.00
2 firemen 6 mos. @ $40 per month	480.00
175 cords of wood @ $4.50 per cord	787.50
	$10,364.94
No. 2. Scarp Wall	
1763 52/100 cyds brickwork @ $11.92	$21,021.16
3469 87/ cyds concrete @ $6.477	22,474.34
394 33/ cyds concrete @ $6.189	2,440.50
1268 c. ft. cordon stone @ $124.39	1,577.26
1268 running feet of asphaltic joint @ $0.076	96.37
23 sets embrasures @ $618	14,214.00
	$61,823.63

8. Prime to De Russy, March 12, 1859, NA, RG 77, Ltrs. Recd., Chief Engineer.

9. De Russy to Prime, March 23, 1859, NA, RG 77, Ltrs. Sent, Chief Engineer.

No. 3. Piers & partitions to springing line of gunroom arches (15'/parade wall of land front to same reference)

268 8/10 cyds concrete @ $6189	$ 1,626.47
957 cyds brickwork @ $11.92	11,407.44
	$13,033.91

No. 4. Arches of gunrooms & of gorge casemates & parade wall including coping

1299 8/10 cubic yds. of work @ $1.92	$15,493.62
410 running ft. asphaltic joints @ 0.076	31.16
1458 4/10 cyds. concrete @ $6.477	9,447.05
	$24,971.83

No. 4. [sic] Asphalting arches

1813 sq. yds. inclined asphalting @ $1.6936	$ 3,070.50
520 sq. yds. vertical asphalting @ $2.461	1,279.72
	$ 4,350.22

No. 5. Covering arches with dry brick, shells, etc.

115,838 bricks laid dry @ $13.079 per th.	$ 2,038.10
264 cyds. shells spread @ $3.662 per cyd.	966.87
	$ 3,004.87

No. 6. B.H. Wall, Drains, wells & well covers for drainage over casemates

704 8/10 cyds. brickwork @ $11.92	$ 8,391.21
397 running feet of asphaltic joints @ 0.076	30.17
27 well covers (11,785 lbs casting @ 0.051)	589.25
	$ 9,010.63

No. 7. Embanking, grading & planting parapet & terreplein

2100 cyds embankment @ 0.36	$ 756.00
1396 sq. yds. grading planting etc. @ 0.557	767.57
	$ 1,523.57

No. 8. Gun platforms & traverse circles & pintles (barbette)

Columbiad Platforms @ $424.94	$ 8,498.80
9 sets traverse circles & pintles @ $182.90	1,646.10
	$10,144.90

No. 9. Traverse circles & pavement in gunrooms, paving main entrance, staircases & bridge piers

23 sets traverse circles @ $119.63	$ 2,751.49
9556.5 sq. ft. of flagging @ 0.2291	2,199.39
500 sq. ft. of Brust Pavement @ 0.85	425.00
Staircases 128 steps @ $3	384.00
163 cyds of brickwork @ $11.92	1,942.00
8 days stonecutters @ $3	24.00

Bridge piers, 35 cubic yds. brick masonry @ $11.92	437.20
Bridge piers, 8 cubic yds. concrete @ $6.1889	49.51
	$ 8,213.55

No. 10. Woodwork of Magazines

7000 ft. lumber @ $25	$ 75.00
84 days carpenter @ $2.75	231.00
20 days labourer @ $1.44	28.80
4 mortice composition locks @ $14.50	58.00
4 sets composition hinges 150 lbs @ 50 cts	75.00
100 lbs copper nails @ 60 cts.	60.00
45 lbs bar copper at 40 cts.	18.00
10 days smith @ $2.75	27.50
75 sq. ft. copper guaze @ 30 cts.	22.50
	$ 695.80

No. 11. Gates & fastenings

18 days carpenter @ $2.75	$ 49.50
12 days labour @ $1.44	17.28
10 days smith @ $2.75	27.50
3400 ft lumber @ $20 per M	68.00
250 lbs composition hinges, etc. @ 0.50	125.00
180 lbs iron @ 5 cts.	9.00
3 days painter @ $3	9.00
75 lbs. paint @ 10 cts.	7.50
	$ 312.78

No. 12. Bridge & Drawbridge

Drawbridge Machinery	$ 297.25
4500 ft lumber @ $15	67.50
10 days carpenter @ $2.75	27.50
8 days laborer @ $1.44	11.52
6 days smith @ $2.75	16.50
250 lbs. of iron @ 5 cts.	72.50
200 lbs. spikes @ 4 cts.	8.00
	$ 430.77

No. 13. Plank road to hoist 200 yards

27500 ft. lumber @ $12	$ 330.00
6 days carpenter @ $2.75	16.50
20 days labour @ $1.44	28.80
600 lbs spikes @ 4 cts.	24.00
6 days teams @ 0.50	3.00
	$ 402.30

No. 14. Wharf

88 piles @ 50 cts.	$ 44.00
16500 ft. lumber @ $15	247.50
500 lbs spikes @ $2.75	20.00
50 days carpenters @ $2.75	137.50
200 days laborer @ $1.44	208.00
	$ 737.00

No. 15. B.H. Wall of covered way	
313 Cubic yds. brickwork @ $11.92	$ 3,730.96
666 running ft. of asphaltic joints @ 0.076	50.62
224 cubic yds. concrete @ 6.477	1,450.84
	$ 5,232.42
No. 16. Paving ditch & covered way	
5674 sq. yds. or 630.45 cubic yds. borrow @ $11.92	$ 7,515.06
No. 17. Embanking, grading, & planting glacis	
3438 cubic yds. @ 0.000 being put in place while excavating ditch, etc.	$ 000.00
5874.5 sq. yds. grading planting, etc., @ 0.557	3,272.09
	$ 3,272.09
No. 18. Embankment of parade	
708 cubic yds. deported from excavation of ditch, etc. @ 0.00	$ 000.00
No. 19. Fence around work	
1450 running feet @ 0.2132 per foot	$ 309.14
No. 20. Temporary buildings	
54111 ft. lumber @ $16 per M.	$ 865.78
74.500 shingles @ $4½ per M.	335.25
doors & windows	96.50
2500 lbs. nails & spikes $4 cts.	100.00
462 days carpenters @ $2.75	1,270.50
462 days labour @ $1.44	665.28
	$ 3,333.31
No. 20. [sic] Cisterns-(estimates -- 50L x 20W x 10D)	
200 cubic yds. brick work @ $11.92	$ 2,384.00
50 cubic yds. concrete--$6.189	309.45
480 cubic yds. excavation @ 0.14 cts	67.20
pumps, manholes, etc.	200.00
	$ 2,960.65
No. 21. Contingencies	
1 overseer 2 years @ $130 per month	$ 3,120.00
1 master mason 18 months @ $130 per month	2,340.00
1 clerk 2 years @ $130 per month	3,120.00
office rent 2 years @ $10 per month	240.00
1 suboverseer 2 years @ $75 per month	1,800.00
1 receiver of materials, etc., 2 years @ $50 per month	1,200.00
	$11,820.00

Recapitulation

No. 1.	Excavating ditch foundations--	$10,364.94
No. 2.	Scarp wall--	61,823.63
No. 3.	Piers, etc., to springing line of arches--	13,033.91
No. 4.	Arches & completing parade wall--	24,971.83
No. 4.	Asphalting arches--	4,350.22
No. 5.	Covering arches with dry brick & shells--	3,004.87
No. 6.	B.H. Wall--drains etc.--	9,010.63
No. 7.	Embanking, grading & planking terreplein & parapet--	1,523.57
No. 8.	Barbette Columbiad Platforms & other traverse circle--	10,144.90
No. 9.	Casemate traverse circles, paving, piers, etc.--	8,213.55
No. 10.	Woodwork of Magazines--	695.80
No. 11.	Gates & fastenings--	312.78
No. 12.	Bridge & Drawbridge--	430.77
No. 13.	Plank road--	402.30
No. 14.	Wharf--	737.00
No. 15.	B.H. Wall of covered way--	5,232.42
No. 16.	Paving ditch & covered way--	7,515.06
No. 17	Embanking, grading & planking glacis--	3,272.09
No. 18.	Embanking parade--	000.00
No. 19.	Fence--	309.14
No. 20.	Temporary buildings--	3,333.31
No. 20.	Cisterns--	2,960.65
No. 21.	Contingencies--	11,820.00
	Total	$183,463.37

Deduct

52,522 ft. lumber @ $15	$ 740.35
2,300 lbs. spikes & nails @ 4 cts.	92.00
62,000 shingles @ $4½ per M.	279.00
	$1111.35

Amount required to complete Fort $182,352.02

FINANCIAL STATEMENT

Expenditures to 1st Janry. 1859--	$ 5,397.18
Amount required to complete work--	$182,532.02
Total cost of work--	$187,929.20
Total amount of expenditures to 1st Janry. 1859--	5,397.18
Amount available 1st Janry. 1859--	94,602.82
Amount required to complete work--	87,929.20
Total cost of work	$187,929.20

NOTES

Note A.--Cost of brickwork per cubic yqrd

459 bricks @ $11.964 per thousand	$ 5.4914
8 cubic ft. mortar @ 0.2016	1.6128
1.03 days masons @ $2.79	2.8737
1.35 day labourer @ $1.44	1.9440
	$11.9219

Cost of 1,000 bricks delivered on work

1,000 bricks @ $11	$11.00
0.3 day labour @ $1.44 receiving	0.432
0.3 day labour @ $1.44 receiving	0.432
0.3 day labour @ $1.44 moving	0.432
0.2 day team @ $0.50 "	0.10
	$11.964

Cost of cubic yard of cement mortar

3 bbls. cement (975 lbs/@ $1.75)	$ 4.65
20 cubic ft. sand	0.00
0.5 day labour @ $1.44 making	0.72
0.15 day team @ 0.50 hauling sand, etc.	0.075
cost per cyd.	$ 5.445
cost per c. ft.	0.2016

Note B.--Cost of concrete per cubic yard

10.5 cubic ft. mortar @ 0.2016	$ 2.1168
0.88 c. yard of shells @ 2.582	2.27216
1.25 days labour @ $1.44	1.80
cost per cubic yard	$ 6.18896

Cost of shells delivered on work

Cubic yard of shells on wharf	$ 2.10
Receiving and moving	
0.3 day labourer @ $1.44	0.432
0.1 day team @ 0.50	0.05
	$ 2.582

Note C.--Cost of concrete with lime per cubic yard
Make in batches according to Dept.
Instructions for Dauphin Island as follows:

3 parts cement	
1½ part lime paste	
6 parts sand	
12 parts shells	
1½ bbl. cement @ $1.55 (487 bbls)	$ 2.325
3/4 bbl. lime paste (103 lbs. quicklime @ $1.75 oer 240 lbs.)	0.750
3 bbls. sand (11¼ cu. ft.)	0.000
6 bbls. shells (22½ cu. ft. @ $2.582 per cyd)	2.151

0.19 day team hauling sand, cement, etc:	0.075
1.25 day labour @ $1.44	1.80
cost of 29.6 cu. ft.	$ 7.101
cost of cubic yard	$ 6.477

Note D.--Cost of laying flagging for Casemates in mortar per square foot

Square foot of flagging received on work	0.17
1/12 cub foot of mortar @ 0.2016	0.0168
1/100 day labour @ $1.44	0.0144
1/100 day mason $ 2.79	0.0279
	0.2291

Note E.--Cost of Asphalting per sq. yard Horizontal or Inclined Asphalting

50 lbs. of Asphalt @ 0.029	$ 1.45
0.2 lb of mineral tar @ 0.05	0.01
1/35 day applicator @ $2.40	0.0686
4/35 day labour @ $1.44	0.165
cost per sq. yd.	$ 1.6936

Vertical Asphalting

55 lbs of asphalt @ 0.029	$ 1.595
± lb of mineral tar @ 0.05	0.05
1/10 day applicator @ $2.40	0.24
4/10 day labour @ $1.44	0.576
cost per sq. yd.	$ 2.461

Note F.--Cost of Columbiad Platform

1.4 cubic yard of brickwork @ $12.38	$17.332
15.9 " " of concrete @ 6.477	102.984
1 day application @ $2.40	2.40
4 day labour @ $1.44	5.76
500 lbs. asphalt @ 0.029	14.50
2 lbs mineral tar @ 0.05	0.10
10 gunny bags @ 0.13	1.30
10 lbs mineral tar @ 0.05	0.50
1 set traverse & pintle stones	150.00
1 set " " " irons	70.80
2 days masons @ $2.79	5.58
6 days labour @ $1.44	8.64
10 cu. ft. of cement mortar @ 0.2016	2.016
7 days stonecutter @ 3.00	21.00
2 days smith @ 3.00	6.00
Hoisting, hauling, & receiving stone	
- hoisting concrete & bricks	
- 3.46 days team @ 0.50	1.73
- 9.93 days labour @ 1.44	14.299
Total	$424.941

Note G.--Cost of pintle & traverse of barbette gun (complete). The stones & iron required are supposed to be obtained from Fort Pickens at same cost as those sold to Fort Gaines by Fort Morgan--

1 set stones & irons	$86.22
9 cubic yards of concrete @ 6.477	58.293
2 cubic yards brickwork @ 12.38	24.76
1 day stonecutter @ 3.00	3.00
½ day smith @ 3.00	1.50
1 day mason @ 2.79	2.79
2 days labour @ 1.44	2.88
10 cubic feet of mortar @ 0.2016	2.016
8 gunny bags @ 0.13	1.04
8 lbs mineral tar @ 0.05	0.40
	$182.899

Note H.--Cost of moving earth from ditch to terreplein & parapet

0.25 day labour @ 1.44	0.36
cost per cubic yard	$ 0.36

Note I--Cost per cubic yard of earth excavated from ditch and embanked in glacis & parade

0.333 day labour @ $1.44	0.48
cost per cubic yard	$0.48

Note K--Cost of grading, enriching, & planting per sq. yard

¼ cubic yard mould & clay @ $2	0.60
0.05 day labour @ 1.44, spreading, grading, & planting	0.072
0.05 day labour hauling mould @ 1.44	0.072
0.03 day team " " @ 0.50	0.015
	0.557

Note L--Cost of fence per running foot

11 cedar posts @ 0.50	5.50
550 ft. juniper @ 20 cts per ft	11.00
3 days labour @ 1.44	4.32
10 lbs. nails @ 0.05	0.05
cost of 100 running feet	21.32
cost per running foot	0.2132

Note M--Cost of asphalting joints per running foot--(the joint being I square foot)--all the asphaltic joints are reduced to this area

1/3 gunny bag @ 0.13	0.0434
1/3 lb of mineral tar @ 0.05	0.0166
1/90 day labour @ $1.44	0.016
cost per running foot	0.076

Note N--Cost of Brust Pavement per square foot

Granite block per sq. ft. of surface	0.60
1/45 day mason @ $2.79	0.0602
1/45 day labour @ $1.44	0.032
1/6 cubic foot of mortar @ 0.2016	0.0336
½ cubic foot of concrete	0.131
cost per sq. foot	$0.8568

Note O--Cost of cordon per cubic foot--(laid)

cubic foot of stone ready to lay	1.00
1/20 day mason @ 2.79	0.1395
1/15 day labour @ 1.44	0.096
1/24 cubic foot mortar @ 0.2016	0.0084
cost per cubic foot	1.2439

Note P--Cost of dry bricks & shells (in position) for drainage of casemate arches.

Cost of dry brick laid, per thousand	
1000 bricks on work	11.964
0.5 day mason @ 2.79	1.395
1.0 day labour @ 1.44	0.72
Total cost per thousand bricks	$13.079

Cost of shells spread per cubic yard	
Cubic yard of shells on work	2.582
Hoisting & spreading 0.75 day labour @ 1.44	1.08
Total cost per cubic yard	3.662

Note Q--Cost of Casemate Traverse circle

24 cubic feet stone @ $1.50	36.00
2 days masons @ .79	5.58
4 days labour @ 1.44	5.76
6 cubic ft. mortar @ 0.2016	1.2096
4 cubic yards concrete @ $6.189	24.756
332 lbs iron @ 10 cts	33.20
1½ day smith @ 2.75	4.125
3 days stone cutter @ 3	9.00
Total cost per set	$119.6306

Note R--Cost of irons & stones for each casemate embrasure

Irons (one set complete)	$500.00
28 cu. ft. stone @ 1.00	28.00
1500 lbs. of laid @ 6 cts.	90.00
Total cost per set	$618.00[10]

10. Prime to De Russy, March 16, 1859, NA, RG 77, Ltrs. Recd., Chief Engineer.

These estimates, Prime explained, were predicated on the assumption that an additional appropriation will be secured, thus enabling him to complete the project by June 30, 1861.[11]

2. Prime Submits His Fiscal Year 1860 Program

In accordance with procedures, Prime coincidentally submitted for review and approval a program for expenditure of the balance of the $100,000, appropriated by Congress in March 1857 for construction of the fort. Between mid-March 1859 and June 30, 1860, the $94,602.82 would be applied:

Temporary buildings	$ 3333.31
Plank road	407.30
Wharf	737.00
Excavation .3982 cyds. @ 0.48	1911.36
Steam engine, services, etc.	2487.50
Brickwork, 2616 4/10 cyd. @ $11.92	30287.48
Concrete, 2979 9/10 cyd. @ 6.477	19300.81
Concrete, 657 2/10 cyd @ $6.189	4067.41
Embrasures	14214.00
Overseer 15 mos @ $130	1950.00
Clerk 15 mos. @ $1.30	1950.00
Receiver of materials 12 mos @ $50	600.00
Suboverseer 12 mos @ $75	900.00
Mastermason 10 mos @130	1300.00
Office rent--15 mos. @ $12	180.00
Total	$83,621.17
Balance to be applied to casemates of gunroom	10,981.65
Total	$94,602.82[12]

Such a program would enable the workmen to: (a) build the wharf; (b) erect the temporary buildings; (c) layout the plank road; (d) excavate for the scarp foundations; (e) raise the scarp, including the embrasures, to reference (23); and (f) construct the piers, including the skewback, partitions, and parare wall of gorge to reference (15), which is the spring line of the gunroom arches.

The balance, $10,981.65, was to be applied to turning the arches of the gunroom casemates. As the cost of turning all the subject

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11. Ibid.

12. Ibid.

arches was placed at $14,580.04, this sum would suffice for turning two-thirds of these arches, and leave enough money for hire of a fort keeper should Congress fail to fund the project in Fiscal Year 1861.

Excavation of the wet ditch would be deferred until such time as the scarp was completed, because it would materially interfere with construction of the scarp.[13]

As soon as the wharf was built, Prime planned to call for proposals for delivery of one million bricks and 3,200 cubic yards of shells. The workforce (some 25 laborers) would be engaged receiving the bricks and shells and excavating for the scarp.

In October or November, as soon as the sickly season was over, the workforce would be reinforced and the laying of masonry commenced.[14]

3. The Department Approves the Program

The Department approved the Fiscal Year 1860 program as outlined. Authority was also granted to advertise for bricks and shells. Prime was reminded that all contracts entered into must be forwarded to Washington, along with an abstract listing all bids, for approval.[15]

D. Construction of the Wharf and Temporary Buildings

Prime, upon reviewing Alexander's plans and estimates for a wharf and temporary buildings, found no reason to make any changes. He therefore called for authority to proceed.

Meanwhile, he had employed a crew to man the Engineer schooner Baker. Upon her arrival at Biloxi, Prime would locate the wharf,

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13. Ibid.

14. Ibid.

15. De Russy to Prime, March 25, 1859, NA, RG 77, Ltrs. Sent, Chief Engineer.

and ascertain by sounding if any changes had occurred in the offshore hydrography in the months since Lieutenant Alexander's death.

In addition, he had engaged an overseer at a salary of $130 per month.[16]

The Department by telegram through Major Beauregard at New Orleans approved these actions.[17]

Work was promptly commenced on these structures and pushed to early completion.[18]

E. Prime Meets Several Inherited Administrative Challenges

1. Settling the Thompson Claim

Superintending Engineer Prime was compelled to devote considerable time and energy to settling claims against the United States. The most troublesome was one filed by James Thompson.

In mid-March 1858, Lieutenant Alexander had contracted with Thompson to "furnish good and substantial board" to the project employees. For this service, Thompson was to be paid fifty cents per man for each working day. In addition to the rations, Thompson was to provide the necessary cooks and waiters.[19]

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16. Prime to De Russy, March 9, 1859, NA, RG 77, Ltrs. Recd., Chief Engineer. The schooner had been purchased to facilitate construction of Fort Gaines.

17. De Russy to Prime, March 16, 1859, NA, RG 77, Ltrs. Sent, Chief Engineer.

18. Annual Report of Operations at Ship Island for Fiscal Year 1859, NA, RG 77, Ltrs. Recd., Chief Engineer.

19. Thompson to Alexander, March 15, 1858, NA, RG 77, Ltrs. Recd., Chief Engineer. The bill of fare was to include: Breakfast--hash, sugar and coffee, butter, molasses, fried potatoes, fish, and cold meats. Dinner--soup (bean, pea, vegetable, etc.), fresh beef, mutton or pork (twice a week), corn beef, pork and beans (on the other days), cabbage or turnips, potatoes or rice, fish (fresh), pickles (twice a week), and baker's bread; and supper--hash, cold meats, tea, coffee, and sugar, and bread, butter, and molasses.

Besides his agreement to provide subsistence, for which there was documentation, Thompson claimed that Alexander, when work was suspended, had placed him in charge of the mules and other government property on the island. Upon looking into this subject, Lieutenant Prime found that Thompson had attended to the Engineer property from May until October 1, 1858. During these months, Thompson had lived on the east end of the island and had visited the Engineer sheds at least once and some-times three times a week. For these services, Prime held that $30 per month was ample compensation.

To complicate the situation, there was Alexander's letter of August 11, 1858, in which he stated that "the other property is at Ship Island in care of the Light-house Keeper though he receives no compensation." Keeper Reed had since died, and his wife knew nothing further on the subject, other than that Alexander has asked her husband to look after the mules and buildings.[20]

It seemed to the Department that Thompson's claim for additional compensation for boarding men was unwarranted. To enable the Department to evaluate Thompson's claim for compensation for care of public property, Prime was to give his rationale for recommending that Thompson be allowed $30 per month for his services during the subject period. This appeared to be contradicted by Alexander's letter stating that the public property had been entrusted to the care of Keeper Reed.[21]

Prime, after further correspondence with Thompson, reiterated his recommendation that Thompson be paid $30 per month for attending to the Engineer property during the subject months. The

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20. Prime to De Russy, April 15, Conguergood to Prime, March 9, and Thompson to Prime, March 12, 1859, NA, RG 77, Ltrs. Recd., Chief Engineer. Peter Conguergood had been Alexander's foreman.

21. De Russy to Prime, April 26, 1859, NA, RG 77, Ltrs. Sent, Chief Engineer.

Department accordingly directed Prime to pay Thompson for this service.[22]

2. Evicting a Trespasser

Lieutenant Prime, on his first visit to Ship Island, discovered that a Mr. Little had erected a house on the east end of the island and was living on the military reservation. Before taking action, Prime called on the Department for a definition of the squatter's rights.[23]

When Acting Chief Engineer De Russy called for additional data, Prime explained that, experience at Fort Gaines had demonstrated, there would be problems with whites vending liquor to slaves employed on the project. To forestall such an occurrance on Ship Island, Prime wished to insure that all such persons residing on the island were subject to his control.[24]

Reviewing the files, Colonel De Russy discovered that, three years before, the Commissioner of the General Land Office had held that title to Ship Island was vested in the United States, because the claims to the island had been determined to be invalid by the United States Supreme Court and no sales had since been made.

Indeed, any sales since August 30, 1847, the date of President Polk's order of reservation would be invalid, as the effect of the Presidential proclamation was to reserve such lands from sale under the Nation's General Land Laws and place it under exclusive control of the War Department. A second letter from the Commissioner, dated January 13, 1858, reiterated the position taken 19 months before.

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22. Thompson to Prime, June 15, Prime to De Russy, June 18, and De Russy to Prime, July 1, 1859, NA, RG 77, Ltrs. Recd. and Sent, Chief Engineer. On July 15, Prime paid Thompson $170 to satisfy his claims against the United States. Prime to De Russy, July 17, 1859, NA, RG 77, Ltrs. Recd., Chief Engineer.

23. Prime to De Russy, March 23, 1859, NA, RG 77, Ltrs. Recd., Chief Engineer.

24. Prime to De Russy, April 18, 1859, NA, RG 77, Ltrs. Recd., Chief Engineer.

Reinforced by this information, De Russy directed Lieutenant Prime to inform Little that he must remove or abandon his improvements. It might be convenient, however, for the government to permit Little to continue his occupancy, subject to removal at the pleasure of the project engineer. Such permission could be granted, provided Little acknowledged, in writing, the right of the United States to undisputed possession.[25]

Prime accordingly notified Little, in writing, that he had 30 days in which to remove his dwelling or to acknowledge the United States' right to possession of the tract. When Little failed to heed this request, Prime had his workmen remove the dwelling's roof, thus making it uninhabitable.[26]

F. Prime Contracts for Materials

1. Jules Blanc Gets the Brick Contract

In early April, 1859, Lieutenant Prime employed the New Orleans, Mobile, and Pensacola newspapers to invite interested parties to submit proposals for supplying the Ship Island project with bricks and shells. The deadline for filing the bids was announced as Monday, May 16.

On the designated day, Superintending Engineer Prime opened and abstracted the proposals received for supplying bricks for the fort. The abstract read:

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25. De Russy to Prime, April 29, 1859, NA, RG 77, Ltrs. Sent., Chief Engineer.

26. Prime to De Russy, June 5 and De Russy to Prime, June 15, 1859, NA, RG 77, Ltrs. Recd. and Sent, Chief Engineer. The Department rejected the less drastic alternative of placing the subject in the hands of the U.S. District Attorney for Mississippi.

Firm	Price per Thousand	Size	Place
C.P. Knapp	$18.99	8½ x 4 x 2½	Pensacola
G.W. Boss	15.00	105 cubic inches	Mobile
C. LeBaron	14.90	9 x 4¼ x 2-3/8	Mobile
H. Slabick	15.00	90 cubic inches	Pensacola
George Willis & Co.	12.00	9½ x 4½ x 2½	Pensacola
*Bacon & Abercrombie	14.00	9 x 4¼ x 2-3/8	Pensacola
Jules Blanc	11.00	8½ x 4½ x 2½	New Orleans
**G.W. McCrew	13.49	8½ x 4¼ x 2½	

* Bacon & Abercrombie held the contract for providing the brick for Fort Jefferson; McCrew, if awarded the contract, proposed to burn his bricks in the Biloxi area; while all the other bidders, except C.P. Knapp, had operating yards.

Jules Blanc was the lowest responsible bidder, and Prime recommended that he be awarded the contract.[27]

Upon reviewing the abstract and Blanc's contract, Colonel De Russy saw that George Willis & Co. had offered to furnish for $12 per thousand bricks 9½ x 4½ x 2½, while Blanc's proposal called for bricks 8½ x 4½ x 2½ at $11 per thousand. If the dimensions as cited by Prime were correct, Blanc's price was deceptive because, by cubic measure, Willis & Co. had submitted the low bid. If there were other factors which made Blanc's bricks cheaper, it was Prime's responsibility to call it to the Department's attention and the contract would be approved.

If the agreement with Blanc were consummated, Prime was to provide additional data, i.e., the signatures and residences of the suretors; a statement attesting that no army officer was involved, and designation of Prime or his authorized successor as the supervisor for receiving and inspecting the bricks.[28]

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27. Prime to De Russy, May 16, 1859, NA, RG 77, Ltrs. Recd., Chief Engineer.

28. De Russy to Prime, May 25, 1859, NA, RG 77, Ltrs. Sent, Chief Engineer.

When Prime checked into the subject, Willis & Co. announced that, if the bricks were to be 9½ x 4½ x 2½, their price was $14 per thousand. Consequently, Jules Blanc was awarded the contract and directed to begin making deliveries.[29]

2. Department Opts for an Aggregate of Broken Bats

Three proposals were received by Lieutenant Prime in response to his advertisements for supplying the project with shells for aggregate. The low bidder for both "clean" and "dirty" shells was C.H. Nobles. His price for the former was $2.90 per cubic yard and $2.35 per cubic yard for the latter. Contracts were duly awarded and approved for Nobles to begin delivery of both categories of shells.[30]

Jules Blanc now told Prime that he would provide the project with "hard bats" for aggregate at $1.79 per cubic yard.

Upon being apprised of this, the Department announced that his offer should be considered, inasmuch as concrete made from an aggregate of brickbats was believed equal to or superior in quality to shell concrete. In calculating their cost, the expense of breaking the bats must be considered, and if the total were less than the cost of clean shells, Prime was to employ them in preference to shells.[31]

Acting Chief Engineer De Russy, who had been absent from the office, returned to Washington from Old Point Comfort on June 6. After reviewing the Department's position, he wrote Prime that it would be wise to employ a mixture of shells and broken brickbats as aggregate whenever the cost of brick fragments did not much exceed that of shells, "as the resulting concrete will be superior to that made of shells alone."

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29. George Willis & Co. to Prime, June 14, Prime to De Russy, June 18, and De Russy to Prime, July 6, 1859, NA, RG 77, Ltrs. Recd. and Sent, Chief Engineer.

30. Prime to De Russy, May 18, 1859, NA, RG 77, Ltrs. Recd., Chief Engineer.

31. Prime to De Russy, May 18, and Wright to Prime, May 26, 1859, NA, RG 77, Ltrs. Recd. and Sent, Chief Engineer.

The views of the Department on this subject were: (a) fragments of hard bricks were better than shells, and should be used when the cost of concrete was not increased thereby; (b) a mixture of brick fragments and shells made a better concrete than shells alone, and should be used when the cost of the brick fragments did not enhance the cost of concrete; and (c) shells were to be used alone as aggregate in the interest of economy.[32]

Prime, to check out costs, turned two blacks to breaking bats. In a 10-hour day, they each broke 1.775 cubic yards. Calculating the labor costs, Prime found that the cost of breaking one cubic yard of bricks for concrete was .749¢, which added to the cost of the bats, gave a total price of $2.499 per cubic yard. As the cost of clean shells was $2.95 per cubic yard, this made a cost advantage of .451¢ for the bats.

Consequently, Prime cancelled the contract with Nobles, and called upon Blanc to begin landing bricks, as soon as practicable.[33]

G. Work Accomplished in Fiscal Year 1859

Construction was commenced in mid-March, when the crew of the schooner Baker, assisted by a number of laborers, began transporting piles, lumber, and bricks to Ship Island. During the next three months, a workforce (1 blacksmith, 7 carpenters, 1 mason, and some 35 laborers) erected on the island, west of the lighthouse, an office, smithy, carpenter shop, stable, storehouse, workmen's quarters, wharf, and a plank road leading from the landing to the construction site.

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32. De Russy to Prime, June 6, 1859, NA, RG 77, Ltrs. Sent, Chief Engineer.

33. Prime to De Russy, June 15, 1859, NA, RG 77, Ltrs. Recd., Chief Engineer.

In June, a drainage pit was sunk, and "110 running feet of frame work for excavation" of Section No. 1 of scarp foundation prepared and positioned ready for sinking to the proper level.[34]

H. Certain Details are Reviewed and Refined Preparatory to Breaking Ground

1. Department Rejects a Proposal for a Seawall to Protect the Site

Gale-force winds out of the south and southeast, on April 24 and 25, 1859, inundated the fort site, at flood tide, by from 10 to 12 inches of water. Moreover, the surface sand was eroded, and two channels, each about a foot deep, cut between the fort site and the adjacent dunes.

To combat this situation, Lieutenant Prime proposed to erect a concrete seawall, faced with bricks. The top of the coping to be at reference (6), i.e., four feet above the surface of the flats. Such a wall, designed to present an "obstacle to the action of the sea," would probably cause the sand to be cut away from the front of it. To guard against this, the wall's foundation should extend to low water--reference (-4).

Prime proposed to raise the seawall up to its coping, and leave it in this condition until it was determined whether any more changes were warranted. He estimated the cost of the wall at $15,410.31.[35]

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34. Annual Report of Operations at Ship Island for Fiscal Year 1859, Monthly Reports of Operations for March-June 1859, NA, RG 77, Ltrs. Recd., Chief Engineer. Executive Documents, Printed by Order of the Senate of the United States for the 1st Session of the 36th Congress (Washington, 1860), Serial 1024, p. 651. In addition to the artisons and laborers, the workforce included: 1 overseer, 1 suboverseet, 1 clerk, and 1 receiver of materials. The schooner Baker was manned by a captain and 3 seamen.

35. Prime to De Russy, May 5, 1859, NA, RG 77, Ltrs. Recd., Chief Engineer. Attached to Prime's letter was a "Section of proposed Sea Wall." A copy of the subject correspondence is on file at the Mississippi Unit, GUIS.

Acting Chief Engineer De Russy, after studying the drawing and situation, concluded not to authorize construction of the seawall, because "our first effort should be directed toward bringing the main work in condition to receive its battery, leaving arrangement of the ditch and glacis till more important objects connected with the efficiency of the work are completed."

Under the current appropriation, efforts were to be directed principally, if not exclusively, to construction of the walls of the fort, including the casemates, beginning with the scarp. The scarp foundations could be secured against storms by throwing earth from the foundation trenches into an embankment on the exterior, where it will afterwards constitute a portion of the glacis.[36]

2. Prime Asks for and Receives Guidance on Construction of the Gateway Scarp and Casemate Piers

On the last day of June 1859, Superintending Engineer Prime raised two points on which he wished guidance before beginning work on the fort's foundations. The first concerned the character of the drawbridge. Was it to have a pit? If the bridge were to be similar to the one at Fort Gaines, the drawings on hand would suffice. If not, he needed a plan to ready the masonry for the bridge.

Second, he presumed that the casemate piers were to be laid-up without being bonded into the scarp. If so, he inquired, "Will this be adhered to in case of the small and irreguler piers at the junction of the circular scarp and faces of half bastions?" If it were necessary to connect them with the scarp, were they to begin at the same reference as the other piers or from the foundation of the scarp?[37]

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36. De Russy to Prime, May 16, 1859, NA, RG 77, Ltrs. Sent, Chief Engineer.

37. Prime to De Russy, June 30, 1859, NA, RG 77, Ltrs. Recd., Chief Engineer.

Replying, Acting Chief Engineer De Russy pointed out that "want of height" above low water precluded construction of a pit for a drawbridge turning on an axis except at great expense. Therefore, the scarp should be laid and carried up with a view to employing a bridge turning on its inner edge around an axis located "just within" the scarp. The scarp at the gateway should accordingly be carried up "exactly as in other parts of the land curtain, until referance (3') is reached, and above which it should not be raised till the detailed sketch of the gateway was drawn and forwarded."

The casemate piers and their foundations were to be carried up without being bonded into the scarp; but the triangular projections near the angles at the extremities of the gorge front were to form part of the scarp and be commenced at the same level.

The foundations of the little two-foot piers next the scarp were to start at the same level as the long piers next the parade and be carried up with the same slope and offsets on three sides, the fourth being vertical.[38]

I. Providing the Project with Embrasure Irons and Stones and Gun Pintles

1. Prime Takes an Extended Furlough

On August 26, 1859, Lieutenant Prime, having received a three-month leave of absence, turned over supervision of the project to Clerk A.D. Halleck and left Biloxi, enroute to his parents' home in Huntington, New York. He reached New York City on September 4.[39]

Although his furlough had expired, Prime waited until December 3 before requesting and being granted a 15-day extension.[40]

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38. De Russy to Prime, August 20, 1859, NA, RG 77, Ltrs. Sent, Chief Engineer.

39. Prime to De Russy, August 24, and September 4, 1859, NA, RG 77, Ltrs. Recd., Chief Engineer. While on leave, Prime's mailing address was in care of Prime & Co., 45 Wall Street, New York City, N.Y..

40. Prime to De Russy, December 3, and De Russy to Prime, December 9, 1859, NA, RG 77, Ltrs. Recd. and Sent, Chief Engineer.

Soon thereafter, he started for Mississippi, arriving back in Biloxi in mid-December.

2. Embrasure Irons and Stones are Decided upon and Ordered

While in New York City, Prime stopped at the Engineer Agency and ordered 20 sets of Totten embrasure irons. Upon doing so, he called on the Department to provide him with such drawings as were necessary to enable him to order the stonework to complement the embrasure irons.

He also desired to know whether the flank guns were to be 24-pounder howitzers. This data was required to enable him to receive stonework for the subject embrasures.[41]

In forts, such as the Ship Island work, having brick scarps, the Department answered, three stones were employed in forming an embrasure. Since they were to be ordered through the Agency, their forms and dimensions would be in possession of the agent and be identical to the 2d tier Fort Jefferson embrasures.

The fort's flank guns were to be the usual "flanking howitzers," and their embrasures were to be fitted with light irons, gun irons not being necessary in positions not subject to battering. Only two stones were used in construction of this type embrasure--one to receive the pintle and the other covering the seat of the embrasure recess. The dimensions of the former were 3' x 1' 6" x 1' and of the latter 6'.4" x 2' x 3'.[42]

The Department, in mid-December, transmitted to Prime at Biloxi two sheets of drawings: "Plans, Sections and Elevations of Gun

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41. Prime to De Russy, November 1, 1859, NA, RG 77, Ltrs. Recd., Chief Engineer.

42. Wright to Prime, November 3, 1859, NA, RG 77, Ltrs. Sent, Chief Engineer.

Embrasures for Fort ... Ship Island, Mississippi", and "Plan, Section and Elevations of Howitzer Embrasures for Fort ... Ship Island, Mississippi." Also, enclosed were extracts from Chief Engineer Totten's letters of March 11 and 14, 1856, on this subject to Colonel De Russy.

The casemate floors had been referenced at 15' to suit the circumstances at Ship Island and not (0') as at Fort Point, California.[43]

3. The Embrasures for the Fort's Big Guns

a. Irons

On March 11, 1856, General Totten had informed Colonel De Russy, then superintending construction of Fort Point, that the embrasure irons were to be cast under special contract, and would be forwarded when ready for mounting, with all holes drilled. Hinges, bolts, and washers were to be provided by the project engineer.

Tests had demonstrated that the arrangement of wrought iron about the throat, as shown in the plans, backed by masonry would resist an 8-inch solid shot fired from a columbiad at 200 yards; and the shutter would resist without being dismounted or made unserviceable, the largest grape shot from the same piece fired at a similar distance. But to do so, the iron had to be backed by "solid and well bonded masonry."

It was necessary to protect the exterior facings of the embrasure with plates of one-half inch boiler iron, nine inches in width. There would be a space of one-half inch between the edge of the boiler iron and brickwork to alleviate fears of the side plates being loosened by muzzle blasts. Also shielded by plates of boiler iron, to be supplied by the project engineer, would be the sole of the embrasure and lintel, the throat of the embrasure, and the upper ends of the throat jambs.

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43. De Russy to Prime, December 12, 1859, NA, RG 77, Ltrs. Sent, Chief Engineer. Copies of the subject plans, labeled Dr. 84, Sheet 8, and Dr. 84, Sheet 9, are on file at the Mississippi Unit, GUIS.

b. Embrasure Stones

A few stones had been introduced into the embrasure. They were: (a) one 1'6" x 1'6" x 1' stone to receive the lower end of the carriage pintle; (b) a stone 5'3" long, 1'11-1/8" wide, and 6" high placed over the inside of the tongue-hole; (c) a sole stone 8' long, 1'3" wide, and 2'2" high to bridge part of the tongue-hole, its top notched to receive the pintle and pintle-head, and its upper and outer edges rebated to receive the lower end of the throat jambs. "No fine cutting" was to be applied to any part of these stones, except the pintle-hole and rebate, "both of which should be well executed not for the sake of smoothness but for the sake of the precision that is indispensible."

c. Embrasure Brickwork

"Every brick laid" in these walls and around the embrasures "must be a hard burned brick." They were to be well laid, as were the stones connected with the embrasure, in the strongest cement mortar composed of "energetic cement and sand without admixture of lime."[44]

4. For the Flanking Howitzers

a. Plans

Totten on March 14, 1856, had posted to De Russy drawings of "plans, sections, elevations, and details of embrasures for 32 pdr. or 24 pdr. casemate howitzers." These plans showed the principal horizontal dimensions, where the wall was three feet thick. The interior of the sole of the embrasure was to be 2'4½" above the floor of the casemate. Inside the wall would be constructed as an independent mass of masonry 6 feet long, 2 feet wide, and 2 feet high, affording a lower interior sole on which the forward end of the chassis would rest. It would be built symmetrically with rest to the embrasure, be faced on the three exposed sides with a 9-inch brick wall, filled in with concrete, and covered with a slab of flagging stone about 3 inches thick.

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44. Totten to De Russy, March 11, 1856, NA, RG 77, Ltrs. Sent, Chief Engineer.

b. Ironwork

In placing the ironwork of the embrasure and regulating dimensions, precision was vital. The throat was so small that there was no room for any variance. The axis of the pintle was the vertical line about which all parts of the embrasure must be arranged.

The sill and lintel of the embrasure were to be bars of wrought iron, each 4 feet long, 6 inches wide, and 2 inches thick. Each was to be pierced by three holes, 1½ inches in diameter, into which would be fitted four hinge sockets, the stop, and the bolt catch. The leaves of the shutter were to be flat pieces of 3/8-inch boiler iron. The hinges of boiler iron, ¼-inch thick, were to be bent around a one-inch bolt, and each fastened by three rivets to the shutters. The fastening bolt, one to each leaf of the shutter, was to be connected with the shutter in the same manner as the hinge bolt. A handle would be screwed on once the bolt was emplaced.

To protect the brick throat jambs of the embrasure, a piece of 3/8-inch boiler iron, bent into proper form, would "face the throat and be anchored into the brick cheeks."

Colonel De Russy was to supply and fit the metal parts for the subject embrasures.

c. Brickwork

Brickwork surrounding these embrasures was to be laid in the best manner, using only the best cement and hard bricks.

Wherever howitzer embrasures were exposed to grape and canister, the outer margin would be covered by plates of boiler iron, as with the gun embrasures. The subject embrasures would give the full traverse of 60 degrees.

The arch over the interior of the embrasure would be cylindrical and spring from the imposts, the span being 2'6" and the rise 2"; and the oblique cheeks being covered till they meet the under surface of the arch.

Where the wall was three feet in thickness or less, there would be a single pair of inner cheeks to each embrasure. If the wall were 4 feet thick, there would be a second pair of inner cheeks, "formed in the increase of 1 foot given to the thickness of the wall."[45]

5. Adjusting the Pintles to the Pintle Holes

On the last day of February, in 1860, Lieutenant Prime called on the Department to provide him with data on the dimensions of the pintles to be employed with the casemate carriages. To answer his question, the Department mailed a sketch of the subject pintles.[46]

Some four months later, Prime advised the Department that he had had composition castings turned for the gun pintle holes. Their diameter was 4¼ inches, which was the same size as the tongue-hole in the lower stone. Consequently, there was no space into which to pour molten lead. To prevent any errors, Prime asked for the "exact" dimensions of the "substitute for the pintle to be furnished to me."

An examination of the drawings of the flank howitzer embrasure had divulged that the pintle hole was 3½ inches in diameter before the lead was poured, while the diameter of the gun pintle hole was 4¼ inches after the lead treatment.

Acting Chief Engineer De Russy assured Prime that there was no problem. The diameter of the "mould" for the pintle holes of the gun embrasure was 4¼ inches. The doubt in Prime's mind on this subject, De Russy attributed to Prime confusing the instructions for forming the pintle holes of the gun embrasures with those for the howitzers. In the former no lead was to be used in forming or finishing the pintle hole, except that which entered into composition of the lead

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45. Totten to De Russy, March 14, 1856, NA, RG 77, Ltrs. Sent, Chief Engineer.

46. Prime to De Russy, February 29 and De Russy to Prime, March 8, 1859, NA, RG 77, Ltrs. Recd. and Sent, Chief Engineer. The subject plan is not on file at National Archives.

concrete, while in the latter the "hole was lined with lead poured in and around a substitute for the pintle, of its exact size." The pintle was to fit snugly in the latter case, while in the gun embrasure it would have play.[47]

J. Storms and Gales Plague the Project

On September 14, some days after Prime had reached New York City, a northeaster bore in. During the night, the wind veered around to the west. Before abating, the gale and pounding surf carried away the wharf's pier head, damaged the remainder of the structure, and swept away several thousand bricks.

Measures taken by workmen, in accordance to Prime's instructions, helped mitigate the damage. Soon after the excavation for the foundations commenced, Blanc's people began making large scale deliveries of bats for aggregate and bricks. The bricks were hacked alongside the plank road encircling the fort site. These hacks, rising four or five feet above ground surface, formed a seawall of sorts to break up the surf at high tides and to arrest drifting sand. The latter, during wind storms, blew into the excavations and into the workmen's eyes.

At several points, where it was presumed that drifting sand might be stopped, dry brick wing walls, from 10 to 15 feet in length, were extended seaward.

The necessary repairs were promptly made--the pier head being re-built in a more substantial fashion.[48]

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47. Prime to De Russy, May 23, 1860, and De Russy to Prime, June 28, 1860, NA, RG 77, Ltrs. Recd. and Sent, Chief Engineer.

48. Annual Report of Operations at Ship Island for Fiscal Year 1860, and Monthly Reports for September and October 1859, NA, RG 77, Ltrs. Recd., Chief Engineer.

Two months later, on the night of November 12, a nor' wester pounded the barrier islands. The schooner Enterprise laden with bricks was caught in the anchorage. Dragging her anchor, she drifted into the Engineer schooner Baker. The crew of Baker were compelled to slip her cables, and she was driven ashore west of the wharf. Enterprise followed and became a total loss.

After 30 hours, the winds and seas subsided. The laborers were turned out, and Baker was repaired and refloated in mid-December. The wharf had again been battered, but it was repaired at a small cost.[49]

There was a succession of storms during the winter of 1859-60 which frequently drove the workman to cover and slowed progress.[50]

K. The Coast Survey Studies the Tides

On December 7, 1859, the Department forwarded to Lieutenant Prime a letter from the Superintendent of the Coast Survey describing results of the tidal observations made by his people at Ship Island.[51]

In his communication, Superintendent A.B. Bache pointed out that, in 1848, personnel from the Coast Survey had manned a station and had made hourly tidal observations on nearby Cat Island. They had found that the average ebb and flow of the tide was 1.3 feet. The highest flood tide recorded was 2.7 feet above mean low water, while the lowest tide observed fell 2.1 feet below mean low water.

No benchmark had been left by the Coast Survey people to identify the site of their observations.[52]

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49. Annual Report of Operations at Ship Island for Fiscal Year 1860, and Monthly Reports for November-December 1859, NA, RG 77, Ltrs. Recd., Chief Engineer.

50. Annual Report of Operations at Ship Island for Fiscal Year 1860, NA, RG 77, Ltrs. Recd., Chief Engineer.

51. Wright to Prime, December 7, 1859, NA, RG 77, Ltrs. Sent, Chief Engineer.

52. Bache to Wright, December 6, 1859, NA, RG 23, Ltrs. Sent, Supt., Coast Survey.

L. Fort Takes Shape: Fiscal Year 1860 Construction Program

1. The Program

The 1860 construction program proposed by Superintending Engineer Prime and approved by the Department called for: (a) building a messhouse, (b) enlarging the wharf, (c) continuing the plank road around the site, (d) excavating foundations of the scarp, (e) raising scarp to reference (23'), and (f) building casemate piers.[53]

2. Excavating for the Foundations, Pouring Concrete, and Laying-up Brickwork

During the 12 months ending June 30, 1860, workmen finished sinking the framework (110 running feet) of Section No. 1 into the sand. This section of the cofferdam included fifty percent of the southern half of the scarp, commencing a few feet north of the sally port. It extended south along the land front and then westward along the circular portion of the scarp. By August 22, the framing and sheet piling had been positioned, and the workforce began pouring concrete for the foundations of this part of the fort.

Upon completion of the foundations of Section No. 1, the laborers were turned to sinking the framing and sheet pilings for Section No. 2. The latter abutted on Section No. 1 and extended a short distance north of the mid-point of the circular scarp. Section No. 2 was also drained by Pit No. 1. The engine and centrifugal pump, except on several occasions when there were surging flood tides, had no trouble keeping the section free of water.

On August 22, 1859, an exceptional high tide sent water cascading over the sheet piling and into the excavations. This tide surged to reference 3'4", or to within 8 inches of the parade level, "which . . . was the more remarkable, as at that time there was no wind; which on this coast materially affects" the action of the tides.

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53. Prime to De Russy, July 20, 1859, NA, RG 77, Ltrs. Recd., Chief Engineer.

By October 5, the excavation was finished, and a large crew began pouring concrete for Section No. 2's foundations. This was completed on the 11th, and one week later the masons began facing the scarp with brick.

In November, laborers excavated a draining pit to facilitate construction of the northern half of the scarp. The steam engine and centrifugal pump were then relocated to Pit No. 2, and the sinking of the framing for Section No. 3 began. Coincidentally, the framing and sheet piling fronting Section No. 1 (the masonry of this front having been raised to parade level) was removed, and sand backfilled against the exterior and interior scarp slopes.

On January 10, 1860, the overseer reported Section No. 3 excavated and the pouring of concrete foundations commenced. By the 23d, the foundations were in place, and on Saturday, the 28th, the masons started laying up bricks on this section.

On January 24, workmen commenced excavating for Section No. 4. Although they were slowed by a malfunctioning engine and pump, this section was ready to receive its concrete foundation by March 5. The foundations had been poured by the 9th, and the bricklayers turned to. Construction was expedited to raise this section of the scarp "above low water and thus relieve the engine which with great difficulty kept this section free of water."

Early in April, the engine was stopped, and by the end of the month the entire scarp had been raised to the level of the parade, except at the sally port. Here, the scarp was left about 3 feet lower, because of the need for details concerning the drawbridge.54

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54. Annual Report of Operations at Ship Island for Fiscal Year 1860, and Monthly Reports of Operations for July 1859-June 1860, NA, RG 77, Ltrs. Recd., Chief Engineer.

3. Coping with Subsidence and Repairing the Damage

By mid-January, Lieutenant Prime was able to report that the brick facing of section No. 2 had been laid-up to parade level; the concrete backing was some 4 feet below that level; and the greater part of the framing and sheet piling removed. Simultaneously, two cracks, "extending through the brick and concrete masonry" opened, while several smaller cracks appeared in the upper part of the masonry. At its mid-point, this section settled a little more than 2 inches. No subsidence, however, was visible where section No. 2 joined section No. 1. At its junction with section No. 3, the settlement was about one-half inch.

On January 31, Prime observed that one of the two major cracks had closed, and the other had narrowed to one-eighth inch. During the first week of February, section No. 2 was "loaded with dry brick," and these allowed to stand until mid-April. At that time, no farther settlement being observed, the load was removed. The cracks were then cut out, the upper courses of brick facing removed, and the masonry of the section carried up to the reference of the parade.

Lieutenant Prime attributed the subsidence to the existence of "a vein or veins of very fine sand under this portion of the wall." This sand, he theorized, had been sucked from beneath the concrete foundations by water rushing into section No. 3 from all directions, when the concrete foundations of that section were being laid. Anticipating this problem, Prime had seen that close fitting sheet pilings were driven to a depth of 5 or 6 feet below the bottom of the concrete foundation to prevent water from section No. 2 washing sand from under that section into section No. 3. His plan, however, misfired. The settlement had stopped as soon as the water in section No. 3 was permitted to stand level with the top of the concrete foundations.[55]

4. Condition of the Work on June 30, 1860

As of June 30, 1860, Supervisory Engineer Prime reported the condition of the work: (a) scarp of land front at reference 12 feet;

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55. Ibid.

(b) circular scarp for 87 feet to the west of northeast angle at reference (9') and the four embrasures in this area ready for lead concrete; (c) circular scarp for 87 feet west of southeast angle at reference 7'6" and the four embrasures nearly ready for lead concrete; (d) 20 sole stones (one not on hand) laid; (e) two flank embrasure irons completed; (f) sheet piling and framing removed; (g) sand filled in against both slopes of scarp to "natural level" of the ground; (h) parade partially filled in; (i) all the brick, except for 80,000, due on Blanc's contract delivered; and (j) sufficient bats and cement on hand to see the project through September 30, 1860.[56]

5. Division of Labor and Tasks Accomplished

During these 12 months, from 4 to 7 carpenters had built a messhall and water tanks; readied frames and sheet piling for foundation pits; repaired and rebuilt wharf; repaired temporary buildings, tools, boats, schooner Baker, etc. The masons, numbering 1 to 3, had built a chimney for the messhall; and had laid-up the brick scarp facings. The blacksmith had attended the engine; shoed the teams; made ironwork for the frames; repaired tools, carts, the wharf's ironwork, boats, the schooner Baker, etc. Forty to 58 laborers had sunk frames for foundations; assisted the artisans; received materials (bricks, bats, lumber, cement); moved cement from wharf to site; cooked; excavated for foundations; mixed and poured concrete; broke bats; threw up embankment; helped repair wharf; and salvaged the schooner Baker. The captain and 3-man crew of Baker transported materials and supplies from the mainland and salvaged the schooner. The overseer, suboverseer, clerk, physician, and receiver of materials had attended to their duties as assigned.[57]

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56. Annual Report of Operations at Ship Island for Fiscal Year 1860, NA, RG 77, Ltrs. Recd., Chief Engineer; Executive Documents, Printed by Order of the Senate of the United States for the 2d Session of the 36th Congress (Washington, 1861), Serial 1079, p. 268.

57. Monthly Reports of Operations at Ship Island Fort for July 1859-June 1860, NA, RG 77, Ltrs. Recd., Chief Engineer.

M. Prime and the Department Agree on Several Details

By the end of Fiscal Year 1860, the scarp had been laid-up to a point, where, if work were to be expedited, Superintending Engineer Prime needed approval of detailed plans for guidance in building cisterns, privies, and a drawbridge.

1. Cistern Plans are Developed

Consequently, on July 13, 1860, Prime transmitted to the Department a drawing of the proposed cistern to the left of the sallyport. This cistern and a similar one on the right flank of the entranceway would hold about 30,000 gallons. He was anxious to "complete these cisterns as high as the springing lines as soon as possible."[58]

After reviewing the correspondence, Acting Chief Engineer De Russy returned the drawing. In a covering letter, he suggested the propriety of making the end walls, particularly of the gorge, at least two feet thick. Before turning the covering arches, it would be necessary to make arrangements for the drainage of the casemate roofs into the cisterns, and make provision for the overflow. Prime would accordingly raise the masonry only as high as the spring line of the covering arches of the cisterns, pending receipt of additional instructions.[59]

2. Plans for the Drawbridge Pit are Submitted, Revised, and Approved

On July 21, Lieutenant Prime mailed to the Department for review and approval a "Sketch of the Main Entrance showing Pit for Drawbridge." It was proposed, he explained, to adapt to the fort the details of the Fort Gaines drawbridge, except in these particulars: (a) the thin wall closing the drawbridge pit will have a different batter, because the thickness of its "foot" was dictated by the width the concrete

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58. Prime to De Russy, July 13, 1860, NA, RG 77, Ltrs. Recd., Chief Engineer; "Sketch, Showing Plan and Elevations of proposed cistern on left side of main entrance," Drawer 84, Sheet 84-10.

59. De Russy to Prime, August 6, 1860, NA, RG 77, Ltrs. Sent, Chief Engineer.

foundation projected beyond the face of the scarp wall. It was desirable, Prime continued, "to avoid going below the top of the concrete foundations," because of the instability of the sand, which had caused serious trouble on the western section of the circular scarp. Consequently, the width of the thin wall had been established at one-foot.

(b) Moreover, the greater thickness of the curtain scarp shortened the recesses to the right and left of the sallyport by 3 inches, as shown on the drawing. These recesses were to be arched over as skrewbacks for the casemate arches over the sally port. Because the side walls would not be bonded in with the scarp walls, they would be subject to cracks caused by unequal settlement.

If the Department found the subject arches objectionable, they would be corbelled. It would also be possible to eliminate the recess, depicted on the plan on the right of the entrance.

Excavation of the drawbridge pit would be undertaken coincidentally with those for the cisterns. The drawbridge was to be one foot above parade level, allowing it a slight fall "in the length of the main entrance." To facilitate its construction, a part of the scarp shown in the sketch must be taken down.

The foundations of the sallyport's side walls, Prime noted, will be carried "as low as those of the drawbridge pit for a length of 8 feet, and them break up to the same reference as the foundations of the piers and other partition walls of the work."[60]

The Department approved construction of the drawbridge and sallyport, in accordance with the Fort Gaines scheme, subject to those modifications: (a) the wall closing the drawbridge pit was

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60. Prime to De Russy, July 21, 1860, NA, RG 77, Ltrs. Recd., Chief Engineer; "Fortifications at Ship Island, Miss. Sketch of Main Entrance Showing Pit for Drawbridge," Drawer 84, Sheet 11. A copy of the subject drawing is on file at the Mississippi Unit, GUIS.

to be two feet thick at the bottom rather than one-foot. The addition was to rest upon the offset of the scarp foundation, while its thickness at the top was to remain 10½"; (b) Instead of arching over the recesses, on the right and left of the pit, Prime was to continue the casemate arch down till it formed a full semi-circle "thus gaining a distance of six inches on each side and giving a depth of 2' to these recesses." This arrangement of the arch, while it shortened the axle between the drum and the large forked wheel, required that some space be gained for this wheel out of the arch. This gain could be affected by the introduction of a small arch to groin into the main arch.[61]

3. Guidelines for the Privies are Outlined

Before submitting a drawing of the privies, Lieutenant Prime wished to know whether they were to be similar to those at Fort Gaines, or if they were to discharge into the wet ditch.

A sewer, he explained, had been constructed through the scarp wall on the north side of the work, opening into the ditch below low tide mark. The privies could be connected with this sewer, and flushed by the tidal ebb and flow.[62]

Acting Chief Engineer De Russy directed that the privy arrangements be like those at Fort Gaines, and that they could discharge either into the ditch or main sewer. Before proceeding with construction of the two privies, Prime was to submit a sketch of their proposed location, size, and other details.[63]

Before Prime found time to prepare the subject drawings, the secession of Mississippi and other states of the Deep South shut down the project.

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61. De Russy to Prime, August 22, 1860, NA, RG 77, Ltrs. Sent, Chief Engineer.

62. Prime to De Russy, July 21, 1860, NA, RG 77, Ltrs. Recd., Chief Engineer. A copy of the Fort Gaines drawing, "Rough Study of Privies on North Front," Drawer 83, Sheet 6, is on file at National Archives.

63. De Russy to Prime, August 22, 1860, NA, RG 77, Ltrs. Sent, Chief Engineer.

N. Fiscal Year 1861 Program and Fiscal Year 1862 Estimates

1. Congress Appropriates $20,000 for Fiscal Year 1861

On June 21, 1860, President James Buchanan signed into law the Fortifications Bill enacted by the 1st Session of the 36th Congress, appropriating $20,000 for construction of the Ship Island fort in Fiscal Year 1861. Relaying this news to Lieutenant Prime, Acting Chief Engineer De Russy called on him to prepare and submit for approval by the Department a program for expediture of this sum. He was to reserve sufficient monies to maintain a proper watch over the public property for one year beginning on July 1, 1861, should Congress fail to make another appropriation.[64]

2. Prime Submits and Department Approves the Program

Prime found, on reviewing his books, that with the balance available from the 1857 appropriation, he now had $28,310,96. He proposed to employ this sum to continue construction of the scarp to reference 23'; to build the cisterns and drawbridge on the land front; lay-up the casemate piers; and apply any funds remaining to turning the maximum number of casemate arches.[65]

On September 1, 1860, two weeks after the mid-August gale, the Department approved the program, subject to the stipulation that costs of repairing storm damage would be substracted from the appropration.[66]

3. Prime Calls for an $85,000 Appropriation in Fiscal Year 1862

To complete the project, excepting the ditch, Prime called for a $85,000 appropriation in Fiscal Year 1862. This would result in the

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64. De Russy to Prime, June 28, 1860, NA, RG 77, Ltrs. Sent, Chief Engineer.

65. Prime to De Russy, July 11, 1860, NA, RG 77, Ltrs. Recd., Chief Engineer.

66. De Russy to Prime, September 1, 1860, NA, RG 77, Ltrs. Sent, Chief Engineer.

cost of construction exceeding the estimate by more than $17,000. Prime attributed this to two factors: (a) the difficulties in reaching the depth required for the foundations in "a water saturated sandy sod." The poor condition of the engine and frequent breakdowns by the centrifugal pump had accentuated this problem. (b) Then, there had been an increase in the costs of labor and materials in recent months, as the Nation's economy recovered from the 1857 depression.[67]

O. End of the Schooner "Baker"

On June 29, 1860, Lieutenant Prime called for authority to make extensive repairs to the schooner Baker. Such action was dictated by her present unseaworthy condition, which had resulted from her being built of unseasoned timbers and planking. When and if she were laid-up for repairs, Prime proposed to raise her deck 12 to 16 inches to allow for an additional tier of barrels.

Estimates received from local boat builders indicated that Baker could be repaired for about $2,200. If she were sold she would bring about $1,000, while a suitable replacement could not be obtained for less than $3,500.[68]

The Department approved the proposal to repair Baker. The cost of the work would be prorated between the Ship Island and Fort Gaines accounts, provided no authorization was received to commence work on the Grant's Pass fort.[69]

Prime accordingly made arrangements with a Back Bay boatyard to repair Baker. She was on the ways, stripped of her plank and decking when the September hurricane struck. Swept off the ways by a

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67. Prime to De Russy, July 11, 1860, NA, RG 77, Ltrs. Recd., Chief Engineer.

68. Prime to De Russy, June 29, 1860, NA, RG 77, Ltrs. Recd., Chief Engineer.

69. Wright to Prime, July 6, 1860, NA, RG 77, Ltrs. Sent, Chief Engineer.

surging tide, she was carried up the bay some 14 miles and left in a swamp, when the water fell.

Upon checking with the builder and visiting the site, Prime concluded to abandon the hulk as beyond salvage. Her sails, rigging, anchor, cables, etc., having been previously removed, would be sold.

To replace Baker, Prime suggested that thought given to purchase of a schooner for use on Mississippi Sound at New York City or Baltimore. A desirable vessel should displace about 60 tons, draw no more than 4½ feet when loaded, have a 12-foot centre board, a good cabin rising about 3½ feet above deck, be coppered, and carry a captain, three hands, and a cook.[70]

In accordance with instructions from the Department, Prime, as an emergency measure, chartered the schooner Pelican for $10 per day.[71]

On October 26, Lt. Quincy Gillmore, the officer in charge of the New York Engineer Depot, was directed by the Department to purchase for the Ship Island project a vessel. The craft was not to cost more than $4,500. Arrangements were perfected by Gillmore, and a New York boatbuilder was engaged to build Baker's replacement.[72]

The secession of the Gulf coast states and seizure of the forts for which Lieutenant Prime was responsible, except Fort Pickens, made the vessel superflous. Consequently, Gillmore, on February 12, 1861, suggested that the Department allow the craft to remain on the stocks, storing her rigging and sails in the hold. Chief Engineer Totten vetoed

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70. Prime to De Russy, September 23, 1860, NA, RG 77, Ltrs. Recd., Chief Engineer.

71. De Russy to Prime, September 24, 1860, NA, RG 77, Ltrs. Sent, Chief Engineer.

72. De Russy to Prime, October 26, 1860, NA, RG 77, Ltrs. Sent, Chief Engineer.

this plan, directing that she be launched and laid-up at the Brooklyn Navy Yard, under care of a keeper.[73]

P. Series of Gales Batters the Island and Alters Priorities

1. August 16, 1860, Storm

On August 14, 1860, Lieutenant Prime forwarded a letter to the Adjutant General, requesting a 20-day leave. Since he planned to remain in the Biloxi area until September 20, he hoped to have his furlough commence about that date.[74]

Within 72 hours a tropical storm campelled Prime to shelve his travel plans. Roaring in on the 16th, gale-force winds and surging surf hammered the island. Upon visiting Ship Island and taking inventory, Prime found: (a) the wharf wrecked and the debris scattered; (b) the plank road between the wharf and site and encircling the fort demolished, but most of the planking had been salvaged; (c) the bricks hacked around the fort to serve as a breakwater, except the hacks extending from north to southeast, had been thrown down and scattered, and an estimated 100,000 bricks lost; (d) 10,000 feet of lumber stacked on the wharf had been carried away by the waves; (e) the floor of the carpenter's shop was smashed; (f) the lower level of the cement stockpiled in the warehouse was damaged; (g) the smithy was undermined and both forges and chimneys destroyed; (h) the stable was undermined and wrecked; (i) several temporary buildings had lost their chimneys; and (j) some 40 hogs had drowned or strayed.

The fort, itself, had not been injured, although water sweeping through the gap left for the entrance had reached a depth of 1 foot on the parade. The bricks hacked and positioned to shield the south and southwest fronts had sufficed to forestall the beach eroding and undercutting the scarp.

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73. Totten to Gillmore, February 16, 1861, NA, RG 77, Ltrs. Sent, Chief Engineer.

74. Prime to De Russy, August 14, 1860, NA, RG 77, Ltrs. Recd., Chief Engineer.

Prime estimated that four to six weeks would be required to repair the damage and clear away debris. The masons, who had been cutting bricks for embrasure jambs, were turned to rebuilding chimneys.[75]

2. September 14-15 Killer Hurricane

Before much of the damage had been repaired and while the clean-up was in progress, a hurricane savaged the Mississippi Gulf Coast on the night of September 14-15. At Biloxi, the surf was higher than it had been in any storm since the hurricane of 1819.

Before departing for the island on the 16th, Lieutenant Prime dashed off a note to the Department. From what he had seen on the mainland, he forecast that the sea tide on the island would have reached a height of reference 10½' or 11', which would bring it above the soles of the embrasures.[76]

Prime spent the day on Ship Island. Upon going ashore, he found all the temporary buildings either wrecked or destroyed, except the storehouse in lee of the fort, which probably owed its survival to the weight of a thousand barrels of cement stored within. Most of the construction materials had been lost, and there were "but few bricks to be seen above the sand."

The fort had been more fortunate. It had suffered no damage, except a few bricks knocked loose by floating debris and several overturned embrasure jambs.

Mountainous waves had beaten their way through the narrow sand ridge, fronting the north beach, between the lighthouse and

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75. Prime to De Russy, August 17 & 22, 1860, NA, RG 77, Ltrs. Recd., Chief Engineer.

76. Prime to De Russy, September 16, 1860, NA, RG 77, Ltrs. Recd., Chief Engineer.

the "clump of hills" where the office, quarters, etc., were located. To escape the wind and water, the employees, at great risk, had crossed the breach to find refuge in the lighthouse. Miraculously, no lives were lost, although two blacks were swept off their feet--one succeeded in fighting his way to the stable and the other landed atop the scarp.

Prime saw that the sea, when the storm was at its height, had flooded the hills to the south and southeast of the wharf. He discovered that the water had reached a depth of 8 feet on the plan of the work, or some 2½ feet higher than in mid-August.

When he returned to Biloxi that evening, Prime evacuated all his employees, except one white and a black whom he left in charge of the Engineer property.[77]

3. October 1-2 Storm

By the last week of September, the workmen were back on the island and busy salvaging and collecting materials and reconstructing the temporary structures. Their work was interrupted by a heavy blow on October 1 and 2, which again sent surf pounding across the western end of the island. Unlike the year's two earlier storms, this one did little damage, undoubtedly because all the vulnerable temporary structures were already wrecked.[78]

4. November-December Work Program

By mid-November, the situation had improved, and with the work well in hand, Lieutenant Prime again applied for a leave, this time for 15 days, to begin in late December. His request was granted, and he left Biloxi for New York City on the 20th.[79] Engineer Clerk A.J. Halleck would be in charge of the project during his absence.

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77. Prime to De Russy, September 17 & 18, 1860, NA, RG 77, Ltrs. Recd., Chief Engineer.

78. Prime to De Russy, October 10, 1860, and Monthly Report for October 1860, NA, RG 77, Ltrs. Recd., Chief Engineer.

79. Prime to De Russy, undated and December 16 and Wright to Prime, Nov. 23, 1860, NA, RG 77, Ltrs. Recd. and Sent., Chief Engineer.

At this time, as it had since November 1, the workforce was employed: 2 carpenters erecting a temporary parade storehouse and a derrick, and repairing tools; 5 masons laying-up brick facing on the scarp of the north one-half of the gorge to 13'4", cutting out and replacing broken brick, and building chimneys; 1 blacksmith fitting embrasure irons and repairing boats; and 22 laborers assisting artisans, salvaging and hacking bricks, laquering embrasure irons, cooking, and boating supplies and stores from the mainland. The overseer and clerk were "attending to their duties."[80]

5. Department Transmits a General Casemate Plan

Superintending Engineer Prime, in view of damage to the cement compounded by lack of storage space, broached a plan to build-up some of the casemate piers to the spring line of the arches and cover them with temporary roofs. To do this, he called on the Department to provide him with data on the positions and dimensions of the drainage system for leading water off the casemate arch roofs.[81]

Consequently, on October 3, the Department mailed to Prime "a general plan of a casemate, showing the arrangement of cast iron water pipes and drains, traverse circles, traverse stones, etc."[82]

6. Construction of a Parade Storehouse

To facilitate resumption of operations, Lieutenant Prime had called for authority to erect two 2-story frame storehouses, the first to be 60 by 20 feet and the second 40 by 20 feet. These structures would provide necessary quarters, workshops, office, and storerooms for the force he proposed to employ under the recent appropriation.

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80. Monthly Reports for November and December 1860, NA, RG 77, Ltrs. Recd., Chief Engineer.

81. Prime to De Russy, September 9, 1860, NA, RG 77, Ltrs. Recd., Chief Engineer.

82. Wright to Prime, October 3, 1860, NA, RG 77, Ltrs. Sent, Chief Engineer; "Fort on Ship Island, Miss., General Plan of a casemate, showing the arrangement of cast iron Water-pipes and Drains, Traverse circles, Traverse Stones, etc," Drawer 84, Sheet 13. A copy of this print is on file at the Mississippi Unit, GUIS.

These structures, to insure their security against another hurricane, were to be positioned on the parade.[83]

The Department approved the proposal, and, by late October, the necessary lumber had been received. By mid-January 1861, the carpenters and laborers had completed one of the parade storehouses.[84]

Q. Sectional Strife and Secession Stop Construction

1. South Carolina Secedes from the Union

In the summer of 1860, the Nation edged toward disaster. The Democratic party split when its leaders convened to nominate candidates for President and Vice President in the November election and decide on its platform. The Northern wing nominated Stephen A. Douglas of Illinois for the Presidency and the Southern faction John C. Breckinridge of Kentucky. The Democratic party a shambles, the victory of the Republican candidate, Abraham Lincoln, was assured. A fourth party, the Constitutional Union, also entered the field soliciting votes for its nominee John Bell of Tennessee. Southern fire-eaters boldly declared that if Mr. Lincoln were elected they would leave the Union. The Buchanan Administration, unlike President Andrew Jackson when confronted by the nullification crisis in 1832-33, failed to take vigorous action to demonstrate force would be used to preserve the Union.

On November 6, Lincoln was elected 16th President, but it would be four months before the new administration took office. Southern radicals were not prepared to compromise. South Carolina, on December 20, led the way, when a state convention voted to secede. On the 26th, the United States troops in Charleston Harbor evacuated Fort Moultrie and occupied Fort Sumter. State conventions in early January assembled in Jackson, Mississippi; Montgomery, Alabama; and Tallahassee, Florida, to consider and vote ordinances of secession.

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83. Prime to De Russy, Sept. 23, 1860, NA, RG 77, Ltrs. Recd., Chief Engineer. Prime estimated the cost of the buildings at $1,500.

84. De Russy to Prime, Oct. 2, 1860, Monthly Reports for Nov. & Dec. 1860, NA, RG 77, Ltrs. Recd., Chief Engineer.

2. Lieutenant Prime Returns to Ship Island

Lieutenant Prime was en route from Biloxi to New York City, when he heard that South Carolina had left the Union. Unwilling to believe that the states of the Lower South would follow South Carolina's lead, Prime continued on to his destination.

While visiting friends on January 5, 1861, he received a telegram from his assistant at Mobile, Lt. Chauncey Reese, dated the 4th, reporting that three companies of state troops had left the city by boat to take possession of Forts Morgan and Gaines. They were reportedly under orders from Governer Andrew B. Moore, although Alabama had not yet seceded. After relaying this news to Washington, Lieutenant Prime rushed to the station, and boarded the first southbound train.[85]

Prime reached New Orleans on January 10. There, he found a letter from Lieutenent Reese, posted the 6th, stating that about 100 Alabama State Troops were in possession of Fort Morgan. Fort Gaines had been visited by the Alabamans' commander, but it had not been occupied.

Unable to learn what was happening at Pensacola, Prime started for that city on the 11th. On doing so, he notified General Totten, who had returned to duty as Chief Engineer, that he proposed to shut down operations at Ship Island and Fort Gaines as soon as practicable, but to continue repair of the Fort Morgan wharf, "as far as may be needed to insure its safety."

As yet, he had received no information of any allotments having been placed to his credit for the Gulf Coast fortifications, in accordance with his requisi-tions. He urged the Department to provide him funds to meet "the outstanding indebtness incurred under the supposition that my requisitions would be filled as usual."[86]

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85. Prime to Totten, Jan. 5, 1861, NA, RG 77, Ltrs. Recd., Chief Engineer.

86. Prime to Totten, Jan. 11, 1861, NA, RG 77, Ltrs. Recd., Chief Engineer.

Prime traveled from New Orleans to Pensacola by way of Mobile. Arriving in Pensacola on January 13, he found Forts Barrancas and McRee in the hands of the secessionists. Refused passage across the bay to Fort Pickens, Prime checked in at a local hotel.

Soon thereafter, Prime was summoned to meet with Col. William H. Chase. A former senior member of the Corps of Engineers, Chase, who had resigned his commission in 1856, commanded the Florida forces assembled in and around the city. Prime, in view of the seizure of the forts and his status as an army officer, refused to heed the call. Whereupon, he was arrested and to secure his release, Prime was compelled to give parole that he would not visit Forts Pickens, Barrancas and McRee, or the navy yard, and that he would not communicate with Lt. Adam Slemmer or any other person at Fort Pickens, or with any personnel aboard U.S. ships laying in or off Pensacola Bar touching the existing Military, Political, or naval condition of things in the State of Florida.[87]

3. Department Orders all Construction Stopped

Covered by his parole, Prime boarded a New Orleans boundship. He landed in the Crescent City on January 17 and picked up a telegram from General Totten, advising him that Secretary of War, Joseph Holt had ordered all construction on Gulf Coast fortifications for which Prime was responsible stopped. "No further liabilities" will be "contracted except for objects necessary for the preservation of the government property."

He was to report to the Department all outstanding obligations against the works under his supervision; their amounts; the dates they would become due; and the Department would do all in its power to make provision to dis-charge them. Measures were to be taken to reduce these obligations to an absolute minimum.

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87. Prime to Totten, January 17 & 18, 1861; Prime's Parole, Jan. 13, 1861, NA, RG 77, Ltrs. Recd., Chief Engineer.

At fortifications seized by the secessionists, all expenditures were to cease.[88]

Prime accordingly reported that a remittance of $2,307 on account of Fort Gaines would enable him to retire all liabilities incurred for the Gulf Coast fortifications, excepting these at Pensacola. Another $500 on account of Fort McRee "would probably cover all liabilities incurred there."

To balance the accounts in his Cash Statement, after payment of all liabilities, these remittances were needed:

On account of Fort Gaines	$5,293.71
On account of Ship Island fortifications	280.01
On account of Fort McRee	500.00
	$6,073.72[89]

4. Mississippians Seize the Fort

An anxious week was spent by Prime waiting for the funds scheduled to be desposited to his credit with the U.S. Treasurer. When none were forthcoming by the 26th, he booked passage on a Biloxi-bound boat.

Before embarking, he wrote the Department, notifying General Totten that Lieutenant Reese had reported to him, but as there was nothing for Reese to do, he should be ordered elsewhere. To discharge his obligations, Prime reminded the Department that he needed at least $4,000.[90]

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88. Totten to Prime, January 14, 1861, NA, RG 77, Ltrs. Sent, Chief Engineer. Holt, a staunch Unionist, had replaced John Floyd as Secretary of War on December 31, 1860.

89. Prime to Totten, January 28, 1861, NA, RG 77, Ltrs. Recd., Chief Engineer.

90. Prime to Totten, January 26, 1861, NA, RG 77, Ltrs. Recd., Chief Engineer.

Reaching Biloxi, Prime learned from Clerk Halleck that the Ship Island fort site had been visited on the forenoon of the 13th, four days after the Mississippi Convention had passed its secession ordinance, by an armed party. The leader told the overseer that they proposed to take possession of the works, and they were acting on their own responsibility. After spending a few hours on the island, the intruders reboarded their boat and disappeared.

That afternoon another armed party landed on the island. They again told the overseer that their mission was to seize the United States property. A secessionist flag was hoisted over the fort, and the invaders, except for ten men who occupied a vacant Engineer building, returned to the mainland at dusk. Because no interference was offered by the ten, the workforce continued operations with the goal of closing down the work as rapidly as possible.

On the morning of the 20th, a third armed party landed and took forcible possession of the fort and Engineer property. As of that moment, Lieutenant Prime deemed himself relieved of all connection with the project.

Relaying this news to the Department, Prime reported that occupation by secessionists of all forts for which he was responsible had restricted his duties to "settlement of outstanding liabilities against the works formerly in my charge." If the Department thought differently, he wished to be so apprised.[91]

5. Work Accomplished by the United States in Fiscal Year 1861

At the time work was suspended on the Ship Island fort, the workforce included: 1 clerk, 1 overseer, 2 carpenters, 1 blacksmith,

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91. Prime to Totten, January 30, 1861, NA, RG 77, Ltrs. Recd., Chief Engineer. On January 18, Alabama secessionists had seized Fort Gaines and the Engineer property at the east end of Dauphin Island.

4 masons, and 19 laborers. In the first six and one-half months of Fiscal Year 1861, the workmen, despite time lost by repair of the storm damage, had built-up the four embrasures nearest the northeast angle to a height where they were ready to receive their covering arches. All the embrasure irons, except one set, had been positioned and leaded. Seven "marginal lower plates" torn out by the September hurricane had been replaced and the inverted arches turned. The damaged arch of the flanking howitzer embrasure, south of the sallyport, had been torn out and rebuilt. The masonry of the gorge front had been laid-up to reference 13' 4" on both sides of the sallyport, starting from the jambs of each of the two loopholes from the main entrance." Much of the concrete backing of the south half of the gorge had not been laid.

All the materials and tools, except the cement, had been placed in the parade storehouse.[92]

6. Mississippians Evacuate Ship Island

The Mississippi State Troops were withdrawn from Ship Island before the end of January, upon receipt of news that Governor John J. Pettus could provide no armament for the fort.

On the 29th, the governor's private secretary met with Lieutenant Prime at Biloxi. Prime told the secretary that, even if the State Troops had not interferred, he would have shut-down the project, because the appropriation was nearly exhausted.

Relaying this information to the governor, the secretary cautioned that the local people were distressed to learn that the state was unable to arm a fort possessing such regional strategic significance.[93]

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92. Prime to Totten, February 1, 1861, NA, RG 77, Ltrs. Recd., Chief Engineer.

93. Secretary to Pettus, January 29, 1861, MDAH, RG 27, Series E, Governors' Records.

7. Department Stops the Fort's Armament

A letter from Chief of Ordnance Henry K. Craig had caused misgivings on Prime's part. From it, he learned that a number of big guns were to be shipped from Pittsburgh's Allegheny Arsenal to Ship Island. This troubled him, because the wharf had not been rebuilt following the mid-September hurricane, and great difficulty would be encountered in landing the cannon.[94]

Apprised of this situation and safisfied that if sent the guns would fall into secessionists' hands, the War Department promptly countermanded the ship-ment.[95]

8. Prime Closes Down the Project and is Reassigned

At the end of the first week of February, Prime was ordered to New Orleans to receive from Lt. Walter McFarland the public funds and records pertaining to the defenses of the approaches to New Orleans for which McFarland was responsible.[96] Reaching New Orleans on the 10th, Prime met with McFarland, who told Prime that he had nothing to turn over to him. Prime then returned to Biloxi.[97]

There, he received a message from the Department to remain on the Gulf Coast, unless compelled to leave by the secessionists, until such time as he had concluded all business connected with his duties. If interferred with in a manner which prevented him from carrying out his instructions, Prime was to proceed to Washington, D.C., and report to Chief Engineer Totten.[98]

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94. Prime to Totten, January 18, 1861, NA, RG 77, Ltrs. Recd., Chief Engineer.

95. Totten to Prime, January 28, 1861, NA, RG 77, Ltrs. Sent, Chief Engineer.

96. Ibid.

97. Prime to Totten, February 10 & 12, 1861, NA, RG 77, Ltrs. Recd., Chief Engineer.

98. Totten to Prime, February 14 & 26, 1861, NA, RG 77, Ltrs. Sent, Chief Engineer.

The Mississippians allowed Prime to discharge his duties. On March 9, General Totten, five days after Abraham Lincoln's inauguration ordered Prime to come to Washington, as soon as he had closed his accounts and retired all outstanding claims against the United States.[99] Prime left Biloxi in early April. He was in Washington on April 20, when he was ordered to duty at Willetts Point, New York.

99. Totten to Prime, March 9, 1861, NA, RG 77, Ltrs. Sent, Chief Engineer.

V. CONSTRUCTION IS RESUMED UNDER LIEUTENANT PALFREY'S SUPERVISION

A. Palfrey Undertakes a Challenging Assignment

1. General Totten Selects a New Superintending Engineer

News that the Union Navy had reoccupied Ship Island was welcomed in Washington. The decision to employ the island as a staging area for an early attack on New Orleans galvanized the Engineer Department into action. On December 11, 1861, one week after the first of Maj, Gen. Benjamin F. Butler's troops had reached the island, measures were initiated by Chief Engineer Totten to insure that construction of the fort was promptly resumed. Frederick E. Prime, having been promoted to captain, was currently assigned to the Department of the Ohio, where he had been wounded, captured, and paroled near Mill Springs, Kentucky, on December 5. Totten accordingly selected Lt. John C. Palfrey to be superintending engineer for the Ship Island fort.

Massachusetts-born and reared, Palfrey had graduated from the U.S. Military Academy as No. 1 in the Class of 1857. Commissioned a Brevet 2d. Lieutenant of Engineers, he was assigned to duty as assistant to the Board of Engineers for the Atlanta Seacoast Defenses. In 1859, he served as assistant engineer for the repair and construction of fortifications at Portland, Maine, and in 1860 he became superintending engineer for construction of a number of seacoast defenses in Maine and New Hampshire. From April to November 1861, Palfrey was assistant engineer at Fort Monroe, Virginia. He was promoted 1st lieuntenant on August 3, 1861.1

2. Department Provides Palfrey With Plans

Palfrey was accordingly ordered to travel to Louisville, Kentucky, and consult with Captain Prime regarding problems experienced in construction of the fort. As soon as he had secured the desired information, Palfrey was to return to Washington.2

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1. Cullum, Biographical Register, Vol. II, p. 674.

2. Totten to Palfrey, December 11, 1861, NA, RG 77, Ltrs. Sent, Chief Engineer.

Palfrey was back in Washington before Christmas. Making use of the information gleaned in his conversations with Prime, Palfrey requested that he be provided with copies of these drawings: (a) "Plan and sections of fort on Ship Island," (b) Plan and elevations of proposed cisterns," (c) Plan and elevations of iron embrasures built in brick," (d) "Plan and elevations of flank howitzer embrasures built in brick," (e) "Topographical map of West end of Island," (f) Borings at West end of Island," (g) Printed coast survey map of Island," and (h) details of shot furnaces." Also needed were drawings giving these details: (I) data for constructing trace of work and laying it out, including details of piers and drainage pipes; (II) of drawbridge and the machinery; and (III) of band of bricks in casemate and parade arches.[3]

The Department provided Palfrey with copies of drawings (a) through (f), along with a sketch detailing the fort's plans and sections.[4]

3. Palfrey Calls for Additional Data

Palfrey also called for data pertaining to: (a) whether the casemate arches ran through to the parade or if there were an arch on the parade lower than the casemate arch and covering it? The drawings were vague on this point. (b) Would there be any service magazines on the terreplein? (c) What was the communication between the parade and terreplein? (d) Were privies to be provided in the gorge angles, or were they to be outside the fort? (e) How was the earthen parapet to be drained? (f) What material was to be employed for reveting the wet ditch? (g) What was to be the difference in levels between the traverse circles and embrasure soles? (h) Where were the shot furnaces to be positioned? (i) In addition, the drawings provided no data for constructing the fort's trace or the exterior place de arms, or for determining the shape or dimensions of the piers. He accordingly desired

3. Palfrey to Totten, December 21, 1861, NA, RG 77, Ltrs. Recd., Chief Engineer.

4. Totten to Palfrey, January 24, 1862, NA, RG 77, Ltrs. Sent, Chief Engineer.

to be provided with drawings supplying this information, along with a sketch giving the dimensions of the iron drainage pipes.[5]

4. Department Provides Some Answers

(a) As To Stairways, Differences in Levels of Traverse Circles and Embrasure Soles, and Whereabouts of Shot Furnace

On February 25, 1862, the Department answered several of the questions raised. No stairways were to be built until such time as the terreplein was formed. Differences in the levels of the traverse circles and embrasure soles could be found on the embrasure drawings mailed on January 25. Where the embrasures were brick, it was to be 2' 11½" to the top surface of the iron traverse circle.

Personnel at the New York Agency had been directed to ship to Ship Island irons for a 7foot shot furnace. The furnace was to be built on the parade at an out-of-the-way location.[6]

(b) Design and Location of Service Magazines is Deferred

Palfrey was advised that questions involving construction of the service magazines would be resolved after the arches were turned and the roof surfaces formed. Consequently, Palfrey would give the Department timely notice to facilitate preparation of the subject drawings.[7]

(c) Department Calls for Plans for Privies

Chief Engineer Totten called upon Palfrey to provide the Department with plans for the gorge angle privies.[8]

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5. Palfrey to Totten, December 21, 1861, NA, RG 77, Ltrs. Recd., Chief Engineer.

6. Totten to Palfrey, February 25, 1862, NA, RG 77, Ltrs. Sent, Chief Engineer.

7. Ibid.

8. Ibid.

5. Recruiting a Labor Force and Establishing Wage Rates for Supervisory Personnel

Next, Palfrey called for authorization to employ certain supervisory personnel and artisans at these rates: a clerk, draftsman, overseer, and physician each to command a salary of $125 per month; a mastermason at $3.50 per day; a carpenter at $4.00 per diem; a blacksmith at $2.50 per day; an overseer of laborers at $3.00 per diem; and a chief cook at $1.50 per day. These men, along with all others hired by the Engineers, were to be boarded by the United States.[9]

The wages proposed for master craftsmen were based on a study and comparison with those paid in recent years by Captains Frederick E. Prime, James St. C. Morton, and Edward B. Hunt, and in no case exceeded those paid by these officers. Prime and Morton had been in the habit of allowing key employees board.[10]

Chief Engineer Totten approved the recommended wage rates subject to these changes--mastermasons and carpenters to be paid $3.00 per day, master smiths $2.50 per diem, and cook's $20.00 per month.

Under no circumstances were master craftsmen, clerks, draftsmen, and overseers to be boarded by the government.[11]

Word that board was to be denied certain classes of supervisory employees proved to be a bombshell, because Palfrey, before sailing for the Gulf, had promised the overseer, mastermason, and head carpenter their board and room. Consequently, he had secured the services of superior men, who, in view of the hard times, had agreed to

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9. Palfrey to Totten, December 21, 1861, NA, RG 77, Ltrs. Recd., Chief Engineer.

10. Palfrey to Totten, December 28, 1861, NA, RG 77, Ltrs. Recd., Chief Engineer. Captain Morton was superintending engineer at Fort Jefferson and Captain Hunt helt that position at Fort Taylor.

11. Totten to Palfrey, December 26, 1861, and February 20, 1862, NA, RG 77, Ltrs. Sent, Chief Engineer.

work for less than their usual wages. Now., they would find themselves "working at every disadvantage on a most disagreeable island, and in an unhealthy latitude, with the roughest provision for shelter and food." Moreover, it was a physical impossiblity for these men to board themselves on the island.

Palfrey trusted that the Department would permit him to provide the trio with board.[12]

Although the Department could not authorize board, in addendum to wages for master craftsmen, Palfrey was to provide them quarters at minimum rates.[13]

6. Department Sanctions Palfrey's Proposal to Erect a Number of Temporary Structures

To support construction activities, Palfrey proposed to erect:

FACILITY	DIMENSIONS	COST NOT TO EXCEED
Storehouse and carpenter Shop, kitchens, storeroom	30' X 60'	$1,100
Messroom and barracks	100' X 30'	2,500
Office and quarters	45' X 20'	1,200
Blacksmith shop	25' X 15'	200
Stable	25' X 12'	175
Two stores	60' X 30'	500
	Total	$5,670

12. Palfrey to Totten, March 18, 1862, NA, RG 77, Ltrs. Recd., Chief Engineer. Overseer Rich and Mastermason Bates had been previously employed by Lt. Col. Barton Alexander in construction of the defenses of Washington.

13. Totten to Palfrey, March 31, 1862, NA, RG 77, Ltrs. Sent, Chief Engineer.

He hoped to use the wharf scheduled to be constructed by General Ben Butler's quartermaster. But, as this could not be ascertained until he reached Ship Island, Palfrey called for a blank check to erect either a temporary or permanent wharf at his discretion.[14]

Chief Engineer Totten approved construction of the subject structures, as described, within the financial constraints outlined. Palfrey was admonished to be on guard against the ouster of his workmen by Butler's soldiers.[15]

7. Palfrey Secures Authority to Purchase Items to Facilitate Accomplishment of his Mission

Palfrey now called for authority to purchase for the project, one set of account books, a medicine chest, two boats, and four horses.[16]

General Totten, on approving these purchases, suggested the possibility of reducing medical costs by sharing the services of a surgeon with the Quartermaster Department.[17]

This would be done, Palfrey responded, as soon as he had an opportunity to chat with General Butler.[18]

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14. Palfrey to Totten, December 21 and 28, 1861, NA, RG 77, Ltrs. Recd., Chief Engineer.

15. Totten to Palfrey, December 26, 1861, NA, RG 77, Ltrs. Sent, Chief Engineer.

16. Palfrey to Totten, December 21 and 28, 1861, NA, RG 77, Ltrs. Recd., Chief Engineer. The estimated cost of the medical chest was $50 and the boats $150.

17. Totten to Palfrey, December 26, 1861, NA, RG 77, Ltrs. Sent, Chief Engineer.

18. Palfrey to Totten, December 28, 1861, NA, RG 77, Ltrs. Recd., Chief Engineer.

8. Palfrey Sails for the Gulf Frontier

(a) He Gets His Instructions

On December 23, 1861, two days after Lieutenant Palfrey's return from Louisville, orders were issued by the Department formally designating him superintendent of construction for the fort on Ship Island. He would proceed to New York City and make arrangements for hire of workmen and collection of supplies, and then to start for Ship Island. Palfrey was to avail himself of the aid of the Engineer Agency in making his purchases, and to facilitate his endeavors, $10,000 had been deposited to his credit with the assistant treasurer in New York City. These monies were to be charged against the appropriation for "Contingencies" of Fortifications.

He was to resume construction of the fort, "in such condition as you may find it, perhaps not in precise accordance with the project." He was to bring it into conformity thereto as rapidly as possible," with the object of completing preparation for the first tier of guns, including magazine space, and turning the bombproof arches of the casemates." This would be followed by construction of the terreplein parapet.

Congress, Palfrey was informed, had been asked for an appropriation of $100,000 to fund completion of the fort. If and when the appropriation became available, $10,000 would be reserved to reimburse the contingency account.[19]

At New York City, Palfrey learned that Boston was the port of embarkation for troops and supplies bound for Ship Island. He therefore called for and was granted permission to proceed to the Massachusetts city, and there book passage for his duty station.[20]

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19. Totten to Palfrey, December 23, 1861, NA, RG 77, Ltrs. Sent, Chief Engineer.

20. Palfrey to Totten, December 27 & Totten to Palfrey, December 30, 1861, NA, RG 77, Ltrs. Recd. and Sent, Chief Engineer.

(b) He Perfects Arrangements for Purchases Through the New York Agency

Before traveling from New York City to Boston by rail, Palfrey spent long hours with W.P. Trowbridge, who had succeeded a Corps of Engineers officer as manager of the New York Agency. Large orders were placed for materials and tools. Priority was to be given to shipment of materials for construction of the temporary structures. In view of these actions, Palfrey was distressed to learn, on checking with the assistant treasurer, that the $10,000 had not been transmitted by the Department. Unless this money was forthcoming, he complained, his efforts to recruit a labor force would be hamstrung.[21]

Responding, Chief Engineer Totten informed Palfrey that necessary engagements and preparations were not contingent upon the receipt of the $10,000 to be deposited to his credit.[22]

(c) He Boards "Saxon"

Thus reassured, Palfrey turned over his New York City business to Trowbridge and traveled to Boston, where, on January 21, he took passage on the steamer Saxon.[23]

B. Plans are Agreed Upon and Preliminary Projects Implemented

1. Palfrey Goes Ashore

The outbound voyage took four weeks and Lieutenant Palfrey went ashore at Ship Island, on February 21. Reporting to Brig. Gen. John W. Phelps, he boldly announced that, to support his

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21. Palfrey to Totten, January 8 & Trowbridge to Totten, January 20, 1862, NA, RG 77, Ltrs. Recd., Chief Engineer.

22. Totten to Palfrey, January 13, 1862, NA, RG 77, Ltrs. Sent, Chief Engineer.

23. Palfrey to Totten, January 21, 1862, NA, RG 77, Ltrs. Recd., Chief Engineer.

construction program, he would need considerable space for his workmen and materials.[24]

Another two weeks passed before a vessel reached the island with the first shipment of materials and tools sent out by Agent Trowbridge. Also aboard the craft was the workforce engaged in New York City. On Saturday, March 8, the hands were turned to unloading the vessel and stockpiling the cargo ashore.[25]

2. Erecting the Support Facilities

As his order for tents had been countermanded, Palfrey boarded his men on the vessel for several days until they could raft sufficient provisions and lumber ashore, and put up some temporary huts. He had to resort to rafting, because the soldiers were using the wharf to land supplies and reinforcements. To facilitate transfer of materials from the beach to the fort, a railway track was laid. Next, construction of the temporary buildings was commenced.[26]

During his first fourteen weeks on-site, Palfrey gave priority to erecting buildings designed to support construction activities. By June 30, 1862, a barracks had been built, with a kitchen storeroom and messhall on the first floor; and sleeping quarters for the overseer, master craftsmen, and laborers on the second. A storehouse, with space for provisions, rigging, etc., downstairs, and a carpenter's loft and masons' sleeping room upstairs was raised. There was a two-story office, with office and messroom on the first floor, and sleeping quarters upstairs for Lieutenant Palfrey, and the clerk, physician, and draughtsman.

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24. The War of the Rebellion: A Compilation of the Official Records of the Union and Confederate Armies (73 Vols. 128 Parts: Washington, 1880-1901), Series I, Vol. VI, p. 693; cited hereinafter as Official Records. Palfrey would soon be wearing two hats. On March 7, he was named a member of Phelps' staff.

25. Palfrey to Totten, March 11, 1862, NA, RG 77, Ltrs. Recd., Chief Engineer.

26. Annual Report of Operations at Ship Island Fort for Fiscal Year 1862, NA, RG 77, Ltrs. Recd., Chief Engineer.

The huts erected upon landing were left standing, and used to house the black members of the force--blacksmiths, cooks, laborers, etc.

A cement shed was thrown up.

Some timbers formerly employed to cover the casemates were used to make a "trestle boat-landing." All unloading of materials for construction of the quarters and support facilities had been done on the project's 24-foot boat and craft borrowed from General Butler's quartermaster. Soon after these materials were ashore, a schooner loaded with brick dragged her anchors during a norther, and drifted into the structure, knocking it to pieces. Consequently, in late June, Palfrey turned his carpenters and laborers to building a substantial wharf.[27]

3. Fort, Its Condition, and Armament in February 1862

A detailed examination by Lieutenant Palfrey documented the fort's February 1862 condition. He found that the inner end, 11' 6" long, of piers I-III, IX-XV, and XVIII-XX, and the end of pier XXI next the scarp, had been laid-up to 13'.

The Scarp from the southeast angle to embrasure IV had been built to 11'. Casemates Nos. 1 and 2 were roofed with about 15 inches of timber covered with tarred felt. From there, a frame shed extended to embrasure IV. Casemates Nos. 5-7 were open, and the scarp raised to 9'6". Casemates Nos. 8 to 14 were roofed in the same manner as casemates Nos. 1 and 2, and the scarp laid-up to 11'. Casemates 15 and 16 were open and the scarp built-up to 8'. The scarp of casemate No. 17 "stepped off down to the foundation (5') and kept this level for 5'." It then rose to casemate No. 18, which was open, with its scarp built to 13'. Casemates Nos. 19-21 were laid-up to 13' and roofed with timbers similar to casemates Nos. 1 and 2, and covered with loose sand and sandbags. Their sides down to the parade were "heavly secured by planks, sand, sandbags, and dry bricks, one chamber being roofed with zinc and having copper-covered doors."

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27. Ibid.

The gorge scarp extended from the circular scarp toward the middle of the gorge to the first loophole at level 12. It then dropped to the sills of the loopholes, and extended at this level to the center loophole. It then "racked" off to the concrete foundation, leaving an entrance into the fort. The embrasures for the flanking howitzers had been commenced.

Palfrey saw that the small arches for the gun carriage wheels were too small for iron carriages. Much of the brickwork was badly cracked and fast crumbling. A fire along the interior of the gorge, near the entrance, had badly excoriated and cracked the bricks to an extent, where it would be necessary to take 4 inches off the face. Indeed, these bricks were in such bad condition that it would be necessary to remove them, cutting out the header courses to a depth of 8 inches and laying up a new face.[28]

The exterior of this portion of the scarp had at several places been pressed outward by the weight of materials covering the magazine in the angle, and "one pyramid at the shoulder angle ran from a base at (12') to an apex at (6')." This area must be refaced. The scarp wall, to a height of 8 feet Palfrey observed, was well built. When the Rebels had resumed construction, the area above this level had been reduced to "a thickness of 5 feet, and they had followed the line back of the scarp instead of the outside." Their work was course and had not been pointed. The interstices for the lead concrete had been filled with masonry. Most of the heavy iron jambs had been set in wrong positions, and the scarp covered up without putting on any of the iron facings. The inner line, between the embrasure recesses, had been laid-up on a straight line instead of an arc of a circle, and no provision made for the small embrasure arches. Consequently, Palfrey determined to take down the scarp to reference (8) and rebuild it.

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28. Annual Report of Operations at Ship Island Fort for Fiscal Year 1862; Palfrey to Totten, July 7, 1862, NA, RG 77, Ltrs. Recd., Chief Engineer.

The soles of many of the embrasures were badly broken, from single bricks to portions a foot long, and extending downward sometimes as much as a foot. Where this occurred, the masonry would be chiseled out and replaced. A similar deterioration was evident in the angles of the embrasure recesses. The arched recesses for gun carriage wheels would have to be altered to accommodate the dimensions of the new model iron casemates carriages.

The piers were 3 feet instead of 4 feet, had wooden lintels inserted in them, had no spaces for drains, and were built on plank foundations. Irons for seven embrasures were on hand, as well as all the heavy jamb pieces for all the embrasures but one. Some of the embrasure irons had been set and then twisted out of place. Others were scattered about the fort, and some had been appropriated by the soldiers for use as ovens, fireplaces, etc. Many were undoubtedly buried in the sand.

A requisition for sufficient embrasure irons to provide the fort with its complement was accordingly prepared by Palfrey and mailed to Mr. Trowbridge at the New York Agency.[29]

There were emplaced in the fort eight IXinch Dahlgrens. They were positioned on timber platforms. The fort, itself, was occupied by the 4th Battery, Massachusetts Light Artillery.[30]

4. Plans and Guidelines for Forming Roof Surface Arches, Drainages, Gutters, etc.

In the weeks after Superintending Engineer Palfrey reached Ship Island, a number of vexing construction details had to be settled before work on the fort could be accelerated.

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29. Palfrey to Trowbridge, undated, NA, RG 77, Ltrs. Recd., Chief Engineer.

30. Palfrey to Totten, July 7, 1862, NA, RG 77, Ltrs. Recd., Chief Engineer.

On February 10, 1862, the Department transmitted to Palfrey a drawing of the gun casemate drainage pipes. Palfrey was to provide the Chief Engineer as soon as possible, a sketch depicting the present conditions of the masonry of the casemates (gorge, flank, and gun) to facilitate preparation of plans for the roof drainage.[31]

Responding to the Department's letter, Palfrey reported that there were "no piers, casemates, or preparations for casemates on the gorge." At the flank and end casemates, piers had been laid-up some 10 feet above the floor, crudely built, with wooden lintels set into the masonry over the small communication passages. No provision, however, had been made for introduction of drainage pipes. No masonry was too far along to forestall any plan the Department might perfect for roof drainage.[32] He would, Palfrey noted, need, within two months, the prerequisite drawings of the roof surfaces, arches, etc.[33]

Some seven weeks passed before General Totten was able to prepare and mail the subject plan. In a covering letter, Totten pointed out that this drawing detailed the approved manner for covering the roof surface with mastic, founding breast-height walls, and construction of gun platforms.[34] Calling attention to the drawing, General Totten pointed out that the breast-height wall was to be built directly on the concrete roof surface. Between the breast-height and parade walls, the roof surface was to be covered by a layer of mastic turned up at the junction "with these walls and inserted in the joints" of

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31. Totten to Palfrey, February 10, 1862, NA, RG 77, Ltrs. Sent, Chief Engineer. No copy of the subject drawing is on file at National Archives.

32. Palfrey to Totten, March 14, 1862, NA, RG 77, Ltrs. Recd., Chief Engineer.

33. Palfrey to Totten, March 7, 1862, NA, RG 77, Ltrs. Recd., Chief Engineer.

34. Totten to Palfrey, April 29, 1862, NA, RG 77, Ltrs. Sent, Chief Engineer. A copy of the subject plan, "Plan and Sections, showing roof surface, arches, etc., of Fort on Ship Island, Coast of Mississippi," is on file at the Mississippi Unit, GUIS.

the brick work. Continous joints for this purpose and also for insertion of a strip of sheet lead would be provided by laying the lower portions of the face of the walls in courses parallel to the roof surfaces. Upon the inclined top of the parade wall, the descent of which would commence at least 3 inches below the bottom of the coping, would be laid a sheet of mastic, with one edge turned up, and inserted in the joint between the slate and top of the wall, the other projecting over the vertical face of the wall and turned slightly down to afford a "drip." The vertical face of the parallel wall was to be coated with a thin layer of mastic applied with a mop.

The horizontal sketch of the roof demonstrated how the surfaces were "generated." The ridge was to be slightly rounded. After the roof surface had been formed, there would be superimposed at the foot of all vertical surfaces, a small slope, one foot wide and half a foot high, over which the roof mastic was to extend.

All inclined roof surfaces were to be covered with first grade mastic applied by an applicator, Totten continued, while the vertical surfaces connected therewith would be covered with "mastic of suitable temper applied with swabs."

Upon the mastic roof surfaces and running from gutter to ridge would be laid rows of brick about 3/4 inches apart, upon which would be laid another flat course with the brick in contact. Rainwater running down between the rows in the first course would enter the valley gutters, i.e., the bricks constituting the sidewalls of this arched gutter.

Against all vertical walls would be built hollow dry brick walls, of which only the headers would touch these walls. Generally, these walls would be one brick thick, though occasionally there might be a need to make them 1½ or 2 bricks thick.

Over each vertical pipe leading down from the gutter, there would be formed a well, capped at top by flagging and covered with an iron plate that could be removed. A course of slate, laid without mortar, would underlay each side wall of the valley gutter.

Bricks in the gutter side walls would be laid in mortar, but the lower three courses would be without mortar in the end joints. The gutter/arch was to have joints across from impost to impost, without mortar, at 18-inch intervals. The sides of the wall would be laid in mortar, but all brickwork of hollow walls and their foundations were to be laid without mortar.

After the brickwork was completed, Totten wrote, a layer of clear gravel, "perfectly compacted," would be laid thereon. Upon the gravel, in "horizontal layers not to exceed six inches in thickness, and perfectly rammed," would be positioned an earth covering.

The top of the vertical cast iron drain pipes was to be connected with the roof by a sheet of lead moulded to the form of the roof at that point, and extending around under the mastic surface for 8 to 12 inches. The mastic to be moulded "down" upon the lead, and inserted into the top of the pipe. A plug was to be inserted and to remain until the top of the wall was removed. The vertical cast iron pipes at the bottom were to be inserted into appropriate sockets in horizontal pipes to be built into the lower parts of the piers.

Upon that portion of the concrete roof, between the breast-height wall and scarp, the earth forming the parapet would be laid and rammed. Care would be taken that it sloped upward from the top of the cordon to a pre-determined line on the breast-height wall, parallel to, and 18-inches below, the true crest of the parapet. On the surface of the parapet would be laid a sheet of mastic, overlaying the cordon and breast-height wall. To provide for discharge of water that might reach the roofs, under the parapet, openings would be left in the breast-height wall at each gutter. The subject gutter would be covered by a small arch without mortar.[35]

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35. Ibid.

5. Settling on the Dimensions and Arrangements of the Casemate Traverse Irons and Flagging

(a) Palfrey Spends Several Weeks at Fort Jackson

On May 3, 1862, Lieutenant Palfrey, as assistant engineer on General Butler's staff, was ordered to report for temporary duty at Fort Jackson. Before sailing for the mouth of the Mississippi the next day, Palfrey placed Clerk A. Murphy and Draughtsman S.B. Haggert in charge of his office.[36]

Before daybreak on April 24, Flag-Officer David G. Farragut's squadron had fought its way by Forts Jackson and St. Philip and had destroyed the Confederate River Defense Fleet. The ocean-going ships had continued upriver to New Orleans. Confederate authorities hurriedly evacuated the city. Forts Jackson and St. Philip surrendered to the Navy on April 28, and, on May 1, General Butler's troops landed and took possession of New Orleans.

(b) Several Drawings are Exchanged and Reviewed

In mid-May, some ten days after Palfrey's departure for the mainland, Draughtsman Haggart mailed to the Department and the New York Agency drawings of the flagging and traverse irons, as described in the circular of March 13, along with requisitions for flagging and 21 sets of traverse rails. Plan No. 1, he pointed out, was for the irons, which altered the positions and dimensions of the flagging and traverse stones shown in Plan No. 2. The latter depicted the "additional Traverse irons 6" wide," and gave the additional radii, as called for in the circular.[37]

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36. Palfrey to Totten, May 4, 1862, NA, RG 77, Ltrs. Recd., Chief Engineer.

37. Haggart to Totten, May 15, 1862, and Trowbridge to Totten, May 19, 1862, NA, RG 77, Ltrs. Recd., Chief Engineer. Copies of the subject drawings, "Plan No. 1 of Casemate, showing the arrangement of Flagging, Traverse Stones, and Traverse Irons," Drawer 84, Sheet 15; and "Plan No. 2 of Casemate, showing the arrangement of Flagging, Traverse Stones, and Traverse Irons," Drawer 84, Sheet 16, are on file at the Mississippi Unit, GUIS.

Haggart's action had been mandated by the need to put a stop on the order for flagging and traverse circles placed with the New York Agency on April 10. This order had prescribed that the dimensions for the subject items be in accordance with those showing on the January 24 tracing.[38]

Upon reviewing the drawings, General Totten forwarded to the New York Agency a sketch, on which was entered the arrangement and dimensions of the traverse stones as outlined in the January 24 drawing. But, to accommodate the increased width of the irons, the outer set were to be positioned about 4 inches farther from the scarp wall.[39]

C. Appropriations, Plans, Programs, & Projections

1. Fiscal Year 1862 Appropriation

On February 20, 1862, President Lincoln signed into law the Fortifications Bill passed by the 2d Session of the 37th Congress, appropriating $100,000 for construction of the Ship Island fort in Fiscal Year 1862. Relaying this information to Lieutenant Palfrey, General Totten reminded him that, in accordance with regulations, he was to prepare and forward for review and approval by the Department a construction program for expenditure of this sum.[40]

2. Palfrey Submits a Program

Palfrey proposed to employ the appropriation to "clear up the fort and demolish improper work, to build scarp all around to a level

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38. Palfrey to Totten, May 28, 1862, NA, RG 77, Ltrs. Recd., Chief Engineer.

39. Totten to Palfrey, June 25, 1862, NA, RG 77, Ltrs. Sent, Chief Engineer; "Fort on Ship Island, Mississippi, General Plan of a Casemate, Showing the arrangement of Traverse Circles, Traverse Stones, etc.," Drawer 84, Sheet 17. A copy of this drawing is on file at the Mississippi Unit, GUIS.

40. Totten to Palfrey, February 22, 1862, NA, RG 77, Ltrs. Sent, Chief Engineer.

of (23' 3"), leaving a space 12' wide for a gateway." He would then construct the cisterns and lay-up the piers to a level of (16' 3") or the spring line; position the drainage pipes; pave the gunrooms; lay the casemate traverse circles; and turn the magazine and flank howitzer arches.[41]

The estimated cost of these projects brokedown:

SCARP

Brickwork	1081 Cubic Yards	@$ 18.00	$19,458.00
Concrete	1.556.7 Cubic Yards	@$ 14.00	$21,793.80
Engine			$ 1,800.00
An Engineer	6 months	@$100.00	$ 600.00
Two Firemen	6 months	@$ 60.00	$ 720.00
Embrasure Irons			$ 7,000.00
Lead			$ 1,200.00

CISTERNS

200 Cubic Yards Brickwork	@$ 18.00	$ 3,600.00
125 Cubic Yards Concrete	@$ 14.00	$ 1,750.00
500 Cubic Yards Excavation	@$ .20	$ 100.00
Pumps, Manholes, etc.		$ 200.00
	Total	$ 5,650.00

PIERS

673.8 Cubic Yards Brickwork	@$ 18.00	$12,128.40
110.6 Cubic Yards Concrete	@$ 14.00	$ 1,548.40
	Total	$13,676.80

MAGAZINE AND FLANK HOWITZER ARCHES

Brickwork	217 Cubic Yards	@$ 18.00	$ 3,906.00
Concrete	185 Cubic Yards	@$ 14.00	$ 2,590.00
Asphalt	166 Square Yards	@$ 2.00	$ 532.00
		Total	$ 7,028.00

MISCELLANEOUS

Drainage Pipes		$ 1,500.00
23 Sets Traverse Circles	@$120.00	$ 2,760.00
1,200 Square Yards Flagging	@$ 1.80	$ 2,160.00
200 Cubic Yards Concrete	@$ 14.00	$ 2,800.00
	Total	$ 9,220.00

41. Prime to Totten, May 26, 1862, NA, RG 77, Ltrs. Recd., Chief Engineer.

Contingencies			$ 1,093.40
Already expended on temporary buildings, apparatus, landing and transporting materials, etc.		$ 10,000	
Reserved for fort keeper		1,000	
	Total	$ 11,000	
Appropriation			$ 109,000
			$ 89,000[42]

3. Totten Comments on the Program

Acknowledging receipt of Palfrey's proposed program, General Totten announced that he was unable to judge of its merit, because he had no information on the "actual state of the work." He needed to know: (a) How many guns, if any, are or could be mounted? (b) How many embrasures are finished, etc.?

Hereinafter, Palfrey, in his monthly reports, was to describe the operations, so we may always know the fort's condition, and be prepared to report the same to the Secretary of War. As for the projects to be undertaken, Totten urged Palfrey to adopt the principle that "the efficiency of the work be forwarded and augmented as rapidly as possible." As the embrasures were built, their platforms, in succession, were to be prepared insofar as the traverse stones, whether the traverse irons were ready or not. Palfrey was to leave the casemate pavement to a subsequent appropriation. Construction of the magazines was to be expedited, with all the fittings prepared.

If Palfrey followed this principle, the fort would soon have all the firepower the lower tiers of guns could provide, before the recess arches were turned or the piers of the gun casemates commenced. "Matters of accommodation would be the last items taken up." The high estimates for workmanship and materials surprised Totten, although he understood that circumstances were unfavorable to economy.[43]

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42. Ibid.

43. Totten to Palfrey, June 27, 1862, NA, RG 77, Ltrs. Sent, Chief Engineer.

3. Palfrey Justifies His Actions

Lieutenant Palfrey, responding to the Department's criticisms, announced that the required annual drawing, depicting the condition of the fort as of June 30, 1862, was nearly finished and would soon be en route to Washington.

As yet, he continued, no guns were mounted in the fort, nor any traverse circles laid. Seven embrasures had been finished; the scarp in front of all the other gun casemates, except one, had been raised three feet above the floor, and the corresponding pintle-holes formed.

In the future, he would take up the work in accordance with the priorities established by the Chief Engineer. This would be difficult to accomplish in some respects, because the drain pipes for the magazine piers, materials for the "inner fittings," traverse stones for the circles, and embrasure irons had not been received. The traverse stones were expected in two to three weeks, and the embrasure irons had been on order for more than five months.

Failure by the Department to provide data "for constructing the trace of the work" had precluded his ordering drain pipes. Since these were deemed a priority item, he would order these irregular pipes by dimensions obtained by protraction. The time lag between placing an order through the New York Agency and its delivery at Ship Island was about three months.[44]

His estimates, Palfrey explained, were based on the prices he was compelled to pay for materials in the months since he had reached Ship Island. For example, the first cargo of brick had cost $7.00 per thousand in Maine, while their freight had added $12.00 per thousand to the price. Since then, Agent Trowbridge had been able to secure brick for $5.50 per thousand, but in the weeks following capture of New Orleans, freight rates between New York and the Gulf Coast had soared.

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44. Palfrey to Totten, July 23, 1862, NA, RG 77, Ltrs. Recd., Chief Engineer.

With respect to wages, the climate and isolation discouraged workmen taking employment on the island. Added to these factors were the high wages commanded in New Orleans. Consequently, it was difficult to retain workmen beyond the three months required to entitle them to their passage money. Of those brought down from New York in March, he had lost an overseer, all the foremen, all but three of the masons, all but three of the carpenters, and a large proportion of the best laborers.

To replace them, he had contacted Lt. Godfrey Weitzel in New Orleans. Weitzel could offer little encouragement at securing competent people at the wages offered by Palfrey. The "going daily rate" in that city was foremen $5.00; journeymen, $3.50 and $3.00, and their rations; and common laborers, $1.00, with rations for their families.[45]

Turning to the condition of the fort to resist attack, Palfrey noted that, on the exterior of the work, sand and "old brick rise about to the level of the embrasure sills for the greater part of the circumference." There were no magazines nor other covered areas. Entrance into the fort was through the gorge and the circular scarp. The four northeast gun casemates were masked by temporary buildings erected by the Quartermaster people. In event of attack, these structures would enable Confederate storming parties to take the fort by surprise, and compromise the safety of the magazine in that angle of the fort.[46]

Pending receipt of the embrasure irons, Palfrey planned to employ the masons on the "piers and such portions of the work as necessary materials are on hand for."[47]

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45. Ibid.

46. Ibid.

47. Ibid.

4. Palfrey Provides the Department with an Annual Drawing

Some two weeks later, on August 4, Lieutenant Palfrey mailed to the Department the completed tracing of the fort, showing the state of work at the close of Fiscal Year 1862.[48]

5. Estimates of Additional Monies Required to Complete the Project

Meanwhile, on May 4, 1862, Superintending Engineer Palfrey had estimated that, to complete the project, another $100,000 appropriation was required, provided there was no further escalation of wage and material costs.[49]

Before the end of the month, he revised this figure upward to $130,000. If however, the Union could further exploit its capture of New Orleans and occupation of Pensacola to include Mobile, the economic situation might improve, the costs of freight decline, and the United States could again look to Southern brickyards rather than shipping in bricks from the North. Such a situation could possibly enable him to finish the project with the additional $100,000.

Palfrey's $130,000 estimate was allotted:

Excavating Ditch and Foundations

Excavation for piers	9,480		
Excavation for ditch	207,900		
	217,380	cubic feet or 8,051 cubic yards @ $50	$4,026.00
30,000 feet sheet piling @ $22			660.00
Steam engine & pump			1,800.00
1 Engineer 6 months @ $100.			600.00
2 Firemen 6 months @ $40.			480.00
150 Tons coal @ $10.			1,500.00
		Total	$9,066.00

48. Palfrey to Totten, August 4, 1862, NA, RG 77, Ltrs. Recd., Chief Engineer. A copy of the subject plan is on file at the Mississippi Unit, GUIS.

49. Palfrey to Totten, May 4, 1862, NA, RG 77, Ltrs. Recd., Chief Engineer.

Scarp Wall

40,825.5 cubic feet or 1,512 cubic yards brick @ $18.		$27,215.00
47,622 cubic feet or 1,763 cubic yards concrete @ 14.		$24,682.00
1,275 cubic feet cordon stone @ 1.25		$ 1,593.75
1,275 feet asphalt joint @ .08		$ 102.00
Embrasure irons		$ 7,000.00
Lead		$ 1,200.00
	Total	$61,793.75

Piers & Partitions to Spring line of Gunroom Arches (15'), Parade Wall of Land Front to Same Reference

547.06 cubic yards brick @ $18.		$ 9,847.08
110.6 cubic yards concrete @ 1		$ 1,548.40
	Total	$11,395.48

Arches of Gunrooms & of Gorge Casemates, & Parade Wall Including Coping

1,466 cubic yards brick @ $18.		$26,388.00
976 cubic yards concrete @ 14.		$13,664.00
410 running feet asphalt joint @ .10		$ 41.00
	Total	$40,093.00

Asphalting Arches

2,157 square yards inclined @ $1.75		$ 3,774.75
520 square yards vertical @ $2.50		$ 1,300.75
	Total	$ 5,074.75

Covering Arches with Dry Bricks

200,000 @ $20	$ 4,000.00

Breast-height Wall, Drains, Walls, and Well Coverings for Drainage over Casemates

16 squares (10 X 10) slate @ $8		$ 80.00
555 cubic yards brickwork @ 18		$ 9,900.00
400 running feet asphalt joints @ 40.00		$ 40.00
28 well covers (5 cubic feet granite @ 1.25)		$ 175.00
Iron pipes 50,000 @ .03		$ 1,500.00
	Total	$11,695.00

Embanking, Grading, Planting Parapet & Terreplein

2,100 cubic yards embankment @ .40		$ 840.00
1,400 square yards grading, planting, etc. @ .60		$ 840.00
	Total	$ 1,680.00

Gun Platforms & Traverse Circles & Pintles (Barbette)

20 columbiad platforms @ $500		$10,000.00
9 sets traverse circles & pintles @ 200		$ 1,800.00
	Total	$11,800.00

Traverse Circles & Pavements in Gunrooms, Paving Main Entrance, Stairways & Bridge Piers

23 sets traverse circles @ $120		$ 2,740.00
1,200 square yards flagging @ $1.80		$ 2,160.00
500 square feet russ pavement @ .90		$ 450.00
4 staircases 128 steps @ 3.12		$ 400.00
175 cubic yards brickwork @ 18.		$ 3,150.00
Bridge piers 35 cubic yards brickwork @ 18.		$ 630.00
Bridge piers 8 cubic yards concrete @ 14.		$ 112.00
	Total	$ 9,662.00

Woodwork of Magazines

7,000 feet lumber @ .35		$ 245.00
85 days carpentry @ $2.		$ 170.00
20 days laborer @ $1.50		$ 30.00
4 mortice composition locks @ $15		$ 60.00
4 sets composition hinges, 150 lbs. @ .50		$ 75.00
100 lbs. copper nails @ .60		$ 60.00
50 lbs. bar copper @ .50		$ 25.00
10 days blacksmithy @ $2.50		$ 25.00
75 square feet copper gauze @ .30		$ 22.50
	Total	$ 712.50

Gates & Fastening

20 days carpentry @ $2		$ 40.00
15 days laborer @ 1.50		$ 22.50
10 days blacksmithy @ 2.50		$ 25.00
3,500 feet lumber @ $30.		$ 105.00
250 lbs. composition hinges @ $.50		$ 125.00
100 lbs. iron @ $.05		$ 10.00
3 days painter @ $2.		$ 6.00
75 lbs. paint @ .15		$ 11.25
	Total	$ 344.75

Bridge & Drawbridge

Drawbridge machinery		$ 300.00
4,500 feet lumber @ .30		$ 135.00
10 days carpentry @ 2.00		$ 20.00
10 days laborer @ $1.50		$ 15.00
6 days blacksmithy @ $2.50		$ 15.00
250 lbs. iron @ .05		$ 12.50
200 lbs. spikes @ $.05		$ 10.00
	Total	$ 507.50

Breast-height Wall of Covered Way

350 cubic yards brickwork @ $18.		$ 6,300.00
650 running feet asphalt joint @ $.10		$ 65.00
225 cubic yards concrete @ $14		$ 3,150.00
	Total	$ 9,515.00

Paving Ditch & Covered Way (with 4" Bricks)

650 cubic yards brickwork @ $18.		$11,700.00
Grading & Planting Glacis		
6,000 square yards @ $.60		$ 3,600.00
Cisterns		
200 cubic yards brickwork @ $18.00		$ 3,600.00
50 cubic yards concrete @ $14.00		$ 700.00
500 cubic yards excavation @ $.20		$ 100.00
Pumps, manholes, etc.		$ 200.00
	Total	$ 4,600.00
Contingencies		$22,760.27
	Grand Total	$220,000.00
Temporary buildings		$ 4,000.00
Apparatus		$ 2,000.00
Receiving & Transporting materials		$ 4,000.00
	Total	$10,000.00
Appropriated 2/20/62		$100,000.00
		$90,000.00
		$220,000.00
Needed to finish project:		$130,000.00[50]

6. Palfrey Calls for a $100,000.00 Appropriation in Fiscal Year 1863 and $75,000 for Fiscal Year 1864

If it were the Department's intention to push the project to completion at an early date, Lieutenant Palfrey called for an appropriation of $100,000.00 in Fiscal Year 1863, and for $75,000 to finish the fort in Fiscal Year 1864. These estimates, he informed the Department, were based on current wages, but were lower than the present rates for materials and freight, especially the latter which was excessive.[51]

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50. Palfrey to Totten, May 27, 1862, NA, RG 77, Ltrs. Recd., Chief Engineer.

51. Annual Report of Operations for Ship Island Fort for Fiscal Year 1862, NA, RG 77, Ltrs. Recd., Chief Engineer.

D. Work Accomplished on the Fort in Fiscal Year 1862

On April 1, 1862, the masons had began cutting out broken brickwork, and, by June 30, the masonry slated for demolition had been mostly taken down. Seven embrasures had been enclosed, and the fort raised to the level represented by the "unshaded line" on the annual drawing. The quantity of new masonry laid-up in the fort, exclusive of altering and repaving, was 110 cubic yards of brickwork and 125 cubic yards of concrete.[52]

Since beginning work in mid-March, the men had been engaged:

Masons--Landing and transporting materials, constructing storehouse, demolishing old masonry, laying-up the scarp around embrasures, painting embrasure irons, and altering recesses for gun carriage wheels.

Carpenters--Landing and transporting materials, constructing temporary buildings, making patterns for masonry, repairing tools and machinery, building furniture and scow.

Blacksmiths--Fabricating tools and railroads switches, repairing tools, mending embrasure irons, and repaving tools.

Laborers--Assisting artisans, landing and transporting materials, pulling down old masonry, painting shot furnace irons, breaking bricks, mixing concrete, and removing guns and carriages from fort.[53]

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52. Ibid.; "Fort on Ship Island, Mississippi, Plan and Elevations, Showing State of Work, June 30th, 1862."

53. Monthly Reports of Operations for April-June 1862, at Ship Island Fort, NA, RG 77, Ltrs. Recd., Chief Engineer.

During these four months (March-June), there had been expended on the project:

CATEGORY	MATERIALS	LABOR
Temporary buildings	$ 6,110.84	$ 1,354.01
Machinery	4,463.64	672.97
Scarp masonry	10,431.91	2,823.28
Subsistence	4,119.18	396.19
Mules & their freight	746.24	
Forage	266.78	
Passage of men	2,275.00	
Office furniture	147.99	$ 122.75
Stationery	149.98	
Receiving & transporting materials		$ 2,251.76
Pulling down & repair of fort		$ 1,876.18
Clerk, draughtsman, overseer, etc.		$ 1,596.22
Medicine	$ 51.00	
	$28,762.56	$ 10,598.30
Total expenditures		$ 39,360.87
Balance of appropriation		$ 60,639.13
Total		$100,000.00

Lieutenant Palfrey forecast that the balance of the February 1862 appropriation, $60,639.13, would suffice to close the circular scarp to level 16' 8", to build the piers to the spring line of the casemate arches to erect a shot furnace, to lay all the casemate flagging and traverse circles, and to complete the pile wharf and a stable. All these projects should be accomplished by November 30, 1862.

Such a schedule would ready the fort to receive and mount the armament of the first tier--21 guns and 2 flank defense howitzers. No magazines would be ready by that date. The fort would then be prepared to offer considerable resistance to an amphibious attack or naval bombardment. It would have to depend on "temporary expedients to cover its supplies and men from weather" and shell fire.[54]

54. Annual Report of Operations at Ship Island Fort for Fiscal Year 1862, NA, RG 77, Ltrs. Recd., Chief Engineer.

E. Labor Force in Fiscal Year 1862

1. Climate and a Poor Diet Saps the Workforce's Effectiveness

By early April, the climate was adversly affecting the workforce. This was aggravated by a poor diet that included little "fresh animal food, and almost a total absence of fresh vegetables." This cut the force's efficiency by about one-third, and continued through the end of June. Meanwhile, there had been almost a complete turn over in the force.[55]

2. Workforce and its Cost of Maintenance

As of June 1, 1862, there were employed at the fort:

OCCUPATION	NO.	DAILY WAGE	MONTHLY WAGE
Draughtsman	1		$ 120.00
Clerk	1		$ 115.00
Physician	1		$ 52.00
Overseer	1		$ 125.00
Mastermason	1		$ 81.00
Masons	15	$2.06	$ 810.00
Master Carpenter	1		$ 81.00
Carpenters	7	$1.75	$ 330.75
Blacksmith	1	$2.50	$ 65.50
Blacksmith	1	$2.00	$ 54.00
Suboverseer	1		$ 54.00
Laborers	30	$1.25	$1,012.50
Laborers	32	$1.00	$ 864.00
		Total	$3,766.75
		Provisions	$1,500.00
		Contingencies	$ 233.25
	Total allotment for June 1862		$5,500.00[56]

55. Annual Report of Operations at the Ship Island Fort for Fiscal Year 1862, NA, RG 77, Ltrs. Recd., Chief Engineer. Although none of the men's illnesses were diagnosed as scurvy, sore mouths and lips were a common complaint.

56. Palfrey to Totten, May 27, 1862, NA, RG 77, Ltrs. Recd., Chief Engineer.

VI. AN ACCELERATED CONSTRUCTION PROGRAM: JULY 1, 1862 -- JUNE 30, 1865

A. Palfrey's Duties and Assignments Multiply

1. He Divides His Time Between Ship Island & New Orleans

Wearing as he did several hats, Palfrey, who was promoted to captain to rank from March 3, 1863, found more and more of his time and energy engrossed by duties that called him away from Ship Island. On November 9, 1862, he was summoned to New Orleans for duty on Maj. Gen. Nathaniel P. Banks' staff. Banks had recently relieved General Butler as commander of the Department of the Gulf. Soon after reaching the "Crescent City," Palfrey was felled by a bilious fever and hospitalized. Clerk Murphy was in charge of the project during Palfrey's absence.[1]

It was the last of January before Palfrey returned to Ship Island. Hereinafter, Palfrey was to divide his time between the island and the New Orleans area, because General Banks had placed him in charge of the Crescent City's permanent defenses. Banks assured Palfrey that he could "be at Ship Island as much as the work" at New Orleans allowed.[2]

2. He Transfers His Duty Station to New Orleans

Then, in mid-October 1863, Captain Palfrey was instructed by General Banks' headquarters to see that additional guns were mounted at Forts Livingston, Pike, Macomb, Jackson, and St. Philip, and on Ship Island. This was to be done in conformity with a report made by the Board on the Defenses of New Orleans. He would also see that Forts Jackson and Livingston were placed in "good condition for defense."

To comply with these instructions, Palfrey informed the Department, he would be compelled to change his duty station from Ship

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1. Murphy to Totten, November 10 & December 8, 1862, NA, RG 77, Ltrs. Recd., Chief Engineer.

2. Palfrey to Totten, January 27, 1863, NA, RG 77, Ltrs. Recd., Chief Engineer.

Island to New Orleans, and hereinafter visit the island and other defenses as opportunity afforded.

For example, during the last month, he had been called to Port Hudson to layout a new line of works, to Fort Jackson twice, and to Fort Livingston once. Consequently, he had been absent from his duty station for more than three weeks. This had been mitigated by his hire of a new assistant, Joseph P. Frizell at Ship Island. This individual, an experienced surveyor, Palfrey believed, would be better able to oversee the project than his predecessor.[3]

3. He Joins the Red River Expedition

In late March 1864, General Banks undertook a campaign aimed at capturing Shreveport and carrying the war into East Texas. Consequently, in early April, Captain Palfrey was ordered to join General Banks in the field. On the 2d, before leaving New Orleans for the Red River Country, Palfrey wrote the Department, requesting that payments to his accounts be suspended during his absence from the city. He reassured the Chief Engineer that work had progressed at Ship Island to where it could be continued under his overseer's supervision for "some months without serious injury."[4]

By the time this letter reached Washington, the United States had a new Chief Engineer. General Totten, who had been in failing health for several months, died of pneumonia on April 22, 1864, having been Chief Engineer for more than 26 years. Totten's successor was Richard Delafield, a West Point graduate of the Class of 1818, and a senior officer in the Corps. Promoted from colonel to brigadier general, he assumed his new duties on May 19.[5]

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3. Palfrey to Totten, October 17, 1863, NA, RG 77, Ltrs. Recd., Chief Engineer.

4. Palfrey to Totten, April 2, 1864, NA, RG 77, Ltrs. Recd., Chief Engineer.

5. Ezra J. Warner, Generals in Blue: Lives of the Union Commanders (Baton Rouge, 1964), pp. 117-18.

Six days later, on May 25, General Delafield took action aimed at again focusing Palfrey's attention on the Gulf Frontier's coastal fortifications. Writing Maj. Gen. Edward R.S. Canby, who had been named to command the recently constituted Military Division of West Mississippi, Delafield asked that Captain Palfrey be ordered to resume his duty station at Ship Island.

Palfrey, himself, questioned the wisdom of this move as long as he continued to be responsible for the other Third System coastal defenses in Canby's Division. His reasons for this view was the difficulty of securing transportation to and from the forts, other than aboard vessels belonging to or under charter to the Quartermaster Department. All these craft either sailed from or to New Orleans. Moreover, all mail and freight from the North was landed in the Crescent City, and all materials not brought from the North must be purchased there. Hiring halls for workmen were also in that city.

These circumstances compelled Palfrey to spend more time in New Orleans than at any other post.[6]

The Department, replying, reminded Palfrey that, in addition to the Ship Island project, he was responsible for engineer operations at these coastal fortifications: Forts Jackson, St. Philip, Livingston, Macomb, Pike, Pickens, McRee, and Barrancas; Tower Dupré; Battery Benvenue; and the defenses of Proctor's Landing. Consequently, he was authorized to establish his duty station at New Orleans or such place as would best enable him to discharge his heavy workload.[7]

4. He Participates in the Mobile Campaign

In the third week of February 1865, Captain Palfrey was handed two orders signed by local commanders. The first, dated the

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6. Palfrey to Delafield, June 11, 1864, NA, RG 77, Ltrs. Recd., Chief Engineer.

7. Delafield to Palfrey, June 21, 1864, NA, RG 77, Ltrs. Sent, Chief Engineer.

17th, named him Chief Engineer of the District of West Florida and South Alabama, and the second, issued on the 19th, appointed him assistant inspector-general and chief engineer of the XIII Army Corps. Relaying copies of these orders to Chief Engineer Delafield, Palfrey noted that he had neither solicited nor sought these assignments, and General Canby had told him that the latter assignment had been made to give him a merited promotion to major of volunteers. If the impending campaign aimed at capture of Mobile involved a siege, Palfrey desired an active role, and could arrange his affairs so that construction and repair projects associated with the coastal forts did not suffer.

If, however, personal preference had any weight, Palfrey preferred to remain in charge of the forts, thus forgoing field service.[8]

Unsuccessful in his efforts to escape service in the field, Palfrey reported to headquarters, XIII Corps, and participated in the Mobile Campaign, distinguishing himself at Spanish Fort (March 25 - April 8) and in the April 9 assault on Blakely.

B. Wartime Funding and Programming

1. Palfrey's Proposed Fiscal Year 1863 Program

On the last day of September, 1862, Palfrey notified the Department that the $100,000 in construction monies appropriated by Congress for the project on February 20 would be exhausted by mid-December. As many vouchers had not been received and freight rates varied greatly, his estimates were approximate at best.

In addition, there had been advanced to the project from "contingencies" $38,000, which must be reimbursed. Consequently, Palfrey hesitated to spend "this amount beyond the $100,000 appropriated and it is not included in the estimate enclosed."

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8. Palfrey to Delafield, February 20, 1865, NA, RG 77, Ltrs. Recd., Chief Engineer.

The estimates read:

Amount expended in 1st and 2d quarters 1862 as by vouchers and abstracts	$ 39,360.87
Balance July 1, 1862	60,639.13
Total	$100,000.00
Probable expenditures 3d quarter:	
Embrasure irons	2,500.00
Flagging	4,500.00
Traverse circles	500.00
500,000 bricks	8,750.00
Engine & pump	2,000.00
Rolls	10,050.00
Provisions, cement, lumber, etc.	5,700.00
Balance	24,139.13
Total	$ 60,639.13
Probable expenditures to December 15, 1862:	
Fort keeper, etc.	$ 1,000.00
Rolls (2½ months)	8,800.00
850,000 bricks	15,300.00
Cement	1,600.00
Contingencies	439.13
Balance, December 15, 1862:	0.00
	$27,139.13[9]

In view of this situation, Palfrey inquired, is work to be discontinued when the appropriation is exhausted? If not, what provision is to be made for its continuance, and at what rate of expenditure?

Should construction be continued, Palfrey would transmit necessary requisitions to Agent Trowbridge.

The fort, he informed the Department, was in condition to facilitate the advantageous employment of a large workforce. He accordingly recommended that he be provided with the wherewithal to enable him to spend $16,000 per month. This figure breakdown:

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9. Palfrey to Totten, September 30, 1862, NA, RG 77, Ltrs. Recd., Chief Engineer.

500,000 bricks @ $18.00 per thousand	$5,400.00
600 barrels of cement @ $2.00 per barrel	$1,200.00
Concrete, stone, & brick	$3,000.00
Rolls	$5,000.00
Subsistence	800.00
Contingencies	600.00
For a force of 130 to 140 men	$16,000.00[10]

Chief Engineer Totten, after reviewing the Corps' nationwide commitments, authorized construction to be continued on the project "from the middle of December until you are informed of the action of Congress on the annual Fortification Bill, at the rate of ten thousand dollars per month to be supplied . . . from the contingency fund." Monies thus provided would be deducted from the next appropriation for Ship Island.[11]

2. Fiscal Year 1864 Appropriation and Program

On February 20, 1863, the 3d Session of the 37th Congress enacted and President Lincoln signed into law the Fortifications Bill to fund construction of coastal defense in Fiscal Year 1864. A line item in the subject legislation made $175,000 available for the Ship Island Fort.

Secretary of the Treasury Salmon P. Chase ruled that the subject appropriation was available for immediate use, so Chief Engineer Totten made application for $37,600 to reimburse the "contingencies" fund. Relaying this information to Superintending Engineer Palfrey, Totten directed him to prepare and submit for review and approval a program for expenditure of the remaining $137,400.[12]

Because of manifold duties associated with the Department of the Gulf which mandated long absences from Ship Island, Palfrey failed

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10. Ibid.

11. Totten to Palfrey, November 6, 1862, NA, RG 77, Ltrs. Sent, Chief Engineer.

12. Totten to Palfrey, April 15, 1863, NA, RG 77, Ltrs. Sent, Chief Engineer.

to respond to the Department's letter until late August. When he did he placed the cost of completing the fort at $106,000.[13]

3. Fiscal Year 1865 Appropriation and Program

On July 28, 1864, Chief Engineer Delafield notified Captain Palfrey that President Lincoln had approved, on the 2d, a Fortifications Bill appropriating $100,000 for the fort on Ship Island in Fiscal Year 1865. Palfrey, in accordance with procedure, would formulate and forward for approval a construction program for expenditure of this sum. On doing so, he would reserve enough money to maintain a proper watch over the public property from the close of operations in the subject year to June 30, 1866, should Congress fail to make an appropriation to fund the undertaking in Fiscal Year 1866.[14]

Once again, as he had the previous year, Major Palfrey failed to submit the requested document.[15]

4. Fiscal Year 1866 Appropriation and Program

On February 28, 1865, President Lincoln signed into law the Fortifications Bill enacted by the 2d Session of the 38th Congress, which included a $50,000 appropriation for the Ship Island fort in Fiscal Year 1866. Upon relaying this information to Palfrey, the Department called on him to prepare a program for review for expenditure of this sum. In formulating his program, Palfrey was to limit his operations inasmuch as possible "to such parts of the work as will least conflict with the views expressed" in the appended abstracts from the Board of Engineers' report.

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13. Palfrey to Totten, August 22, 1863, NA, RG 77, Ltrs. Recd., Chief Engineer.

14. Delafield to Palfrey, July 28, 1864, NA, RG 77, Ltrs. Sent, Chief Engineer.

15. Registers of Letters Received from Engineer Officers, NA, RG 77.

Palfrey was to bear in mind that no part of the subject appropriation could be used before July 1, without special authority from the Secretary of War.[16]

Palfrey, when he submitted his program, noted that available monies included:

Sum appropriated February 28, 1865	$50,000
Balance of former appropriation in Treasury	$25,900
Balance in hand unexpended, May 1, 1865	$18,500
Total	$94,400
Allowing for preservation of public property from close of operations til June 30, 1867	$ 2,000
Balance	$92,400

No plan had yet been approved for the necessary outworks, so Palfrey proposed to hold expenditures, during the next 14 months, to $6,600 per month. Such a figure would allow him to employ a workforce to include:

NUMBER	CLASSIFICATION	MONTHLY RATE
1	Assistant Engineer in charge of work	$150
1	General overseer of work	$115
1	Clerk	$110
1	Foreman of masons	$105
1	Foreman of carpenters	$105
1	Foreman of laborers	$ 90
1	Assistant foreman of laborers	$ 50
12	Masons @ $2.75 per day (26 days)	$858
4	Carpenters @ $2.75 per day (26 days)	$286
4	Stone cutters @ $2.75 per day (26 days)	$286
1	Blacksmith @ $3 per day	$ 78
1	Assistant blacksmith @ $2.50 per day (26 days)	$ 65
1	Steam engineer	$ 65
50	Laborers	$1,625
1	Steward	$ 40
2	Cooks @ $30	$ 60
3	Assistant cooks @ $20	$ 60
	Provisions	$750
	Forage	$ 80
	Materials & contingencies	$1,622
	Total	$6,600

16. Delafield to Palfrey, March 14, 1865, NA, RG77, Ltrs. Sent, Chief Engineer.

Because this payroll was predicated on the assumption that "all the work is to keep pace with the masonry," it was necessary to consider the amount to be laid-up with the subject force.

To document this expenditure, Palfrey calculated:

CLASSIFICATION	DAYS
To finish ten 10-inch gun platforms	150
To finish breast-height wall of curtain and 15-inch platforms	150
To build breast-height wall for circular part of fort	175
To set storework of two 15-inch platforms	40
To build the irregular groined arches under parados	200
To build five regular groined arches under parados	100
To point the arches	250
To build parade wall	75
To build gutter arches	300
To set traverse stones for twelve 10-inch platforms	60
To lay dry brick over mastic	80
To set remainder of coping	50
To build the service magazines	350
To carry up and arch the stair towers	150
To set and point the flagging revetment of the parapet	100
To build revetment of traverses and parados	150
Miscellaneous	240
Total days	2620
For outworks	1748
Total days	4368

As details of the outworks had not been settled, the parts of the masonry to which the above labor was to be applied were not specified.[17]

C. Certain Construction Details are Developed, Reviewed, and Approved

1. Drawbridge Plans Spark a Needless Debate

On March 24, 1862, the Department transmitted a tracing of a design for a drawbridge, "with the arrangement of masonry, bridge, machinery, and fixtures," such as were believed applicable to the fort. If, however, the masonry of the work would not admit of this type of

17. Palfrey to Delafield, May 24, 1865, NA, RG 77, Ltrs. Recd., Chief Engineer.

bridge, Palfrey was to prepare and forward plans and estimates for one that would conform to his needs.[18]

The subject structure, Palfrey found to be inappropriate. Consequently, some 11 months later, on February 12, 1863, he transmitted to the Department for review a drawing of a drawbridge. In a covering letter, he pointed out that the structure would be strong enough for "ordinary service." Notches would be cut in the masonry for reinforcing timbers to support the passage across the bridge of great weights.

A watertight well, similar to the one proposed for the Sandy Hook Fort, could be included in the project. Such a well would have to be pumped out after heavy rains.[19]

Chief Engineer Totten took issue with Palfrey's proposal. He assured his superintending engineer that the mode of construction presented in the drawing transmitted on March 24, 1862, with the bridge frame extending within the entrance-way and forming a counterpoise to revolve into the masonry pit, was practicable. This, Totten continued, "could not be said of the other devices I am acquainted with." For this reason, he preferred it to the one prepared by Palfrey.

The liability of the well being partly filled with water was not objectionable, as an outlet pipe could be placed in the front wall of the pit, at the height of the spring tides. Inflow from the ditch could be excluded by a screw tap to be attached on the ditch end of the pipe.

The radius of the well need not be so great as at Sandy Hook. At Ship Island, it could be 7 or 9 feet, making the weight of the preponderating end of the bridge sufficient to grade properly.

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18. Totten to Palfrey, March 24, 1862, NA, RG 77, Ltrs. Sent, Chief Engineer.

19. Palfrey to Totten, February 12, 1863, NA, RG 77, Ltrs. Recd., Chief Engineer. A copy of the subject plan, "Sketch of Proposed Draw Bridge for Fort on Ship Island, Mississippi," is on file at the Mississippi Unit, GUIS.

There was no serious objection to having water in the lower part of the well, though the preponderance must be adjusted thereto. It would have the advantage of operating as a brake, moderating the latter part of the movement, the first part of which must be quick.

The axis of the movement, Totten cautioned, must be in the same vertical plane as the center of gravity, when the bridge is vertical, and it should be at the mid-point.[20]

The issues raised by Totten in his comments proved to be academic, because a drawbridge was never built.

2. Readjusting the Elevation of the Breast-Height Wall Coping

On February 25, 1863, the Department by circular letter directed that, hereinafter the top of the breast-height wall at Third System forts was to be 2 feet below the interior crest instead of 1 foot 6 inches. Reviewing his drawings, Palfrey observed that, if he retained the same superior slope and kept the asphalt on parallel to it, it would result in the crest of the exterior coping being at 29' rather than 29' 6".

"For the sake of appearance," Palfrey recommended that the cordon be dropped 6 inches to keep it at its present distance below the coping. This would place the top and bottom of the coping at 24' 6" and 23' 6" instead of the present 25' and 24'.[21]

The Department approved this change order.[22]

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20. Totten to Palfrey, March 5, 1863, NA, RG 77, Ltrs. Sent, Chief Engineer.

21. Palfrey to Totten, August 22, 1863, NA, RG 77, Ltrs. Recd., Chief Engineer.

22. Woodruff to Palfrey, September 18, 1863, NA, RG 77, Ltrs. Sent, Chief Engineer.

3. Plans of the Stair-Towers Evolve and are Finalized

On May 5, 1863, Palfrey mailed to the Department for review and comment two tracings, giving "proposed number, positions, and construction of stair-towers leading from parade to terreplein."[23]

General Totten, on studying the plans, suggested three modifications: (a) the tower walls not to be raised above the surface of the terreplein, and if kept a little below it so much the better. If carried higher, they would be in line of fire, and projectiles striking them would hurl rock and brick fragments about the fort. Recent practices had been to crown stair-towers with wooden penthouses, which would withstand the winds and exclude the elements, with windows for lighting in their polygonal sides. (b) The thickness of the stair-tower should be reduced in the interest of economy. (c) With an open doorway below and windows in a wooden superstructure, there was no need for a window in a wooden superstructure, there was no need for a window in the tower walls.[24]

On August 30, 1865, Captain Palfrey submitted to the Department for review a drawing detailing a different mode of "finishing the tops of the stair-towers." The advantage of this construction, he argued, would be to conceal portions of the communications and thus avoid unnecessary exposure of masonry.[25]

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23. Palfrey to Totten, May 5, 1863, NA, RG 77, Ltrs. Recd., Chief Engineer; "Plan Showing Proposed Arrangement of Stair-Towers Leading from Parade to Terreplein of Fort on Ship Island," Drawer 84, Sheet 20, and "Sketch of Proposed Stairs Leading from Parade to Terreplein of Fort on Ship Island," Drawer 84, Sheet 21. Copies of these drawings are on file at the Mississippi Unit, GUIS.

24. Totten to Palfrey, May 25, 1863, NA, RG 77, Ltrs. Sent, Chief Engineer.

25. Palfrey to Delafield, August 30, 1865, NA, RG 77, Ltrs. Recd., Chief Engineer. "Fort on Ship Island, Miss., Sketch of Proposed Deviation from Dept. Drawing of Dec. 13, 1864, in the mode of finishing the Stair Towers." A copy of the subject drawing is on file at the Mississippi Unit, GUIS.

Chief Engineer Delafield, upon returning the sketch, informed Capt. John M. Wilson, who had replaced Palfrey, that the towers would be completed, in accordance with Palfrey's original design, because it was "inexpedient to tear down and alter the work done . . ., although not conforming to plans forwarded" by the Department.[26]

4. Arranging the Flanking Howitzer Platforms

In the autumn of 1863, to provide guidance in arranging the flanking howitzer platforms, the Department mailed to Palfrey a tracing and plan of section of chassis and traverse circle for a flank defense howitzer.[27]

Additional information was provided in a letter, dated November 20. Palfrey was directed to have holes drilled for the pintle bolts, the axes of which "will stand 7½ inches measured on the directrix back from the plain of the throat." The hole was to be 2 feet deep below the lower sole of the embrasure, and have a diameter of 3¼ or 3½ inches.

The pintle was to be wrapped with several thicknesses of "stout paper," and be held in position while moltern lead was poured into the annular space. Until such time as the howitzers were positioned, the pintle hole was to be stopped with a wooden plug.

Before mounting the chassis, a 3½-inch washer should be placed over the pintle.[28]

Palfrey was disturbed by the statement that the holes should be drilled for the pintle bolts, the "axis of which will stand 7½" on the direction back from the plane of the throat." According to the

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26. Delafield to Wilson, Nov. 17, 1865, NA, RG 77, Ltrs. Sent, Chief Engineer.

27. Woodruff to Palfrey, Oct. 2, 1863, NA, RG 77, Ltrs. Sent, Chief Engineer.

28. Totten to Palfrey, Nov. 20, 1863, NA, RG 77, Ltrs. Sent, Chief Engineer.

tracing transmitted on October 2, this distance was to be 4-3/4 inches instead of 7½ inches, provided the line a-b was the trace of the throat.[29]

General Totten's health was failing and he failed to respond to Palfrey's communication.[30]

D. Technological Advances Result in Major Changes to the Barbette Tier

1. Department's February 25, 1863 Circular

On February 17, 1863, Superintending Engineer Palfrey reported the fort's lower tier completed, and called on the Department to provide him with lithographic drawings of gun platforms and traverse circles for the barbette tier.[31]

Long before Palfrey's letter reached Washington, the Department by circular letter, dated February 25, and enclosed drawings providing Palfrey with necessary details for laying barbette platforms for 15-inch Rodmans and for modifying those already laid. The tracings, marked A and B, depicted platform details. The pintle-block on A was a single stone, as were the several traverse stones on the side of the platform. Pintle-block B was "compounded" of 5 stones, held together by iron traverse circles on top, and by 2 side clamps of iron bolted to the stone.

The iron traverse circles were 1-inch thick, and the Ordnance Department had proposed that the set of circles next the pintle, counting outward, be severally 3", 3.3" & 4" broad, with narrow spaces between, making the total breadth 13-8/10".

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29. Palfrey to Totten, Dec. 20, 1863, NA, RG 77, Ltrs. Recd., Chief Engineer.

30. Registers of Letters Sent by Chief Engineer to Engineer Officers, Dec. 20, 1863-May 19, 1864, NA, RG 77.

31. Palfrey to Totten, Feb. 17, 1863, NA, RG 77, Ltrs. Recd., Chief Engineer.

The subject space could be so occupied as at A and B, or it could be occupied by 2 rings as at A', or by a polygonal piece as at A". The outer traverse circle irons were to include two of 4-inch width and two of 5 inches. These latter irons were to be in several arcs, each as large as could be conveniently formed and handled. They were to be bolted down (with provision for expansion and contraction) in a manner calculated to bind the stones together.

To seat the pintle, a hole 6 inches in diameter and 15 inches deep would be sunk in the pintle-block. After the pintle had been positioned and centered, wrought-iron strips would be wedged between the stone and pintle, the tops of the wedges not quite reaching the top of the stone. Molten lead would be poured in to fill the voids and cover the tops of the wedges.[32]

The distance below the horizontal plane of the axis of the trunnions of the traverse irons on the pintle-block would be 78.652 inches, and of the top of the outer sets of the traverse irons 84 inches.

Sections of drawings A and B gave "two cases of depression" of 3 and 6 degrees respectively. This demonstrated that, while a difference in this did not change the relative references of the axis of the trunnions and top of the platform, it affected the height of the crest and, consequently, the cover afforded by the parapet. The top of the breast-height wall would always be 2 feet below the crest. This 2-foot height above the top of the breast-height wall was to be earth sustained by thin flagging stones, "standing in a slope at right angles with the superior slope of the parapet." The flagging would be secured by clamps.

Where the 15-inch gun platforms were thrown in advance of the general line of the parapet crest, it was deemed advisable to place the surface of the concrete, lying between the most advanced part of the platform and the parapet, 6 feet 3 inches below the crest. This provided good drainage to the rear.

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32. Circular Letter of Feb. 25, 1863 & Palfrey to Totten, April 27, 1863, NA, RG 77, Ltrs. Recd. & Sent, Chief Engineer.

Under all circumstances, the polygonal sides of the recesses for the big Rodmans were to circumscribe a circle having a radius of 11' 6".

Iron traverse circles affording the track to the eccentric truck could be fabricated in three rings, or in polygonal plates. In either event, they were to be 1/2-inch thick, with their upper surface 1/8-inch above the top of the pintleblock.[33]

In the new front-pintle platforms, there would be no change in the pintle-block and bolster. There was to be a curbing of stones, i.e., a 5' 4" by 2' by 2' back piece; two side pieces of 6' by 2' by 1' 4", each; three flat, or flagging stones, 6 or 8 inches thick; and one 3- or 4inch flagging stone. These stones would be embedded in a large mass of high-grade concrete made with cement. Before being positioned, the platform side pieces were to be pierced with 2 holes to take 1-1/2-inch bolts and, after being laid, these bolts were to be driven 6 inches farther: One into the end of the pintle-block bolster, and the other into the back piece. A 12-inch bolt, smeared with pine bitumen, would be pushed to the bottom of these holes, the remainder of the void being plugged with cement mortar. The upper surface of these platform stones was to be 3/8-inch below the top of the pintle stone. The eccentric truck traverse irons were to be fastened to the flagstones.[34]

Tests had demonstrated that it was necessary to make the traverse stones and their foundations stronger than heretofore. They were to be in "polygonal portions," the stones 2 feet broad by 1-1/2 feet deep; and their concrete foundations to be 3 feet broad by 2-1/2 feet deep. Where the foundations rested on sand, the concrete should be deposited and rammed in thin layers, on a pavement of small stones, which had been driven into the sand by blows from a heavy rammer.[35]

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33. Circular Letter, Feb. 25, 1863, NA, RG 77, Ltrs. Sent, Chief Engineer.

34. Ibid.

35. Ibid.

Where the gun would not require a depression of more than 1 or 2 degrees, the top of the pintle-block would be 4' 10" below the plane of the crest. Where 3 degrees, the distance must be 4' 8"; where 6 degrees of depression was needed the distance to be 4' 4"; and where 9 degrees 4' 1" or below.

In all new breast-height walls, the top was to be 2 feet below the crest, instead of 18 inches as heretofore. This upper 2 feet was to be sustained by flagging and clamps.[36]

2. Details for 28 Barbette Tier Platforms are Perfected

On July 23, 1863, the Department mailed to Palfrey detailed drawings of platforms for front-pintle barbette carriages for 8-, 10-, 13-, and 15-inch guns.[37]

Before receipt of the plans, Captain Palfrey had ordered from the New York Agency 24 pintleblocks, each 4' 6" by 2' by 2'. He accordingly fired off a communication, directing Trowbridge to stop shipment.

Coincidentally, Palfrey wrote the Department, seeking data on the type of platforms desired. If for 8- and 10-inch guns, which the latest tracing depicted, the 4' by 2' by 2' pintleblocks could be altered. If larger, new stones must be furnished.[38]

Chief Engineer Totten reassured Palfrey that the guns to be mounted on the barbette tier would, in all likelihood, be 8- or 10-inch columbiads or 200- or 300-pounder Parrotts, all of which could be adapted to the same type of platform, the one described in the Departmental

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36. Ibid.

37. Totten to Palfrey, July 23, 1863, NA, RG 77, Ltrs. Sent, Chief Engineer.

38. Palfrey to Totten, Aug. 19, 1863, NA, RG 77, Ltrs. Recd., Chief Engineer.

Circular of February 25, 1863. Of these platforms, the fort was to have 28. Heretofore, he continued, there had been some misunderstanding as to whether the pintle-block would be 4' or 4' 6" long. If the former had been sent, Palfrey was to retain them, although the latter would suffice.

It was not proposed to emplace at Ship Island any barbette guns requiring heavy pintle-blocks for 13- or 15-inch guns, Totten added.[39]

Meanwhile, Palfrey had asked for additional data. He wished to know whether the Ordnance people had front-pintle iron carriages for 8- and 10-inch columbiads. If so, did they require a different platform than those mandated for wooden carriages for guns of similar caliber?[40]

Chief Engineer Totten responded that the lithographic drawings were correct, and no changes were contemplated necessitating a change in the front-pintle platforms for the subject guns.[41]

On December 14, 1863, the Department transmitted to Palfrey a plan and sections of the barbette tier for his "guidance in erection of the gun platforms thereon."[42]

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39. Totten to Palfrey, Nov. 20, 1863, NA, RG 77, Ltrs. Sent, Chief Engineer.

40. Palfrey to Totten, Nov. 10, 1863, NA, RG 77, Ltrs. Recd., Chief Engineer.

41. Totten to Palfrey, Nov. 30, 1863, NA, RG 77, Ltrs. Sent, Chief Engineer.

42. Totten to Palfrey, Dec. 14, 1863, NA, RG 77, Ltrs. Sent, Chief Engineer; "Fort on Ship Island, Miss., Plans, Showing Arrangement of Traverse Stones in the Barbette Tier, as accurately as could be determined by the General Plan in Office of U.S. Engineer Agency, New York." A copy of the subject plan is on file at the Mississippi Unit, GUIS.

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3. Department Calls for Major Changes to the Barbette Tier

On August 6, 1864, Chief Engineer Delafield notified Captain Palfrey that a Board of Engineers, appointed by Secretary of War Edwin M. Stanton on January 27, 1864, had reviewed the Ship Island plans, and had made recommendations incorporating lessons learned during the Civil War. Among these were: (a) the vulnerability of the masonry scarps of the Third System forts to the fire of heavy rifled guns; and (b) the need to increase the weight of the armament to cope with steam-powered ironclads.

The Board, on studying the Ship Island project, questioned the decision to emplace twenty-eight 10-inch barbette guns in a "constricted circular" area. They recommended that about one-half the number of platforms proposed be laid, and that earthen bombproof traverses be provided for every pair of guns. Should additional armament be required, it could be mounted behind adjacent sand hills.

The Board also concluded that the magazines and storerooms were insufficient, and the former "insecure" against projectiles crashing through the embrasures.

Palfrey was accordingly directed by the Department to review these points, and prepare a plan incorporating the Board's recommendations. Although the Secretary had not authorized suspension of work, "yet respect for the opinions of a Board composed of many of the senior members of the Corps," required that "the progress you shall make be upon such parts as will admit of modification and alternations in the event you find they can be advantageously introduced without pulling down existing work, and produce a more powerful offensive and defensive work than by finishing the existing plan."

As for himself, General Delafield concurred with the Board on the wisdom of introduction of "earthen parapets." In this respect, Delafield found that about eight feet of earth on the exterior slope, backed by six feet of masonry, would be as effective against heavy naval shells as "a full 18 feet earthen parapet." This could be achieved at the

Ship Island fort by modifying the profile as indicated on the attached sketch. Should this constrict too greatly the rampart's terreplein, a wrought iron gallery for communications could be constructed. Service magazines were indispensible with the new armament to be introduced, and must be placed on the rampart.

Five 13- or 15-inch guns, mounted on centre-pintle carriages, were deemed advisable for the fort, with the remainder to be 8- or 10-inch smoothbores or rifled guns on front-pintles. The unit of fire for each gun was 240 rounds.

It might be advantageous, Delafield added, to introduce batteries exterior to the fort.[43]

4. Plan for a Reduced but Heavier Armament is Adopted

On October 22, 1864, Palfrey transmitted to the Department for review and consideration a "Proposed Plan for Arrangement of Barbette of Fort for Ship Island." The service magazine entrances, he noted, would need additional protection, but this could be easily arranged once the plan was approved.

The first element, on which a decision was required, was the "small front pintle platforms."[44]

If this drawing were approved, Palfrey called on the Department to forward to the New York Engineer Agency a requisition for the necessary materials for center- and front-pintle platforms.[45]

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43. Delafield to Palfrey, Aug. 6, 1864, NA, RG 77, Ltrs. Sent, Chief Engineer; "Study of Modified Profile of Fort on Ship Island and other localities as a substitute for Masonry." A copy of this plan--labeled Drawer 84, Sheet 27-is on file at the Mississippi Unit, GUIS.

44. Palfrey to Delafield, Oct. 12, 1864, NA, RG 77, Ltrs. Recd., Chief Engineer. A copy of the subject plan is on file at the Mississippi Unit, GUIS.

45. Palfrey to Delafield, Oct. 29, 1864, NA, RG 77, Ltrs. Recd., Chief Engineer.

In mid-November, the Department, having approved the drawing, mailed to the Agency the subject requisitions.[46]

Then, on December 23, the Department transmitted to Captain Palfrey "a plan for the armament of the Fort on Ship Island; with modifications to cover both the land and water fronts from being battered in reverse."

Palfrey's attention was called to the long parados parallel with the curtain of the land front, crossing the entire work with its extremes projecting on the parapets as far as practicable without interferring with the adjacent guns.

Only two platforms for 13- or 15-inch guns had been introduced, because the existing rampart was not wide enough to admit a solid foundation for front-pintle guns of this caliber. The ten front-pintle platforms would answer for 10-inch rifled guns.

Palfrey was free to complete the fort's armament, leaving the extension of the terreplein of the rampart to be added, wherever ironwork was not so costly.

He was to observe the "peculiar trace of the breast-height [wall] intended to give the maximum thickness of parapet and as much traverse as practicable . . . for guns 22 feet from centre." This distance was the minimum. This limitation was dictated by the need to secure platform stones independent of each other--so that a shot destroying one platform would not necessarily put out of action an adjoining one.

Also enclosed were plans giving details for barbette platforms common to the 100-, 200-, and 300-pounder rifled guns, and 8- and 10-inch smoothbores for seacoast batteries.

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46. Delafield to Palfrey, Nov. 16, 1864, NA, RG 77, Ltrs. Sent, Chief Engineer.

A step to facilitate loading had been introduced for all barbette guns. Part of this step would be wood, on hinges, to be housed in time of peace, and raised or lowered at pleasure.[47]

5. Service Magazines are Substituted for Shell Vaults

The addition of service magazines on the barbette tier would involve important changes in configuration of the parapet. Palfrey therefore apprised the Chief Engineer that the fort had been "materially modified," in accordance with the Department's tracings of 1862 and December 1863. Consequently, a masonry parapet backed by earth had replaced the "simple masonry parapet." Although the one now called for was an improvement, part of the scarp had been laid-up to its full height, so Palfrey recommended its retention.

The shell vaults provided for were neither as safe nor as spacious as the recommended service magazines. Construction of service magazines, however, would eliminate one gun platform and materially interfere with the traverse of a second, whereas shell vaults mandated much narrower traverses. Materials for the vaults had already been ordered from the agency.

The first tier magazines and embrasures, Palfrey reminded the Department, had been finished so that the entrances could only be protected by the "interposed doors."

He argued that additional magazine space could best be provided by reinforcing several of the casemates in the projected counterscarp, rather than by adding service magazines.[48]

General Delafield, on reviewing the situation, directed Palfrey to allow the entire parapet to conform with the "earthen one

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47. Delafield to Palfrey, Dec. 23, 1864, NA, RG 77, Ltrs. Sent, Chief Engineer; "Fort on Ship Island, Plan and Sections of Barbette Tier." A copy of the subject plan is on file at the Mississippi Unit, GUIS.

48. Palfrey to Delafield, Sept. 2, 1864, NA, RG 77, Ltrs. Recd., Chief Engineer.

backed with masonry." Any materials taken down could be used elsewhere.

He considered it advisable to omit the shell vaults, substituting service magazines in the traverses, as the shell vaults, besides being expensive, would be open in the rear to an enemy's fire, greatly endangering the fort.[49]

6. Palfrey Vainly Seeks to Introduce Major Changes

Construction had reached a point where the proposed changes constituted a major problem. Palfrey, therefore, called for a slow down to permit a thorough review of the situation.

Recent experiences at Mobile Bay and the New Orleans forts, he reminded the Department, had demonstrated that masonry forts could not be depended upon to prevent passage of warships, especially ironclads. This would be a particular problem at Ship Island, where ships could navigate the channel without approaching nearer than two and one-half miles of the fort. Moreover, hostile vessels could concentrate their fire on the fort from many directions. Its circular shape and limited dimensions would cause all projectiles passing near the interior crest to take effect on the opposite terreplein. Several ships would be able to take all the barbette guns in reverse and soon silence them.

To cope with this situation, Palfrey recommended construction of parados around the rear of the terreplain, in addition to the traverses. Because the parados would of necessity be 8 feet high and 12 feet thick at the top, additional magazines and space would be required.

Palfrey suggested, as a viable alternative, the arching over of the entire parade with

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49. Delafield to Palfrey, Sept. 2, 1864, NA, RG 77, Ltrs. Sent, Chief Engineer.

> two systems of cylindrical arches (each system being of 22 uniform dimensions throughout, turned to form rectangular piers, the skewbacks of one system coming above the crowns of the other, and the two systems corresponding to the main casemate and larger casemate arches already built.

Ventilators covered with strong iron gratings would provide light and air, and the parade would have space for tents, magazines, traverses, ordnance, etc.

It was Palfrey's view that no guns could be mounted in the fort's vicinity, and the necessity for a demilune was thereby increased by diminishing the number of guns emplaced in the fort. Additional guns could be mounted on the sand hills near the lighthouse and on the "high ground at the W end of the beach."[50]

To illustrate his proposal, Palfrey, on October 8, submitted a sketch, with sections, for covering the fort's parade as casemates, leaving an area 12 feet wide in front of the guardroom doors and windows. If this arrangement were adopted, there would be no groined arches, all of them being cylindrical, although some of them would be cut obliquely at the head.[51]

Before the end of the month, Palfrey mailed to the Department a "Second Plan of Proposed Alternations in the Fort on Ship Island." The difference between this drawing and the first, as the Chief Engineer would perceive, was a change in the casemate arches. Except on the gorge, all the main casemate arches were to be conical. All quions were to be avoided.

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50. Palfrey to Delafield, Oct. 1, 1864, NA, RG 77, Ltrs. Recd., Chief Engineer.

51. Palfrey to Delafield, Oct. 8, 1864, NA, RG 77, Ltrs. Recd., Chief Engineer; "Plan of Proposed Alternations of the Fort on Ship Island." A copy of the subject plan, labeled Drawer 84, Sheet 30, is on file at the Mississippi Unit, GUIS.

Palfrey deemed this arrangement preferable to the one first submitted, because it provided more "air, light, dryness, freedom of communications symmetry, and facility for arranging" the gorge parados.[52]

Palfrey should have saved his time and energy, Chief Engineer Delafield found the proposed modifications of such magnitude that they must be submitted to the Board of Engineers for review, comment, and approval.

Priority, Delafield chided Palfrey, must be directed toward making "arrange-ments for mounting as many heavy guns as the case will permit, without interfering with modifications that may be adopted," because the fort's mission was to prevent a hostile fleet from occupying the anchorage as a rendezvous and the island as a depot for supplies. The development and deployment of ironclads and rams had somewhat modified this role, as these craft could sortie from Lake Ponchartrain and Mobile Bay to attack a fleet lying in the anchorage.[53]

7. Arranging the Half-Bastion Traverses

To enable his people to arrange correctly the traverses for protection of the centrepintle 15-inch Rodmans to be emplaced on the half-bastions, Captain Palfrey inquired, What is the horizontal distance from the centre of the pintle to the end of the chassis of the iron barbette carriage for a 15-inch Rodman? He also needed to know the greatest elevation of the breech above the horizontal plane through the axis of the trunnions, and whether the axis of the trunnions intersected the axis of the bore.[54]

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52. Palfrey to Delafield, Oct. 13, 1864, NA, RG 77, Ltrs. Recd., Chief Engineer. A copy of the subject drawing, labeled Drawer 84, Sheet 31 is on file at the Mississippi Unit, GUIS.

53. Delafield to Palfrey, Oct. 13, 1864, NA, RG 77, Ltrs. Sent, Chief Engineer.

54. Palfrey to Delafield, October 12, 1864, NA, RG 77, Ltrs. Recd., Chief Engineer.

To answer Palfrey's questions, Chief Engineer Delafield mailed him a drawing of a centre-pintle 15-inch Rodman carriage.[55]

E. Monthly & Annual Reports Detail the Construction History

1. Construction Accomplished in Fiscal Year 1863

During the 12 months ending June 30, 1863, the workforce had been engaged:

July 1862

Masons--Building scarp, small gun carriage recess arches, and piers; repairing embrasure sills; and laying concrete.

Carpenters--Building stables, scow, wharf, and office furniture.

Blacksmiths--Fabricating brick hammers, and bolts and clamps for wharf; repairing tools; and leading pipes for piers.

Laborers--Assisting artisans, breaking bricks, concreting, policing fort, and unloading vessels.

Engineer--Running the pile driver engine.[56]

August 1862

Masons--Laid-up piers III to XIII to 12' 6", pier XIV to 11' and pier XV to 6'; positioned horizontal drainage pipes from pier VII to XV, and the lower joint of vertical pipes of piers V to XV. They had superintended pouring concrete foundations for gun centres II to VI and the foundations of piers V to XV. They set the jambs and side irons for

55. Delafield to Palfrey, October 27, 1864, NA, RG 77, Ltrs. Sent, Chief Engineer.

56. Monthly Report of Operations, July 1862, NA, RG 77, Ltrs. Recd., Chief Engineer.

embrasures VIII to X; reinforced parade side of scarp between embrasures XVII and XX; and cut angle brick for embrasure jambs and pointed arch above embrasure VII.

Engineer--Ran and cared for engine.

Blacksmiths--Made, repaired, and sharpened tools; worked on embrasure irons; cut drain pipes to fit; and fabricated iron work for derrick.

Carpenters--Finished stables and wharf; built boathouse; repaired boat; got out planks for scow; and positioned roofing felt on barracks and storehouse.

Laborers--Assisted artisans; made and poured concrete; broke bricks; landed cargo and stored supplies; and laid concrete foundations for piers VII to XV and gun centers II to VI.[57]

September 1862

Masons--Laid-up piers XIV to XV to 12', exterior shell of scarp for casemates VIII-X to 16' 8, and the interior shell to 8" above intrados of main casemate arch; turned the arch of embrasures XI to XIII, where the intrados crown is at 13"; half turned the arch of embrasure XII, and commenced the arch of No. XIV; laid concrete foundations of pier XVI and those for traverse circles XI, XII and XV; laid stone for traverse circles II to VII and XIII to XIV; laid flagging for casemates III to VII, from scarp to horizontal drainge pipes; and positioned concrete foundations for shot furnace and flagging for casemates II to V.

Engineer--Worked on engine.

Carpenters--Built patterns and railway cars; laid railway track; built scow; and made derrick frames.

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57. Monthly Report of Operations, Aug. 1862, NA, RG 77, Ltrs. Recd., Chief Engineer.

Blacksmiths--Fabricated and repaired tools; fitted and painted embrasure irons; and shaped iron for wharf derrick.

Laborers--Assisted mechanics; mixed and laid concrete; dis-charged cargo; culled bricks; screened sand; graded railway right-of-way; and painted barracks roof.[58]

October 1862

Masons--Laid flagging at parade end of piers in casemates III to VII and to the large traverse arches as far as the south half of casemate XIV; positioned concrete for arches as far as embrasure XV and for piers to pier XXI; piers XVI and XVII were build to 12' and piers XVIII and XIX were started at the horizontal drain pipes; the scarp was built-up to 16' 8" to meet the gorge at the fort's mortheast angle; embrasures were leaded; and the shot furnace laid-up to the foot of the chimney.

Engineer--Operated engine.

Blacksmiths--Made and repaired tools; and leaded drain pipes and embrasures.

Carpenters--Made patterns; building scow and barges; repaired boat; and cut piles for rebuilding wharf.

Laborers--Assisted artisans; mixed concrete, screened sand; culled and carted bricks; and landed cargo.

The ship which brought to Ship Island from New York City the traverse irons and flagging was quarantined by the post commander for 12 days and further delayed by adverse winds.59

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58. Monthly Report of Operations, Sept. 1862, NA, RG 77, Ltrs. Recd., Chief Engineer.

59. Monthly Report of Operations, Oct. 1862, NA, RG 77, Ltrs. Recd., Chief Engineer.

November 1862

Masons--Laid-up all communication arches ready to receive main roof and arches of casemates between Nos. III and IX; completed flagging in casemates III to VI ready for curb; laid traverse stones in casemates XVII to XIX; finished shot furnace; and filled in scarp core with concrete to 15'.

Engineer--Ran engine.

Blacksmiths--Made and repaired tools; positioned traverse circles; and fabricated bolts.

Carpenters--Made patterns and centers for cisterns; roofed shot furnace; and positioned centers.

Laborers--Discharged cargo; assisted mechanics; mixed and poured concrete; screened sand; culled and carted bricks; and attended to mules.[60]

December 1862

Masons--Built-up scarp wall from 15' 6" to 19' 6" from south-east angle of gorge to casemate XIV; built piers between casemate I and II to 12'; set curb of casemates II to XVII; and laid flagging to outside of large traverse in casemates I, XX, and XXI.

Engineer--Ran engine.

Blacksmiths--Made and repaired tools; and laid both traverse circles in casemates III to XIV and the small circles in casemates I, II, and XV to XXI.

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60. Monthly Report of Operations, Nov. 1862, NA, RG 77, Ltrs. Recd., Chief Engineer.

Carpenters--Made patterns and centres for roof arches of casemates; repaired railway track; built cement shed; boxed drain well in fort; and set centres.

Laborers--Assisted artisans; dug well in fort; landed cargo; mixed concrete; and piled lumber and brick.[61]

January-June 1863

Masons--Built scarp wall and piers, drain well and magazine piers, and cisterns flanking sally port; pointed arches; cut brick; laid curbstone; turned roof arches; and culled brick.

Carpenters--Built and set centres; erected engine house; built and sank frames for drain, well, and cisterns; repaired barracks and storehouse; built bunks for masons; and completed scow.

Engineer--Ran engine and pumped cisterns and drawbridge well.

Blacksmiths--Made and repaired tools; laid traverse circles; hung and painted embrasure shutters; fabricated ironwork for sand batteries; and repaired drays.

Laborers--Assisted artisans; landed cargo; excavated for cistern drains, well, and drawbridge; mixed and poured concrete; piled lumber; screened sand; broke bricks; cut brick; laid foundations for drawbridge well, guardrooms, and magazines.[62]

Because of his multiple duties, heavy work load, and long absences from Ship Island, Captain Palfrey failed to submit an annual

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61. Monthly Report of Operations, Dec. 1862, NA, RG 77, Ltrs. Recd., Chief Engineer. On the 22d, the bark Templar, 30 days out of Bangor, Maine, landed a cargo of bricks.

62. Monthly Reports of Operations for Jan.-June 1863, NA, RG 77, Ltrs. Recd., Chief Engineer.

report for Fiscal Year 1863. He did, however, prepare and transmit an annual drawing, showing the condition of the fort on June 30, 1863.[63]

2. Construction Accomplished in Fiscal Year 1864

By June 30, 1864, the cisterns and casemate arches had been finished, but those in the guardrooms had not. The magazines, except a small portion of wood-work at the entrance of the southeast magazine, were completed. The casemate platforms were ready to receive their armament.

The circular scarp had been laid-up everywhere to 23' 6", and to 27' 6" without concrete backing for about one-third of its distance. The gorge was raised to 23' 6", and two of the three stair-towers laid-up to one-half their planned height.

Provided there were no unforeseen developments, Captain Palfrey forecast the fort's completion in Fiscal Year 1865.[64]

During the subject 12 months, materials had been expended for these objects.

Brickwork

Lake Brick	
In wall of land front below 23' 6"	43,438
In wall of land front above 23' 6"	6,208
Total lake brick	51,646
Red Brick	
In wall of guardrooms and magazines	333,984
In circular part of parade wall	51,312
In 2 large magazine arches	31,416
In 2 small magazine arches	11,440
In guardroom roof arch	63,336

63. Palfrey to Totten, Oct. 13, 1863, NA, RG 77, Ltrs. Recd., Chief Engineer. A copy of the subject plan is on file at the Mississippi Unit, GUIS.

64. Palfrey to Delafield, Oct. 3, 1864, NA, RG 77, Ltrs. Recd., Chief Engineer.

In entrance roof arch	21,567
In 8 casemates, arches, roof--21,156 x 8	169,240
In 2 flank casemates--27,965 x 2	55,930
In circular scarp from 19' 6" to 23' 6"	62,370
In circular scarp from 23' 6" to 27' 6"	21,870
In gallery arches at flank casemate	3,150
In stair-towers	32,010
Total amount of bricks laid,	909,279
or in cubic feet, allowing 20 bricks per cu. ft.	45,464
No. of bricks expended, allowing 5 percent for wastage in laying	945,743
Cement used in brickwork	1,500 barrels

18 casemate arches, 1 flank casemate arch, 3 gallerys, 4 windows, and 2 door arches were pointed during the year.

Cementing

	Cubic Feet
In arch covering	16,978
In parade wall backing	3,008
In scarp wall	1,520
In scarp wall filling	4,040
In pavement	1,119
In foundation of stair-towers	992
In gun platforms, shells, vaults, etc.	2,100
Total	29,757

Cement used in concreting	1,341 barrels
Shells employed in concreting	4,453 barrels
Brickbats used in concreting	2,976 barrels

Stonework

No. of steps laid in stair-towers	33
Flagging in flank casemate	945 sq. ft.
9-inch curbing	64.5 sq. ft.

Woodwork of Fort

The two magazines had been furred, lined, floored, and finished, except a small area at the entrance of the southeast magazine.

The quarters part of the woodwork in the guardrooms' doors and windows was completed.

Earthwork

Some 1,300 cubic yards of earth were removed from the wet ditch, while 839 barrels of earth were received for the earthen slopes.

Temporary Work

All the temporary buildings, except the masons' quarters, had been shingled; the cement house had been reroofed; a two-story frame quarters (26' x 12') had been erected for the cooks and a 45' by 12' stone-cutters' shed. Fireplaces and chimneys had been built for the workmen's quarters.

An Engineers' wharf had been built, and the railway track extended to the Quartermaster wharf. Timber for the track had been felled on the east end of the island and rafted to the site.

Finally, a scow capable of transporting 36 tons had been completed.[65]

To supplement his annual report, Captain Palfrey submitted a "Plan of Fort on Ship Island, Exhibiting the Condition of the Work, June 30, 1864."[66]

3. Construction Accomplished in Fiscal Year 1865

Operations during the first three months of Fiscal Year 1865 were limited to completion of the three stair-towers; finishing the concrete arch covering and parade wall backing; and carrying up the entire scarp wall to a height of 27' 6", in accordance with the approved plans. The scarp backing was also laid-up to the same height for a length of about 200 feet, and to a height of 23' 6" for the remainder of the work.

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65. Ibid.

66. A copy of the subject drawing is on file at the Mississippi Unit, GUIS.

Considerable delay was experienced in securing the services of a competent applicateur to apply the mastic covering. The masonry of the barbette tier gun platforms and shell vaults was raised six inches above the surface of the arch covering, awaiting arrival of the applicateur. In late September, the applicateur reached Ship Island and began applying the mastic.[67]

Upon receipt of orders to suspend work on "all heavy masonry," pending formulation of and review of plans, most of the hands were laid off. The small force employed was kept busy cutting away and removing those sections of the scarp wall and backing that had been raised above 25' 6".

In November, Assistant Engineer Frizell reported that the force had been employed:

Brickmasons--Pointing arches of guardrooms and sally port; cutting down and rebuilding scarp to accommodate proposed change in plan of barbette tier; and in sundry small jobs.

No. of days' service in pointing arches	39.
No. of days' service in altering scarp	86.3
No. of days' service paving stair-towers	15.
No. of days' service in other work	23.
TOTAL	163.3

Stonecutters--Trimming arches, cutting away concrete to facilitate change order, jointing and setting pavement of stair-towers, and miscellaneous jobs.

No. of days' service spent trimming arches	33.5
No. of days' service cutting away concrete	21.
No. of days' service jointing and setting stair-tower pavement	54.
No. of days' involved in sundry work	19.
TOTAL	127.5

67. Annual Report of Ship Island Fort for Fiscal Year 1865, NA, RG 77, Ltrs. Recd., Chief Engineer.

Carpenters--Repairing boat, making forms for concrete, and miscellaneous jobs.

No. of days' service in repair of boat	23.
No. of days' service in building forms	21.
No. of days' service in other work	41.
TOTAL	85.

Blacksmith--Making and repair of tools and miscellaneous jobs. 30.

Engineer--Attending, painting, cleaning, and repair of engine. 26.

Applicateur--Has done very little, because of uncertainity about proposed alterations of barbette tier.

Laborers--Assisting artisans, discharging and storing materials, etc.

No. of days' helping masons	64.1
No. of days' assisting carpenters	30.
No. of days' helping blacksmith	30.6
No. of days' assisting steam engineer	30.6
No. of days' discharging & storing cargo	305.2
No. of days' breaking brickbats and cutting firewood	98.
No. of days' attending mules	106.
No. of days' miscellaneous work	129.7
Total	794.2[68]

Late in November, upon receipt of word that Captain Palfrey's plan had been approved, the workforce was reinforced. The subject plan called for construction, on the barbette tier, of seven front-pintle platforms for 10-inch guns, three front-pintle platforms for 10-inch Rodmans, and two centre-pintle platforms for the giant 50,000-pound 15-inch Rodmans. These guns were to be shielded by an earth and masonry parapet, to be 18 feet thick. There was to be a

68. Monthly Report of Operations for Nov. 1864 for Ship Island Fort, NA, RG 77, Ltrs. Recd., Chief Engineer.

traverse for every two guns, except the three 10-inch guns on the gorge, which would not be separated by a traverse. Details for the extension of the rampart dictated by adoption of the front-pintle 10-inch platform would be considered later.

From December through the third week of January work was pushed. Stonecutters were turned to altering the coping previously prepared for the parade wall. Pipes were positioned to facilitate drainage of the exterior parapet slope. The concrete masonry, over the circular rampart, was raised sufficiently to receive the stone and brickwork of the gun platforms and breast-height wall. The mastic roofing, leading, and culvert arches of this portion of the terreplein were completed, and the entire surface covered with dry brickwork, preparatory to receiving its "final covering of earth."

Receipt of Chief Engineer Delafield's letter of December 23 and the enclosed plan caused Captain Palfrey to close down the project briefly. The new plan called for "an entirely different arrangement" of the barbette tier, with long parados parallel with the curtain. Such a change dictated "a range of heavy arches for the parados' support."

Captain Palfrey and Assistant Engineer Frizell promptly arranged the details of the piers and arches for support of the parados, and work was resumed in early February. Construction was also commenced upon the gorge parapet and gun platforms.[69]

In February and March 1865, the workforce was employed:

Masons and Stonecutters--They completed the stonework for gun platforms Nos. 13 and 14 and two brick traverses shielding a magazine; commenced building the piers, centre arches, and skewback to support the parados; set and pointed scarp coping; laid parade coping; altered traverse stones as called for by new plan; and jointed and flagged gun platforms.

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69. Annual Report of Ship Island Fort for Fiscal Year 1865, NA, RG 77, Ltrs. Recd., Chief Engineer.

Carpenters--Built centers and extended and repaired wharf.

Blacksmiths--Repaired steam engine and tools.

Engineer--Took care of steam engine

Laborers--Employed assisting mechanics, rebuilding wharf, concreting, and preparing materials.[70]

By April, details for the circular portion of the barbette tier, in reference to drainage and other particulars, had been developed. Work was then resumed on these features. The dry brickwork, masonry of gun platforms, mastic roofing, leading, and culvert arches were removed, and construction resumed in accordance with the approved plan.

During the month, the masons completed their work connected with the drawbridge-well, piers, etc., which had been delayed awaiting receipt of stone and ironwork.[71]

In May and June, the masons set granite for the 10-inch gun platforms; laid-up northeast bastion and circular front breast-height wall; and steps around the platform of the southeast 15-inch gun. Stonecutters prepared bluestone steps for recesses in front of the gun platforms; trimmed, drilled, and bolted granite for gun platforms; and fitted the platforms' bluestone flagging. The carpenters fashioned centers; built boxing for concrete; and repaired the wharf, quarters, tools, buoys, etc. The blacksmiths took up and replaced a number of traverse irons; fabricated bolts for gun platforms; and repaired tools.

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70. Monthly Reports of Operations for Feb. & March 1865 for Ship Island Fort, NA, RG 77, Ltrs. Recd., Chief Engineer.

71. Annual Report of Ship Island Fort for Fiscal Year 1865, NA, RG 77, Ltrs. Recd., Chief Engineer.

The engineer attended to the steam engine. The laborers, besides assisting the mechanics, prepared materials and laid concrete.[72]

All the stone required by the 1857 plan of the fort had been received from the New York Agency, by the time the new scheme for the barbette tier was adopted. Most of this stone could be used in the new work, with some alterations. The traverse stones for the 10-inch platforms had to be recut; the flagging, steps, etc., of the service magazines could be employed as steps for the gun platforms; the parade wall coping had been used to cope the scarp wall; and a temporary coping of brick built for the parade wall.[73]

To detail graphically what had been accomplished in the 12 months, ending June 30, 1865, the superintending engineer prepared and submitted an annual drawing.[74]

During Fiscal Year 1865, the labor force had accomplished:

Brickwork

60' parade wall (21' 6") to (24')	4,800
445' scarp wall (23' 6") to (27' 6")	64,080
412' facing of gun platforms and parapet	39,552
166.5 running feet culvert arches	12,987
32' 6" in height, circular stair-towers 10' int. 14' ext. dia.	58,812
piers and counter arches under parados	64,620
Breast-height wall	68,564
Dry brick laid over mastic	9,149
Traverses for protection of magazines	15,680
Total number of bricks laid	338,344

72. Monthly Reports of Operations for May-June 1865 for Ship Island Fort, NA, RG 77, Ltrs. Recd., Chief Engineer.

73. Annual Report of Ship Island Fort for Fiscal Year 1865, NA, RG 77, Ltrs. Recd., Chief Engineer.

74. "Fort on Ship Island Miss., State of Work, June 30, 1865," Drawer 84, Sheet 35. A copy of the subject drawing is on file at the Mississippi Unit, GUIS.

More than 60,000 bricks had been removed, because of alterations mandated by the Department to the barbette tier.

Stonework

	Cubic Feet
439 running feet scarp coping	1,317
12 10-inch gun platforms	990
Steps of stair-towers	252
Coping of stair-towers	167
Drawbridge stones	39
Flagging of stair-towers	127
Steps of 15-inch gun platforms	57
2 10-inch gun platforms (subsequently removed)	165
8 pintle stones (subsequently removed)	144
15 manhole stones for culverts (removed)	8
TOTAL	3,342

Concrete

	Cubic Feet
Arch covering over guardrooms and sally port	2,900
Parade wall backing	2,327
Scarp wall backing	8,144
Parapet from arch covering up to ref (25')	29,266
Gun platforms as at first laid out	2,077
Gun platforms as at present laid out	2,160
Foundations of piers for parados	912
Floor of guardrooms	1,440
Parapet at N.E. 15-inch gun platform	2,496
TOTAL	51,722

Woodwork

The only woodwork of a permanent character undertaken was completion of the lining of the southeast magazine, and "preparation of the framework and boarding" for the three stair-tower penthouses.

Roofing

	Square Feet
Inclined roof surface covered with asphalt	2,735
Vertical roof surface covered with asphalt	642
TOTAL	3,377
Sheet lead used in roofing	7,813 pounds

Sixteen hundred and seventy-nine square feet of mastic and 3,000 pounds of sheet lead had been removed from the barbette tier because of the change order.

Iron and Metal Work

All the drawbridge ironwork, "requiring to be permanently fixed to the masonry," had been set. Thirteen iron pipes, 11' 3" in length, for the drainage of the earthen parapet had been positioned.

Composition hooks for the drawbridge had been built into the entrance piers.

Temporary Work

To extend the wharf into deeper water, an addition had been made to the structure. The rowboat had been rebuilt and one of the scows beached and caulked.[75]

F. Palfrey and the Department Cope with Various Problems

A number of unforeseen problems were encountered by Captain Palfrey in the months between June 30, 1862, and July 1, 1865.

1. Workman Loses His Life

On the evening of August 4, 1862, Bernard Knaup, one of the laborers, drowned in the Gulf while bathing.[76]

2. Delays in Shipment of Drainage Pipe Causes Shifts in Priorities

Early in November 1862, Palfrey complained to the Department that, failure by the New York Agency to ship the drainage pipe for the piers ordered in August, was frustrating plans to push

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75. Ibid.

76. Palfrey to Totten, Aug. 12, 1862, NA, RG 77, Ltrs. Recd., Chief Engineer.

construction of the magazines. It was impossible, he wrote General Totten, to lay the subject pier foundations till the adjacent cisterns were built, and he could not excavate for the cisterns until the small parade was flagged.

Finally, if the drawbridge were to have a pit, it should be built coincidentally with the cisterns.[77]

It was mid-winter before a vessel arrived with the pipe. After it was landed, the laborers began excavating for the cisterns.

3. Department Seeks to Pare the Cost of Concrete

Meanwhile, the Department had directed Palfrey to reduce the price of concrete. To do so, he was to visit New Orleans and any other place with a view of "obtaining shells or other needed materials at the lowest practicable prices."[78]

Palfrey was absent from Ship Island when this communication was delivered. When he returned from New Orleans in late January, he merely acknowledged its receipt.[79]

4. Difficulties in Securing Clay, Shells, and Loam Increase Costs and Cause Delays

In the autumn of 1863, the sluggishness with which materials for mixing concrete was delivered kept Captain Palfrey from reinforcing the workforce. The best local brickyards and shell banks were behind the enemy lines, on the north shores of Mississippi Sound and Lake Ponchartrain. He had succeeded in getting several vessels to go there to load shells and clay, but one of them had been captured and burned by the Rebels.

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77. Palfrey to Totten, Nov. 8, 1862, NA, RG 77, Ltrs. Recd., Chief Engineer.

78. Totten to Palfrey, Nov. 13, 1862, NA, RG 77, Ltrs. Sent, Chief Engineer.

79. Palfrey to Totten, Feb. 9, 1863, NA, RG 77, Ltrs. Recd., Chief Engineer.

Since Brig. Gen. Charles P. Stone had been named General Banks' chief of staff, the situation had improved, and more confidence was placed in Palfrey's "certificates." Concrete materials were now arriving as fast as they could be landed.

A similar difficulty was apprehended in securing earth for the parapets. If they were to use island sand, which blew and drifted like snow, they must first mix it with clay or loam, of which there was plenty on the Mississippi shore, but it was impossible to land there. They must accordingly obtain the needed loam from the banks of the Mississippi, at an increased cost for freight.[80]

5. Arrearages Plague Captain Palfrey

In the summer of 1864, the Treasury seemingly ignored Palfrey's requisitions for funds. On September 2, Palfrey called this situation to the attention of the Department. Many of the workmen, he explained, had been compelled to sell their receipts at a 25 percent discount. As all "necessaries of life are exorbitently dear" in New Orleans, they and their families must suffer.

Moreover, as the Corps' wages were among the lowest paid by the United States, news that he was in arreas made it difficult to engage workmen for the forts. Palfrey's vouchers were currently being discounted at from 8 to 10 percent.[81]

The Department took action to insure that hereinafter Palfrey's requisitions were promptly honored.

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80. Palfrey to Totten, Oct. 19, 1863, NA, RG 77, Ltrs. Recd., Chief Engineer.

81. Palfrey to Delafield, Sept. 2, 1864, NA, RG 77, Ltrs. Recd., Chief Engineer.

G. Labor Costs Continue to Escalate

1. Workforce and Wage Scale: June 30, 1863

As of June 30, 1863, there were employed on the project:

Capacity	Number	Time	Wage	Total
Draughtsman	1	1 mo.	$120.05	
		less provisions	1.11	$118,89
Clerk	1	1 mo.		
Overseer	1	1 mo.		
		less provisions	3.82	103.68
Mastermason	1	30 da.	3.00	
		less 17 da. board	.25	85.75
Master Carpenter	1	26 da.	3.06	
		less 30 da. board	.25	70.50
Master Blacksmith	1	19 da. 3	2.50	
		less 23 da. board	.25	42.50
Head - Laborer	1	27 da. 4 hrs.	1.75	48.47
Engineer	1	1 mo.		70.00
Mason	1	21 da.	2.00	42.00
Masons	10	178 da. 5 hrs.	2.16	374.85
Carpenters	4	78 da. 5 hrs.	1.80	140.40
Carpenters	4	103 da. 6 hrs.	2.00	207.20
Laborers	26	624 da. 5 hrs.	1.00	624.50
Laborers	41	880 da. 8 hrs.	1.10	968.88
Cook	1	3 da.	20.00	2.00
Cook	1	27 da.	20.00	18.00
Baker	1	1 mo.	20.00	18.00
- Assistant Cooks	4	1 mo.	14.60 ea.	56.00
- Assistant Cook	1	1 mo.	10.00	10.00
Blacksmith	1	26 da.	2.00	52.00
Laborer	1	1 mo.	2.00	20.00[82]

82. Monthly Report for Ship Island Fort, June 1863, NA, RG 77, Ltrs. Recd., Chief Engineer.

2. General Banks Seeks to Control Wages

In the late summer of 1863, Palfrey hired two good master mechanics. They quickly became dissatisfied with the wages allowed, and announced that they would quit and head for New Orleans, as soon as there was an improvement in the mainland construction industry.[83]

Department Commander Banks, at the close of 1863, introduced wage controls. He hoped that by standardizing wages, he could prevent skilled workmen from taking advantage of the higher wages paid by certain of the bureau. As of January 1, 1864, the pay scale for blue collar government employees in the Department would be:

Trade	Daily Wage
First class mechanics	$3.25
Second class mechanics	2.50
Third class mechanics	2.00
Laborers, without rations	1.50
Laborers, with rations	1.25

Hereinafter, all employees, in absence of special contracts, were to be held to service until properly discharged, and were to be exempted from the draft or compulsory military service while so engaged.

Any mechanics or laborers who deserted their employment, without proper discharge or malingered, were to be subject to the draft.[84]

Captain Palfrey, on transmitting a copy of these orders to Chief Engineer Totten, noted that, on works under his supervision, the wages designated were about 25 cents per day higher than those currently being paid. If he did not raise his rates, he would be compelled to conform or see his men lured off by higher pay elsewhere.

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83. Palfrey to Totten, Oct. 19, 1863, NA, RG 77, Ltrs. Recd., Chief Engineer.

84. General Order No. 88, Dec. 18, 1863, Hqs. Dept. of the Gulf, NA, RG 77, Ltrs. Recd., Chief Engineer.

He accordingly called for authority to raise the pay of first class mechanics to $3 per diem and their board, and his cooks from $20 to $30 per month and their rations.[85]

The Department approved the proposal. The subject raises were to be retroactive to January 1, 1864.

3. Palfrey Boosts the Pay of Key Personnel

Because he was not allowed to pay his master mechanics more than $3 per day and their board, Palfrey soon found himself in a bind. To escape this dilemma, he determined that his mastermason was agreeable to overseeing the stonecutters, in addition to his present duties, for an increase in his wages to $4 per diem, without his board. If the Department could not sanction this administrative change, Palfrey would be compelled to hire a master stonecutter at a wage of not less than $2.50 a day.

The Department promptly sanctioned Palfrey's suggestion.[86]

By the autumn of 1864, wages paid journeyman mechanics employed on the fort had been boosted from $2.50 to $2.75 per day and their board. During the same period, the pay of the master mechanics, excepting two "unusually good foremen," had not been upped. To increase the pay differential between the journeymen and masters, Captain Palfrey called for authority to increase the wages of his master craftsmen to $4 per diem and their board.

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85. Palfrey to Totten, Jan. 29, 1864, NA, RG 77, Ltrs. Recd., Chief Engineer.

86. Palfrey to Woodruff, June 3 & Delafield to Palfrey, June 23, 1864, NA, RG 77, Ltrs. Recd. & Sent, Chief Engineer.

Coincidentally, Palfrey sought permission to raise the pay of his Ship Island clerk to $125 per month without board.[87]

Chief Engineer Delafield approved these pay raises as outlined.[88]

4. Assistant Engineer Frizell Gets a Merited Raise

In mid-December 1864, Assistant Engineer Frizell broached the question of a raise. Upon reviewing the rolls, Frizell found that he was the "most undeserving person employed here, since I am the only one whose pay has not been increased" during the past 16 months. Although called on to superintend operations, there was no distinction in his pay and that of his principal subordinates. Such a differential was necessary, he argued, to give him the "respect and confidence" of those whom he supervised. There had been such a distinction when he reported for duty, but it had been nearly obliterated by recent changes in the pay scale. The blacksmith, along with the mastermason and master carpenter, taking into consideration their board, received a compensation equal to his.[89]

Reviewing the situation, Captain Palfrey agreed that justice was on Frizell's side. He, therefore, went to bat for his assistant. Writing the Department, Palfrey pointed out that, since his arrival from the North, Frizell had proved to be "reliable, capable, and highly educated," and a man that could not be replaced. As the press of business kept Palfrey in and around New Orleans, Frizell was usually in charge at Ship Island, holding much the same position as that formerly discharged by Palfrey, except for monetary matters.

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87. Palfrey to Delafield, Oct. 21, 1864, NA, RG 77, Ltrs. Recd., Chief Engineer. Although Palfrey had been given authority to pay the Ship Island clerk $125 per month in 1862, he had never availed himself of the opportunity, because he had not deemed the incumbents worthy of this sum.

88. Delafield to Palfrey, Nov. 2, 1864, NA, RG 77, Ltrs. Sent, Chief Engineer.

89. Frizell to Palfrey, Dec. 17, 1864, NA, RG 77, Ltrs. Recd., Chief Engineer.

The highest salary Palfrey was authorized to pay civil assistants was $125 per month, without board, while he was allowed to pay master mechanics $4 per diem and their rations. Each of the latter thus received an equivalent of $128 per month. To preserve a proper pay differential, Palfrey requested and was granted authority to pay Civil Assistant Frizell $150 per month, without board.[90]

5. Department Proposes to Employ Military Convicts

On Christmas Eve 1864, the Department called on its superintending engineers for a report on the number of military convicts that might be advantageously employed at the coastal defenses for which they were responsible.

Replying, Captain Palfrey reported that at the Ship Island fort 10 prisoners with ball and chain, or 25 without such restraints, could be employed with advantage. These men could be housed in the nearby stockade.[91]

H. Planning the Defense of the Gorge Front

1. Department Calls Attention to the Need

In mid-November 1862, the Department called Lieutenent Palfrey's attention to the note on "the drawing of the general plan and profile of the Fort," indicating that certain details of the project were incomplete and were to be supplied after its approval by the Department. Among these were details of the ditch and covered way.

The counterscarp, terreplein, and slopes of the covered way, Totten wrote, would have to be protected, but they should not be by paving as shown on the drawing, nor should the bottom of the ditch be covered with concrete. Palfrey was to call these matters to the

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90. Palfrey to Delafield, Dec. 21, 1864, & Delafield to Palfrey, Jan. 13, 1865, NA, RG 77, Ltrs. Recd. & Sent, Chief Engineer.

91. Delafield to Palfrey, Dec. 24, 1864 & Palfrey to Delafield, Feb. 9, 1865, NA, RG 77, Ltrs. Recd. & Sent, Chief Engineer.

Department's attention "in season to admit" of his "being furnished with proper instructions before commencing work thereon."[92]

When the months passed and he heard nothing further on the subject, Palfrey, in the summer of 1864, decided to take the initiative. The time seemed propitious, General Totten, who had kept a tight rein on his superintending engineers, was dead, and his successor might be more receptive to a subordinate's proposals. In addition, the fort proper, except for the barbette a tier and gateway, was in an advance stage of construction.

2. Palfrey Designs a Demilune

In the summer of 1864, Captain Palfrey prepared and submitted a project for construction of a demilune to protect the landward approach to the fort's gorge. Along with two sheets of drawings, he transmitted a covering letter to the Department.

On studying the drawings, Chief Engineer Delafield saw that the interior crest of the demilune formed an angle of 60 degrees with its exterior slope. The sides of the glacis were on the lines of "extreme traverse" of the fort's two "end casemate guns."

Casemates had been introduced into the demilune, because of the lack of bombproofs in the fort for stores and personnel. The demilune's barbette tier had been arranged for musketry alone, the breast-height wall rising from the casemate arches.

The structure's concrete surfaces were arranged to throw water over the rear walls onto the glacis, and the sides of the glacis were supported by a retaining wall.

Palfrey proposed to form the outside of the ditch enclosing the fort with the natural slope of the ground, and face it with concrete.

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92. Totten to Palfrey, Nov. 13, 1862, NA, RG 77, Ltrs. Sent, Chief Engineer.

If revetted with wood and kept open, the cost of maintenance, in view of the teredoes, would be considerable.[93]

On September 15, the Department put a hold on planning for the demilune by directing that its construction must await a study by the Board of Engineers, as to "the necessity of an exterior battery to compensate for the elimination of gun platforms for accommodation of traverses."[94]

I. Determining the Casemate Tier's Armament

Returning to Ship Island from New Orleans, in the first week of February 1863, Superintending Engineer Palfrey transmitted to the Department a plan of the fort. The first tier embrasures, he reported, were completed, and the work was now ready to receive its casemate guns. Insofar as he knew, no board had been convened to determine the caliber of the fort's armament.[95]

The Department failed to acknowledge, let alone answer Palfrey's letter.[96]

On March 9, 1864, the Department asked Palfrey for information on the condition of the fort's platforms and the number currently ready to receive their armament.[97]

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93. Palfrey to Totten, Aug. 12, 1864, NA, RG 77, Ltrs. Recd., Chief Engineer; "Project for a Demilune to Cover the Land Front of the Fort on Ship Island," two sheets, Nos. 28 & 29. Copies of these drawings are on file at the Mississippi Unit, GUIS.

94. Delafield to Palfrey, Sept. 15, 1864, NA, RG 77, Ltrs. Sent, Chief Engineer.

95. Palfrey to Totten, Feb. 2, 1863, NA, RG 77, Ltrs. Recd., Chief Engineer.

96. Registers of Letters Sent by Chief Engineer to Engineer Officers, Feb. 2 to Sept. 8, 1863, NA, RG 77.

97. Woodruff to Palfrey, March 9, 1864, NA, RG 77, Ltrs. Sent, Chief Engineer.

Responding to the Department's call, Palfrey reported that, at the Ship Island fort, there were 21 front-pintle casemate gun platforms and two flank howitzer platforms completed and ready to receive their armament.[98]

J. Capacity of the Fort's Magazines

Captain Palfrey, replying to a circular letter from the Department calling for data on the holding space of the magazines of the defenses for which he was responsible, reported that the maximum capacity of those at the Ship Island fort was 1,200 powder barrels. Their ordinary capacity was 900 barrels, while currently they housed 400 barrels of black powder.[99]

K. Protecting the Project's Steam Engine from the Elements

On his return from New Orleans, in February 1863, Palfrey saw that a shed had been erected to provide shelter for the steam engine. Since this had not been cleared with the Department, Palfrey dashed off a letter to General Totten, explaining what had happened. The Department found this a reasonable and necessary expenditure.[100]

L. Palfrey Proposes to Name the Work Fort Totten

On December 29, 1864, Captain Palfrey notified the Department that the fort was unnamed, which, especially in correspondence, had proved to be very inconvenient. He accordingly suggested that it be called "Fort Totten," as a demonstration of the respect and esteem the Corps had for its "late eminent chief."[101]

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98. Palfrey to Totten, March 25, 1864, NA, RG 77, Ltrs. Recd., Chief Engineer.

99. Palfrey to Delafield, May 24, 1865, NA, RG 77, Ltrs. Recd., Chief Engineer.

100. Palfrey to Totten, Feb. 10 & Totten to Palfrey, March 6, 1863, NA, RG 77, Ltrs. Recd & Sent, Chief Engineer.

101. Palfrey to Delafield, Dec. 29, 1864, NA, RG 77, Ltrs. Recd., Chief Engineer.

Chief Engineer Delafield, in tabling Palfrey's suggestion, announced that it would be more fitting to honor General Totten's memory by naming one of the Connecticut forts for him. Palfrey was urged to devote additional thought to the subject.[102]

Disappointed by the cavalier manner in which his suggestion had been received, Palfrey, who had been ordered into the field, dropped the subject.

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102. Delafield to Palfrey, Jan. 17, 1865, NA, RG 77, Ltrs. Sent, Chief Engineer.

VII. CONSTRUCTION COMES TO A HALT: 1865-70

A. Captain Wilson Becomes Superintending Engineer

1. Captain Palfrey Submits His Resignation

In the spring of 1865, after four years of war, the Confederacy collapsed. Following surrender of the Trans-Mississippi forces, in the fourth week of May, Captain Palfrey was ordered to Texas with Maj. Gen. Gordon Granger's XIII Corps. As has always happened with the end of a war, America rushed to demobilize. On June 30, Palfrey, who was considering leaving the Army, asked General Granger for permission to return to New Orleans so he could attend to his duties as engineer in charge of the Gulf Frontier masonry fortifications. There, he wished to remain while awaiting action of the War Department on the enclosed resignation of his appointment as lieutenant colonel of volunteers and acting inspector-general of the XIII Army Corps.[1]

General Granger vetoed Palfrey's return to New Orleans, "as the exigencies of the service are so great at present."[2] Undaunted by this rebuff, Palfrey wrote Chief Engineer Delafield.

He explained that when he had accepted his appointment to headquarters, XIII Corps, he had been assured by General Canby, General Granger's immediate superior, that his new duties would not interfere with his performing those as supervising engineer for the Gulf Frontier forts. Since then, however, the XIII Corps had been transferred from Mobile Bay to Texas, and it was no longer possible for him to wear two hats. He had, therefore, resigned his staff position with the XIII Corps, but it had been rejected.[3]

To enable General Delafield to understand his position, Palfrey explained that he had been appointed to the staff during the

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1. Palfrey to Emery, June 30, 1865, NA, RG 77, Ltrs. Recd., Chief Engineer. Maj. F.W. Emery was A.A.G., District of Texas.

2. Granger to Palfrey, June 30, 1865, NA, RG 77, Ltrs. Recd., Chief Engineer.

3. Palfrey to Emery, June 30, 1865, NA, RG 77, Ltrs. Recd., Chief Engineer.

Mobile Campaign. Now that the fighting was over, and the principal duties of the XIII Corps would be "civil or political," he judged "the exigencies of the service rather require that I should attend to the Permanent works in my charge than that I should remain in garrison with troops in Texas."[4]

Delafield went to bat for Captain Palfrey. On July 25, he recommended to the Adjutant General that Palfrey's resignation as lieutenant colonel be accepted, because his services were urgently needed as engineer in charge of the forts guarding the approaches to Mississippi Sound, Pensacola, Mobile, and New Orleans.[5]

Palfrey, by the time his resignation as lieutenant colonel had been accepted by the War Department, had determined to leave the Army. He submitted his resignation. When several weeks passed and he heard nothing further on the subject, he telegraphed the Chief Engineer, requesting "to know when I am to expect an order to transfer public property and to leave New Orleans." His resignation, he noted, "was uncon-ditional and its delay is doing me great injury."[6]

The Department's difficulty in finding a replacement for Palfrey was caused by almost one-half of the Corps' officers being on detached duty and not subject to its orders.[7] Palfrey's telegram, however, brought results. On September 13, he was directed to turn over to Capt. John M. Wilson his duties relating to Ship Island and the New Orleans forts and to Capt. William E. Merrill responsibility for the seacoast defenses of Pensacola and Mobile Bay.[8]

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4. Palfrey to Delafield, July 1, 1865, NA, RG 77, Ltrs. Recd., Chief Engineer.

5. Delafield to Palfrey, July 25, 1865, NA, RG 77, Ltrs. Sent, Chief Engineer.

6. Palfrey to Delafield, Aug. 26, 1865, NA, RG 77, Ltrs. Recd., Chief Engineer.

7. Delafield to Palfrey, Aug. 14, 1865, NA, RG 77, Ltrs. Sent, Chief Engineer.

8. Delafield to Palfrey, Sept. 13, 1865, NA, RG 77, Ltrs. Sent, Chief Engineer.

2. Enter Captain Wilson

Wilson, District of Columbia-born, had been graduated from the U.S. Military Academy as No. 12 in the class of 1860. Commissioned a bvt. 2d lieutenant in the artillery, he was ordered to Fort Monroe. In October, he was transferred to the Ordnance Department, and, in January 1861, was reassigned to the 2d U.S. Artillery. As a lieutenant of artillery, Wilson fought at 1st Manassas, Williamsburg, and at the Seven Days, winning brevets for gallanty at Gaines' Mill and Malvern Hill.

On July 24, 1862, Wilson was transferred to the Topographical Engineers, and as a member of that Corps was with the Army of the Potomac at South Mountain and Antietam. On March 30, 1863, he was ordered to West Point as Assistant Professor of Spanish. Some two months later, Wilson was promoted captain and assigned to the Corps of Engineers. In August, he was ordered to duty in the Department of the Tennessee, as superintending engineer in charge of construction of defensive works at Vicksburg, Memphis, and Natchez. On May 26, 1864, Wilson was detailed to General Canby's staff as an assistant inspector-general. While assigned to Canby's staff, Wilson was breveted for gallantry and meritorious service for his actions at Spanish Fort and during the Mobile Campaign.[9]

Captain Wilson, currently in New Orleans, had been recently relieved of duty on Canby's staff. On August 25, he had written Chief Engineer Delafield, requesting assignment as assistant engineer at one of the Third System Forts in the North or with the Engineer Battalion. His reasons for this request were twofold--he had had no experience with permanent works and was anxious to improve himself in his profession, and his wife was in poor health that was aggravated by the hot, humid Gulf Coast summers. Already, their only child had "died from the effects of this climate."[10]

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9. Cullum, Biographical Register, Vol. II, pp. 502-03.

10. Wilson to Delafield, Aug. 25, 1865, NA, RG 77, Ltrs. Recd., Chief Engineer.

Upon receipt of a telegram to relieve Captain Palfrey of his duties at Ship Island and in New Orleans, Captain Wilson was thrown into a quandary. First, the copy of the message had been garbled in transmission and read, "Relieve Colonel Palfrey at once of all his duties in this Department one ship is loaded and Defenses of New Orleans."[11] Although he suspected what was meant, Wilson wired the Department for confirmation. In addition, he had not yet been relieved from duty at Headquarters, Department of Louisiana, but expected to be on September 16.

Upon receipt of the garbled order, Wilson had informed Palfrey that he was to relieve Palfrey of some of his duties. Coincidentally, Wilson had asked Palfrey to prepare his papers to facilitate the transfer. He also wrote the Department, asking to be provided with a copy of the regulations governing the Corps of Engineers.[12]

It was late September before Wilson received a copy of a War Department order directing him to proceed to Ship Island and relieve Captain Palfrey, along with a corrected copy of the Chief Engineer's telegram of the 13th. Meanwhile, accompanied by Captain Palfrey, Wilson had spent several days on Ship Island and at the Mississippi River forts.

By the end of the first week of October, the necessary transfers had been finalized, and Palfrey started for Massachusetts. Reaching Boston on the 21st, Palfrey notified the Department that all future correspondence should be addressed to him there.[13]

3. Wilson Retains Palfrey's Staff

At this time there were employed at the fort, in either supervisory or clerical positions, these people, commanding these wages:

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11. Delafield to Wilson, Sept. 13 & Wilson to Delafield, Sept. 14, 1865, NA, RG 77, Ltrs. Recd. & Sent, Chief Engineer.

12. Wilson to Delafield, Sept. 16, 1865, NA, RG 77, Ltrs. Recd., Chief Engineer.

13. Wilson to Delafield, Sept. 30 & Palfrey to Delafield, Oct. 9 & 21, 1865, NA, RG 77, Ltrs. Recd., Chief Engineer.

an assistant engineer, $150 per month; a clerk, $110 per month; a foreman, $4 per day; a master carpenter, $3.50 per diem; a blacksmith, $3.50 per day; and an overseer, $2.50 per day.

Captain Wilson, in accordance with regulations, asked for and was given authority to retain these people on the payroll at their current wages.[14]

B. Captain McAlester Replaces Captain Wilson

Captain Wilson's tour as superintending engineer was brief. On December 23, 1865, he was ordered to proceed to Jefferson Barracks, Missouri, and assume the duties at the St. Louis Engineer Depot formerly exercised by Bvt. Maj J. B. Wheeler. Bvt. Brig. Gen. Miles McAlester would relieve Wilson of his responsibilities connected with the Ship Island fort and the defenses of New Orleans.[15]

These orders reached New Orleans on the day after Christmas, and Captain Wilson began putting his paperwork in order for transfer to his successor. Because of the communications bottleneck, it was January 4 before he could send his clerk to Ship Island to secure the necessary documents from Civil Engineer Frizell.

A norther now roared in and raged for ten days, and kept the clerk on the island for nearly two weeks. Then, when he did return, he nearly lost his life.

It was January 17 before the clerk was back in New Orleans. The next day, the 18th, Wilson finished transferring the monies and accounts to Captain McAlester, and boarded a St. Louis-bound steamboat.[16]

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14. Wilson to Delafield, Oct. 5 & Delafield to Wilson, Oct. 31, 1865, NA, RG 77, Ltrs. Recd. & Sent, Chief Engineer.

15. Delafield to Wilson, Dec. 23, 1865, NA, RG 77, Ltrs. Sent, Chief Engineer.

16. Wilson to Delafield, Jan. 31, 1866, NA, RG 77, Ltrs. Recd., Chief Engineer.

Wilson's replacement, Michigan-born Captain McAlester, had graduated from the United States Military Academy as No. 3 in the Class of 1856. Commissioned a brevet 2d lieutenant in the Corps of Engineers, McAlester was ordered to Fort Taylor as assistant engineer. From 1857 to 1858, he was detailed to the Board of Engineers for Atlantic Coast Defenses. He spent the next three years as superintending engineer for the defenses of the Narrows to New York Harbor. During the Civil War, McAlester served in 1861 and 62 with the Army of the Potomac, and, on October 30, 1862, was assigned to duty as Chief Engineer, Army of the Ohio. From September 1863 to June 1864, he was at the Military Academy as principal assistant professor of engineering. He returned to the field in June 1864 as Chief Engineer of the Military Division of West Mississippi. McAlester emerged from the war a brevet brigadier general of volunteers and captain of Engineers.[17]

C. Fiscal Year 1867 Appropriations and Program

On March 21, 1866, General Delafield cautioned Captain McAlester that the House of Representatives had reduced his request for funding construction of the Ship Island fort in Fiscal Year 1867 from $75,000 to $10,000. With Congress seemingly adverse to making big appropriations for Gulf Frontier forts, McAlester must restrict the force and materials on hand," so that the labors may at any time be promptly discontinued with the least practicable detriment to the works." The employees must be reduced as fast as circumstances allowed and no new engagements made until the Department knew Congress' pleasure.[18]

Acknowledging this news, McAlester advised the Department that he hoped to finish the masonry, if not the earthwork, by May 1.[19]

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17. Cullum, Biographical Register, Vol. II, pp. 419-420.

18. Delafield to McAlester, March 21, 1866, NA, RG 77, Ltrs. Sent, Chief Engineer; Delafield to Stanton, Nov. 4, 1865, NA, RG 77, Communications to Secretary of War and Congress.

19. McAlester to Delafield, March 28, 1866, NA, RG 77, Ltrs. Recd., Chief Engineer.

On June 12, President Andrew Johnson signed into law the Fortifications Bill enacted by the 1st Session of the 39th Congress, appropriating $10,000 to fund con-struction of the Ship Island fort in Fiscal Year 1867. For some unknown reason, the Department was derelict in apprising Captain McAlester. He first learned about this action on the 27th, when reading the Army and Naval Journal for June 23.

Writing the Department, McAlester asked, is this correct? If so, he must decide whether to retain or discharge his skeleton force.[20]

By telegraph the Department confirmed what McAlester had read.[21]

In accordance with procedures, McAlester now submitted a program for expenditure of the $10,000. He proposed to disburse these monies to complete the bastion platforms; the earthwork of the parapet, traverses, and parados; and the paving of the sally port. Involved would be an expendure of $3,000 per month.

Chief Engineer Andrew A. Humphreys promptly reviewed and approved the program as submitted.[22]

The 55-year-old Humphreys, a distinguished engineer, staff officer, and combat commander, had been named Chief Engineer, on August 8, to replace General Delafield, who had retired after more than 45 years service.[23]

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20. McAlester to Delafield, June 27, 1866, NA, RG 77, Ltrs. Recd., Chief Engineer.

21. Delafield to McAlester, July 5, 1866, NA, RG 77, Ltrs. Sent, Chief Engineer.

22. McAlester to Humphreys, Aug. 30 & Humphreys to McAlester, Sept. 6, 1866, NA, RG 77, Ltrs. Recd. & Sent, Chief Engineer.

23. Warner, Generals in Blue, pp. 117-18, 241.

D. Construction Guidelines and Change Orders for the Barbette Tier

1. Department Calls for Low Traverse Stones

Soon after Captain Wilson was named superintending engineer, the Department provided him with construction guidelines. He was to rely on the plans and instruc-tions turned over to him by Captain Palfrey, with this exception:

> The front-pintle gun traverse circles now existing, and rising a foot and more above the terreplein of the rampart, are not to be lowered until after the receipt of additions and modifications of the rear wheels and chassis now being tested by the Ordnance Department.

None of these traverse circles were to be displaced for lowering until the carriages were provided with suitable parts to adapt them to a low traverse stone.[24]

2. Department Provides Details on Arranging Parapets and Platforms for Low Traverse Stones

Early in 1866, the Department, in accordance with Captain McAlester's requests, mailed him two sheets of drawings, providing details of the planned sections of a parapet and front- and center-pintle platforms, with low traverse stones, for large caliber smoothbore and rifled guns.

These, along with supplementary notes, superceded all former instructions on the subject, except where platforms were nearly completed in accordance with former plans. If he had any doubts, he was to contact the Department.

Also enclosed for McAlester's information were extracts from the Board of Engineers' report relating to Fort Carroll and the

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24. Delafield to Wilson, Oct. 5, 1865, NA, RG 77, Ltrs. Sent, Chief Engineer.

Staten Island barbette batteries. In implementing his projects, Captain McAlester was to be careful "to do nothing inconsistent with or in opposition to the views of the Board."[25]

3. Department Directs That the Concrete Backing of the Compound Parapets Present a Vertical Front to Earthen Fill

On May 24, 1866, the Department transmitted to Captain McAlester a sketch detailing the "latest improvements in construction of compound parapets." Hereinafter, on the parts of the fort's parapet not finished, the workmen were to form masses of sand and concrete with a vertical front instead of an incline plane.

On those portions of the parapet not yet commenced, the depicted arrangement "will be followed." On sections begun, but not finished, it would be adopted as far as circumstances permitted. In either case, the essential feature of the arrangement would be observed, namely the front of the concrete mass to be vertical, not inclined.[26]

This order would have no effect, because the subject concrete work had been completed.

E. Department Defers Construction of a Ditch and Counterscarp

On December 27, 1865, the Department notified Captain McAlester that no cover-face or other outwork had been authorized, and his Ship Island operations were to focus on "completion of the main work in accordance with two plans sent by Captain Palfrey" on September 23, 1864.

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25. Delafield to McAlester, Dec. 15, 1865, & McAlester to Delafield, Jan. 22, 1866, NA, RG 77, Ltrs. Recd. & Sent, Chief Engineer.

26. Delafield to McAlester, May 24 & McAlester to Delafield, May 31, 1866, NA, RG 77, Ltrs. Recd. & Sent, Chief Engineer. A copy of the subject drawing, labeled Drawer 84, Sheet 40, is on file at the Mississippi Unit, GUIS.

The Chief Engineer, however, agreed on the desirability of an outwork to cover the gorge of the fort from the fire of a breeching battery, and McAlester's views on the subject were invited. He should also be thinking about a "suitable revetment for the counterscarp of the main work," and ways of keeping drifting sand out of the ditch.[27]

More than seven months passed before McAlester responded. When he did, he reminded the Department that the approved project called for a masonry counterscarp and a wet ditch to hold water to a depth of 6 feet. The character of the soil, however, was such as to "render these structures very costly." Moreover, it would be a constant struggle to keep the ditch free of drifting sand and debris in the wake of storms. Maintenance of the ditch seemed to dictate that its bottom be paved with heavy stone or be concreted. To flush the ditch, either a long sluice or a pump would be required.

McAlester placed construction costs of such a ditch (including paving and a masonry counterscarp, but excluding the sluice) at $50,000.

If, however, it were decided to restrict the ditch to a structure about 60 feet long and 30 feet wide fronting the sally port, it could be accomplished for $6,000. This figure included a masonry counterscarp and end revetments; paving the bottoms; and a bridge and drawbridge.[28]

Chief Engineer Humphreys, after reviewing McAlester's comments about the ditch, authorized him to defer work on it until receipt of additional orders. "The subject of any further work upon the fort" would be referred to the Board of Engineers.[29]

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27. Delafield to McAlester, Dec. 27, 1865, NA, RG 77, Ltrs. Sent, Chief Engineer.

28. McAlester to Delafield, Aug. 10, 1866, NA, RG 77, Ltrs. Recd., Chief Engineer.

29. Humphreys to McAlester, Dec. 18, 1866, NA, RG 77, Ltrs. Sent, Chief Engineer.

The failure of Congress to make an appropriation to complete construction of the fort made the question of the extent, type, and configuration of a ditch and counterscarp academic.

F. Fort Proper is Essentially Completed

1. Construction Accomplished in Fiscal Year 1866

In July 1865, work was commenced and accelerated on turning the arches supporting the parados. By September, the breast-height wall, the culvert arches under the terreplein, and the mastic covering of the roof surfaces of the casemate arches were finished. October saw the arches supporting the parados and the scarp coping completed.[30]

By the end of November, the walls of the service magazines, stair-towers, and passages leading from the stair-towers to the service magazines had been completed, as had the flagging of the service magazines and the flagging of the steps and passages. Entrance steps to the central and southeast service magazines had been laid.

Considerable progress had been made in turning the arches of the service magazines.

The concrete masonry of the parapet had been finished, and progress made in applying mastic thereon.

The earth covering of the barbette tier had been applied over the guardrooms, sally port, and for about half the circular rampart to a depth to permit laying the concrete foundations of the traverse circles.

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30. Annual Report of Operations at the Fort on Ship Island for Fiscal Year 1866, NA, RG 77, Ltrs. Recd., Chief Engineer; Executive Documents, Printed by Order of the House of Representatives During the 2d Session of the 39th Congress (Washington, 1867), Serial 1285, p. 429.

By early December, the concrete masonry of the parapet and of the foundations of five barbette platforms for 10-inch guns was completed.[31]

Progress was retarded from December through February by failure of the New York Agency to promptly ship needed building materials.

In March, 370 feet of parade coping, one 15-inch gun platform, foundations for five barbette platforms for smaller caliber cannon, the service magazines, and the revetment walls of the parados and traverses were finished.[32]

In April, the main culvert was completed as far as the angle of the southeast bastion, leaving only the portion fronting the gorge to be finished. With the exception of fastening down the traverse irons and setting the pintles, the barbette tier was ready to be armed.

Most of the inner piers, supporting the casemate arches, had settled, and cracks had opened in 18 of these arches. Many of these cracks extended only a few inches from the spring line, but in several "the cracks nearly reached the crown and had opened to 1/16 of an inch.

In May, the large valley culvert, except for some 70 lineal feet, was finished. The embankment of the parapet had been "partially completed from the angle of the NE bastion to the angle of the SE bastion." Because of the small amount of earth on hand, only enough had been placed upon the parapet to prevent sand from being carried away by wind and rain and damage to the mastic.

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31. Monthly Report of Operations at Ship Island Fort for Nov. 1865; Annual Report of Operations at Ship Island Fort for Fiscal Year 1866, NA, RG 77, Ltrs. Recd., Chief Engineer.

32. Monthly Reports of Operations for Dec. 1865-March 1866, at Ship Island Fort, NA, RG 77, Ltrs. Recd., Chief Engineer.

Most of the appropriation for Fiscal Year 1866 had been obligated by April 30, and Captain McAlester was compelled to lay-off all the employees, except the master masons, master carpenter, master blacksmith, superintendent-overseer, and five laborers. The labor force was accordingly reinforced by military convicts doing time in the Ship Island stockade, and, by June 30, McAlester reported that all culvert arches and their mastic coverings were completed, and the terreplein graded.[33]

During the subject 12 months, the workmen had been employed:

The masons had laid-up the southwest groined arches, arches to support the parados, the small culvert arches over the casemates, and the large valley culvert; built the breast-height wall, steps of the southeast bastion 15-inch gun platform, service magazines, drains to connect the old masonry with the new, the walls of the stair-towers and adjacent passages; set bluestone flagging of the 10-inch gun platforms, the flagging steps of breast-height wall opposite the 10-inch gun platforms, "hooks" for the sustaining walls of parados, 15-inch gun platform extension steps, scarp coping and traverse stones; pointed the parade arches and traverse walls; prepared surfaces of concrete for mastic; partially paved sally port; and laid dry brick over mastic.

The carpenters had built and positioned centres and boxing for concrete; rebuilt wharf; repaired quarters, tools, wheelbarrows, etc.; and attended to jobbing and miscellaneous repairs.

The stonecutters had altered traverse stones for 10-inch gun platforms; trimmed and jointed gun platform steps; drilled bolt holes for traverse circles; jointed scarp coping, stone and pintles for 15-inch gun platforms, and passageway flagging under parados; readied steps and

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33. Monthly Reports of Operations at Ship Island Fort for April-June 1866; Annual Report of Operations at Ship Island Fort for Fiscal Year 1866, NA, RG 77, Ltrs. Recd., Chief Engineer.

flagging for service magazines and 10-inch gun platforms; dressed flagging; lewised and jointed traverse stones for 15-inch gun platforms; and split stone for paving postern.

The blacksmiths had repaired tools, engine, machinery, etc., and laid traverse circles.

The steam engineer had attended the engine.

The applicateur had applied mastic to the ramparts, terreplein, and parapets.

The laborers had assisted the artisans; received and prepared materials; mixed and laid concrete; drove piles for wharf; hauled and positioned earth fill for barbette tier; collected and broke brickbats for aggregate; rafted logs; cut firewood; cared for mules; served as watchmen; attended derrick and steam engine; drew water; embanked parapet and parados; and laid dry brick over mastic.[34]

2. Work Accomplished in Fiscal Year 1867

Efforts to complete the embanking and sodding of the parapets, parados, and terreplein were frustrated, in August 1866, by an accident to the wharf on the 18th. To effect necessary repairs to insure early receipt of materials, round-the-clock working parties were turned out. Nevertheless, it was the 29th before the wharf was again open for traffic. Meanwhile, the concreting of the passageways under the parados had been completed, preparatory for flagging.

During September, the embanking of the parapets, parados, and traverses was finished; the 10-inch barbette gun platforms prepared to receive their armament; while the 21 casemate and 2 flanking howitzer platforms were nearly ready for their guns; extension steps had been positioned at the 10-inch barbette tier gun platforms; and the guardrooms' woodwork completed.

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34. Monthly Reports of Operations at Ship Island Fort for July 1865-June 1866, NA, RG 77, Ltrs. Recd., Chief Engineer.

By October 5, when work was secured and the hands paid off, the fort had been "completed as far as contemplated and made ready for its armament."[35]

During the abbrevated Fiscal Year 1867 construction season, the workforce was employed:

Masons -- They paved the postern; set curbstones at the entrance of passageways and in parados; reamed out and filled cracks in casemate arches; reset traverse stones; and pointed traverses.

Stonecutters -- They jointed flagging for passageways and under parados; and drilled holes in traverse stones of 10- and 15-inch gun platforms.

Carpenters -- They set profiles for embankment of parapets and parados; repaired wharf, boat, wheelbarrows, and quarters; laid flooring in south guardroom; built extension steps for 10-inch gun platforms; and attended to general repairs involved in their trade.

Blacksmiths -- They dressed stone cutting tools and made general repairs.

Laborers -- They had embanked parapets, parados, and traverses; assisted the mechanics; rafted logs; attended engine and derrick; laid dry brick over arches of south stair-tower and passageway leading to it; discharged vessels; cut sod for revetment of interior parapet slopes; cared for mules; repaired wharf; mixed and poured concrete; guarded materials; and secured Engineer property preparatory to a suspension of operations.[36]

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35. Monthly Reports of Operations for July-Oct. 1866, at the Ship Island Fort; Annual Report of Operations for Fiscal Year 1867 at the Ship Island Fort, NA, RG 77, Ltrs. Recd., Chief Engineer; Executive Documents, Printed by Order of the House of Representatives During the 2d Session of the 40th Congress (Washington, 1868), Serial 1325, p. 14.

36. Monthly Reports of Operations for July-Oct. 1866 at Ship Island Fort, NA, RG 77, Ltrs. Recd., Chief Engineer.

3. Closing Down the Project

In September 1866, before closing down the project, Captain McAlester sought and received authority to sell the four mules charged against the Ship Island appropriation.[37]

Superintending Engineer McAlester, upon suspending work, placed the fort and Engineer property in chage of a keeper.

Some two months later, McAlester asked for permission to pay for the services of the fort keeper out of the appropriation for "Contingencies." The fort, he reminded the Department, "as a water battery, is essentially finished ready for reception of its entire armament." But to bring the fort into condition for emplacement of its guns had mandated expenditure of all the $10,000 appropriated by the 1st Session of the 39th Congress, except about $90. This balance would have sufficed to pay the keeper through January 1 had he not received a bill for $96 contracted for in 1865 by Captain Palfrey.[38]

Responding to McAlester's plight, Chief Engineer Humphreys authorized him to pay the fort keeper out of the contingencies appropriation. Any other outstanding accounts charged against the project, now that the special appropriation had been exhausted, could also be charged to contingencies.[39]

G. General Delafield Calls for a Proposal to Modernize the Fort

On October 5, 1865, the Department directed Captain Wilson to prepare a study of a system of defense for Ship Island and the approaches to New Orleans and Mobile, being guided by his experiences during the Civil War, and a study of operations of "our army and navy against the permanent works we had constructed before the war, as well as the temporary areas erected by the rebels" during the conflict.

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37. McAlester to Humphreys, Sept. 3 & Humphreys to McAlester, Sept. 17, 1866, NA, RG 77, Ltrs. Recd. & Sent, Chief Engineer.

38. McAlester to Humphreys, Dec. 10, 1866, NA, RG 77, Ltrs. Recd., Chief Engineer.

39. Humphreys to McAlester, Dec. 18, 1866, NA, RG 77, Ltrs. Sent, Chief Engineer.

Among the important technological advances, to which attention was called, were the introduction of huge shellguns and rifled cannon of "great range," and the use of iron for protection of guns and gunners. These advances were to be considered, along with the value of existing permanent works and the ones occupied by the Federals in reducing them, as well as defense erected by the Confederates.

The employment of torpedoes for land and water defenses was to be weighted, together with barriers positioned to arrest passage of warships and hold them under the guns of the forts.

Wilson might discover that, in the years since the existing Second and Third System works had been constructed, changes had taken place in channels which would necessitate special considerations.

In relation to the works under his supervision, it seemed to the Department that the one on Ship Island needed additional accommodations for a garrison. Continous peacetime residence, within such circumscribed limits as at that fort, could be injurious to the health of the troops. He might, therefore, devise "some work covering the gorge," possessing the least possible masonry, that would house barracks and storerooms.[40]

Consequently, Wilson forwarded to the Department a "plan for an outwork to cover the land front of the fort . . . , and to furnish storehouses and quarters," prepared prior to Captain Palfrey's departure.

In case of extreme flood tides, Wilson warned, the depicted casemates would flood.

As for accommodations for a garrison, in time of peace, very elaborate quarters and barracks had been recently erected about 500 yards east of the fort.

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40. Delafield to Wilson, Oct. 5, 1865, NA, RG 77, Ltrs. Sent, Chief Engineer.

An outwork of some kind, Wilson reminded General Delafield, was needed to shield the fort's land front, which, as presently situated, would take but a short time to breach by an investing foe. He, however, could not improve on Palfrey's concept.[41]

H. Two 15-inch and Thirteen 10-inch Rodmans and Two 100-Pounder Parrotts are Landed

On November 24, 1865, Chief Engineer Delafield notified Captain Wilson that the Ordnance Department was shipping 13 10-inch smoothbores, with casemate carriages, and one 15-inch Rodman, with centre-pintle barbette carriage, to Ship Island.[42]

A vessel reached Ship Island with several guns in early February 1866. The Quartermaster's Wharf being in ruinous condition, a 10-inch Rodman was landed over the Engineers' Wharf. First Lieutenant D. W. Payne, McAlester's young assistant, was alarmed to see that the wharf, as a number of spiles had been eaten through by teredoes, sagged 6 inches under the weight of the 14,900-pound tube. What he saw satisfied him that the structure would collapse under the weight of the 50,000-pound 15-inch Rodman, scheduled to be sent ashore on the 3d.[43]

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41. Wilson to Delafield, Dec. 14, 1865, NA, RG 77, Ltrs. Recd., Chief Engineer.

42. Delafield to Alexander, Nov. 24, 1865, NA, RG 77, Ltrs. Sent, Chief Engineer. Some six months earlier, General Delafield had written the Ordnance Department, urging that certain weaponry be sent to Ship Island: three 10-inch smoothbores and their casemate carriages in August, and two 15-inch Rodmans with centre-pintle carriages in October. Delafield to Bache, May 17, 1865, NA, RG 77, Ltrs. Sent, Chief Engineer.

43. Payne to Fettis, Feb. 2 & Fettis to Sherman, Feb. 3, 1866, NA, RG 77, Ltrs. Recd., Chief Engineer. Capt. Jesse Fettis of the 10th U.S. Colored Heavy Artillery was the post commander. Payne, a New Yorker, had graduated from the U.S. Military Academy as No. 7 in the Class of 1865. Commissioned a 1st lieutenant in the 1st U.S. Artillery, he was ordered to New Orleans. Then, in mid-November, Payne was reassigned to the Corps of Engineers and ordered to report to Captain Wilson for duty at Ship Island. Cullum, Biographical Register, Vol. II, p. 610; Wilson to Delafield, Nov. 13, 1865, NA, RG 77, Ltrs. Recd., Chief Engineer.

Maj. Gen. Thomas W. Sherman, the district commander, held that the Engineers should take charge of and be responsible for landing and mounting the guns in the Ship Island fort. This was particularly true because Post Commander Jesse Fettis had received no order to take charge of the fort.[44]

Sherman's immediate superior, General Canby, agreed that responsibility for construction and armament of permanent fortifications rested with the Corps of Engineers. Any damage to Quartermaster property resulting from the landing of the big guns was to be assessed against the Corps.[45]

Captain McAlester accordingly directed Lieutenant Payne to see that the wharf was reinforced and the 15-inch Rodman sent ashore. Communicating this news to the Department, he sought guidance. In view of the stance taken by Generals Canby and Sherman, McAlester desired to know whether he should proceed with mounting the guns as rapidly as the platforms were completed and the guns and carriages delivered.[46]

The Department failed to respond to McAlester's inquiry, and the big gun was sent ashore and placed on blocking.[47]

In mid-May, General Delafield alerted McAlester that the Ordnance Department was about to ship additional guns to Ship Island.

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44. Sherman to Canby, Feb. 13, 1866, NA, RG 77, Ltrs. Recd., Chief Engineer.

45. Canby to McAlester, Feb. 13, 1866, NA, RG 77, Ltrs. Recd., Chief Engineer.

46. McAlester to Delafield, Feb. 13, 1866, NA, RG 77, Ltrs. Recd., Chief Engineer.

47. Registers of Letters Sent by Chief Engineer to Engineer Officers, Feb. 15-June 30, 1866, NA, RG 77.

Capt. William E. Merrill, who had recently returned from duty on the Gulf Frontier, had questioned whether the Engineers' Wharf would sustain the great weight of a huge 15-inch Rodman. Consequently, Delafield suggested that McAlester employ blocking to get the cannon off the vessel and skids to send them ashore.[48]

McAlester reassured the Department and contradicted Captain Merrill. A 15-inch Rodman, he explained, had been landed across the Engineers' Wharf, in late February, without the slightest risk or difficulty. The labor of landing the guns, however, must fall on the garrison, because the Engineer workforce had been slashed to six (an overseer, a foreman, and four laborers) on May 1.[49]

Once again, the Department failed to answer McAlester's letter.[50]

I. Mapping the West End of the Island

1. The Payne Drawings

Captain McAlester's first Ship Island assignment was to provide the Department with a map of all structures within "gun range of the fort," expecially the garrison's quarters.[51]

McAlester assigned this task to his young assistant--1st Lieutenant D.W. Payne. Inside of six weeks, Payne partially completed the project. On February 13, 1866, McAlester transmitted to the Department, Payne's "Plan of the Buildings on Ship Island."[52]

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48. Delafield to McAlester, May 12, 1866, NA, RG 77, Ltrs. Sent, Chief Engineer.

49. McAlester to Delafield, May 19, 1866, NA, RG 77, Ltrs. Recd., Chief Engineer.

50. Registers of Letters Sent by Chief Engineer to Engineer Officers, May 10-July 18, 1866, NA, RG 77.

51. Delafield to McAlester, Dec. 27, 1865, NA, RG 77, Ltrs. Sent, Chief Engineer.

52. McAlester to Delafield, Feb. 13, 1866, NA, RG 77, Ltrs. Recd., Chief Engineer. A copy of the subject plan, labeled Drawer 84, Sheet 39, is on file at the Mississippi Unit, GUIS.

Three months later, in mid-May, McAlester mailed to the Chief Engineer a second map prepared by Payne titled, "Topographical Sketch of Ship Island." This handsome drawing provided much appreciated detail on the entire island, including location of several of the Civil War sand batteries.[53]

2. The Hodges' Sketch

More than 34 months later, on December 7, 1868, Major Prime mailed to the Department a detailed "Sketch of the Fort on Ship Island." This map, drawn by Civil Engineer Henry K. Hodges, also showed the Engineer and Quartermaster buildings and the adjacent shore line.[54]

J. Efforts to Secure a Boat to Support Construction of the Fort Fail

On September 11, 1865, shortly before he was relieved as superintending engineer, Captain Palfrey called for authority to purchase a sailing vessel of not more than 30 tons, at a cost not to exceed $4,000, for use at Ship Island. To justify this expenditure, Palfrey pointed out that, with the end of the war, few vessels under charter to the Quartermaster General were now calling at the island. Henceforth, as before 1861, the only reliable means of communication would be by steamboat from New Orleans to Mississippi City or Biloxi, and between these towns and the island in a craft belonging to the fort.[55]

Chief Engineer Delafield accordingly contacted Maj. Charles H. Trumbull at Baltimore and directed him to make inquiries regarding the

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53. McAlester to Delafield, May 19, 1866, NA, RG 77, Ltrs. Recd., Chief Engineer. A copy of the subject map is on file at the Mississippi Unit, GUIS.

54. Prime to Humphreys, Dec. 7, 1868, NA, RG 77, Ltrs. Recd., Chief Engineer. A copy of the subject sketch, labeled Drawer 84, Sheet 42, is on file at the Mississippi Unit, GUIS.

55. Palfrey to Delafield, Sept. 11, 1865, NA, RG 77, Ltrs. Recd., Chief Engineer.

cost of sailing vessels built and employed on Chesapeake Bay. The Department, in this respect, was of the opinion that a craft of 50 tons would be more serviceable and require no more hands.[56]

Upon being apprised of this situation, Captain Wilson, who had succeeded Palfrey, assured the Department that he would contact Major Trumbull. Wilson was satisfied that the cost of a vessel in New Orleans would be much greater than in the Baltimore area.[57]

Major Trumbull found a ship-shape craft, drawing 7 feet when loaded. Captain Wilson, however, questioned whether this vessel would suffice, because a craft en route to Ship Island from New Orleans, traveling by way of Lake Pontchartrain should not, when loaded, draw more than 6 feet. To communicate with New Orleans such a Chesapeake vessel would have to navigate the round-about route by way of the Mississippi.

Relaying this information to the Department, Wilson noted that it was desirable that a vessel be attached to the fort, because large quantities of bricks, earth, shells, etc., would soon be needed, and freight rates were exorbitant.[58]

Pending purchase of a vessel, Wilson requested and was given authority by the Department to employ a private boat to visit the Ship Island fort and the other works for which he was responsible.[59]

Captain McAlester, on reporting for duty, was confronted by this continuing problem. Consequently, on January 28, 1866, he urged

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56. Delafield to Wilson, Sept. 26, 1865, NA, RG 77, Ltrs. Sent, Chief Engineer.

57. Wilson to Delafield, Oct. 7, 1865, NA, RG 77, Ltrs. Recd., Chief Engineer.

58. Delafield to Wilson, Oct. 14 & Wilson to Delafield, Oct. 27, 1865, NA, RG 77, Ltrs. Recd. & Sent, Chief Engineer.

59. Wilson to Delafield, Nov. 11, 1865, NA, RG 77, Ltrs. Recd., Chief Engineer.

that steps be taken promptly to purchase a vessel. This request was dictated by efficiency as well as economy. Freight rates between New Orleans and points on the Mississippi coast and river were high, frequently exceeding those between New York and New Orleans.[60]

The Department responded by authorizing McAlester to purchase from the Quartermaster Department at its New Orleans auction, scheduled for the last day of February, a vessel of from 100 to 150 tons.[61]

Visiting with the New Orleans Quartermaster, Capt. J.G. Chandler, McAlester was disappointed to learn that no schooners, suitable for either Ship Island or Key West, were available. The only schooner to be disposed of was Adams registered at 112 tons and drawing 7½ feet when loaded. Her draft was, therefore, too great for Ship Island.[62]

Confronted by this situation, Captain McAlester turned his attention to the North Atlantic coast to supply his need.[63]

In June, M. A. Mitchell of Baltimore offered to sell Captain McAlester the schooner Corridor for $6,000. The craft was reportedly well adopted to the waters of Mississippi Sound and the character of the Engineers' cargoes. As the Ship Island appropriation for Fiscal Year 1866 had been exhausted and the one to take effect on July 1, 1866, was limited to $10,000, there were financial problems. If the schooner were charged against the fort, only $4,000 would be left in that account. Consequently, McAlester recommended that Corridor be purchased from

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60. McAlester to Delafield, Jan. 28, 1866, NA, RG77, Ltrs. Recd., Chief Engineer.

61. Delafield to McAlester, Feb. 17, 1866, NA, RG 77, Ltrs. Sent, Chief Engineer.

62. McAlester to Delafield, Feb. 21 & 24, & Chandler to McAlester, March 14, 1866, NA, RG 77, Ltrs. Recd., Chief Engineer.

63. McAlester to Delafield, March 15, 1866, NA, RG 77, Ltrs. Recd., Chief Engineer.

either the appropriation for "Contingencies" or for "Permanent Platforms."[64]

The Department vetoed use of the cited appropriations for purchase of the schooner. This was fortunate, because the Fortifications Bill for Fiscal Year 1867 was to be the last one containing a line item for the Ship Island fort.

K. McAlester's Final 15 Months of Responsibility for the Ship Island Fort

In late August 1866, Captain McAlester applied for a 30-day leave. While absent, he would recall Lieutenant Payne from Ship Island to take charge of the New Orleans office. The furlough was approved, and McAlester left the Crescent City on September 6, en route to New York City. He returned to Louisiana in early October, and was in the office on November 1, the day proposals for improving the navigation of Southwest Pass were opened.[65]

When he submitted the prerequisite annual estimates of the appropriations required for defensive works under his supervision in Fiscal Year 1869, McAlester announced that no monies were required for the Ship Island fort.[66]

L. Major Prime's 19 Months as Superintending Engineer

1. Prime Returns to the Gulf Frontier and Prepares a Program

Captain McAlester, in September 1867, learned that he would soon be relieved of his responsibilities as superintending engineer of the Ship Island fort and for the defenses of Pensacola and Mobile

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64. Mitchell to McAlester, June 27 & McAlester to Delafield, July 6, 1866, NA, RG 77, Ltrs. Recd., Chief Engineer.

65. McAlester to Humphreys, Aug. 24 & Sept. 6, 1866, NA, RG 77, Ltrs. Recd. Chief Engineer.

66. McAlester to Humphreys, Sept. 18, 1867, NA, RG 77, Ltrs. Recd., Chief Engineer.

Bays. He would, however, remain on the Gulf Coast and continue to exercise his duties as superintending engineer for the defenses of New Orleans and improvements to navigation at the mouth of the Mississippi.[67]

McAlester's replacement was Maj. Frederick E. Prime, who had recently returned to duty from an extended leave. Upon reporting to Chief Engineer Humphreys, Prime learned that he had been named Senior Engineer on the Gulf Frontier and was ordered to Mobile.[68]

Major Prime reached Mobile from New York on November 26, 1867. He spent the next several weeks getting organized and inspecting the Mobile Bay defenses, the Ship Island fort, and the Pensacola works. On his return to Mobile from the Mississippi coast, in mid-December, Prime advised the Department that work should be resumed on the Ship Island fort. His object would be "to repair and complete the slopes, to complete the flagging on the land front and to overhaul the drainage of the work which is at present in bad condition, to complete the doors, etc., of the rooms on both sides of the entrance."

The amount of work called for was not great unless the Department wished to complete the moat.

In addition, there were at the fort four guns (two 15-inch Rodmans and two 100-pounder Parrotts) for the barbette tier and thirteen 10-inch Rodmans for the casemates, which should be mounted. If this were done by the troops, it should be supervised by the Engineers to protect the masonry.

There were confined in the stockade a "large number" of military convicts, whom the post commander wished to see employed. Consequently, Prime asked for authority to employee an overseer at $125

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67. Cullum, Biographical Register, Vol. III, p. 255; Military Service Register of Officers of the Engineer Corps, 1857-1894, NA, RG 77.

68. Humphreys to Prime, Sept. 1, 1867, NA, RG 77, Ltrs. Sent, Chief Engineer.

per month to supervise prisoners detailed to undertake approved projects.[69]

Chief Engineer Humphreys approved all the proposed projects, except construction of the ditch, as well as hire of the overseer. In regard to the ditch, Prime was to prepare and submit estimates for its completion.[70]

Before any measures were taken to resume operations at the fort, the Department notified Major Prime not to proceed on any of these projects, until such time as it was determined to mount the 15-inch Rodmans. Nothing was, therefore, done at the fort in Fiscal Year 1868 beyond having the keeper cut the grass and care for the slopes.[71]

Major Prime, on submitting estimates for construction funds for the defenses under his supervision in Fiscal Year 1870, deemed it inadvisable "to do anything that might interfere with any changes" that are to be proposed by the Board of Engineers.[72]

2. Updating the Drawings

On March 5, 1868, Chief Engineer Humphreys called on his superintending engineers to provide the Department with drawings of each of the permanent defenses for which they were responsible. Sheet No. 1 was to contain a map with a scale of one inch to fifty feet, with "the horizontal curves of the ground on which would be established the trace

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69. Prime to Humphreys, Dec. 14, 1867, NA, RG 77, Ltrs. Recd., Chief Engineer.

70. Humphreys to Prime, Dec. 20, 1867, NA, RG 77, Ltrs. Sent, Chief Engineer.

71. Annual Report of Operations for Fiscal Year 1868 at the Ship Island Fort, NA, RG 77, Ltrs. Recd., Chief Engineer; Executive Documents, Printed by Order of the House of Representatives During the 3d Session of the 40th Congress (Washington, 1869), Serial 1368, p. 18.

72. Prime to Humphreys, July 29, 1868, NA, RG 77, Ltrs. Recd., Chief Engineer.

and outlines of the works, including all dependent batteries." Sheet No. 2 was to exhibit a plan of the works, at a scale of one inch to twenty-five feet, and, if need be, to contain delinations of such portions of the works as the casemate tiers, scarp, counterscarp, galleries, etc., as might clutter the principal plan, if included thereon. Sheet No. 3 was to include sections and profiles, scaled one inch to ten feet, sufficient to exhibit general construction details.

A tracing of each of the aforementioned drawings was to be forwarded to the Department, but not at the same time as the original.

Any and all drawings, belonging to the fortifications, exhibiting the subject details or the manner in which the defenses had been built or were to be constructed, copies of which were not already on file at Engineer Headquarters, were to be trans-mitted as soon as practicable. To make the records "more perfect," it was General Humphreys' desire that original drawings be forwarded and tracings retained for use at the works.[73]

Responding to part of the circular, Major Prime, on December 7, transmitted to the Department a survey of Ship Island. No new drawings of the fort were prepared.[74]

3. Congress Compels the Department to Retrench

The 3d Session of the 40th Congress, meeting in the winter of 1868-69, refused to make an appropriation for construction of fortifications. The only money to fund operations of the Department on the Nation's coastal defenses for Fiscal Year 1870 would be that allotted by the Chief Engineer from the general appropriation for care and preservation of fortifications and contingencies. To enable him to

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73. Humphreys to Prime, March 5, 1868, NA, RG 77, Circulars and Office Memoranda, 1861-1871.

74. Prime to Humphreys, Dec. 7, 1868, NA, RG 77, Ltrs. Recd., Chief Engineer.

evaluate needs, before making any allotments for the next fiscal year, Chief Engineer Humphreys, on May 1, 1869, called on his project engineers for estimates of expenditures needed for maintenance of the defenses under their supervision in the period May 1, 1869-June 30, 1870.[75]

On May 11, Major Prime reported that, for the final two months of the fiscal year, he needed for Fort Pickens $140-$160 for sundries and $40 per month for pay of the fort keeper. To fund operations of his office, during these two months, $400 was required. This item was to be charged against all the works for which he was responsible--Forts Barrancas, Pickens, McRee, Morgan, and Gaines, and the fort on Ship Island.

For preservation and protection of the Ship Island fort in Fiscal Year 1870, there must be budgeted $40 per month for pay of the keeper and cost of his rations. In addition to the fort keepers, stationed at all the works except Fort Barrancas, Prime employed in his office, one clerk at $125 per month and an overseer at Fort McRee. If operations were completely shut down during the year, the clerk could be laid off.[76]

M. Captain Damrell as Acting Superintending Engineer

1. Damrell Takes Charge

Before Major Prime learned what his allotment would be in the forthcoming fiscal year, he received a leave of absence. His replacement was Capt. Andrew M. Damrell. A native of Massachusetts, Damrell had graduated No. 12 in the Class of 1864 from the U.S. Military Academy. Commissioned a 1st lieutenant, he was assigned to duty as an engineer with the Army of the Cumberland. He emerged from the war a brevet major. On August 8, 1865, Damrell was ordered to Willetts Point,

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75. Humphreys to Prime, May 1, 1869, NA, RG 77, Ltrs. Sent, Chief Engineer.

76. Prime to Humphreys, May 11, 1869, NA, RG 77, Ltrs. Recd., Chief Engineer.

New York, and on July 2, 1866, was named assistant engineer for construction of the fort at Sandy Hook. Fourteen months later, he was ordered to West Point as commander of the Engineer Detachment and instructor in Practical Military Engineering. On October 26, 1868, Captain Damrell had reported to Major Prime as his assistant.[77]

2. Maintenance and Protection in Fiscal Year 1869

To Captain Damrell fell the task of preparing the annual report for Fiscal Year 1869. During the past 12 months, he wrote the Department, one of the Engineer buildings had been seriously endangered by the gale of February 5 and 6, "which submerged part of the Island, east of the Fort."

At present, he continued, the fort's masonry and slopes were in good order, as was the woodwork in the casemates. The flagging on the left side of the sally port had not been laid, while the stone for same and other materials were "lying about in unsafe position."[78]

3. Department Calls on its Superintending Engineers to Charge More Projects to "Preservation"

On July 17, 1869, the Department notified its superintending engineers that, as the appropriation for "Contingencies" was much reduced for Fiscal Year 1870, they, where appropriate, would charge maintenance- and protection-oriented projects to the appropriation for "Preservation." Remittances already authorized would be made upon requisition.[79]

Captain Damrell, not understanding what was desired, inquired, do the funds turned over to me by Major Prime "belong to

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77. Cullum, Biographical Register, Vol. II, p. 603.

78. Annual Report of Operations for Ship Island Fort for Fiscal Year 1869, NA, RG 77, Ltrs. Recd., Chief Engineer.

79. Humphreys to Damrell, July 17, 1869, NA, RG 77, Ltrs. Sent, Chief Engineer.

'specific appropriation' for the works?" He also wished to know whether he would continue to make "expenditures from amount remaining on hand for payment to Fort Keepers, etc.," or if he should apply for remittances from the appropriation for "preservation and necessary repairs for the fortifications" to fund this activity.[80]

Writing Captain Damrell, Chief Engineer Humphreys explained that for a number of years there had been no "specific appropriation" for any of the works under your supervision, except for the fort on Ship Island. The funds received from Major Prime were from the general appropriations for "Contingencies of Fortifications." The object of the July 17 Circular was to spare the appropriation for "Contingencies" whenever that for "Repairs, etc.," could be applied. It was not intended that funds already drawn from the former appropriation be returned to the Treasury or their expenditure for legitimate projects stopped.

As Prime had been allotted funds from "Contingencies," Damrell would, unless otherwise instructed, continue to utilize them until they were exhausted. In the future, in making estimates, he would include sufficient information to enable the Department to judge whether the funds should be allocated from the appropriations for "Contingencies" or the "Preservation and Repair of Fortifications," or both.[81]

N. Major Reese's Ten Months as Superintending Engineer

1. Reese Reports for Duty

Major Prime, while on leave, was reassigned and would not return to the Gulf Frontier. His replacement was Maj. Chauncey B. Reese, no stranger to the area. A New Yorker, Reese had graduated from the U.S. Military Academy as No. 4 in the Class of 1859. Commissioned a brevet 2d Lieutenant of Engineers, Reese was ordered to Alabama as

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80. Damrell to Humphreys, July 30, 1869, NA, RG 77, Ltrs. Recd., Chief Engineer.

81. Humphreys to Damrell, Aug. 12, 1869, NA, RG 77, Ltrs. Sent, Chief Engineer.

assistant engineer at Fort Gaines. From January to November 1861, he served at Forts Jefferson and Pickens. Reese, on returning to Washington from Florida, fought with the Army of the Potomac until the summer of 1863, first as commander of an engineer company, then a battalion. After a brief tour of duty on the Sea Islands, near Charleston, Reese, on April 29, 1864, became Chief Engineer of the Army of the Tennessee. Reese emerged from the war a brevet brigadier general of volunteers and a major of Engineers.[82]

Major Reese reached Mobile on November 19, 1869, and relieved Captain Damrell as engineer-in-charge of the defenses of Pensacola and Mobile Bays and of the fort on Ship Island. Damrell reverted to his former billet as assistant engineer for these defenses.

2. The Ship Island 15-inch Rodmans

In late November 1869, the Department called on its superintending engineers to provide it with certain data on the huge 15-inch Rodmans at the works for which they were responsible.

Major Reese responded that at Ship Island there were:

Gun No.	Where Manufactured	Pintles	Is Gun Mounted
51	C.A. & Co.	None	No [83]
88	Fort Pitt Foundry	None	No

3. Engineers Agree to Placing the Fort in a Caretaker Status

On February 16, 1870, Chief Engineer Humphreys notified Major Reese that Cols. Horatio G. Wright and Zealous B. Tower would be visiting Ship Island in conjunction with the War Department proposal to withdraw the garrison. Provided there was time to consider modernization

82. Cullum, Biographical Register, Vol. II, pp. 482-83.

83. Reese to Humphreys, undated, NA, RG 77, Ltrs. Recd., Chief Engineer.

of the fort, Reese was to be associated with the two senior colonels to constitute a Board of Engineers for this purpose.[84]

Colonels Wright and Tower spent a day on Ship Island in the second week of March. They found the fort to be in good condition, and that "there is no other equally protected anchorage from Mobile westward admitting the same draft of ships if we except that under the Chandeliers which cannot be made secure by shore batteries." Consequently, they recommended the fort's retension in the defense system, and its armament to cope with "sea going vessels that can enter" Ship Island Pass.

As the fort did not afford protection to any city or naval yard, there was no need to provide for a peacetime garrison. It should, however, be "kept in order, be well armed and be ready to receive a garrison with all necessary supplies," whenever there was a threat of war with a naval power. Occupation of the fort and anchorage by an enemy squadron, they warned, would cause serious problems for United States naval forces on the Gulf and to the navigation of Mississippi Sound and the approaches to New Orleans by way of Lakes Borgne and Pontchartrain.[85]

The garrison was accordingly withdrawn from the island in April 1870, and the fort placed in charge of a keeper.

4. Maintenance and Protection in Fiscal Year 1870

The annual report of operations at the Ship Island fort for Fiscal Year 1870 is missing from the files.[86]

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84. Humphreys to Reese, Feb. 16, 1870, NA, RG 77, Ltrs. Sent, Chief Engineer.

85. Tower & Wright to Humphreys, March 12, 1870, NA, RG 77, Ltrs. Recd., Chief Engineer.

86. Registers of Letters Received by Chief Engineer from Engineer Officers, NA, RG 77.

5. Major Reese Dies

On September 23, 1870, 33-year-old Major Reese died of yellow fever at Mobile. Once again, Captain Damrell took charge of the office pending selecting and arrival of Reese's replacement.

VIII. THE FORT FROM 1870 TO 1895

A. Colonel Simpson as Superintending Engineer: 1870-1872

1. Maintenance and Protection in Fiscal Year 1871

Chief Engineer Humphreys selected one of the Corps' senior officers as Major Reese's replacement. The new superintending engineer for the defenses of Pensacola and Mobile Bays and the fort on Ship Island would be Lt. Col. James H. Simpson. He had graduated from the U.S. Military Academy as No. 18 in the Class of 1832. Commissioned a brevet 2d lieutenant, he was assigned to the 3d Artillery. After service in the Second Seminole War, Simpson, in July 1837, was commissioned a 1st lieutenant, in the Topographical Engineers. On August 12, 1861, he was commissioned colonel of the 4th New Jersey Volunteer Infantry, and led his regiment in McClellan's Peninsula and Seven Days' Campaigns. Simpson resigned his volunteer commission and returned to duty with the Engineers in August 1862. On June 1, 1863, he was promoted lieutenant colonel of Engineers.[1]

There would be scant work on the fortifications in fiscal year 1871, Colonel Simpson's first on the Gulf Frontier. On September 17, 1870, five days before Major Reese's death, the Department had allotted from "Contingencies" $1,800 for maintenance and protection of the Ship Island fort during the next nine months.[2]

Consequently, no maintenance projects were initiated at the Ship Island fort by the Engineers in the year ending June 30, 1871. During the subject 12 months, operations were restricted to preservation and care by the keeper of the public property.[3]

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1. Cullum, Biographical Register, Vol. I, pp. 405-06.

2. Humphreys to Reese, September 17, 1870, NA, RG 77, Ltrs. Sent, Chief Engineer.

3. Executive Documents, Printed by Order of the House of Representatives, During the 2d Session of the 42d Congress (Washington, 1872), Serial 1504, p. 21; Annual Report of Operations at Ship Island Fort for Fiscal Year 1871, NA, RG 77, Ltrs. Received, Chief Engineer.

2. Maintenance and Protection in Fiscal Year 1872

On March 10, 1871, the Department notified Colonel Simpson that President U.S. Grant had signed into law on the 3d an act appropriating for "Contingencies of Fortifications" $250,000. He would submit, as soon as practicable, an estimate of the sums needed from this appropriation in Fiscal Year 1872 for each of the "defensive works" under his supervision.[4]

Colonel Simpson, after reviewing the bleak financial situation and condition of the Gulf Frontier forts, wrote Chief Engineer Humphreys that in the forthcoming fiscal year, he needed at Ship Island for the keeper's salary, repairs, and the works' proportion of the pay of his clerk and messenger, $1,500.[5]

On May 17, Chief Engineer Humphreys approved the requested allotment.[6]

Again, as during the previous 12 months, no maintenance projects were undertaken at the fort. When he submitted his annual report for Fiscal Year 1872, Colonel Simpson noted that, in this period, work was limited to care and preservation of the fort. A gale on February 16, however, had demolished a storehouse in which some engineer property was stored. The keeper had salvaged and transferred the property into another building and cleaned up the debris.[7]

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4. Casey to Simpson, March 22, 1871, NA, RG 77 Ltrs. Sent, Chief Engineer.

5. Simpson to Humphreys, May 1, 1871, NA, RG 77, Ltrs. Recd., Chief Engineer.

6. Humphreys to Simpson, May 17, 1871, NA, RG 77, Ltrs. Sent, Chief Engineer.

7. Executive Documents Printed by Order of the House of Representatives, During the 3d Session of the 42d Congress (Washington, 1873), Serial 1559, pp. 19-20; Annual Report of Operations at Ship Island Fort for Fiscal Year 1872, NA, RG 77, Ltrs. Recd. Chief Engineer.

3. Maintenance and Protection in Fiscal Year 1873

On June 22, 1872, the Department notified Colonel Simpson that President Grant had signed into law an act passed by Congress appropriating $250,000 for "Contingencies of Fortifications." According to procedures, Simpson was to submit, as early as feasible, an estimate of monies needed from this appropriation in Fiscal Year 1873 for the defensive works for which he was responsible.[8]

On July 27, Colonel Simpson wrote the Department that for the Ship Island fort, during the subject months, he required $1,500 for the keeper's wages, the works' share of the clerk's and messenger's pay, and ordinary repairs.[9]

The Department responded by telegraph that there had been allotted from "Contingencies" the requested sum for Ship Island.[10]

On January 1, 1873, Colonel Simpson was relieved as Superintending Engineer by Lt. Col. W.F. Raynolds. Raynolds, in turn, was replaced by the office's longtime assistant, Captain Damrell, on April 7. Damrell, therefore, had the task of drafting the annual report for Fiscal Year 1873, accounting for expenditure of $1,500 in departmental funds. During the past 12 months, Damrell informed General Humphreys, maintenance at the Ship Island fort had been restricted to care and preservation of the public property stored there.[11]

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8. Casey to Simpson, June 22, 1872, NA, RG 77, Ltrs. Sent, Chief Engineer.

9. Simpson to Humphreys, July 27, 1872, NA, RG 77, Ltrs. Recd., Chief Engineer.

10. Casey to Simpson, August 8, 1872, NA, RG 77, Ltrs. Sent, Chief Engineer.

11. Executive Documents, Printed by Order of the House of Representatives for the 1st Session of the 43d Congress (Washington, 1874), Serial 1598, p.20; Annual Report of Operations at Ship Island Fort for Fiscal Year 1873, NA, RG 77, Ltrs. Recd., Chief Engineer.

B. Captain Damrell's First Three Years as Superintending Engineer

1. Damrell Learns the Ways of the Bureaucracy

On March 22, 1873, Major Raynolds, three weeks before he was relieved, informed General Humphreys that there was "no special work" programmed at the Ship Island fort. The only expenditures anticipated in Fiscal Year 1874 were for pay of the fort keeper, and such incidental cleaning up and light repairs as may be required. To provide for maintenance and protection of the five works (the fort on Ship Island and Forts Barrancas, Pickens, Morgan, and Gaines) for which the Mobile office was responsible, Raynolds estimated that $1,600 would be the average required for each.

As it was impossible to anticipate the extent of repairs which might be required at each of the forts, Major Raynolds recommended that the amount asked for be allotted in gross, or $8,000 for the five.[12]

Major Raynolds had transferred by the time Chief Engineer Humphreys replied. As Fort Barrancas was garrisoned, he informed Captain Damrell, the Department questioned making an allotment from the "Contingency Appropriation" for its maintenance in Fiscal Year 1874.[13]

Echoing his predecessor, Captain Damrell asked that the allotment for fortifications, under his supervision, be "a general one, without specifying a parti-cular amount for each." If this were impossible, and it were deemed adviseable to exclude Fort Barrancas, he urged that an additional sum be allotted for Fort Pickens, to be applied to Fort Barrancas for any repairs or work that may be needed during the next 12 months and called for by the post commander, as had occurred in Fiscal Year 1873.[14]

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12. Raynolds to Humphreys, March 22, 1873, NA, RG 77, Ltrs. Recd., Chief Engineer.

13. Casey to Damrell, May 23, 1873, NA, RG 77, Ltrs. Sent, Chief Engineer.

14. Damrell to Humphreys, May 27, 1873, NA, RG 77, Ltrs. Recd., Chief Engineer.

On June 2, the Department replied. It could not accept Damrell's reasoning because Chief Engineer Humphreys, desirous of economizing, believed that where posts were garrisoned, the troops should watch the government property belonging to all Departments. Damrell would review the subject, reporting "whether there are any circumstances that will prevent this oversight of the property by the garrison," which would compell the Corps to hire a watchman to prevent loss of its gear. If he considered a watchman necessary, he was to report the sum needed for his wages, along with the amount required for general repairs. In addition, he would give the monetary value of the subject property and his opinion as to "whether it may not be better economy to sell or transfer it to some other Engineer work or to some other Department of the Army."[15]

Captain Damrell dropped the subject, thereby accepting the Department's dictum as to the employment of fort keepers.

In Mid-July, Chief Engineer Humphreys asked Damrell to explain why his estimate of funds for contingencies was submitted for the entire year, rather than in monthly installments as needed to fund operations of his office.[16]

In explanation, Captain Damrell observed that he had merely followed the form used by Colonel Simpson, which had been approved by the Department on October 4, 1872.[17]

Replying, the Department gave no explanation of the rationale for the change in policy, but asked Damrell to forward estimates for fortifications under his supervision for which allotments had been

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15. Casey to Damrell, June 2, 1873, NA, RG 77, Ltrs. Sent, Chief Engineer.

16. Casey to Damrell, July 22, 1873, NA, RG 77, Ltrs. Sent, Chief Engineer.

17. Damrell to Humphreys, July 22, 1873, NA, RG 77, Ltrs. Recd., Chief Engineer.

made from "Contingencies" for one month at a time, stating the amount required for each defense. If it were necessary to make an estimate for a period in excess of one month, reasons must be cited.[18]

2. The "Virginius" Affair Momentarily Revives Interest in Coastal Defense

In the autumn of 1873, a crisis threatened war between the United States and Spain. On October 31, the United States merchantman Virginius was intercepted on the high seas off the coast of Jamaica by the Spanish gunboat Tornado. Virginius was suspected by the Spanish government of carrying arms and men to assist Cuban forces rebelling against the mother country. Virginius was brought into a Cuban port, and her American captain, 36 crewmen, and 16 passengers summarily executed. The victims included a number of United States citizens. Public indignation compelled the Grant Administration to prepare for war to avenge the "massacre" and free Cuba from Spanish tyranny.

On November 21, the War Department accordingly alerted Captain Damrell, along with other Gulf and Atlantic coast superintending engineers, "to use all possible dispatch in preparing all your works so as to be able to place every available gun now at them in the best positions for defense from sea-attack." It was believed that the forts contained more platforms than there were guns ready to mount. If, however, this were not the case, they were to proceed to position necessary platforms, and, if, after doing so, they still had unexpended funds on hand, they were to continue "to strengthen and increase the extent of the defenses in accordance with approved plans."

They were to report immediately: (a) the amount of funds available for each work; (b) the additional sum required to finish and put down needed platforms for the "disposable guns at your works"; and (c) the additional amount needed for "erection and preparation of such positions" as you deem "indispensible for an efficient defense."

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18. Humphreys to Damrell, July 28, 1873, NA, RG 77, Ltrs. Sent, Chief Engineer.

Damrell and his fellow engineers were authorized to employ "wooden platforms or any others that can be procured in the shortest time."[19]

Failing to receive a prompt reply from Damrell as to the monies required to place the five works under his supervision in condition to resist naval attack, Chief Engineer Humphreys telegraphed on December 1, "How much will you want?" [20]

On December 3, Damrell replied, "At least $60,000." [21]

Captain Damrell, meanwhile, had replied to the Department's November 21 letter. He reported that for the works under his supervision, he had on hand $5,513, of which $547,51 was in the Ship Island account. To finish and lay wooden platforms for the "disposable guns" at his forts, he needed $53,400. No monies, however, would be required at Ship Island, because all the gun platforms, both in the casemates and on the barbette tier, had been completed.[22]

A peaceful resolution of the Virginius affair resulted in the suspension of the crash construction program. It was established that Virginius was owned by Cuban revolutionaries and was illegally registered; that she had been carrying arms to Cuba; and was fraudulently flying the "stars and stripes." Although Spain refused to punish her officers who had carried out the seizure or salute the United States flag, she released Virginius' survivors and paid an indemnity of $80,000 to families of the American victims.

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19. Casey to Damrell, November 21, 1873, NA, RG 77, Ltrs. Sent, Chief Engineer.

20. Casey to Damrell, December 1, 1873, NA, RG 77, Ltrs. Recd., Chief Engineer.

21. Damrell to Humphreys, December 3, 1873, NA, RG 77, Ltrs. Recd., Chief Engineer.

22. Damrell to Humphreys, November 28, 1873, NA, RG 77, Ltrs. Recd., Chief Engineer.

3. Four Guns are Mounted on the Barbette Tier

During the six weeks, while the crisis was at its height, personnel from the Ordnance Department visited Ship Island and mounted on the barbette tier the two 15-inch Rodmans and two 100-pounder Parrotts and their iron carriages which had been on hand since 1865. The Rodmans were positioned on platforms Numbers 2 and 13 and the Parrotts on platforms Numbers 1 and 14. The strength of the fort's armament, however, was impaired by the absence of composition sockets for the carriages of the thirteen 10-inch Rodmans emplaced en casemate or platforms Numbers 6-18.[23]

The emplacement of the rifled Parrotts and the 50,000-pound Rodmans had been facilitated by construction, in September, of a "temporary bridge" across the drawbridge well. This project had been triggered by a complaint from Chief of Ordnance Alexander B. Dyer that these guns and their carriages were being damaged through exposure to the elements.[24]

4. Damrell Suggests Possible Names for the Fort

By circular letter, on April 9, 1874, the Department called on its superintending engineers to submit for consideration by the Secretary of War names for the unnamed works for which they were responsible.[25]

When he replied, Captain Damrell advised Chief Engineer Humphreys' that the Ship Island fort did not have an official name. To correct this situation, he enclosed a list of names anyone of which, he believed, would be appropriate. The list read:

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23. Annual Report of Operations at the Ship Island Fort in Fiscal Year 1874, NA, RG 77, Ltrs. Recd., Chief Engineer; Executive Documents, Printed by Order of the House of Representatives, During the 2d Session of the 43d Congress (Washington, 1875), Serial 1636, p. 25; McKee to Benét, March 29, 1874, NA, RG 156, Ltrs. Recd., Chief of Ordnance.

24. Parke to Damrell, August 13 & 23, & Damrell to Humphreys, September 22, 1873, NA, RG 77, Ltrs. Recd. & Sent, Chief Engineer.

25. Casey to Damrell, April 9, 1874, NA, RG 77, Ltrs. Sent, Chief Engineer.

Jonathan Williams
Joseph G. Swift
Walker K. Armistead
Charles Gratiot
Sylvanus Thayer
Joseph G. Totten
Edwin M. Stanton
Abraham Lincoln
William H. Seward
George H. Thomas
George G. Meade
Henry W. Halleck
Winfield Scott
John A. Rawlins
David G. Farragut
Richard Delafield
Mississippi, State of[26]

Either these names were deemed inapproporiate or the Department lost interest in the subject, because there was no follow-up.

5. Maintenance and Protection in Fiscal Year 1875

On May 18, 1874, Captain Damrell, responding to a call from the Department, transmitted estimates of sums from the appropriation for "Contingencies" required to fund operations for Fiscal Year 1875 at each of the defense works under his charge. For salary of the keeper at the Ship Island fort; its share of the pay of the clerk and messinger for the Mobile Office; and for ordinary repairs, $1,600 was needed.[27]

When he made the allotments, Chief Engineer Humphreys budgeted $1,600 for the fort.[28]

Accordingly, operations were confined during the year ending June 30, 1875, to care and preservation of the public property. When he filed his annual report for the fiscal year, Captain Damrell

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26. Damrell to Humphreys, May 11, 1874, NA, RG 77, Ltrs. Recd., Chief Engineer.

27. Damrell to Humphreys, May 18, 1874, NA, RG 77, Ltrs. Recd., Chief Engineers.

28. Casey to Damrell, June 12, 1874, NA, RG 77, Ltrs. Sent, Chief Engineer.

informed the Department that the Ship Island fort was "about the same condition as on the 1st of July 1874."[29]

6. Keeper is Provided a Yawl

In mid-March 1875, Captain Damrell called for authority to purchase a "suitable boat" for use of the keeper, at a cost not to exceed $150. Such an expenditure was justified by these factors: (a) the isolated situation of the island; and (b) the high cost of passage from the island to Mississippi City, $7.00 per round trip, where the keeper had to travel to purchase his groceries and pick-up his mail. Heretofore, the keeper had depended on the lighthouse service's boat. Recently, the fort keeper had clashed with lighthouse keeper James McCabe.[30]

The Department promptly approved the proposal.[31]

But, on further investigation, Captain Damrell learned that an 18-foot yawl, of the type desired, cost $225, including freight, if built in John Mahoney's Algiers, Louisiana, yard.[32]

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29. Annual Report of Operations at the Ship Island Fort for Fiscal Year 1875, NA, RG 77, Ltrs. Recd., Chief Engineer; Executive Documents, Printed by Order of the House of Representatives, During the 1st Session of the 44th Congress (Washington, 1876), Serial 1675, p. 25.

30. Damrell to Humphreys, March 12, 1875, NA, RG 77, Ltrs. Recd., Chief Engineer.

31. Casey to Damrell, March 19, 1875, NA, RG 77, Ltrs. Sent, Chief Engineer.

32. Damrell to Humphreys, April 17 & Mahoney to Damrell, April 16, 1875, NA, RG 77, Ltrs. Recd., Chief Engineer. The cost breakdown was: one yawl boat, 18-foot long, beam 5-feet 6-inch, and depth 22-inches. Juniper plank copper fastened and revitted with copper (illegible), $127.50; center case and center-board, $10.75; 2 coats of paint and puttied, $11.75; two 14-foot oars, $4.20; 1 boatlock and staff, $2.50; 4 galvanized swivel rowlocks, $4; mast, boom and galop, $14; 1 sail, middle seam, $18; rope for rigging and blocks, $7.75; anchor and cable, $7.60; paints, to make rope fast, $1.50; 6 mast hoops, $2; and freight from Algiers to Mississippi City.

The Department sanctioned the increased expenditure, and Damrell purchased the yawl from John Mahoney.[33]

7. Maintenance and Protection in Fiscal Year 1876: Completing the Flagging, Repairing the Storehouse, Quarters, etc.

On March 10, 1875, the Department called on its district engineers to submit estimates for sums required from the appropriation for "Contingencies of Fortifications" for "care and preservation" of the works under their superintendence in Fiscal Year 1876.[34]

Replying, Captain Damrell called for $3,600 to fund operations at Ship Island during the 12 months ending June 30, 1876. Onehalf this sum was to be applied to the keeper's salary, a proportionate part of the office expenses, and "ordinary current repairs." The balance was to be employed in removing, to a place of safety, a "lot of stone in such proximity to the beach that it is threatened by the encroachment of the sea", and to lay the flagging on hand in the fort.[35]

The Department allotted the requested funds on May 20.[36]

It was spring of 1876 before Captain Damrell was able to devote attention to the Ship Island projects. As the first item on his program, he requested and secured authority to hire an overseer at $175 per month. Next, he obtained permission to charter a boat for a dollar a day to take the workmen back and forth from the mainland.[37]

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33. Casey to Damrell, April 24, 1875, NA, RG 77, Ltrs. Sent, Chief Engineer.

34. Humphreys to Damrell, March 10, 1875, NA, RG 77, Ltrs. Sent, Chief Engineer.

35. Damrell to Humphreys, April 12, 1875, NA, RG 77, Ltrs. Recd., Chief Engineer.

36. Casey to Damrell, May 20, 1875, NA, RG 77, Ltrs. Sent, Chief Engineer.

37. Damrell to Humphreys, March 31 & April 1 and Casey to Damrell, April 5 & 10, 1876, NA, RG 77, Ltrs. Recd. & Sent, Chief Engineer.

A workforce was soon engaged and turned to. By the end of the fiscal year 272 square yards of flagging had been laid in the fort, fronting the guard- and storeroom, thus completing this detail; the engineer storehouse and keeper's quarters put in "good repair"; and all ironwork, stone, and other property exposed to the weather collected and properly stored.[38]

8. Chief Engineer Vetoes Removal of the Fort's Armament

In the spring of 1876, Capt. F.H. Phipps of the Department of the Gulf visited Ship Island and the other ungarrisoned coastal fortifications guarding the approaches to New Orleans. He found the big guns in need of maintenance and the ordnance stores deteriorating in the region's hot, humid climate, and recommended their early removal. Captain Phipps' report was referred to the Corps of Engineers by Chief of Ordnance Stephen V. Benet.[39]

Whereupon, Chief Engineer Humphreys informed General Benét that it would be a mistake to remove from the Ship Island fort, Battery Bienvenue, and Forts Pike and Macomb those serviceable guns and carriages not liable to decay. It would be good policy, however, to evacuate all perishable property belonging to the Ordnance Department.[40]

C. Years Between July 1, 1876, and June 30, 1880

1. Maintenance and Protection in Fiscal Year 1877

a. The Allotment

On June 20, 1876, the Department notified Captain Damrell that President Grant had signed into law an act passed by the Congress, appropriating $100,000 for "Contingencies of Fortifications."

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38. Annual Report of Operations at Ship Island Fort for Fiscal Year 1876, NA, RG 77, Ltrs. Recd., Chief Engineer; Executive Documents, Printed by Order of the House of Representatives, During the 2d Session of the 44th Congress (Washington, 1877), Serial 1743, p. 26.

39. Benet to Humphreys, May 13, 1876, NA, RG 156, Misc. Ltrs. Sent, Chief of Ordnance.

40. Humphreys to Chief of Ordnance, June 13, 1876, NA, RG 77, Ltrs. Sent, Chief Engineer.

He, in accordance with procedures, would submit, as soon as possible, estimates of the sums required from this appropriation for the forts under his supervision, "stating clearly the items of application."[41]

Captain Damrell reported that, in Fiscal Year 1877, he needed $8,550 from "Contingencies." Of this sum, the Ship Island fort was to be programmed for $2,460, to be budgeted:

(a)	Proportional payment of office rent, salaries of clerks, draughtsmen, and messenger	$ 900
(b)	Replacing coping over north magazine, ordinary repairs, and boat for fort keeper	$ 900
(c)	Fort keeper's salary, 12 months	$ 660
	Total	$2,460[42]

On July 21, the Department wrote Damrell that from "Contingencies" he had been had been allotted $660 for the keeper's pay and $900 for coping the magazine, repairs, and the keeper's boat.[43]

Shortly thereafter, General Humphreys decided on a bureaucratic change. On August 2, he wrote his district engineers that the July 21 allotments were to be charged to the act, approved June 20, "for the protection and repair of fortifications," rather than the appropriation for "Contingencies."[44]

b. Replacing Coping of North Magazine, Resodding Slope, etc.

Workmen were accordingly employed, and the "granite coping over the retaining wall of traverse, over north magazine, was

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41. Casey to Damrell, June 26, 1876, NA, RG 77, Ltrs. Recd., Chief Engineer.

42. Damrell to Humphreys, July 1, 1876, NA, RG 77, Ltrs. Recd., Chief Engineer.

43. Casey to Damrell, July 21, 1876, NA, RG 77, Ltrs. Sent, Chief Engineer.

44. Casey to Damrell, August 2, 1876, NA, RG 77, Ltrs. Recd., Chief Engineer.

replaced." The traverse was then resloped and sodded, as were the adjacent parapet slopes. The earthen parapet was then weeded and the terreplein grass mowed. The engineer storehouse and office were underpinned, and the latter reshingled. Both buildings were then given a yellow wash. Some unspecified repairs were also made to the ordnance storeroom.[45]

2. Maintenance and Protection in Fiscal Year 1878

On March 26, 1877, the Department, by circular letter, advised its district engineers that President Grant had signed, on the 3d, an act appropriating $100,000 for "Protection, Preservation and Repair of Fortifications" in Fiscal Year 1878. They would submit estimates of money needed for the works, under their charge, having no special appropriation.[46]

Captain Damrell replied, informing the Department that he required an allotment of $10,790 from the subject appropriation. From this figure, he would program $1,510 for the Ship Island fort, to be budgeted $850 for "ordinary repairs" to the fort and outbuildings and $1,660 for the keeper's pay.[47]

Chief Engineer Humphreys, after receiving, abstracting, and reviewing his district engineers' requests, on May 19,. allotted Captain Damrell $4,000 for the defenses for which he was responsible. Because this was more than $6,000 below the sum asked, Damrell was to inform the Chief Engineer of its proposed distribution.[48]

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45. Annual Report of Operations at Ship Island for Fiscal Year 1877, NA, RG 77, Ltrs. Recd., Chief Engineer; Executive Documents, Printed by the House of Representatives, for the 2d Session of the 45th Congress (Washington, 1878), Serial 1795, p. 21.

46. Casey to Damrell, March 26, 1877, NA, RG 77, Ltrs. Sent, Chief Engineer.

47. Damrell to Humphreys, April 18, 1877, NA, RG 77, Ltrs. Recd., Chief Engineer.

48. Casey to Damrell, May 19, 1877, NA, RG 77, Ltrs. Sent, Chief Engineer.

Damrell accordingly divided the $4,000 to include $860 for Ship Island, $200 for Fort McRae, $990 for Fort Pickens, $1,190 for Fort Morgan, and $860 for Fort Gaines. The Ship Island sum brokedown--$200 for ordinary repairs and $660 for the keeper's pay.[49]

The monies available for repairs, during the subject period, were employed for rehabilitating the engineers' buildings: the keeper's quarters were ceiled and painted and necessary repairs made to the storehouse.[50]

3. General Hancock's February 1878 Inspection

On February 18, 1878, Maj. Gen. Winfield S. Hancock, the commander of the Department of the East, who was inspecting the Gulf Frontier Forts, reached Ship Island from Mobile. He saw that the island was long and narrow. The eastern end was about a mile across and wooded, while the western portion was a "narrow sand bank destitute of trees." He was told by Ordnance-Sergeant McCabe that, during hurricanes and gales from the south, much of the island overflowed. Visiting the fort, Hancock found it to be well built, and, if modernized, it could be made a useful work. It was armed with thirteen 10-inch Rodmans, two 15-inch Rodmans, and two 100-pounder Parrotts.

The fort and its guns commanded the anchorage and Ship Island pass. The former was commodius with a depth of 24 feet, sufficient to float the largest ships. While he was at the fort, a large French vessel was lying in the harbor, taking aboard lumber brought out from the mainland in flatboats towed by steam tugs.

Ship Island anchorage, Hancock was told, served as a regional seaport. Before completion of the James B. Eads' jetties at the

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49. Damrell to Humphreys, May 22, 1877, NA, RG 77, Ltrs. Recd., Chief Engineer.

50. Annual Report of Operations at the Ship Island Fort for Fiscal Year 1878, NA, RG 77, Ltrs. Recd., Chief Engineer; Executive Documents, Printed by Order of the House of Representatives, for the 3d Session of the 45th Congress (Washington, 1879), p. 25.

mouth of the Mississippi had improved the riverine approaches to New Orleans, Hancock's informant continued, there had been plans to build a railroad south through Mississippi's piney woods and over trestles extending out from the mainland to the anchorage.

Near the fort, Hancock observed 20 odd frame structures belonging to the Quartermaster Department. They had reached an advance stage of decay in the seven years since the withdrawal of the garrison.

The island, he was told, as he was preparing to reboard a cutter for Bay St. Louis, was healthful and its waters afforded excellent fishing and bathing.[51]

4. Maintenance and Protection in Fiscal Year 1879

a. The Allotment

On April 23, 1878, the Department wrote Captain Damrell that, by an act approved by President Rutherford B. Hayes, in midMarch, Congress had appropriated $100,000 for "Preservation and Repair of Fortifications" in Fiscal Year 1879. Once again, Damrell would prepare and forward estimates of sums needed for maintenance of the defenses for which he was responsible.[52]

Captain Damrell asked $22,840 for the fortifications in his district. Out of this preposterous sum, he proposed to spend $1,360 on the Ship Island fort--$660 for pay of the fort keeper, $500 for "ordinary repairs to fort and buildings," and $200 for the works' share of office expenses.[53]

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51. Hancock to Sherman, February 21, 1878, NA, Ltrs. Recd., Adj. Gen., Microcopy M-666.

52. Twining to Damrell, April 23, 1878, NA, RG 77, Ltrs. Sent, Chief Engineer.

53. Damrell to Humphreys, May 7, 1878, NA, RG 77, Ltrs. Recd., Chief Engineer.

The Department, confronted with nationwide responsibilities, was compelled to pare drastically Damrell's estimates. On June 27, Chief Engineer Humphreys notified Damrell that he had been allotted $6,850 for preservation and repair of his five Gulf Coast forts. He would provide Washington with data on the breakdown of this sum.[54]

After reviewing and evaluating his needs, Damrell budgeted the Ship Island fort for $1,410--the keeper's salary $660, at a rate of $55 per month; and $750 for "ordinary repairs."[55]

b. Repairing, Cleaning, and Painting the Embrasure Shutters

Responding to a complaint from the Ordnance Department that, because of poor maintenance, many of the Totten embrasure shutters did not function properly, Chief Engineer Humphreys called this situation to Captain Damrell's attention. Upon investigating, Damrell found that, to place the shutters in "good order," would necessitate:

Iron-and-brass work for 1 pair new front embrasures and 2 pair flank casemate embrasure shutters, delivered at Ship Island	$ 75.00
One mechanic and four laborers, one month, including provisions, etc.	$335.50
1 Bbb. parafine varnish	30.00
l/2 doz. brushes	
10 gallons coal oil (for burning off old paint)	6.50
Contingencies and transportation	$ 45.00
Total	$495.00

Although the labor estimate seemed excessive, Damrell had personally determined that condition of the shutters was such as to

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54. Twining to Damrell, June 27; 1878, NA, RG 77, Ltrs. Sent, Chief Engineer.

55. Damrell to Humphreys, July 2, 1878, NA, RG 77, Ltrs. Recd., Chief Engineer.

dictate much work to make them operable. In addition, the estimate included sufficient monies to provide for scraping and painting the iron embrasure frames.[56]

The Department, in approving expenditure of up to $500 to underwrite cost of this project, directed Damrell to chide the fort keeper. Damrell was to remind him that timely attention, on his part, would have enabled the Corps to avoid this large disbursement for maintenance and repair of the embrasures.[57]

Besides the necessary repairs to and repainting of the embrasures, several other maintenance-oriented projects were undertaken in the 12 months ending June 30, 1879. The engineer storehouse and quarters were repaired and whitewashed and a new floor laid in the guardroom.[58]

5. Maintenance and Protection in Fiscal Year 1880

a. The Allotment

Congress, by an act approved by President Hayes on March 3, 1879, again appropriated $100,000 for "Preservation and Repair of Fortifications" in Fiscal Year 1880. District engineers were notified by circular letter to submit, at their earliest opportunity, estimates of sums needed from this appropriation for care of fortifications. They were cautioned that "no larger sum should be estimated for any work than will strickly be necessary for expenditure" for that defense in the fiscal year.[59]

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56. McCabe to Damrell, July 15, and Damrell to Humphreys, August 13, 1878, NA, RG 77, Ltrs. Recd., Chief Engineer.

57. Wright to Damrell, September 2, 1878, NA, RG 77, Ltrs. Sent, Chief Engineer.

58. Annual Report of Operations at the Ship Island Fort for Fiscal Year 1879, NA, RG 77, Ltrs. Recd., Chief Engineer; Executive Documents, Printed by the House of Representatives, for the 2d Session of the 46th Congress (Washington, 1880), Serial 1904, p. 29.

59. Elliot to Damrell, March 14, 1879, NA, RG 77, Ltrs. Sent, Chief Engineer.

Captain Damrell accordingly cut his requests for maintenance and protection funds for Fiscal 1880 from $22,840 to $16,040, while boosting that for the Ship Island fort from $1,360 to $1,660--$1,000 for "ordinary repairs to fort and buildings," and $660 for the keeper's pay.[60]

An administrative change delayed the Department's reply. In June 1879, Horatio G. Wright, Civil War hero and a senior officer in the Corps, replaced General Humphreys, who had retired after 52 years of service, 13 of them as Chief Engineer. It was July 28, before the Department notified Damrell that he had been allotted $5,000, about one-third the sum asked, for care of the works under his supervision in Fiscal Year 1880. He would inform the Department how he proposed to program this sum among his five forts.

General Wright, at this time, cautioned his superintending engineers that requests for maintenance and protection funds for the current fiscal year exceeded $130,000, and seemingly did not include many items the Department believed necessary for repair and preservation of the fortifications. He urged that no more of the amount allotted be expended than "is absolutely necessary," so that any surplus, however small, might be applied to "emergent and important cases elsewhere."

A review of the files had revealed, to his distress, that "more of this appropriation is expended on salaries of Assistant Engineers, Overseers, and Clerks, the forage of public animals, and other similar continuous expenditures, than would seem necessary," while there is no "construction in progress."

Hereinafter, General Wright wanted these rules observed: (a) no assistant engineer, overseer, or clerk would be

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60. Damrell to Humphreys, March 7, 1879, NA, RG 77, Ltrs. Recd. Chief Engineer.

employed, no vessel or boat engaged, and no public animals retained, except in special circumstances where their services were required. All men falling into these categories were to be discharged, any boats laid-up or disposed of, and any public animals sold. (b) Fort keepers at ungarrisoned works were to be required, a part of their job, to cut the grass on the parapets and glacis, and to scrape and paint the embrasure irons and other ironwork liable to rust. (c) Salaries paid fort keepers were in some instances higher than necessary, especially when their use of public quarters and land for gardens was taken into account.[61]

When he reprogrammed, Captain Damrell slashed his call for funding "ordinary repairs" for the Ship Island fort from $1,000 to $410, but retained the figure for the keeper's salary at $660.[62]

b. Captain Damrell Reviews the Construction Situation

When he drafted his annual report for the fiscal year ending June 30, 1880, Damrell reviewed for Chief Engineer Wright the situation at Ship Island. The fort, he noted, was at the west end of Ship Island, on the east side of Ship Island Pass, and had been designed as "a fortified maritime depot" for coal, provisions, etc., as well as for the defense of Mississippi Sound and of the eastern approaches to New Orleans.

Since 1866, operations at the fort, excepting construction of a "strong bridge" across the drawbridge well in 1874 and completion of the flagging inside the fort in 1876, had been limited to necessary repairs to the works and outbuildings. During Fiscal Year 1880, maintenance of the fort had been restricted to weeding the slopes, cutting of grass on the slopes and parade, scraping and painting of ironwork, and proper care and preservation of public property.

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61. Elliot to Damrell, July 28, 1879, NA, RG 77, Ltrs. Sent, Chief Engineer.

62. Damrell to Wright, August 5, 1879, NA, RG 77, Ltrs. Recd., Chief Engineer.

The fort, as it had been since 1875, was armed:

Barbette Tier

No.	Caliber	Platforms	Carriages
2	15-inch Rodmans	Nos. 2 & 13	Iron
2	100-pdr. Parrotts	Nos. 1 & 14	Iron

Casemate Tier

13	10-inch Rodmans	Nos. 6-18	Iron

The 10-inch Rodman carriages, lacking their composition sockets, were unserviceable.[63]

D. Five Routine Fiscal Years: 1881-1885

1. Maintenance and Protection in Fiscal Year 1881

a. General Wright Alters the Allotment Procedures

In 1880, Congress appropriated $100,000 for "Protection, Preservation and Repair of Fortifications" for the fiscal year ending June 30, 1881.[64]

Captain Damrell accordingly submitted his estimates of money needed to fund operations at the five forts during the 12 months, beginning July 1. When five months passed and he received no word regarding his allotments, he, on October 30, wrote General Wright. He would like to know the amounts allotted for his defenses.[65]

General Wright answered, informing Damrell that no allotments would be made in Fiscal Year 1881 from the subject

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63. Annual Report of Operations at Ship Island Fort for Fiscal Year 1880, NA, RG 77, Ltrs. Recd., Chief Engineer.

64. Wright to Damrell, May 27, 1880, NA, RG 77, Ltrs. Sent, Chief Engineer.

65. Damrell to Wright, Oct. 30, 1880, NA, RG 77, Ltrs. Recd., Chief Engineer.

appropriation. Calling attention to a circular of August 12, Wright pointed out that he had made a change in the allocation procedure.[66]

Henceforth, requests for management and protection money would be separated from those for maintenance and repair. District engineers would employ funds appropriated for "Protection, Preservation and Repair" to meet monthly salaries of their employees, such as fort keepers. Whenever repairs had to be made at any installation, "a special report" of the work required, along with a detailed estimate of the cost, would be forwarded to the Department for approval.[67]

b. Repair of the February 1881 Storm Damages

On February 28, 1881, the Chief Engineer called on his superintending engineers for reports of funds required for "ordinary expenses" for fortifications between now and June 30. They would also submit necessary projects for protection and preservation of the works and their estimated cost.[68]

Captain Damrell wrote the Department that the money on hand on "account of the fortifications" was sufficient for "ordinary expenses" to June 30. To fund operations for "protection and preservation at Ship Island and Forts Morgan and Gaines, he called for and was allotted $3,708.

The Ship Island monies, $473.75, were earmarked for repair of damage caused by the February 6 storm. During this blow, surging surf had flooded the western end of the island, rising to a height of three feet above mean high tide. Breakers had washed away

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66. Elliot to Damrell, November 4, 1880, NA, RG 77, Ltrs. Sent, Chief Engineer.

67. Elliot to Damrell, August 12, 1880, NA, RG 77, Ltrs. Sent, Chief Engineer.

68. Elliot to Damrell, February 28, 1881, NA, RG 77, Ltrs. Sent, Chief Engineer.

the greater part of the foundations of the structure used as quarters, threw down its chimney, and left the building in a dangerous and uninhabitable condition. A number of windows in the storehouse had been broken by the wind, while some of the underpinnings had given away.

Damrell placed the cost of necessary repairs at:

6 laborers, 30 days' each @ $1.75 (inc. brd.)	$315.00
1 carpenter, 30 days @ $3 (inc. brd.)	$ 90.00
1 bricklayer, 4 days @ $3 (inc. brd.)	$ 12.00
2 kegs nails & spikes @ $5	$ 10.00
1 box glass, 11 X 14	$ 4.25
l bladder putty @ 50¢, 5 gals. oil @ $4.86	$ 5.35
1 gallon turpentine 90¢, 25 lbs. paint for $2.75	$ 3.65
2 bbls. lime @ $2	$ 4.00
6 door locks for quarters	$ 4.50
transportation & incidental expenses	$ 25.00
	$473.75[69]

By June 30, workmen had made necessary repairs to the engineer's storehouse and quarters. Excepting the aforementioned work, operations during Fiscal Year 1881 were limited to preservation of the fort and care of the public property by the keeper.[70]

2. Maintenance and Protection in Fiscal Year 1882

Captain Damrell and his fellow district engineers were advised by circular letter on June 18, 1881, that Congress had passed an act appropriating $175,000 for "Protection, Preservation and Repair of Fortifications" in Fiscal Year 1882. They would report, without delay, funds needed for "ordinary expenses" for the works in their charge during the next 12 months. In accordance with the recent administrative change, they would document needed repairs and the estimated costs thereof.[71]

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69. Damrell to Wright, March 16, 1881, NA, RG 77, Ltrs. Recd., Chief Engineer.

70. Annual Report of Operations at the Ship Island Fort in Fiscal Year 1881, NA, RG 77, Ltrs. Recd., Chief Engineer; Executive Documents, Serial 1904, p. 29.

71. Elliot to Damrell, June 18, 1881, NA, RG 77, Ltrs. Sent, Chief Engineer.

When he submitted his estimates, Captain Damrell called for funding projects budgeted at $9,981. Of this figure, the Ship Island fort was to receive $660 for pay of the keeper and $225 to underwrite costs of whitewashing the storeroom and quarters and painting the fort's ironwork.[72]

The Department promptly made the desired allotment.[73]

In the 12 months ending June 30, 1882, operations, except for construction of the jetties and bulkhead, were limited to ordinary repairs to the fort and buildings, and to care and preservation of public property.[74]

3. Maintenance and Protection in Fiscal Year 1883

On June 2, 1882, the Chief Engineer's Office notified Captain Damrell that President Chester A. Arthur had approved an act appropriating $175,000 for "Protection, Preservation and Repair of Fortifications" in Fiscal Year 1883. He would report, before July 1, the funds necessary for "ordinary expenses" at his five defenses. In addition, he was to detail projects, with estimates, required for upkeep of these forts.[75]

It was late July before Captain Damrell complied and forwarded the desired data to Washington. His program called for $2,736 for ordinary expenses at the five works. But of this sum, all but $96 was designated for pay of the keepers at Forts Pickens, Morgan, and Gaines, and the Ship Island fort. In addition, he called for money to

72. Damrell to Wright, August 11, 1881, NA, RG 77, Ltrs. Recd., Chief Engineer.

73. Elliot to Damrell, August 17, 1881, NA, RG 77, Ltrs. Sent, Chief Engineer.

74. Annual Report of Operations at the Ship Island Fort for Fiscal Year 1882, NA, RG 77, Ltrs. Recd., Chief Engineer.

75. Elliot to Damrell, June 2, 1882, NA, RG 77, Ltrs. Sent, Chief Engineer.

fund these projects: Fort Pickens--$250 for repair of buildings and cisterns and $7,100 for rebuilding wharf and railway; Fort Morgan--$4,067 for brush and stone apron; Fort Gaines--$6,918.15 for new wharf; and $3,491 for construction of two jetties, in addition to those recently completed, to protect the site of the Ship Island fort from the encroaching sea.[76] For data on the jetties, the reader is referred to Section E of this Chapter.

While awaiting word on how his requests had fared, Captain Damrell received welcomed news. He learned that on September 15, after 15 years as captain, he had been promoted to major. Soon thereafter, he was apprised that Chief Engineer Wright had allotted $6,303 for maintenance and protection of the works under his supervision from the appropriation for "Preservation and Repair" in the fiscal year ending June 30. This was the sum requested, less the funds for the Forts Pickens and Gaines wharves and the Ship Island jetties. These projects were to be held in abeyance until the spring of 1883, when they were to be re-evaluated in view of the Department's nationwide commitments and available funding.[77]

Early in March 1883, the Department, as was its practice, called on its district engineers for data as to whether they would have any unobligated funds for Fiscal Year 1883. Major Damrell answered that no money could be spared from his present allotment.[78]

By mid-March, the Department had received and evaluated the reports forwarded in response to its circular letter. On doing so, it found that there were several thousand unobligated dollars in the appropriation for "Preservation and Repair" for Fiscal Year 1883. The

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76. Damrell to Wright, July 25, 1882, NA, RG 77, Ltrs. Recd., Chief Engineer.

77. Elliot to Damrell, September 19, 1882, NA, RG 77, Ltrs. Sent, Chief Engineer.

78. Wright to Damrell, March 10, 1883, NA, RG 77, Ltrs. Sent, Chief Engineer.

district engineers were accordingly advised to apprise the chief engineer of any projects that could be funded from these monies.[79]

Replying, Major Damrell called for allotments of $3,491 for protection of the Ship Island fort site and $4,067 for Fort Morgan.[80]

After reviewing its nationwide commitments, the Department made available $3,266 for construction of two more jetties at Ship Island.[81]

During the 12 months ending June 30, 1883, operations at the island were confined to "ordinary repairs to the fort and buildings and proper care and preservation of the public property."[82]

4. Maintenance and Protection in Fiscal Year 1884

a. The Allotment

On March 20, 1883, General Wright notified his district engineers by circular that President Arthur had approved an act of the last session of the 47th Congress, appropriating $175,000 for "Protection, Preservation and Repair" of fortifications in Fiscal Year 1884. They, in accordance with procedures, would transmit to the Department two sets of figures--those needed for "ordinary expenses," along with estimates for projects required for up-keep of the defenses entrusted to their care.[83]

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79. Wilson to Damrell, March 16, 1883, NA, RG 77, Ltrs. Sent, Chief Engineer.

80. Damrell to Wright, April 2, 1883, NA, RG 77, Ltrs. Recd., Chief Engineer.

81. Wilson to Damrell, April 16, 1883, NA, RG 77, Ltrs. Sent, Chief Engineer.

82. Annual Report of Operations at the Ship Island Fort for Fiscal Year 1883, NA, RG 77, Ltrs. Recd., Chief Engineer.

83. Wilson to Damrell, March 20, 1883, NA, RG 77, Ltrs. Sent, Chief Engineer.

Major Damrell, on May 30, transmitted the desired estimates. On doing so, he called for $3,811 to defray the salaries of his four fort keepers and for ordinary repairs at four of the five defenses for which he was responsible. Of this sum, the Ship Island fort was programmed to receive $660 for pay of the keeper and $250 for ordinary repairs to the masonry fort and outbuildings.[84]

Chief Engineer Wright allotted from the subject appropriation for the works under Damrell's supervision $5,066 in Fiscal Year 1884. The extra $1,254 was for rebuilding the bridge across the Fort Gaines ditch.[85]

b. Chief Engineer Newton Requires More Substance to the Annual Reports

On March 6, 1884, the Army lost its Chief Engineer. General Wright, having reached his 64th birthday, was retired. He was succeeded by Brig. Gen. John Newton, who promptly changed the format of the annual reports. Hereinafter, district engineers would, in making the subject report, detail structural failures and needed repairs, rather than confining themselves to general statements i.e., the fort is in the same condition as at the time of the last annual report. They would also provide data on gun platforms, the number, how many completed, and the number ready to receive their armament.

When he filed his annual report for Fiscal Year 1884, Major Damrell noted that: (a) the "fort is in very fine condition"; the brickwork, with the exception of a few cracks in the scarp walls and casemate arches in the southeast corner, which have been there for years, is in good order and needs no repair. The subject cracks, however, should be pointed, to enable him to determine if any farther movement was taking place. (b) The parapet and traverse slopes were in good order, although the revetments were defective in "a few places."

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84. Damrell to Wright, May 30, 1883, NA, RG 77, Ltrs. Recd., Chief Engineer.

85. Wilson to Damrell, June 25, 1883, NA, RG 77, Ltrs. Sent, Chief Engineer.

(c) The magazines were dry, but the cisterns would have to be cleaned, if the fort were to be garrisoned. (d) The drawbridge had never been built, and "a very primitive gate constructed by the fort keeper prevents cattle from entering the work." Damrell recommended construction of a substantial gate. (e) The keeper had painted the ironwork during the spring. The only woodwork requiring painting was the guardroom doors and windows. Turning to the gun platforms, Damrell listed their condition:

Barbette Tier

6-inch centre-pintle platforms, high traverse stones, completed	2
4-inch front-pintle platforms, high traverse stones, completed	12

Casemate Tier

4-inch fromt-pintle platforms, low traverse stones, completed	21
Platforms for 24-pounder flank defense howitzers	2

The fort's armament included:

En Barbette

Two 15-inch Rodmans, with iron chassis & carriages
Two 100-pounder Parrotts, with iron chassis & carriages

En Casemate

Thirteen 10-inch Rodmans, with iron chassis and carriages. As yet, the Ordnance Department had not provided composition eccentric sockets for these carriages.

The ordnance stores, Damrell continued, were kept in the fort, while the Engineer property was stored in a frame storehouse outside the fort. The latter property, with exception of the condemned articles, was in fair condition. In addition to the engineer storehouse, the Corps was responsible for two other frame buildings exterior to the fort--the keeper's quarters and a building lately used to house workmen employed building jetties. The former was in good order, but the latter required new sash.[86]

86. Annual Report of Operations for Ship Island Fort for Fiscal Year 1884, NA, RG 77, Ltrs. Recd., Chief Engineer.

5. Maintenance and Protection in Fiscal Year 1885

On July 11, 1884, Chief Engineer Newton advised Major Damrell that Congress, on the 5th, had authorized, and President Arthur had approved, an appropriation of $175,000 for "Protection, Preservation and Repair of Fortifications" in Fiscal Year 1885.[87] Some two weeks later, the Department called on its superintending engineers for "a definite and clear description of the parts of the various works," under their charge, requiring "repair and preservation, omitting . . . the portions which . . . would be useless after the modification of the fortifications."[88]

On September 27, Major Damrell submitted a program calling for expenditure of $192 for maintenance and repairs at the fort during the subject Fiscal Year. This sum was to be apportioned:

for cutting grass and weeding slopes	$ 22
for painting ironwork, embrasure shutters, traverse irons, etc.	56
for pointing wall in Southeast corner of fort	36
for building a gate to main entrance to fort	78
Total	$192[89]

The Department allotted $1,196 to finance this work, along with needed repairs at Forts Morgan and Gaines.[90]

By the end of the fiscal year, workmen had removed the sand that had drifted into the sally port and had built and hung a

87. Wilson to Damrell, July 11, 1884, NA, RG 77, Ltrs. Sent, Chief Engineer.

88. Wilson to Damrell, July 24, 1884, NA, RG 77, Ltrs. Sent, Chief Engineer.

89. Damrell to Chief Engineer, September 27, 1884, NA, RG 77, Ltrs. Recd., Chief Engineer.

90. Wilson to Damrell, Sept. 30, 1884, NA, RG 77, Ltrs. Sent, Chief Engineer.

new gate. Next, the cracks in the southeast corner of the scarp wall and adjacent casemate arches were repointed, and the ironwork painted.[91]

6. Damrell's Responsibilites are Redefined

A bureaucratic change made by the Corps of Engineers on August 30, 1884, resulted in a redefination of Major Damrell's zone of responsibilities. West Florida was detached from the Mobile District and assigned, along with Georgia and much of Alabama, to the newly constituted Montgomery Engineer District. Among other facilities which Damrell would no longer oversee were the Pensacola forts.

7. General Newton Calls for Reports on Placing Major Caliber Gun and Mortar Platforms in Serviceable Condition

In mid-March 1885, Chief Engineer Newton called on Major Damrell and his other district engineers to submit, as soon as practicable, estimates of the cost of putting in serviceable order "existing platforms of 8-inch, 10-inch, and 15-inch guns, of mortars and of rifle guns bearing upon the channel entrance of the various harbors for each work." They would also examine the magazines. Separate figures were to be transmitted for each class of gun and mortar.92

Major Damrell had the "slows." On April 10, no figures yet received, Chief Engineer Newton reiterated his request.93

This galvanized Damrell into action. Reviewing his files, he estimated the cost of placing existing 4-inch front-pintle barbette platforms in serviceable condition for emplacing 8- and 10-inch rifled guns

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91. Annual Report of Operations at Fort Massachusetts for Fiscal Year 1885, NA, RG 77, Ltrs. Recd., Chief Engineer; Executive Documents, Printed by Order of the House of Representatives, for the 1st Session of the 47th Congress (Washington, 1886), Serial 2370, pp. 41-2.

92. Wilson to Damrell, March 10, 1885, NA, RG 77, Ltrs. Sent, Chief Engineer.

93. Wilson to Hoxie, April 10, 1885, NA, RG 77, Ltrs. Sent, Chief Engineer.

(with stone pintle-block, 4-inch pintle, and brick reinforcing) at $150 each. The estimated cost for mortar platforms, built of clear yellow pine, for 13-inch mortars was $488 each and for 10-inch mortars $315.[94]

The information provided was not all that was desired. Chief Engineer Newton, on returning the correspondence to Damrell, reminded him that he was to provide the Department with an estimate of the monies required for each of the defenses, with a breakdown detailing the sums needed for the various classes of platforms and magazines.[95]

On May 13, Damrell finally provided the Department with the desired information. There were, he noted, no platforms at the fort designed for 15-inch front-pintle carriages.[96]

Some six weeks later, on July 3, the Department, upon receipt of Damrell's estimates for Fiscal Year 1886, called attention to Damrell's letter of May 13, and his failure to provide figures for making the platforms serviceable. Damrell was accordingly advised that the Department's goal was to employ "the small appropriation to make all existing platforms serviceable." The question was, will "the estimate of $5,775 . . . accomplish this purpose?"[97]

When he replied, Damrell pointed out that, on May 13, he had provided the Department with the desired data, i.e., the cost for changing existing platforms to make them serviceable for heavier ordnance. It was $88,470, while it would cost $5,775 to repair extant

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94. Damrell to Chief Engineer, April 13, 1885, NA, RG 77, Ltrs. Recd., Chief Engineer.

95. Wilson to Damrell, April 16, 1885, NA, RG 77, Ltrs. Sent, Chief Engineer.

96. Damrell to Chief Engineer, May 13, 1885, NA, RG 77, Ltrs. Recd., Chief Engineer.

97. Wilson to Damrell, July 3, 1885, NA, RG 77, Ltrs. Sent, Chief Engineer.

platforms to make "them serviceable for the same pattern of ordnance as had formerly been mounted on them."[98]

Whereupon, the Department countered, are the "existing platforms" for which estimates have been submitted those of 8-, 10-, and 15-inch shellguns and heavy rifled cannon bearing on the channel(s)? In any case, Damrell was to report the "caliber" of guns for the respective platforms.[99]

Damrell answered that at the Ship Island fort, ten front-pintle platforms for 8- or 10-inch guns bore on Ship Island Pass. No expenditure would be required to place these platforms in the desired condition, but to adopt them to a chassis requiring low traverse stones would cost $9,828.[100]

E. Protecting the Fort Against Encroaching Seas

1. Damrell Calls Attention to the Threat

A series of southwest gales pounded the barrier islands in September and the first two weeks of October, 1881. During these six weeks, the 75 yards of beach separating the southwest approaches to the fort and the scarp was washed away. This led keeper John Griffin and Ord.-Sgt. James McCabe to sound the alarm.

On October 17, Griffin wrote Superintending Engineer Damrell that, as a result of this beach erosion, the "water comes right up to the fort, and . . . there is no less than two feet of water right up against the fort, but even at low water you can not go around it on the south side with dry feet."[101]

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98. Damrell to Chief Engineer, July 6, 1885, NA, RG 77, Ltrs. Recd., Chief Engineer.

99. Wilson to Damrell, July 11, 1885, NA, RG 77, Ltrs. Sent, Chief Engineer.

100. Damrell to Chief Engineer, Aug. 12, 1885, NA, RG 77, Ltrs. Recd., Chief Engineer.

101. Griffin to Damrell, Oct. 17 & McCabe to Adj. Gen., Oct. 19, 1881, NA, RG 77, Ltrs. Recd., Chief Engineer.

Upon transmitting a copy of Griffin's letter to the Department, Captain Damrell called for and was granted authority to survey the west end of Ship Island to ascertain the degree to which the fort site was threatened by encroaching seas.[102]

When the end of the calendar year arrived and the Department heard nothing further from Captain Damrell, Chief Engineer Wright called for a report. Such information was needed, he noted, to enable the Department to know the price tag for protecting the site. As the unobligated balance of the current appropriation for "Preservation" was limited, he must know, as soon as possible, the sum that would have to be earmarked for Ship Island.[103]

Damrell responded that the survey was being expedited, and, as soon as completed, a plan would be formulated and forwarded.[104]

2. Damrell Proposes a System of Jetties

The survey and plan were finished in late February, 1882. Upon transmitting them to Washington, Damrell wrote, "the beach was found to have washed away to a great extent, since 1868, and the water is now 1-1/2 feet deep at low tide, around the wall of the fort, from Southeast to Northwest."

Unless measures were taken to prevent additional erosion, Damrell warned, the fort's foundations will be undermined and the scarp will settle and crack. Already, there were cracks in the arches of casemates Nos. 3 to 8. But, as these fractures had been there for a number of years, they "must be due to some other cause."

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102. Damrell to Wright, Oct. 22 & Wright to Damrell, Oct. 25, 1881, NA, RG 77, Ltrs. Recd. & Sent, Chief Engineer.

103. Elliot to Damrell, December 31, 1881, NA, RG 77, Ltrs. Sent, Chief Engineer.

104. Damrell to Wright, January 5, 1882, NA, RG 77, Ltrs. Recd., Chief Engineer.

To cope with the beach erosion, Damrell proposed to build three brick and stone jetties to be carried up to the "ordinary high water line." These jetties were to be 150 feet in length and 20 feet in width. If need be, they could be extended at some future date and their ends connected.

The cost of the proposed work brokedown:

200 cords of brush delivered @ $3.50	$ 700
1,100 tons of rock ballast delivered @ 1.75	$1,925
6,000 feet assorted lumber delivered @ $14.00	84
400 lbs. galvanized wire @ .10	40
3 kegs spikes @ 5.00	15
100 piles delivered @ 1.25	125
17 laborers for two months with provisions @ 55.00	1,870
1 overseer, 2 months @ 100.00	200
Transportation of men & provisions	125
Contingencies	500
Total	$5,584[105]

On March 1, Chief Engineer Wright reviewed and approved Damrell's plan, and allotted $5,584 from the appropriation for "Protection and Preservation" to underwrite its cost.[106]

3. Corps and National Health Board Wrangle over a Special Use Permit for the Wharf

To facilitate landing of materials (brush, stone, and timber) for construction of jetties, Captain Damrell sought and secured permission from the National Board of Health to use their wharf, the Corps of Engineers' pier having succumbed to the ravages of teredoes and the elements more than a decade before.[107]

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105. Damrell to Wright, February 23, 1882, NA, RG 77, Ltrs. Recd., Chief Engineer; "Map showing changes in beach line at west end of Ship Island, Mississippi, since survey made in November 1868, with proposed location of jetties." A copy of this plan--labeled Drawer 84, Sheet 44--is on file at the Mississippi Unit, GUIS.

106. Wright to Damrell, March 1, 1882, NA, RG 77, Ltrs. Sent, Chief Engineer.

107. Damrell to Turner, January 21 and Turner to Wright, January 31, 1882, NA, RG 77, Ltrs. Recd., Chief Engineer. T.J. Turner was Secretary of the National Board of Health.

This arrangement led to trouble in June. On the 6th, the local man in charge of the quarantine station telegraphed his Washington superiors, "Wharf monopolized by Engineer Department, unable to coal steamer or receive coal supplies for season. Please telegraph order countermanding that granting use of wharf to Engineer Department."

Whereupon, the National Board of Health informed Chief Engineer Wright that use of the wharf by the board was necessary for reception of coal. Board Secretary T.J. Turner reminded Wright that, in agreeing to let the Corps have access to the wharf, there had been no intent to do so to the detriment of his Department's program.[108]

Chief Engineer Wright fired off a telegram to Captain Damrell. Under no circumstances were the Engineers' activities to interfere with the Board of Health's use of the wharf.[109]

Replying, Captain Damrell assured Washington that this difficulty would not be repeated. Upon receipt of General Wright's telegram, Damrell had notified his foreman to "avoid all obstruction to the free use of the wharf by the National Board of Health."[110]

Chief Engineer Wright, to pacify Dr. Turner, thereupon informed him that there had never been any intent by the Corps to monopolize the wharf. The structure, Wright agreed, had been unfortunately obstructed, but no more than contemplated when the board issued its special use permit.[111]

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108. Turner to Wright, June 6, 1882, NA, RG 77, Ltrs. Recd., Chief Engineer.

109. Wright to Damrell, June 7, 1882, NA, RG 77, Ltrs. Sent, Chief Engineer.

110. Damrell to Wright, June 10, 1882, NA, RG 77, Ltrs. Recd., Chief Engineer.

111. Wright to Turner, June 13, 1882, NA, RG 77, Ltrs. Recd., Chief Engineer.

4. Corps Builds Three Jetties and a Bulkhead

Men were engaged and work commenced in April. By June 30, 1882, the three jetties were completed as follows: No. 1 for a distance of 221 feet, No. 2 to a distance of 152 feet, and No. 3 for a length of 218 feet. In addition, a plank bulkhead, 714 feet long, was built along the beach east of the fort, to prevent surf from washing across the island in this area. The jetties were built of heavy ballast rock, laid on brush mattresses, their heights varying from 3 to 5 feet. So far there had been expended on the project 483 cords of brush and 1,439 tons of rock.[112]

5. Corps Builds a Fourth Jetty and Extends the Bulkhead

When he submitted his annual report for Fiscal Year 1882, Captain Damrell recommended construction of two more jetties: one to extend 250 feet westward of the fort and the other 300 feet southeastward.[113]

Utilizing the $3,266 allotment made by the Chief Engineer, in mid-April 1883, Major Damrell, in May and June, again employed a force on the island. Because of scarcity of ballast stone at this season, "some of the work had to be constructed with timber." Jetties Nos. 1 and 2 were extended, the former 110 feet and the latter 20 feet, and repaired with mattresses and rock ballast. The timber bulkhead was extended west 215 feet to tie into jetty No. 1 and east 363 feet to the sand hill abreast of the old stockade.

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112. Annual Report of Operations at the Ship Island Fort for Fiscal Year 1882, NA, RG 77, Ltrs. Recd., Chief Engineer; Executive Documents, Printed by the House of Representatives, for the 2d Session of the 47th Congress, (Washington, 1883), Serial 2092, p. 47; "Sketch of completed and proposed jetties for protection of fort on Ship Island, Mississippi." A copy of this plan--keyed Drawer 84, Sheet 45--is on file at the Mississippi Unit, GUIS.

113. Ibid.

A timber jetty (No. 4), filled with brush and sand, 100 feet in length, was erected 80 feet east of and tangent to jetty No. 1. Its mission was protection of the fort's southeast bastion.[114]

6. Storm Compells the Corps to Reconstruct Jetty No. 4 and the Western Extremity of the Bulkhead

Much of this latest work was for naught. A sou'easter, setting in on November 2, wrecked the timber bulkhead and jetty No. 4. Major Damrell, on reporting the loss, attributed it to the failure to secure a sufficient weight of ballast stones, compounded by only slight accumulations of sand building up before the blow. Jetties Nos. 1-3, however, had held firm, and the beach fronting them had gained several hundred feet by accretion. To shield the again exposed southeast bastion, it would be necessary to reconstruct, in a substantial manner, jetty No. 4 and the western extension of the bulkhead. To accomplish this project, Damrell called for a $2,701 allotment, to breakdown:

800 tons rock ballast @ $1.25	$1,000
80 cords brush @ 2.25	180
4,000 feet lumber @ 15.00	60
2 kegs spikes @ 5.00	11
8 laborers, 50 days each, @ 2.05	800
1 carpenter, 50 days @ 3.00	150
1 overseer, 2 months @ 100.00	200
transportation and incidental expenses	300
Total	$2,701[115]

Because ballast stone, at reasonable rates, could be best obtained on the Gulf Coast in the winter, Chief Engineer Wright promptly allotted the requested sum from the appropration for "Preservation and Repair." Coincidentally, Wright requested Secretary of War Robert Todd Lincoln to approach the Secretary of the Treasury to again secure

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114. Annual Report of Operations at the Ship Island Fort for Fiscal Year 1883, NA, RG 77, Ltrs. Recd., Chief Engineer; Executive Documents, Printed by Order of the House of Representatives, for the 1st Session of the 48th Congress (Washington, 1884), Serial 2185, p. 43.

115. Damrell to Wright, December 5, 1883, NA, RG 77, Ltrs. Recd., Chief Engineer.

permission for the Corps to employ the Board of Health's wharf for landing construction materials.[116]

Acting Secretary of the Treasury French, upon being contacted by Secretary Lincoln, gave the Engineers permission to use the wharf during the winter season, provided there was "no epidemic disease being treated at that station."[117]

Major Damrell accordingly organized a workforce. By June 30, 1884, a new jetty, some 485 feet in length, had been built in a southwesterly direction to intersect with jetty No. 1. The new jetty, in conjunction with the three constructed 24 months before, gave promise of restoring "the former beach line." The original jetties had weathered several wild gales without suffering any material damage, and Major Damrell apprehended no further damage to the fort from encroaching surf.[118]

F. Fort Keeper's Last Years

1. Keeper is Ordered to Observe Quarantine

Early in August 1883, Asst. Surg. F. Finney notified his immediate superiors that Fort Keeper Griffin had received no instructions from Major Damrell to consider himself under quarantine. Pending word from Washington on this subject, the officer in charge of the Port of New Orleans' Surgeon Office instructed Dr. Finney to "use sufficient authority to hold anyone in quarantine likely to convey contagion."[119]

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116. Wright to Lincoln and Wilson to Damrell, December 10, 1883, NA, RG 77, Ltrs. Sent, Chief Engineer.

117. Lincoln to Secretary of the Treasury, December 13 and French to Lincoln, December 17, 1883, NA, RG 77, Ltrs. Recd., Chief Engineer.

118. Annual Report of Operations at the Ship Island Fort for Fiscal Year 1884, NA, RG 77, Ltrs. Recd., Chief Engineer; Executive Documents, Printed by Order of the House of Representatives for the 2d Session of the 48th Congress (Washington, 1885), Serial 2278, p. 48.

119. Godfrey to Hamilton, August 8, 1883, NA, RG 77, Ltrs. Recd., Chief Engineer. Dr. John Godfrey was in the New Orleans' Surgeon Office, and J.B. Hamilton was Surgeon General of the U.S. Marine Hospital Service.

Assistant Secretary of the Treasury French, upon receipt of this news, contacted Secretary of War Lincoln, requesting that the fort keeper be directed to consider himself in quarantine until end of the sickly season, which would be declared by Dr. Finney.[120]

Secretary Lincoln referred the subject to the Chief Engineer. General Wright, in turn, ordered Major Damrell to see that Keeper Griffin remained in quarantine until released therefrom by the surgeon in charge of the station.[121]

2. Position is Abolished and Keeper Griffin Discharged

On April 28, 1884, Chief Engineer Newton asked his superintending engineers to review the situation at the ungarrisoned forts, for which they were responsible, to ascertain if at any of them they could dispense with the keepers.[122] Such action was mandated by General Order No. 36, April 21, 1884, which announced that all ungarrisoned works would be in charge of an ordnance-sergeant, "as far as regards the care and preservation of the post and property appertaining to the Engineer Department."

This action had been triggered by a report filed by Inspector-General Roger Jones, after a recent trip to the Gulf Coast. Jones was of the opinion that there was no need for keepers at defenses, such as Ship Island, where there was an ordnance-sergeant.[123] Eastern Department Commander Hancock agreed with Colonel Jones.[124]

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120. French to Lincoln, August 13, 1883, NA, RG 77, Ltrs. Recd., Chief Engineer.

121. Wright to Damrell, Aug. 16 & Tweedale to Secretary of the Treasury, Aug. 21, 1883, NA, RG 77, Ltrs. Recd. & Sent, Chief Engineer. John Tweedale was the War Department's Chief Clerk.

122. Wilson to Damrell, April 28, 1884, NA, RG 77, Ltrs. Sent, Chief Engineer.

123. Newton to Adj. Gen., June 2, 1884, NA, RG 77, Ltrs. Sent, Chief Engineer.

124. Hancock to Adj. Gen., May 20, 1884, NA, RG 77, Ltrs. Recd., Chief Engineer.

Chief Engineer Newton, upon being apprised of Colonel Jones' report and General Hancock's views, reiterated his call for Major Damrell to initiate steps to eliminate the keeper's position at certain Gulf Coast defenses.[125]

If the keeper's position at Ship Island were to be abolished, Damrell responded, the corps' property should be first removed for safekeeping to Fort Morgan. But, to accomplish this transfer, funds were required.[126] The Department accordingly asked Damrell to provide an estimate of monies needed to effect the removal.[127]

Damrell procrastinated. On June 17, he wrote the Department that, because of the probability that the coast would soon be placed under quarantine, it was impossible to charter a boat for the subject service.[128]

Chief Engineer Newton, sensing that Damrell had an ulterior motive, took the position that the only way the keeper could be retained was provided the ordnance-sergeant's duties were too arduous to permit his looking after the corps' property.[129]

The decision to discharge Keeper Griffin made, Chief Engineer Newton, tiring of the bickering, ordered Damrell to lay-off the keeper and direct Ordnance-Sergeant McCabe to assume responsibility for

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125. Wilson to Damrell, June 2, 1884, NA, RG 77, Ltrs. Sent, Chief Engineer.

126. Damrell to Chief Engineer, June 5, 1884, NA, RG 77, Ltrs. Recd., Chief Engineer.

127. Wilson to Damrell, June 7, 1884, NA, RG 77, Ltrs. Sent, Chief Engineer.

128. Damrell to Chief Engineer, June 17, 1884, NA, RG 77, Ltrs. Recd., Chief Engineer.

129. Wilson to Damrell, June 24, 1884, NA, RG 77, Ltrs. Sent, Chief Engineer.

the engineer property. Upon the keeper's departure, his quarters were to be occupied by the ordnance-sergeant.[130]

It was July 12, 1884, before Major Damrell discharged the keeper and transfered responsibility for the Engineer property to Ordnance-Sergeant McCabe. To enable Damrell to pay the keeper for the days worked in the new fiscal year, the Department made a $22 allotment.[131]

3. The Defense is Designated Fort Massachusetts

Meanwhile, on June 27, to further implement General Order No. 36, General Hancock announced that Army Headquarters was turning over to the Corps of Engineers responsibility for a number of ungarrisoned seacoast defenses in the Eastern Department. Included were four of the works under Major Damrell's superintendence--Forts Massachusetts, Pickens,. Morgan, and Gaines. This was the first time that the Ship Island fort, in an official document, was referred to as Fort Massachusetts. There would, however, be no War Department General Order designating the work Fort Massa-chusetts.[132]

G. Major Damrell's Last Ten Years as District Engineer

1. Maintenance and Protection in Fiscal Year 1886

In late March 1885, Chief Engineer Newton alterted his district engineers that lame duck President Arthur had approved an act of the last session of the 48th Congress appropriating $100,000 for "Preservation" of fortifications in Fiscal Year 1886. They would report, before June 1, the sum necessary for "ordinary expenses" in the year ending June 30, 1886. They were to detail the maintenance projects to be executed at each of these works and its estimated cost.[133]

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130. Newton to Adj. Gen., July 3, 1884, NA, RG 77, Ltrs. Sent, Chief Engineer.

131. Wilson to Damrell, July 22, 1884, NA, RG 77, Ltrs. Sent, Chief Engineer.

132. Special Order No. 128, Dept. of the East, June 27, 1884, NA, RG 77, Ltrs. Recd., Chief Engineer.

133. Newton to Damrell, March 30, 1885, NA, RG 77, Ltrs. Sent, Chief Engineer.

Once again, as he had in the past, Damrell missed a deadline. On June 5, he was chided by the Department, and asked to submit, "at your earliest convenience," an estimate of funds required for preservation and repair of the defenses in your charge for the next fiscal year.[134]

Upon submitting his estimates, Damrell called for $232 for Fort Massachusetts--$52 for weeding slopes and cutting and removing grass from slopes and parade; $102 for labor to whitewash and make general repairs to outbuildings; and $78 for required materials.[135]

On August 17, the Department allotted $1,200 for preservation and repair of the three defenses in the Mobile Engineer District. The monies budgeted for Ship Island were $7 less than the sum requested.[136]

Soon thereafter, Ordnance-Sergeant McCabe notified Damrell that the 14 shot beds were rotten and unserviceable. To replace them, Damrell requested and received an additional $40 allotment.[137]

When he filed his annual report for the fiscal year, Major Damrell listed these accomplishments: 14 shot beds built and painted; floors of three service magazines "cemented over and temporary wooden covers placed over entrances to them"; embrasure shutters overhauled and placed in working order and two wooden shutters made and hung to replace broken iron shutters; sally port gate "refastened"; casemates,

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134. Wilson to Damrell, June 5, 1885, NA, RG 77, Ltrs. Sent, Chief Engineer.

135. Damrell to Chief Engineer, June 27, 1885, NA, RG 77, Ltrs. Recd., Chief Engineer.

136. Wilson to Damrell, August 17, 1885, NA, RG 77, Ltrs. Sent, Chief Engineer.

137. Damrell to Chief Engineer August 28 and Wilson to Damrell, September 1, 1885, NA, RG 77, Ltrs. Recd. and Sent, Chief Engineer.

gun platforms and terreplein policed; engineer storehouse repaired and 43 lights installed; and grass cut and drift sand removed from fort.[138]

2. Maintenance and Protection in Fiscal Year 1887

a. Congress Fails to Pass a Fortifications Bill

Congress, during the two years following the 1886 publication of the Endicott Board's report, refused to appropriate money for protection, preservation, and repair of the obsolete fortifications guarding the Nation's ports and harbors. On September 7, 1886, the Department alerted its district engineers that the 49th Congress had failed to make an appropriation for "Preservation" of fortifications in Fiscal Year 1887. Since there would be no allotments, they were to dispense with their monthly reports of operations until such time as there was an appropria-tion and work resumed.

At defenses, where fort keepers were employed, they were to be discharged. No expenditures were to be made from "Contingencies," and they were to report at once any funds on hand previously allotted from that appropriation.[139]

Because no keeper had been employed at Fort Massachusetts since July 1884, this section of the order was held in abeyance. Soon thereafter, Major Damrell, in accordance with instructions, transferred to James Eveleth, the man now in charge of the New York Agency, the unexpended $750 from "Contingencies" currently on hand.[140]

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138. Annual Report of Operations at Fort Massachusetts in Fiscal Year 1886, NA, RG 77, Ltrs. Recd., Chief Engineer; Executive Documents, Printed by Order of the House of Representatives for the 2d Session of 49th Congress (Washington, 1887), Serial 2462, p. 42.

139. Wilson to Damrell, August 6 and September 7, 1886, NA, RG 77, Ltrs. Sent, Chief Engineer.

140. Damrell to Chief Engineer, August 6 & 12, November 2, and Wilson to Damrell, August 6 & November 2 & 9, 1886, NA, RG 77, Ltrs. Recd. and Sent, Chief Engineer.

b. Chief Engineer Duane calls for Semi-Annual Reports

General Newton, having reached his 64th birthday on August 22, 1886, retired from the Army. His replacement as Chief Engineer was Brig. Gen. James C. Duane. The new chief, in mid-October, to make his presence felt, changed the annual report procedure. Henceforth, district engineers would make semi-annual inspections in January as well as the annual inspection. On submitting their reports, following these inspections, they were to include a "statement of the amount and character of the water supply at each post, and also of the number, character, condition, capacity, and present use of all buildings at each work."[141]

Major Damrell, when he filed his semi-annual and annual reports for fiscal year 1887, informed Washington that the fort was in "fair condition," and the jetties built for protection of the site were causing an accreation of the beach in the area where erosion had threatened.[142]

The brickwork required no repairs; the earthwork of the parapets and traverses was well preserved, the revetments were defective, while the magazines were in good order.143

3. Maintenance and Protection in Fiscal Year 1888

Although Damrell made the prerequisite inspection in January 1888, he failed to file a report. He waited until July, when he combined the semi-annual and annual reports. At that time, he noted, the fort was in "fair condition and the jetties constructed for the preservation of its site have so far fully answered their purpose."

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141. Duane to Damrell, October 16, 1886, NA, RG 77, Ltrs. Sent, Chief Engineer.

142. Quarterly Report of Operations at Fort Massachusetts for Jan.-March, 1887, NA, RG 77, Ltrs. Recd., Chief Engineer.

143. Annual Report of Operations at Fort Massachusetts for Fiscal Year 1887, NA, RG 77, Ltrs. Recd., Chief Engineer.

Turning next to sources of water, he reported that the defense was dependent on cisterns and rain water. At the fort, there were two brick, cemented underground cisterns, each of 17,283 gallons. They were under the casemate quarters. Exterior to the fort quarters, there were two cisterns--a brick-cemented, above ground structure, of 2,370-gallon capacity, at the shore end of the wharf; and an 800-gallon wooden cistern at the Board of Health's storehouse.

Among the buildings, outside the fort, for which Damrell was responsible, were:

Building	Fabric	Condition	Description
Officers' quarters	Frame	needs repair	2-story, with attic, 33' X 23', kitchen adjoining, 4 rooms, not occupied, front and back galleries.
Storeroom & carpenter shop	frame	needs repairs	2-story, 21½ X 60', 2 rooms, 1st story used for engineer property.
Engineers' quarters & messhall	frame	needs repairs	2-story, 21' X 46'½, 4 rooms, unoccupied.
Bakery & bake oven	frame	not worth repair	1-story, 13½' X 35½'.
Boathouse	frame	good	houses 1 boat
Ordnance-sergeant's quarters	frame	good	1-story, 4 rooms.
Lighthouse keeper's quarters	frame	good	1½-story, with kitchen attached.
Lighthouse	frame	good	pyramidal tower.
Old Lighthouse keeper's quarters	brick	undermined & crumbling	1½-story, with attached kitchen, 4 rooms, unoccupied.
Old Lighthouse tower	brick	light discontinued, unsafe, undermined by the sea.	

The Engineer property, stored in the frame structure outside the fort, was, with the exception of condemned articles, in fair condition.[144]

4. Congress Resumes its Annual Appropriations for Protection, Preservation, and Repair

a. Damrell Submits a Program

In the autumn of 1888, Congress, for the first time in two years, voted funds for "Protection, Preservation, and Repair" of coastal fortifications. On September 26, the Department advised its district engineers that President Grover Cleveland, four days before, had approved an act making $100,000 available for these purposes. They would submit, as soon as feasible, estimates of funds necessary for "ordinary expenses" for the defenses under their charge for Fiscal Year 1889. They would also detail what projects for preservation and repair should be given priority.[145]

Major Damrell accordingly called for $350 to be apportioned: $50 for cutting and removing weeds and grass from parapets and parade; $100 for pointing casemate walls and arches near principal magazine; and $200 for repair of engineer buildings.[146]

After reviewing the submissions, Chief Engineer T.L. Casey allotted $100 for repointing the casemate walls and arches near the principal magazine, and $200 for repair of the engineer buildings.[147]

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144. Annual Report of Operations at Fort Massachusetts for Fiscal Year 1888, NA, RG 77, Ltrs. Recd., Chief Engineer.

145. Sears to Damrell, September 26, 1888, NA, RG 77, Ltrs. Sent, Chief Engineer.

146. Damrell to Chief Engineer, October 23, 1888, NA, RG 77, Ltrs. Recd., Chief Engineer.

147. Sears to Damrell, November 8, 1888, NA, RG 77, Ltrs. Sent, Chief Engineer. General Duane had retired as Chief Engineer on June 30, 1888.

In January 1889, the Department notified Major Damrell that, with money again being allotted for "Preservation and Repair," the district engineers were to resume submitting monthly operational reports, as well as their annual and semi-annual narratives.[148]

b. Maintenance and Protection in Fiscal Year 1889

When he filed his annual report for Fiscal Year 1889, Major Damrell reported that no improvements had been made to the fort or the engineer buildings during this period.[149]

5. Maintenance and Protection Fiscal Year 1890

On March 13, 1889, the Department notified its district engineers that President Cleveland had signed into law, on the 2d, an act appropriating $100,000 for "Protection, Preservation and Repair of fortifications" in Fiscal year 1890. In accordance with procedures, they would prepare and submit two sets of figures: the first for "ordinary expenses" on account of the works under their supervision, and the other detailing costs of projects for "preservation and repair."[150]

Major Damrell accordingly reported that,

for "ordinary repairs" at Ship Island, he needed:	
for cutting and removing weeds and grass from parade and slopes	$100
for repair of main gate, including materials	$ 25
for general repair of engineer buildings, including materials	$400
Total	$525

148. Sears to Damrell, January 10, 1889, NA, RG 77, Ltrs. Sent, Chief Engineer.

149. Annual Report of Operations at Fort Massachusetts in Fiscal Year 1889, NA, RG 77, Ltrs. Recd., Chief Engineer.

150. Sears to Damrell, March 13, 1889, NA, RG 77, Ltrs. Sent, Chief Engineer.

There was, he noted, no "special works" required for the fort's preservation and repair.[151]

The Department found itself in position to allot $25 for repair of the main gate and $400 for rehabilitation of the engineer buildings.[152]

To supervise this work, along with projects to be undertaken at Forts Morgan and Gaines, Damrell sought and received permission to employ an overseer at a salary not to exceed $150 per month.[153]

Major Damrell, on submitting his annual report for Fiscal Year 1890, informed the Department that the fort was in "fair condition and the jetties constructed for the protection of its site have so far fully answered their purpose." The brickwork required no repairs, the earthwork of the parapets and traverses was "well preserved," and the magazines were in good order. The revetments, however, were defective.

In November, a workforce had been organized and sent to the island. During the ensuing weeks, grass and weeds on the parade and the slopes were cut and removed; "portions of the casemate walls and arches near the magazines were pointed"; the Engineer buildings refurbished; and the main gate to the fort repaired.

In the 24 months, since June 30, 1888, the boathouse had been battered by winds and surf, and was "nearly all washed away." Damrell listed it as not worth repairing. The 1853 brick lighthouse and

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151. Damrell to Chief Engineer, April 12, 1889, NA, RG 77, Ltrs. Recd., Chief Engineer.

152. Sears to Damrell, June 25, 1889, NA, RG 77, Ltrs. Sent, Chief Engineer.

153. Damrell to Chief Engineer, August 7 and Sears to Damrell, August 12, 1889, NA, RG 77, Ltrs. Recd. & Sent, Chief Engineer.

keeper's quarters, listed as undermined and crumbling in 1888, were no longer carried on the inventory.[154]

6. Maintenance and Protection in Fiscal Year 1891

On August 28, 1890, District Engineer Damrell forwarded estimates of funds required for upkeep of the property during the current fiscal year. He called for:

	Materials	Labor
Repairs, painting, & whitewashing of engineer quarters & storehouse	$30	$95
Painting magazine walls and arches	$10	$30
Cutting grass and weeds on parade, terreplein and slopes		$35
Contingencies and superintendence		150
	Total	$350[155]

The Department, after reviewing its nationwide commitments, allotted $40 for painting magazine walls and arches and $150 for superintendence and contingencies.[156]

For some unexplained reason, Damrell failed to expend this allotment for repair and maintenance of the fort during the 12 months ending June 30, 1891. To compound the mystery, he, in submitting his annual report, repeated the one filed for Fiscal Year 1890 almost word for word.[157]

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154. Annual Report of Operations for Fort Massachusetts in Fiscal Year 1890, NA, RG 77, Ltrs. Recd., Chief Engineer.

155. Damrell to Chief Engineer, August 28, 1890, NA, RG 77, General Correspondence 1890-92, Doc. 5123.

156. Chief Engineer to Damrell, October 11, 1890, NA, RG 77, General Correspondence 1890-92, Doc. 5123.

157. Annual Report of Operations at Fort Massachusetts in Fiscal Year 1891, NA, RG 77, General Correspondence 1891, Doc. 4141.

7. Maintenance and Protection in Fiscal Year 1892

To finance needed repairs to the fort and engineer structures in the year ending June 30, 1892, Major Damrell asked for:

	Materials	Labor
Repairs, painting, and whitewashing quarters and storehouse	$60	$75
Pointing magazine walls and arches	$25	$50
Cutting grass and weeds on parade, slopes, and terreplein	$15	$40
Superintendence and contingencies		$125
	Total	$390[158]

On May 10, 1891, the Department allotted $275 for maintenance and repairs at Fort Massachusetts, to be budgeted: $150 for "weeding and cementing part of terreplein"; and $125 for pointing magazine walls and arches.[159]

For some unexplained reason, Major Damrell failed to undertake these projects during Fiscal Year 1892.[160]

8. Maintenance and Protection in Fiscal Year 1893

When he prepared his program for Fiscal Year 1893, Major Damrell asked for:

	Materials	Labor
Temporary covering of service magazines	$50	$100
Repairs to quarters	$25	$ 75
Weeding, cutting grass, cleaning, etc., slopes, terreplein, and parados		$ 50
Superintendence and contingencies		$ 75
	Total	$350[161]

158. Damrell to Chief Engineer, March 12, 1891, NA, RG 77, General Correspondence 1891, Doc. 1969.

159. Chief Engineer to Damrell, May 11, 1891, NA, RG 77, General Correspondence 1891, Doc. 5123.

160. Annual Report of Operations at Fort Massachusetts for Fiscal Year 1892, NA, RG 77, General Correspondence 1892, Doc. 3941.

161. Damrell to Chief Engineer, September 15, 1892, NA, RG 77, General Correspondence 1892, Doc. 5384.

On October 6, 1892, the Department allotted for maintenance and repairs at the fort: $150 for temporary coverings of service magazines; $50 for weeding, cutting grass, cleaning, etc., of slopes, terreplein, and parados; and $75 for superintendence and contingencies.[162]

When he filed his annual report for Fiscal Year 1893, Major Damrell again noted that the fort was in "fair condition, and the jetties constructed for protection of its site, have so far fully answered their purpose." The brickwork needed no repair, the earthwork of the parapets and traverses was "well preserved," but the revetments were defective.

During the past 12 months, funds and labor had been expended putting temporary coverings on the service magazines, cutting grass, and weeding the slopes.

Turning to the buildings outside the fort for which the Corps was responsible, Damrell reported that the officers' quarters should be painted and whitewashed; the storeroom and carpenter shop needed slight repairs to windows and whitewashing; and the engineer's quarters and messhall required repairs to the blocking and windows, and whitewashing.[163]

9. Erosion of the North Beach Threatens the Fort

In the summer of 1893, Major Damrell cautioned the Department that the fort site was menaced by erosion of the north beach, west of the old quarantine wharf. Already, the boathouse and fort keeper's quarters had been undermined and wrecked. To check the encroachment of the sea in this sector, Damrell called for a $1,863.28 allotment to fund construction of 12 brush jetties and 5 sheet piling wings.

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162. Chief Engineer to Damrell, October 6, 1892, NA, RG 77, General Correspondence 1892, Doc. 5384.

163. Annual Report of Operations at Fort Massachusetts for Fiscal Year 1893, NA, RG 77, General Correspondence 1893-94, Doc. 3426.

Damrell's cost figure brokedown:

Materials	Costs
2 pontoons at $55, transportation of fascines, etc.	$100.00
225 piles (6" to 8" dia.) yellow pitch pine, at $25	$ 56.25
50 piles (10" to 20" dia.) yellow pitch pine (fenders) @ .35	$ 17.50
275 cords brush @ $1.25	$343.75
4,500 pounds annealed wire @ 3½¢	$157.50
750 linear feet sheet piling 11,500 feet B.U., @ $15 per M	$172.50
1,500 linear feet stringers @ .014-3/4 per feet	$ 22.00
Tools	
8-inch button plyers 6" side cutting, implements, etc., spikes and nails	$ 65.00
Labor	
5 laborers @ $1.75 per day, 1½ months	$393.75
1 overseer @ $1.25 per month, 1½ months	$187.50
Incidentals	
Provisions and supplies to men at .35¢ per diem, 1½ months	$ 94.50
Superintendence and contingencies	$243.03
Total	$1,863.28[164]

10. The October 1893 Hurricane

Before the Department responded disaster struck. Shortly after midnight, on October 2, 1893, a killer hurricane roared in from the Gulf. Wild winds and surf battered the Ship Island structures, and surging waters from the Sound all but engulfed the lighthouse tower and the quarters occupied by the lighthouse keeper and Ord.-Sgt. Edward Smyth. Even so, the sea tides reached a depth of three feet under their quarters, and if it had inched upward another foot it would have swept them off their pilings.

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164. Ibid; "Fort Massachusetts on Ship Island, Outline showing sea-encroachment and plan of proposed Shore Protection." A copy of the subject drawing is on file at the Mississippi Unit, GUIS.

All the frame buildings on the west end of the island, including the storeroom and carpenter shop, were swept away. The head of the quarantine wharf was destroyed, and a number of piles dislodged from the remainder of the structure. Water pouring through the fort's sally port and embrasures reached a depth of from 3 to 5 feet on the parade.

When the storehouse was pounded to pieces, a "great deal" of engineer property stored within was lost.[165]

Major Damrell, upon visiting the island, confirmed Sergeant Smyth's report. But, in the nearly four weeks since the hurricane, Smyth had salvaged considerable engineer property, some of which was buried under as much as 5 feet of sand. For this, Damrell commended the sergeant. This was nothing new for the sergeant, Damrell added, "as his recored has been of the same character ever since he has been at Ship Island."[166]

11. Maintenance and Protection in Fiscal Year 1894

When he submitted his annual report for Fiscal Year 1894, Major Damrell noted, there have been no changes in the structural condition of Fort Massachusetts during the previous 12 months. Workmen, following the hurricane, had repaired the sally port gate, and the "covering of magazines and at entrance to casemates."

All engineer buildings exterior to the fort, including the 800-gallon Board of Health cistern, had been destroyed by the October 2 hurricane. The water in the 2,370-gallon brick-cemented cistern was no longer fit to drink.

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165. Smyth to Adj. Gen., Department of the East, October 2, 1893, NA, RG 77, General Correspondence, 1893-94, Doc. 4129. Sergeant Smyth also lost in the blow these quartermaster items for which he was charged: 8 cords hardwood, 1 lamp reflector, I metal faucet, 1 mason's trowel, a fire brick, 1 grate, and 1 jackscrew.

166. Damrell to Chief Engineer, October 27, 1893, NA, RG 77, General Correspondence, 1893-94, Doc. 4129.

The ordnance stores, as well as the salvaged engineer property, was now stored in the fort.

Major Damrell listed the ordnance-sergeant's and lighthouse keeper's, quarters, and the lighthouse tower as in good conditions.[167]

167. Annual Report of Operations at Fort Massachusetts for Fiscal Year 1894, NA, RG 77, General Correspondence 1893-94, Doc. 3426.

IX. THE FINAL WAR DEPARTMENT YEARS: 1895-1933

A. Fort Massachusetts During the Last Years of the 19th Century

1. Colonel Damrell is Reassigned

On September 30, 1895, Colonel Damrell, after 22 years as district engineer was transferred to Portland, Maine, where he assumed his new duties. From that date until November 12, his former assistant, Ist Lt. E. Eveleth Winslow, served as acting district engineer. On the latter date, Maj. William T. Rossell reached Mobile and formally took charge as district engineer.[1]

2. Maintenance and Protection in Fiscal Year 1896

During the 12 months ending June 30, 1896, Corps operations were limited at Ship Island were limited to "care and preservation of public property."

When he filed the prerequisite annual report, Major Rossell listed the fort as in fair condition, while the jetties were answering the purpose for which they had been constructed. The brickwork needed no repairs, the magazines were in good condition, the earthwork of the parapets and traverses was well preserved, while the revetments were defective.[2]

There had been no changes in the armament or platforms during the subject 12 months. At present, the fort was armed:

Barbette Tier

Guns	No.	Type of Carriages	Front or Center-Pintle
15-inch Rodmans	2	iron	center
100-pdr. Parrotts	2	iron	center

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1. Annual Report of Operations at Fort Massachusetts for Fiscal Year 1896, NA, RG 77, General Correspondence, 1894-1924, Doc. 16195/2. Lieutenant Winslow served Rossell as assistant engineer until February 27, 1896, when he was relieved by 2d Lt. Harry Burgess. Damrell had been promoted lieutenant colonel on October 12, 1895.

2. Annual Report of Operations at Fort Massachusetts for Fiscal Year 1896, NA, RG 77, General Correspondence, 1894-1924, Doc. 16195/2.

Casemate Tier

10-inch Rodmans	13	iron	* front

* The composition eccentric sockets were missing.

As it had been since the hurricane of 1893, the engineer property was stored in the fort. The greater part of this gear was worthless and should be condemned. The ordnance stores were likewise kept in the fort, but, unlike the engineers', were in good condition.

The water in the fort's two underground cisterns, as well as the 2,375 gallons in the cemented cistern, had been rendered unfit to drink by the 1893 hurricane. Major Rossell urged that funds be allotted for flushing out and cementing the casemate cisterns. The only public buildings on the western end of the island, except the fort, were the quarters occupied by the ordnance-sergeant and the lighthouse keeper, and the lighthouse.[3]

3. Flushing and Repairing the Cisterns

During mid-December 1896, the Chief Engineer, in response to Major Rossell's request, allotted funds for flushing the cisterns at Forts Massachusetts, Morgan, and Gaines, and repair of the leaders and pipes discharging into them. This work was implemented during the winter of 1896-97.[4]

4. Maintenance and Protection in Fiscal Years 1897-1900

In Fiscal Years 1897-1900, operations at Fort Massachusetts were limited by the Corps of Engineers to "care and preservation of public property."[5]

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3. Ibid.

4. Rossell to Chief Engineer, December 9 and Balck to Rossell, December 16, 1896, NA, RG 77, General Correspondence, 1894-1924, Doc. 18441.

5. Annual Reports of Operations at Fort Massachusetts for Fiscal Years 1897, 1898, 1899, and 1900, NA, RG 77, General Correspondence, 1894-1924, Dos. 16195/9, 16195/19, 16195/23, & 16195/34.

5. Department Vetoes a $25,000 Expenditure for a Seawall

District Engineer Rossell, in mid-August 1899, found that the north beach was continuing to wash away, and at ebb tide there was "only about 60 feet" of sand between the surf and the scarp "to the nearest point of low water." A plan of the western end of the island, dated 1894, showed the distance to be 180 feet. Should the erosion continue at this rate for another 24 months, the fort, Rossell reported, would be "endangered in about two years."[6]

Prevailing westerly winds, during the next two months, sent the tides within 12 feet of the scarp at its nearest point. To combat this beach erosion, Major Rossell recommended construction of a 2,500-foot seawall at an estimated cost of $25,000.[7]

Chief Engineer J.M. Wilson, as Ship Island was not included in the present scheme of national defenses, vetoed such an expenditure.[8]

B. Sale and Removal of the Guns and Ordnance Stores

By the spring of 1901, the fort's ordnance and ordnance stores had been condemned and were advertised for sale by the Ordnance Department. The most favorable proposal--$2,054--was submitted by A. Marx of 639 Tchoupitolous Street, New Orleans. Recommending its acceptance, Lt. Edward P. Nones called attention to the "inaccessibility of the fort," vessels being unable to approach within 200 yards of the site.

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6. Rossell to Chief Engineer, Aug. 10, 1899, NA, RG 77, General Correspondence, 1894-1924, Doc. 32303.

7. Rossell to Chief Engineer, August 24 and October 29, 1899, NA, RG 77, General Correspondence 1894-1924, Doc. 32303.

8. Chief Engineer to Rossell, November 1, 1898, NA, RG 77, General Correspondence 1894-1924, Doc. 32303/1.

This would compell Marx to assume the expense of breaking up the guns and carriages.[9]

Chief of Ordnance Adelbert Buffington directed that Marx's bid be accepted and the prerequisite deposit made.[10]

During the ensuing months, Marx's workmen broke up and removed from Ship Island all the heavy ordnance and their carriages and chassis, except the 15-inch Rodman mounted on platform No. 13. This gun was left in position, where it has remained until today. The ordnance stores were removed coincident with the guns.

C. February 1901 Inspection

Some four months before, Maj. J.M.K. Davis of the Inspector-General's Department had spent a day on the island. He found

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9. Nones to Chief of Ordnance, June 8, 1901, NA, RG 156, General Correspondence, 1894-1913, Doc. 26478/a. Among the stores sold were: 13 10-inch Rodmans, their carriages and chassis; 2 100-pounder Parrotts, with their carriages and chassis; 2 15-inch Rodmans, with carriages and chassis; 2 chassis for 100-pounder Parrotts; 574 10-inch shot; 81 100-pdr. Parrott shot; 5 8-inch shells; 602 10-inch shells; 200 15-inch shells; 252 100-pdr. Parrott shells (long); 83 100-pdr. Parrott shells (short); 12 rear sights; 10-inch Rodmans; 2 rear sights, 15-inch Rodmans; 14 middle sights; 2 rear sights, 100-pdr. Parrotts; 14 elevating arcs and indices; 15 elevating bars; 5 fuze extractors, 15 fuze mallets; 1 fuze setter; 5 fuze wrenches; 4 gunners' gimlets; 3 gunners levels; 17 gunners' primer pouches; 14 gunners' quadrants; 4 handspikes, maneuvering; 1 handspike, roller; 11 handspikes, other kinds; 2 ladles and staves for 10-inch gun; 1 ladle and staff for 15-inch guns; 2 ladles and staves, siege and garrison guns; 46 maneuvering bars; 32 pass boxes; 26 pinch bars; 2 powder funnels, copper; 2 powder measures, copper; 24 rammers and staves for 10-inch gun; 3 rammers and staves for 15-inch gun; 4 rammers and staves for 100-pdr. Parrott; 4 shell hooks, pairs; 4 shot-carrying bars; 26 sponges and staves for 10-inch gun; 4 sponges and staves for 100-pdr. Parrott gun; 4 sponges and staves for 15-inch gun; 8 worms and staves for seige and garrison guns; 2 aprons, lead, and straps; 2 gins, casemate; 6 gin handspikes; 1 hoisting apparatus for 15-inch gun; 26 eccentric sockets, 45 floor loads; 12 pintles, casemate; 4 steps, iron, for 100-pdr. Parrott gun; 20 hoops, copper; 1 adze; 1 auger; 1 axe; 1 bench screw; 3 bitts, various; 1 hammer; 3 lanterns, various; 3 planes; 3 planes, iron/sandstone; and 34 wrenches.

10. Chief of Ordnance to Nones, June 14, 1901, NA, RG 156, General Correspondence 1894-1913, Doc. 26478/a.

the fort in "very good condition, the only leaks being under the service magazines for the 15-inch guns."

He, however, was disturbed to see that Biloxi butcher J.T. Swetman was pasturing on the reservation a number of goats, hogs, and cattle. Among the latter were 13 bulls, several of which were "vicious and dangerous." Swetman having refused to remove the cattle, Major Davis recommended that immediate steps be taken to get them off the island.[11]

Swetman, upon receiving a formal complaint from the Lighthouse Board, agreed to remove his cattle from the island. First, however, he had to secure authority from the superintendent of the Gulf Quarantine Station to visit the island during the sickly season.[12]

This was done, and the cattle were removed to the mainland.

D. Lighthouse Keeper Clarisse Assumes Responsibility for the Fort

In February 1903, District Engineer Oscar T. Crosly informed the Department that all the guns and carriages, except the 15-inch Rodman and its centre-pintle carriage emplaced on platform No. 13, had been broken up and removed by Mr. Marx. The fort and reservation, Crosly continued, were, as they had been since 1884, in charge of an ordnance-sergeant. As no modern defenses were projected for Ship Island, there was little to occupy the sergeant's time. Consequently, Crosly saw no reason why his services, in the interest of economy, could not be despensed with. Such of the public property, as was in the sergeant's charge, and worth salvaging should be transferred and shipped to the department to which it belonged.

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11. Davis to Adj. Gen., July 20, 1901, NA, RG 156, General Correspondence 1894-1913, Doc. 6230.

12. Niles to Lighthouse Board, May 31, 1901, NA, RG 26, Lighthouse Correspondence, 1901-10, Ship Island.

If the lighthouse Board were agreeable, the lighthouse keeper might also under-take the duties of fort keeper, at a salary of $5.00 per month, in addition to his other responsiblities. His fort keeper duties would consist of little more than keeping unauthorized persons off the reservation and out of the fort.[13]

All parties were agreeable. On March 26, 1903, Ord.-Sgt. John E. Barnes was transferred to Fort St. Philip. Before leaving the island, he turned over to Lighthouse Keeper Peter Clarisse responsibility for the public property belonging to the War Department.[14]

Lighthouse Keeper Clarisse wore two hats for 13 months. On April 7, 1904, the Chief Engineer was notified that all "movable property" on the reservation belonging to the War Department had been transferred. Accordingly, it was no longer necessary to pay Keeper Clarisse five dollars a month for his custodial services. Chief Engineer Alexander Mackenzie agreed, and Clarisse was laid-off on April 30.[15]

Soon after the departure of the ordnance-sergeant, his quarters, the Army having no use for them, were transferred by the War Department to the Marine-Hospital Service and relocated some distance from the Lighthouse Station.[16]

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13. Crosly to Chief Engineer, February 26, 1903, NA, RG 77, General Correspondence, 1894-1924, Doc. 46056/2.

14. Root to Secretary of the Treasury, April 9, 1903; Secretary of Commerce and Labor to Secretary of War, November 16, 1903; and Secretary of War to Chief Engineer, December 5, 1903, NA, RG 77, General Correspondence, 1894-1924, Doc. 46056/5.

15. Craighill to Chief Engineer, April 7 and Abbot to Craighill, April 13, 1904, NA, RG 77, General Correspondence, 1894-1924, Doc. 46056/10.

16. Wyman to Lighthouse Board, September 4, 1903, NA, RG 77, General Correspondence, 1894-1924, Doc. 30761/9.

E. Murdock's Artesian Well

In May 1900, the War Department approved a request by A. Murdock of Gulfport to drill and maintain an artesian well on that part of the Ship Island Military Reservation included in Section 35, Township 9 South, Range 10 West.[17]

By late August, the well had been drilled, and "a good and satisfactory flow of water" secured. To capitalize on his investment, Murdock applied for and secured authority to erect a well keeper's quarters; to "lay a pipe at bottom of shoal water north from well a distance of not more than 900 feet"; and to construct a small wharf. These improvements were promptly made.[18]

The development of Gulfport as a maritime facility doomed Murdock's venture. Instead of laying-to in the Ship Island anchorage, vessels now put into Gulfport to take aboard and discharge cargo. Murdock's in 1903, was compelled to abandon his plan to supply ships with water. By the summer of 1916, the Chief Engineer called for data to determine whether to cancel Murdock's special use permit. Upon checking into the subject, the district engineer was unable to locate Murdock. The lighthouse keeper told him that it had been a number of years since the well had been used, while the well keeper's house, a 10-by 10-foot shack, had been destroyed by fire about ten years ago.[19]

The papers were accordingly referred to the judge advocate, who recommended that, in view of these circumstances, Murdock's special use permit be revoked. Secretary of War Newton D. Baker concurred.[20]

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17. Rossell to Chief Engineer, June 9, 1900, NA, RG 77, General Correspondence, 1894-1924, Doc. 35141/6.

18. Murdock to Rossell, September 11, and Wilson to Rossell, September 18, 1900, NA, RG 77, General Correspondence, 1894-1924, Doc. 35141/7.

19. District Engineer to Chief Engineer, August 7, 1916, NA, RG 77, General Correspondence, 1894-1924, Doc. 35141/13.

20. Black to Baker, January 19, 1917, NA, RG 77, General Correspondence, 1894-1924, Doc. 35141/13.

F. March 1909 Fire

In March 1909, a fire started by vandals damaged some of the fort's woodwork. Upon being apprised of this, the Eighth Lighthouse District Engineer directed Keeper Clarisse to restrict all trespassers.[21]

G. Opening the Fort to Unrestricted Visitation

To ward off interlopers, Lighthouse Keeper Clarisse erected "NO TRESPASSING" signs and placed a padlock on the sally port entrance door to which he retained the key. In August 1914, this policy resulted in a complaint to local United States Representative B.P. "Pat" Harrison by the Biloxi Commercial Club.

On the 5th, Club Secretary H.H. Roof wrote his congressman, that a group of sightseers from the White House had been boated out to Ship Island to visit the fort. Calling at the keeper's quarters, they asked for the key. He refused, slamming the door in their faces. Such action by Clarisse, whom Roof described as a "crabby old cuss", was not infrequent. Moreover, Roof continued, there is "nothing in the old structure to be harmed by visitors, neither is there anything to be carried away, and it seems to me to be but little concession to arrange that visitors to the island be permitted access to the place."[22]

Representative Harrison referred the complaint to the Lighthouse Service. When the service investigated, it was unable to ascertain the names of any visitors who had been treated in such a manner. It was learned, however, that E.L. Suter of Biloxi was in the habit of boating tourists out to the fort, and that "he was primarily the cause of the charge against" keeper Clarisse.

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21. Jervey to Chief Engineer, March 8 and Acting Secretary of Commerce to Secretary of War, April 5, 1909, NA, RG 77, General Correspondence, 1894-1924, Doc. 70955.

22. Roof to Harrison, August 6, 1914, NA, RG 26, Bureau of Lighthouses, Correspondence File 1062-E.

Upon communicating this information to his supervisors and the Corps of Engineers, Eighth District Inspector B.B. Dorry noted, the responsibility for seeing visitors through the fort was "apt at times to seriously interfere with the duties of the keeper of Ship Island Light Station." Consequently, it seemed that, as the fort had been abandoned and housed no government property, it should be "either permanently closed or left open for inspection at all times."[23]

The Corps of Engineers accordingly determined to make the fort available to all comers, and Keeper Clarisse was directed to "open all the rooms of old Fort Massachusetts" to which he has keys, and then forward the keys to the Mobile District Engineer. This relieved the keeper of all responsibility for the fort.[24]

H. Corps of Engineers Spend $2,000 for Site Preservation

1. Colonel Keller Calls for an Allotment

In mid-July 1915, District Engineer Charles Keller, in response to a circular letter from the Chief Engineer calling attention to the need to expend funds for preservation of the Nation's historic masonry forts, visited Ship Island. He found that vandals, in the months since the public had been given unrestricted access to the fort, had stolen the hinges to one of the magazine doors. To prevent further mischief of this sort, Keller locked the door to the sally port and returned the key to Lighthouse Keeper Clarisse.

He also saw that the site of the fort was continuing to erode, and water, at flood tide, stood to a depth of 2 feet against the exterior walls of the northeast bastion. To prevent this wearing away, which would eventually destroy the bastion, Keller suggested construction of groins and rip-rap. If creosoted pilings and timber were employed in the groins, cost of the project might be held to $10,000.

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23. Dorry to U.S. Engineer, Mobile, September 8, 1914, NA, RG 26, Bureau of Lighthouses, Correspondence File 1062E.

24. Keller to Dorry, September 21, 1914, NA, RG 26, Bureau of Lighthouses, Correspondence File 1062E. Lt. Col. C. Keller was the Mobile District Engineer.

As an alternative to such an expenditure, Keller suggested that the Department offer to transfer the fort to the State of Mississippi "for preservation as a relic of historical interest to all Mississippians, on condition that the State bind itself to execute at once the necessary protection work." He had been told that the United Daughters of the Confederacy had expressed interest in securing title to the fort. Apart from the groins and rip-rap, it would be desirable to construct a more formidable entrance door, and, if the public were to be admitted, to employ a caretaker. The latter proposal would likewise warrant providing the stairways from the casemates to the barbette tier with railings to prevent accidents. Other needed maintenance, i.e., cutting grass, repair of interior woodwork, etc., he estimated would cost about $400 annually.[25]

2. Department Vetoes National Monument Proposal

Nothing, however, came of Colonel Keller's recommendations, and, in October 1916, he suggested that steps be taken to have Fort Massachusetts declared a National Monument. The Department, in vetoing this alternative, reminded the district engineer that setting the fort aside as a National Monument would in itself not provide the wherewithal for preservation. If a keeper were secured, "a small amount could be allotted for the necessary repairs" and the caretaker's compensation.[26]

3. Lighthouse Keeper Clarisse Again Becomes Caretaker

Maj. William L. Guthrie, who had replaced Colonel Keller as district engineer, suggested that the Department, in view of the isolation of the site, again make arrangements for employing Keeper Clarisse as caretaker. Upon checking into the matter, Guthrie learned that Clarisse was currently "exercising considerable care and supervision over the

25. Keller to Chief Engineer, July 12, 1915, NA, RG 77, General Correspondence, 1894-1924, Doc. 96,697/20.

26. Chief Engineer to Guthrie, March 9, 1917, NA, RG 77, General Correspondence 1894-1924, Doc. 96697/166.

fort, and it is only fair and just that he receive some little compensation therefor." If this recommendation were approved by the Chief Engineer, Guthrie asked that a $500 allotment be made for paying Clarisse five dollars per month for his services and for such minor repairs to the fort as were indispensible.[27]

Consequently, the War Department contacted the Secretary of Commerce in regard to again employing Keeper Clarisse as caretaker. This task he could perform in addition to his lighthouse duties.

The Secretary of Commerce raised no objection to this proposal, provided the War Department planned to keep the fort locked and closed to visitors. During the years prior to 1914, the Secretary reminded the War Department that, when the fort had been open to visitation, it had been a "source of annoyance" to the keeper, because many objectionable persons had sought admission. Whenever this was denied, these people frequently clashed with Keeper Clarisse.[28]

Within several weeks, Clarisse's authority was challenged. On July 20, 1917, the caretaker found pilot John E. Lewis and two strangers attempting to enter the fort through a north front embrasure. He told them to leave, but they remained in their skiff, refused to recognize his authority, and "grossly insulted" him.[29]

Upon reviewing Clarisse's report, Major Guthrie called for prosecution of the trespassers and removal of the stranded hulk being used as a "camping place" by the Gulfport pilots.[30]

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27. Guthrie to Chief Engineer, March 15 and April 23, 1917, NA, RG 77, General Correspondence, 1894-1924, Doc. 96697/166.

28. Sweet to Secretary of War, June 11, 1917, NA, RG 77, General Correspondence, 1894-1924, Doc. 112599.

29. Clarisse to Guthrie, July 20, 1917, NA, RG 77, General Correspondence, 1894-1924, Doc. 96697/198.

30. Guthrie to Lighthouse Inspector, 8th District, July 23, 1917, NA, RG 77, General Correspondence, 1894-1924, Doc. 96697/197.

Lighthouse Inspector Dorry ordered the case investigated, and assured Guthrie that Keeper Clarisse had been previously directed not to permit anyone to land on the lighthouse reservation, because all light stations had been closed to visitors since soon after Congress's April 6 declaration of war on Germany.[31]

4. Department Allots $2,000 for Site Preservation

Meanwhile, Major Guthrie had submitted a report on the continuing threat to the fort caused by the erosion of the north beach. When he visited the site on May 1, he found the water at low tide to be 3 feet deep against the north wall. Already there were signs of settlement evidenced in two casemate arches, "while the floor in one of the casemates in this vicinity has collapsed over a space of about 10' X 16'." To protect the fort, which he described as a "marvelous brick work," Guthrie called for an allotment to fund construction of a groin and protecting wall to consist of:

30 18-foot creosoted pipes	$ 405
9,000 F.B.M. cresoted lumber	$ 270
Labor	$ 725
Incidentals	$ 300
	$1,700[32]

On June 16, the Department allotted $2,000 to be expended for preservation of the site of Fort Massachusetts.[33]

This was the last money the Corps of Engineers was to allot and spend on maintenance of Fort Massachusetts and preservation of the site, while the War Department had responsi-blity for the Ship Island Military Reservation.

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31. Dorry to Guthrie, August 2, 1917, NA, RG 77, General Correspondence, 1894-1924, Doc. 96697/197.

32. Guthrie to Chief Engineer, May 9, 1917, NA, RG 77, General Correspondence, 1894-1924, Doc. 96697/173.

33. Chief Engineer to Guthrie, June 16, 1917, NA, RG 77, General Correspondence, 1894-1924, Doc. 96697/173.

I. United States Sells the Ship Island Military Reservation to Joe Graham American Legion Post

1. Several Mississippians Seek to Purchase Fort

Peace returned to the United States in November 1918, and the nation rushed to bring the "boys" home from Europe and to demoblize its Army. During the post-war years, there would be greatly reduced appropriations by Congress for the military. The 1920s and much of the 1930s would be years of austerity and penny pinching by the War Department. Confronted by a bleak economic situation, there would be little money for obsolete coastal fortifications, and measures would be taken to relieve the Army of responsibility for their maintenance and protection.

In the winter of 1920, R.D. Dacey of Biloxi and Charles Sanger of Bay St. Louis, separately, wrote Mississippi Senator Pat Harrison to ascertain the truth of stories they had heard that the United States was desirous of selling Ship Island. Sanger, a member of the board of commissioners in charge of constructing the Bay St. Louis seawall, wished to "pick-up the scattered rocks around Fort Massachusetts." Continuing, he informed his senator, the fort "has been condemned years ago and the west side of the Fort is in the waters of the Gulf." If permitted to buy the fort, Sanger promised to "make good use of the bricks in rebuilding our roadways along our beach."[34]

As the fort was on the lighthouse reservation, Senator Harrison referred these inquiries to the Department of Commerce. When called on for a report, the Eighth District Lighthouse Superintendent recommended that the fort not be sold. In addition, he reminded that removal of the riprap from around the fort, as proposed by Sanger, would hasten the destruction of the lighthouse reservation. In the past, both the Corps of Engineers and the Lighthouse Service, at considerable

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34. Harrison to Commissioner, January 2, 1920, and Sanger to Harrison, February 6, 1920, NA, RG 26, Lighthouse Correspondence, 1911-39, Ship Island, File 1062E.

expense, had positioned "large quantities of rock along the island's north shore to control the erosion," he concluded.[35]

Thus, the Lighthouse Service was on record as opposing disposal by the United States of the fort, if it involved demolition of the structure and removal of the riprap.

2. Congress Authorizes War Department to Sell Certain Surplus Properties

Then, in November 1922, the War Department listed as surplus to its needs a number of its properties. Among the tracts enumerated was Ship Island. The disposal of these parcels, under existing laws and regulations, was made the task of the Quartermaster General. Thus, after nearly three-quarters of a century, the Corps of Engineers was relieved of its responsibility for Fort Massachusetts.[36]

To enable the United States to dispose of the several military reservations, including Ship Island, Congress enacted and President Calvin Coolidge signed into law on March 12, 1926, an act authorizing the Secretary of War "to sell or cause to be sold" the subject lands. Before being placed on the market, the lands were to be appraised and the appraisal approved by the Secretary of War. The Secretary would then notify the governor of the state in which the tract was located. If the state failed to take advantage of its option to purchase the land in question, at the appraised value, it should then be offered, under the same conditions, to first the county in which it was situated and then to the nearest municipality.[37]

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35. Lamphier to Commissioner, February 27, 1920, NA, RG 26, Lighthouse Correspondence, 1911-39, Ship Island, File 106-E.

36. Adjutant General to Quartermaster General, November 20, 1922, NA, RG 92, General Correspondence, 1922-35, File 602.2

37. Judge Advocate to Assistant Secretary of War, March 14, 1932, NA, RG 92, General Correspondence, 1922-35, File 602.2

In mid-June 1926, before any appraisals were made, Capt. Edward A. Mechling of the Quartermaster Corps inspected the Ship Island Military Reservation. He was accompanied by Mayor Joseph Miller of Gulfport and James Fly, former administrative aide to Senator Pat Harrison. They found that the middle portion of the island was very low and at flood tide was often covered by surf. Much of the northern shore, in the vicinity of Fort Massachusetts and the lighthouse, had been claimed by the sea. Currently, at high tide, at least one-half the fort was surrounded by water. The west end of the island, Captain Mechling saw had been enlarged by accretion, so that there was at least a 50-acre tract west of the boundary of the lighthouse reservation. The ship channel to Gulfport passed close to the island's westernmost point.

Mayor Miller told the Army officer that Gulfport was desirous of purchasing the western part of the island. Maj. J.J. Kennedy of Biloxi, when interviewed, announced that his city was interested in acquiring title to the eastern half of the island under provisions of the recent act of Congress. Captain Mechling observed that the part of the reservation desired by Biloxi, was of sufficient elevation to be suitable for development as a winter resort.[38]

3. Redefining Boundaries of the Lighthouse and Quarantine Stations

Before the Military reservation could be disposed of, however, the boundaries of the lighthouse and quarantine stations must be redefined. At the request of the Treasury Department, President Coolidge by executive order transferred to that agency for use as a quarantine station that part of Ship Island bounded as follows: to begin on the north shore at mean low water, 1,000 feet west of the meridian of the U.S. Coast and Geodetic Survey triangulation station (88° 53' 44.884" west longitude and latitude 30° 13' 43.257'); then along the said shoreline in a northeastern direction to mouth of Grand Lagoon, then along the

38. Mechling to Quartermaster General, June 30, 1926, NA, RG 92, General Correspondence, 1922-35, File 602.2.

meandering south low water shore line of Grand Lagoon to a point 3,236 feet east of the triangulation station; then due south across the island approximately 1,100 feet to a point on the south low water shoreline; then in a southwesterly direction along the meandering south low water shoreline to a point on the subject shoreline 1,000 feet west of the triangu-lation station meridian; and then due north approximately 940 feet to the place of beginning.[39]

Next, on March 4, 1929, President Coolidge signed into law legislation enacted by the 2d Session of the 70th Congress, transferring "so much of the lighthouse reservation . . . as the Secretary of Commerce deems unnecessary for lighthouse purposes" to the Ship Island Military Reservation, where it will be under jurisdiction of the Secretary of War. It was also provided that the Ship Island Military Reservation, along with the portion of the lighthouse reservation hereby made a part of it, was to be appraised and disposed of subject to the provisions of the act of March 12, 1926.

The Department of Commerce, upon reviewing the subject, decided to retain two tracts as the Ship Island Lighthouse Reservation. Tract A was to include all that portion of the island "lying between a true north and south line 400 feet east of the center of the lighthouse tower and a true north and south line lying 1,000 feet west of the tower."

Tract B was to consist of "all the westernmost portion" of the island "lying west of a true north and south line 3,640 feet to the westward of the center line of the lighthouse tower."[40]

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39. Executive Order No. 4585, February 15, 1927, NA, RG 92, General Correspondence, 1922-35, File 602.3.

40. Morgan to Secretary of War, August 15, 1929, NA, RG 92, General Correspondence, 1922-35, File 601.4. E.F. Morgan was acting Secretary of Commerce.

The remainder of the lighthouse reservation was transferred to the War Department in accordance with the March 4, 1929, legislation.

4. State of Mississippi Fails to Exercise its Option

Secretary of War John W. Good, the boundaries of the military reservation having been redefined, now obtained new appraisals from the Gulfport Real Estate Board. The valuation of the property was pegged at $17,837.50.

Governor Theodore G. Bilbo of Mississippi, upon being notified of the apprised price, advised the War Department on May 22, 1930, that the state did not wish to acquire the subject acreage. Harrison County, through its Board of Supervisors, however, had written the Secretary of War on May 14, 1930, that it desired to exercise its option to purchase the property at the appraised valuation. At the board's request, its option was extended for two years.[41]

5. United Daughters Seek to Acquire Parcel as Monument Site

Meanwhile, in April 1930, the Mississippi Chapter of the United Daughters of the Confederacy contacted Senator Pat Harrison in regard to securing a small tract, 50 feet square, on which to erect a monument to honor the memory of Southern soldiers and sailors. The preferred location of the tract was 600 feet east of the Fort Massachusetts sallyport and 76 feet west of the western boundary of the lighthouse reservation. Here, the Confederate memorial would be sited "On the line of the ancient wharf which was built during the war for unloading supplies."[42]

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41. Acting Secretary of War to Maples, October 17, 1931, NA, RG 92, General Correspondence, 1922-35, File 602.2.

42. Muth to Department of Commerce, April 21, 1930, and Galloway to Harrison, April 11 & 15, 1930, NA, RG 92, General Correspondence, 1922-35, File 619.3. F.A. Muth was assistant superintendent, Eighth Coast Guard District, and James F. Galloway was a Gulfport lawyer.

The War Department acknowledged that the tract was on the military reservation which had been authorized for disposal. If the State of Mississippi exercised its option, the UDC must make arrangements with the state for acquisition of the desired tract.[43]

6. Harrison County's Option Years

Rumors that the Harrison County Board of Supervisors might not take advantage of their option, because of the depressed economy and collapse of the Gulf Coast tourist industry, led to a move by the American Legion to acquire the reservation. Consequently, legislation was introduced into the 1st Session of the 72d Congress by Sixth District Representative Robert E. Hall, providing for sale of the Ship Island Military Reservation to the Joe Graham American Legion Post for $17,837.50, upon expiration of the Harrison County option.[44]

While anxiously awaiting action on the Hall bill, Luther W. Maples, commander of the Mississippi Department, American Legion, and an influential member of the Joe Graham Post, wrote the War Department. He requested that Joe Graham Post be permitted to occupy the island for "the purpose of preserving the old fort and making it into a real memorial to the World War Veterans and also, a National Playground for the American Legion."[45]

The War Department deemed it improper to grant the American Legion a permit to occupy temporarily the military reservation while legislation governing the transfer of the property was before Congress.[46]

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43. Davison to Harrison, May 15, 1930, NA, RG 92, General Correspondence, 1922-35, File 619.3. T. Turbee Davison was Acting Secretary of War.

44. Payne to Rankin, March 24, 1932, NA, RG 92, General Correspondence, 1922-35, File 680.44. F.H. Payne was Assistant Secretary of War and John E. Rankin represented the First Mississippi District in the 72d Congress.

45. Maples to War Department, June 25, 1932, NA, RG 92, General Correspondence, 192235, File 680.44.

46. Payne to Maples, July 6, 1932, NA, RG 92, General Correspondence, 1922-35, File 680.44.

Meanwhile, the War Department had been apprised of an article in the Gulfport Daily Herald, announcing that the Pan-American Association of Gulf Coast Resort Hotels, "had just completed a new pavilion at its docks on Ship Island." The building, it was reported, housed a restaurant and refreshment stand and had a large screened porch. An electric light plant was being installed, which would light the pier, bathhouses, restaurant, and beach.

Distressed by this information and suspecting that the Joe Graham post had trespassed, the War Department ordered Capt. Bernice McFayden, the Professor of Military Science and Tactics at Gulf Coast Military Academy, to make an investigation. Visiting the island, Captain McFayden found no signs of interlopers nor unauthorized improvements at the fort, lighthouse, or quarantine station. But, at the southeast end of the island, he discovered a pier and a refreshment stand--the former completed and the latter under construction. They belonged to the Pan-American Association, which operated a cruise ship by that name.

Upon conferring with Dennis McManus, Clerk of the Harrison County Board of Supervisors, the Army officer learned that the Pan-American people had been given permission to build the pier and bathing facilities by the Board of Supervisors.[47]

Consequently, the Quartermaster General addressed a letter to the Harrison County Board of Supervisors, asking to be provided with information as to the Board's authority for granting a special use permit for construction of a pier and development of a resort on any portion of the Ship Island Military Reservation.[48]

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47. McFayden to Commanding General, Fourth Corps Area, June 25, 1932, NA, RG 92, General Correspondence, 1922-35, File 680.44.

48. Cratch to McManus, July 20, 1932, NA, RG 92, General Correspondence, 1922-35, File 680.44. Capt. S.C. Cratch was assigned to the Quartermaster General's office.

7. Act of June 15, 1933, Authorizes Sale to Joe Graham Post

The county's option to purchase the reservation had expired on May 14, 1932, and legislation was introduced into the 1st Session of the 73d Congress by Senator Harrison, authorizing sale of the reservation to the Joe Graham Post. S. 1813 sailed through both houses, and was signed into law by President Franklin D. Roosevelt on June 15, 1933. It authorized the Secretary of War to "convey by quick claim deed to Joe Graham Post Number 119, of the American Legion. . . all the lands lying within the Ship Island Military Reservation . . . in consideration of the payment to the United States" by Joe Graham Post of $15,000. The money was to be paid "in equal annual installments over a period of ten years from the date of such conveyance."

Three conditions were to be observed by the grantee: (a) the lands so conveyed must be maintained by the post as a National Recreation Park; (b) the post was to erect and maintain in the area "a suitable monument or other memorial to the veterans of the World War"; and (c) the post was to set aside a "parcel of land not exceeding an acre . . . as may be selected by the United Daughters of the Confederacy for the sole use of that organization for the erection and maintenance of a memorial to veterans of the Civil War."[49]

8. Joe Graham Post Takes Possession but Fails to Make Payments

Three months later, on September 15, officials of the Joe Graham Post contracted with the War Department for purchase of the reservation. The financially-strapped post would make its first payment--$1,500, on December 11. The legionaires were unable to meet this condition and sought and obtained a delay until January 1, 1934. When neither the $1,500 nor the 5 percent interest were forthcoming, the War Department dunned the Joe Graham Post.[50]

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49. Public Law No. 60, 73d Congress, June 15, 1933, NA, RG 92, General Correspondence, File 602.2.

50. Wheeler to Joe Graham Post, March 7, 1934, NA, RG 92, General Correspondence, 192235, File 602.2.

This brought no results, and the War Department, in June 1934, threatened action to repossess the reservation.

Meanwhile, Luther Maples had sought congressional assistance to keep the United States from taking this action. On May 31, he wrote William Colmer, who now represented Mississippi's Fifth District. Colmer was informed that the legionaires had made several improvements to the property. A 520-foot pier had been built and an electric light plant installed. "We," Maples continued, "will soon have sufficient accommodations on the island to take care of people who want to spend several days." It was hoped that they would be able to develop facilities for up to 150 overnight guests.

Visitors, Maples boasted, were "very much impressed with the idea of making this a real playground and fishing resort."

Efforts to secure a boat for taking people to and from the island had been unsuccessful. Several boats, in which the legion was interested, had been sold at Pascagoula for a high price, especially when considering the expenses of placing them in condition to pass an inspection by the Coast Guard.

To fund the project, Joe Graham Post had formed a corporation and was selling stock at $100 a share to the legionaires.[51]

9. Senator Harrison Comes to the Rescue

To forestall foreclosure, Senator Harrison succeeded in prevailing on the War Department to delay action, to enable him to secure relief for the Joe Graham Post in the next Congress. In this Harrison was successful, and on September 4, 1935, President Roosevelt approved legislation authorizing the War Department to have the reservation reappraised and to "accept, in full settlement of the obligation of . . . Joe Graham Post under the terms of said contract, such sum, not less

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51. Maples to Colmer, May 31, 1934, NA, RG 92, General Correspondence 1922-1935, File 602.2.

than $1,658.22," as it deems fair and equitable in the light of such reappraisal.[52]

10. Joe Graham Post Makes Reduced Payment and Gets Clear Title

The Secretary of War accordingly had the three tracts, constituting the military reservation, reappraised by the Mobile Real Estate Association, which valued the property at:

Parcel A	Land		$100.00
	Improvements		$1,000.00 (fort)
Parcel B	Land		$150.00
	Improvements		None
Parcel C	Land		$250.00
	Improvements		$500.00 (timber)
		Total	$2,000.00[53]

Following receipt of this information, Lt. Col. M.D. Wheeler, Assistant Quartermaster, notified Luther Maples that, in accordance with the act of September 4, the Secretary of War had had the reservation reappraised. Upon the basis of the reappraisal, it had been determined that $2,150 in cash was acceptable as the existing obligation of Joe Graham Post.[54]

Acknowledging Colonel Wheeler's communication, Maples announced that on or about January 15, 1936, the post would be in position to make a settlement. When the legionaires did, they, in accordance with instructions, posted two certified checks--one for $2,000 to, Chief of Finance, U.S. Army, and the other for $150 to the Mobile Real Estate Association.[55]

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52. Public Law No. 414, 74th Congress, NA, RG 49, Abandoned Military Reservation File--Ship Island.

53. Mobile Real Estate Association to Wheeler, October 24, 1935, NA, RG 92, General Correspondence, 1922-35, File 602.2.

54. Wheeler to Maples, November 18, 1935, NA, RG 92, General Correspondence, 1922-35, File 602.2.

55. Maples to Wheeler, December 16, 1935 & Wheeler to Maples, December 19, 1935, NA, RG 92, General Correspondence, 192235, File 602.2.

The War Department, after more than three-quarters of a century, had divested itself of its Ship Island responsibilities. For the next 36 years, Joe Graham Post would oversee, such as its limited resources allowed, the maintenance and protection of Fort Massachusetts.

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ILLUSTRATIONS

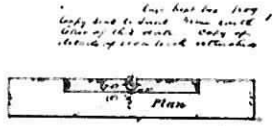
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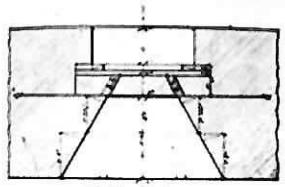
"Plans, Sections & Elevations of Gun Embrasures for Fort. . . Ship Island, Miss." Engineer Department, Jan. 24, 1862. Copy sent to Lieutenant Palfrey on Ship Island.

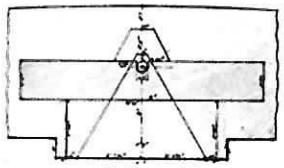
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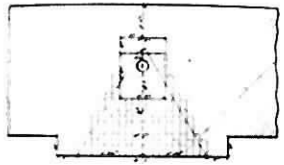
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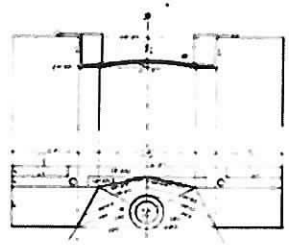
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Ship Island Miss.

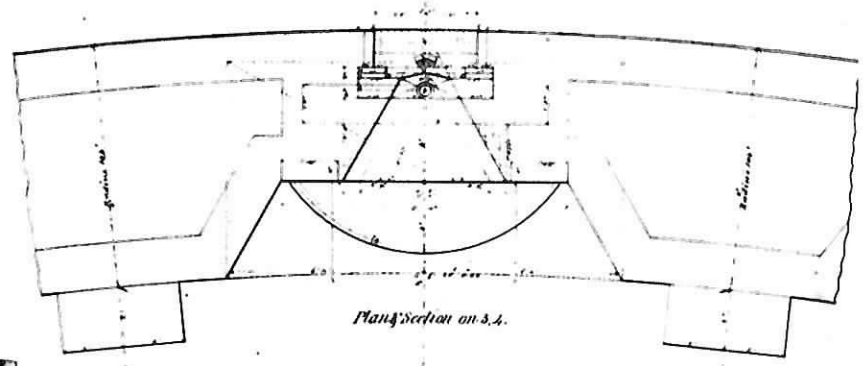


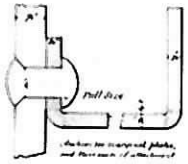

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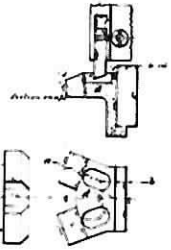

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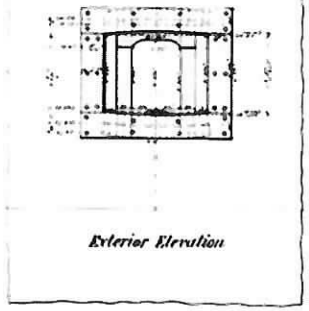

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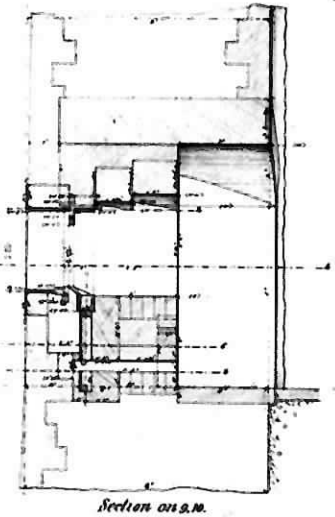


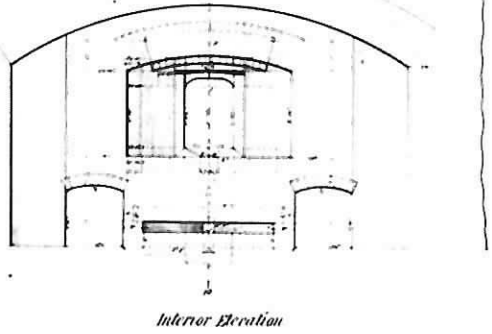

Plan & Section on 5,4.






Exterior Elevation


Section on 9,10.


Interior Elevation

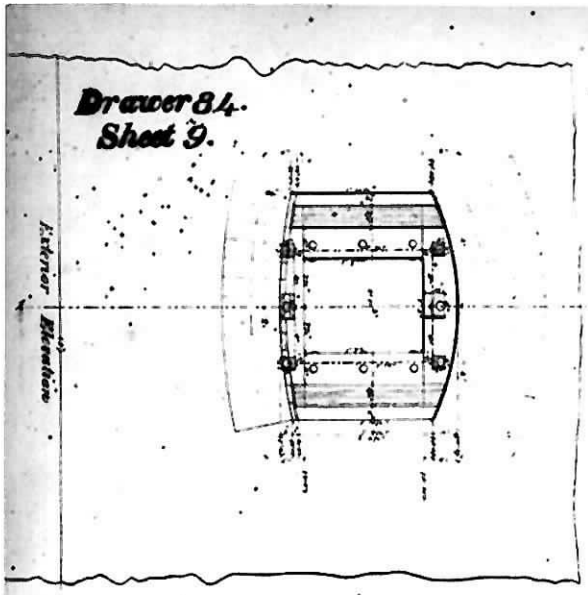
84-8

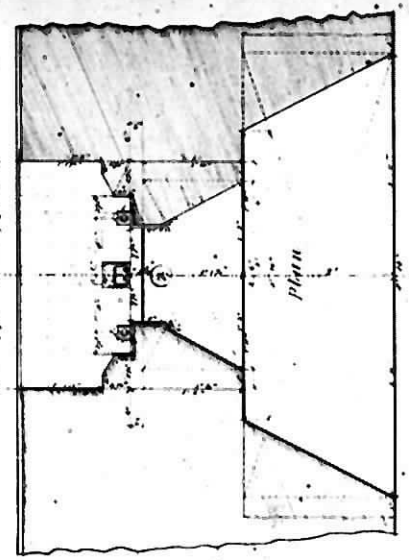
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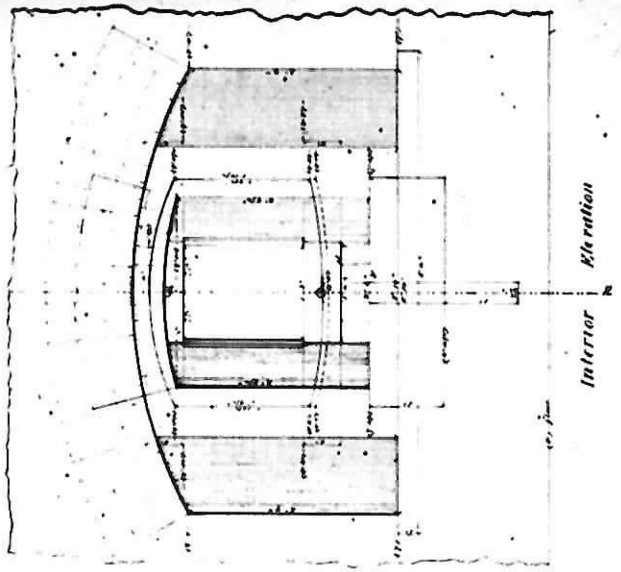
"Plan, Sections & Elevations of Howitzer Embrasures for Fort . . . Ship Island, Miss." Engineer Department, December 1859. Copy sent to Lieutenant Prime.

Courtesy National Archives, File No. Dr. 84, Sht. 9.

Drawer 84.
Sheet 9.



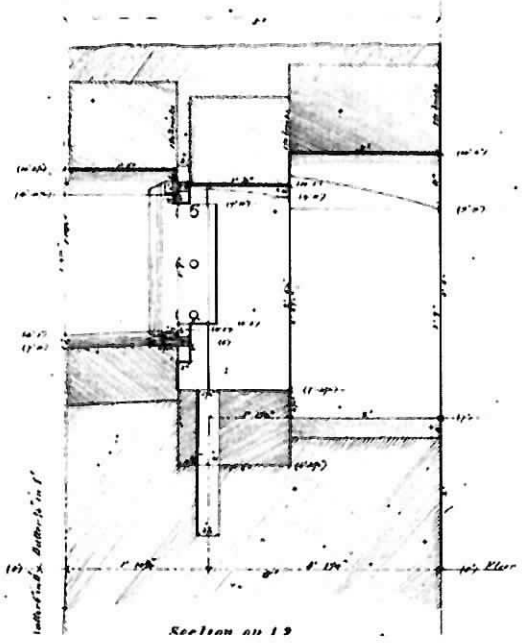




Plan, Section & Elevations
of
Howitzer Embrasures
for
Fort . . . .
Ship Island, Miss.

May 8th 1862
Copy sent to Genl Barnard with letter of this date — a copy of the details of iron work attached.

Copy sent to Genl Barnard Nov 8, 1862
Copy sent to Genl Halleck as ship Alabama
with letter of this date



84-9

Illustration 3.

"Fort on Ship Island, Miss. Plan and Elevations, Showing State of Work, June 30th, 1862." Drawn under direction of 1st Lieutenant Palfrey.

Courtesy National Archives, File No. Dr. 84, Sht. 18.

FORTIFICATIONS. Mississippi.

Drawer 84.
Shed 18.

FORT on SHIP ISLAND Miss.

PLAN AND ELEVATIONS

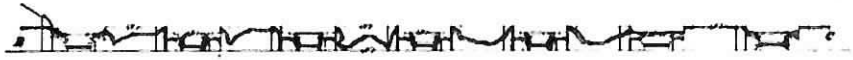
Showing State of Work

June 30th 1862.

Drawn under the direction of
Lt Lieut. J.C. Palfrey.
by C.B. Haggott, Asst.



Section From A to B

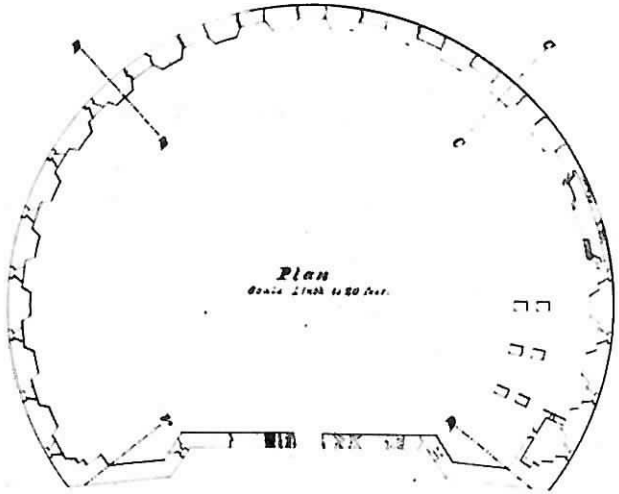


Section From B to C

Scale 1 Inch to 10 Feet



Section From C to D



Plan
Scale 1 Inch to 50 Feet.



Exterior
Elevation of Gorge

Engineer Department
August 19 1862
Received with Lt Palfrey's
letter of 4 Augt 1862 (P115)

84-18

Illustration 4.

"Fort on Ship Island, Miss. Plan and Elevations, Showing State of Work, June 30th, 1863." Drawn under the direction of Captain J.C. Palfrey.

Courtesy National Archives, File No. Dr. 84, Sht. 22.

FORTIFICATIONS. Mississippi.

Drawer 84.
Sheet 22.

FORT on SHIP ISLAND Miss.

PLAN AND ELEVATIONS

Showing State of Work

June 30th 1863

Drawn under the direction of
Capt J.G.Pelfrey.
by [illegible] assistant.

Engineer Department
Nov 18 1863
Read with Capt J.G.Pelfrey's letter
of Oct 12 1863 [illegible]



Section From A to B



Section From B to C

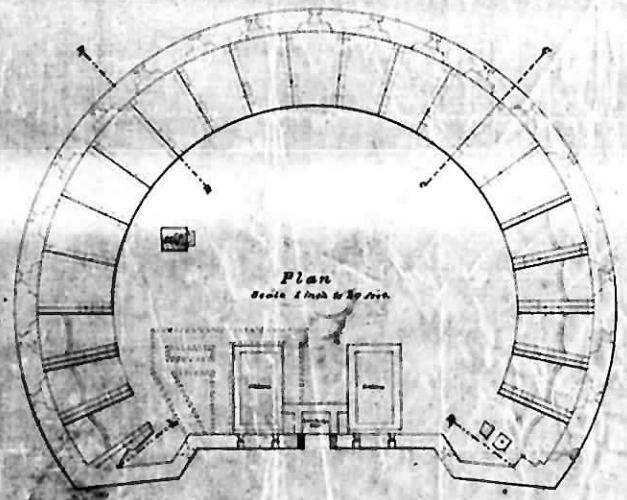
Scale 1 Inch to 16 Feet



Section From C to D



Exterior
Elevation of Gorge



Plan
Scale 1 Inch to 16 Feet

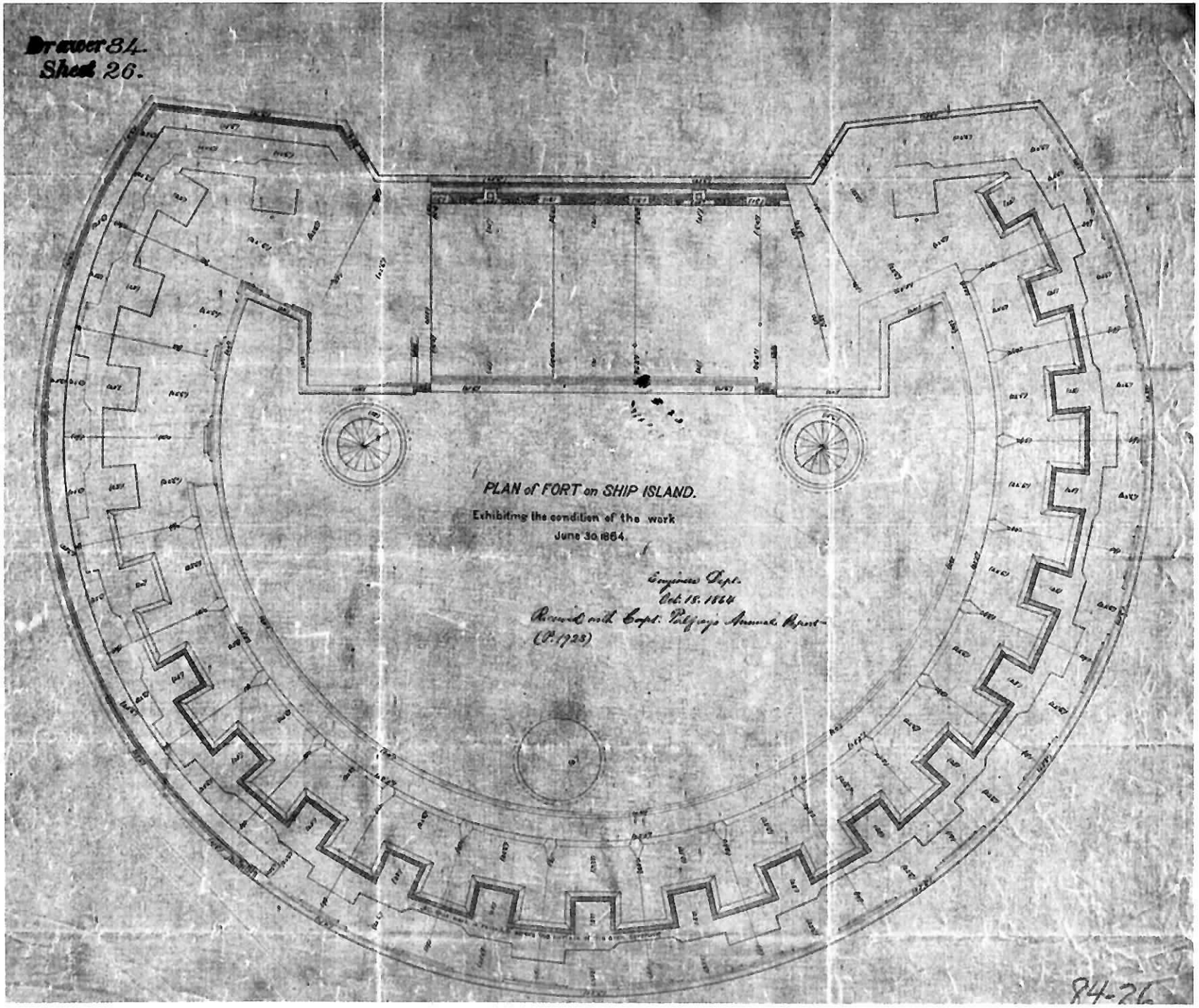
84-RR

Illustration 5.

"Plan of Fort on Ship Island, Exhibiting the Condition of this Work, June 30, 1864." Engineer Department, Oct. 18, 1864.

Courtesy National Archives, File No. Dr. 84, Sht. 26.

Drawer 84.
Sheet 26.



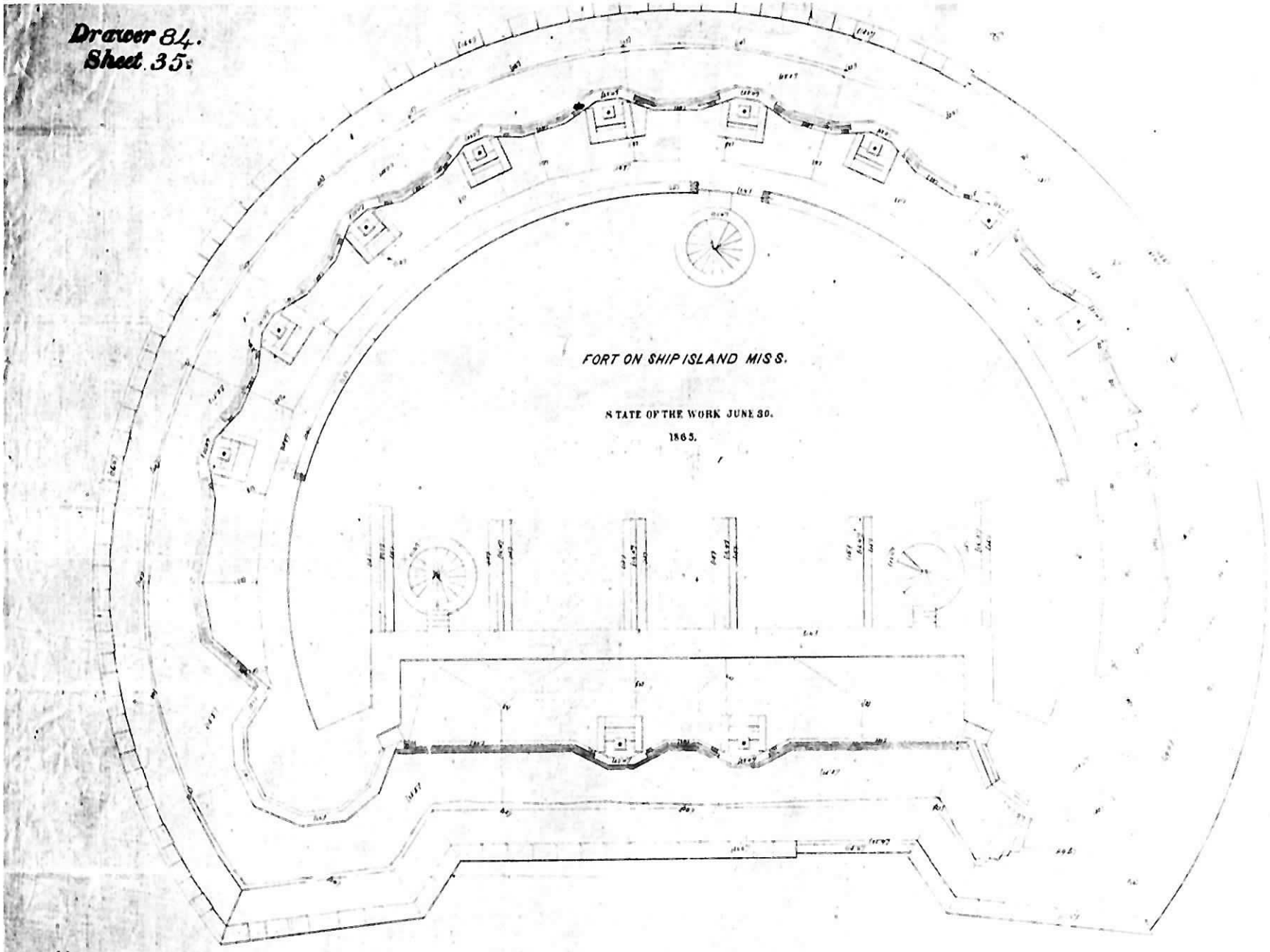
84-26

Illustration 6.

"Fort on Ship Island, Miss., State of the Work, June 30, 1865."

Courtesy National Archives, File No. Dr. 84, Sht. 35.

Drawer 84.
Sheet 35.



U. S. Engineer Office
New Orleans La. Oct 16th 1865 (11.2961)
John M. Tillson
Capt. Engrs U.S.A.

Illustration 7.

"Topographical Sketch of Ship Island." Made by direction of M.D. McAlester, Corps of Engineers, Bvt. Lt. Col. U.S.A. by D.W. Payne, Lt., Engrs.

Courtesy National Archives, File No. Dr. 84, Sht. 41.

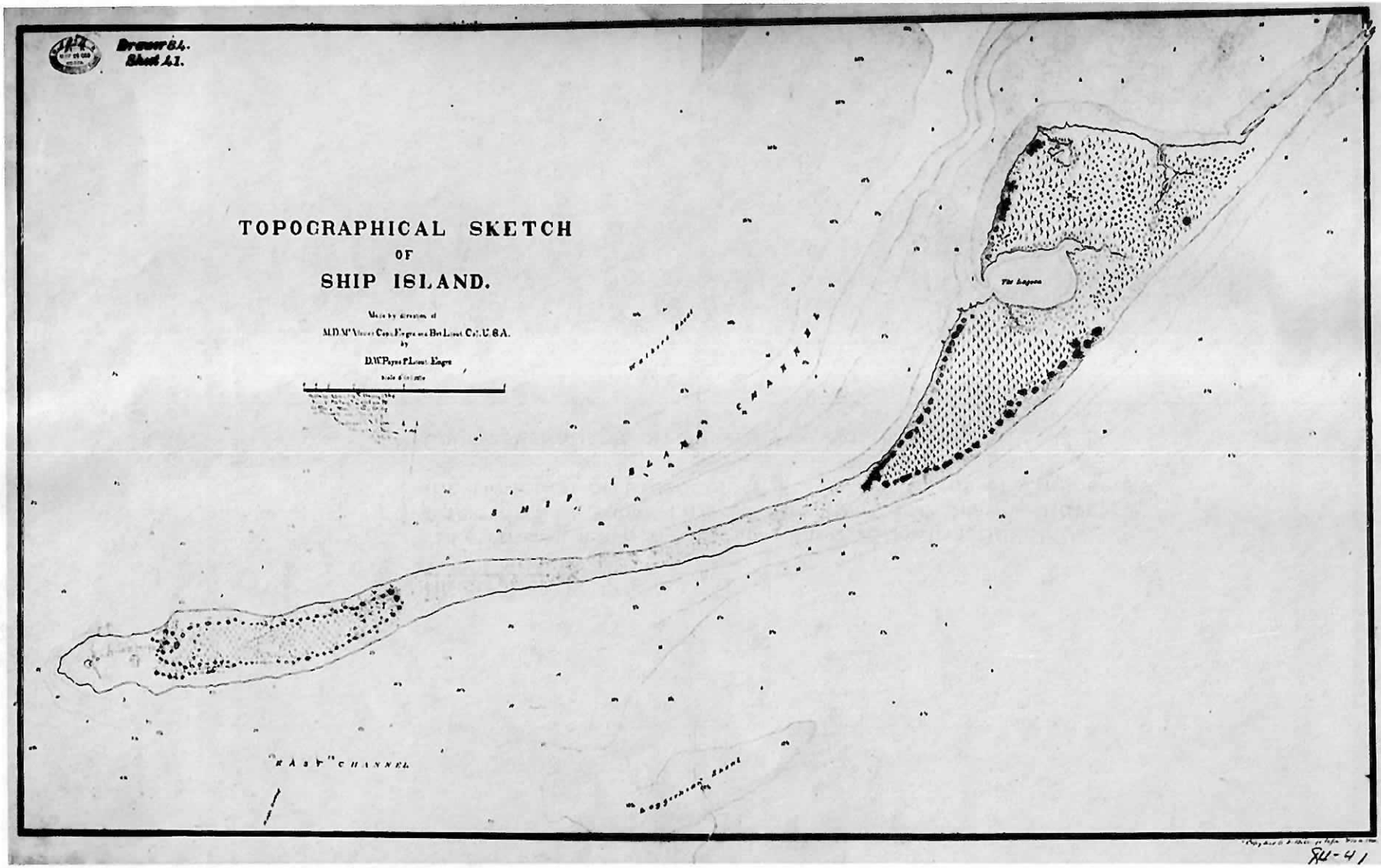
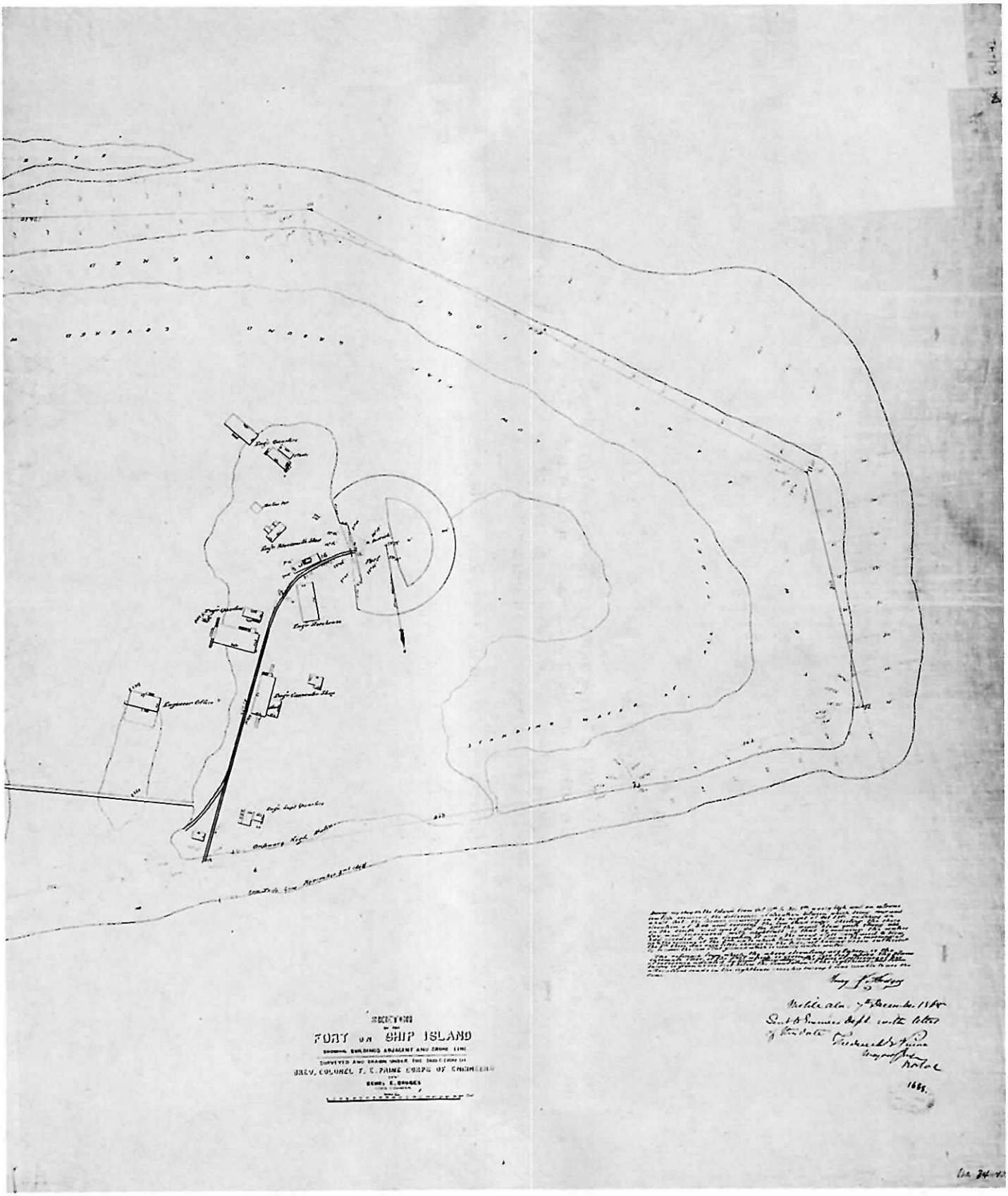

Brewer 84.
Sheet 41.
TOPOGRAPHICAL SKETCH
OF
SHIP ISLAND.
Made by direction of
M.D.M^c Vicar Corps Engrs and Bvt Lieut Col U.S.A.
by
D.W.Payne 1 Lieut Engrs
SHIP ISLAND CHANNEL
"EAST" CHANNEL
The Lagoon
41

Illustration 8.

"Sketch of the Fort on Ship Island, Showing Buildings Adjacent and Shore Line." Surveyed and Drawn under the Direction of Bvt. Col. F.E. Prime, Corps of Engineers.

Courtesy National Archives, File No. Dr. 84, Sht. 42.



SKETCH
OF THE
FORT ON SHIP ISLAND
SHOWING BUILDINGS ARRANGEMENT AND ZONE LINE
SURVEYED AND DRAWN UNDER THE DIRECTIONS OF
BREV. COLONEL T. G. PRIME CORPS OF ENGINEERS
BY
GEORGE E. BROOKES

Mobile ala. 7th December 1864
Sent to Surveyor Dept with letter
of this date
Thos. G. Prime
Engineer
Mobile

1865.

Illustration 9.

"Sketch of the Fort on Ship Island, Showing Buildings Adjacent and Shore Line." Surveyed and Drawn under the direction of Bvt. Col. F.E. Prime, Corps of Engineers.

Courtesy National Archives, File No. Dr. 84, Sht. 42.

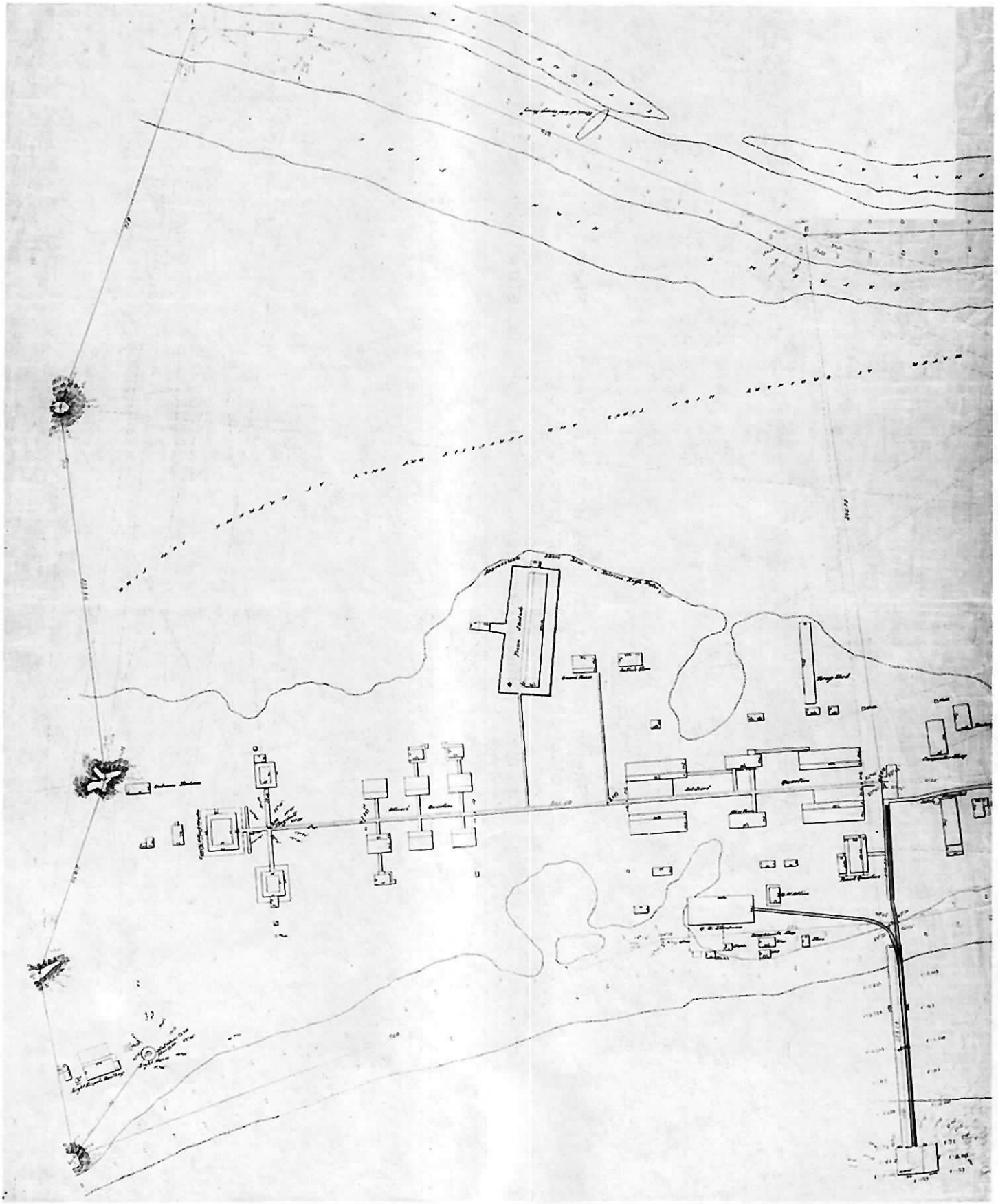


Illustration 10.

"Sketch Showing Changes of Beach Line with Shore Protection. Fort of Ship Island," 1884.

Courtesy National Archives, File No. Dr. 84, Shts. 46-5.

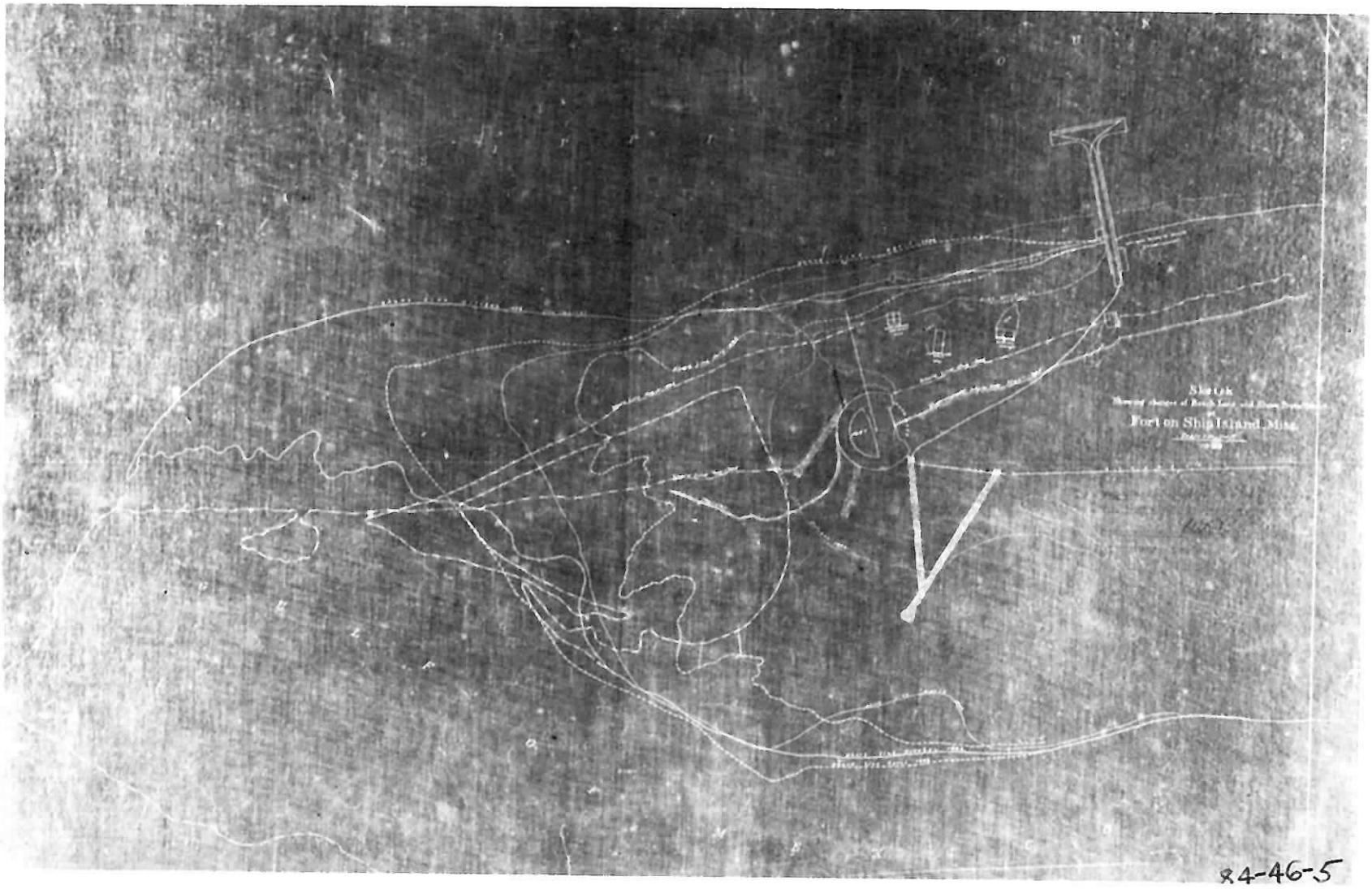

Sketch
Fort on Ship Island Miss.
84-46-5

Illustration 11.

Bombproofs and Earthen Traverses Afford Protection to Gorge Magazines, circa 1925.

Courtesy Naval Observatory, 77-F-84-46-1078.

Illustration 12.

15-inch Rodman Gun and Center-pintle Carriage Mounted on Northeast Bastion, circa 1925.

Courtesy National Archives, Record Group 77, Naval Observatory, 77-F-84-46-1080.

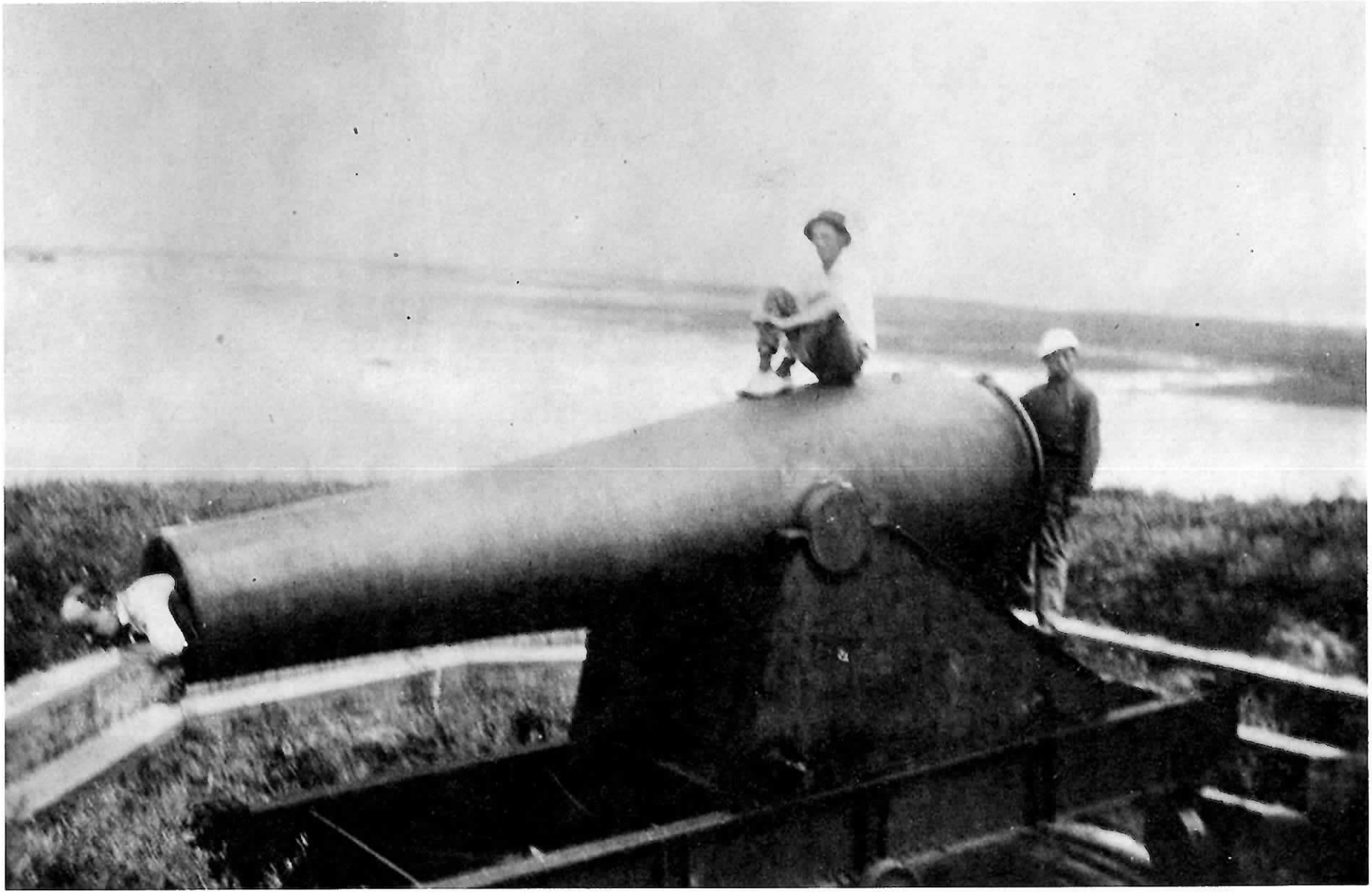


Illustration 13.

Circular Stair Tower, Parade, Terreplein, Gun Platforms, etc., from Entrance to Barbette Magazine, circa 1925.

Courtest National Archives, Record Group 77, Naval Observatory, 77-F-84-46-1081.



Illustration 14.

Shot Furnace and Exterior Casemate Arches. Note Set of Totten Embrasure Shutters Still in Position, circa 1925.

Courtesy National Archives, Record Group 77, Naval Observatory, 77-F-84-46-1082.

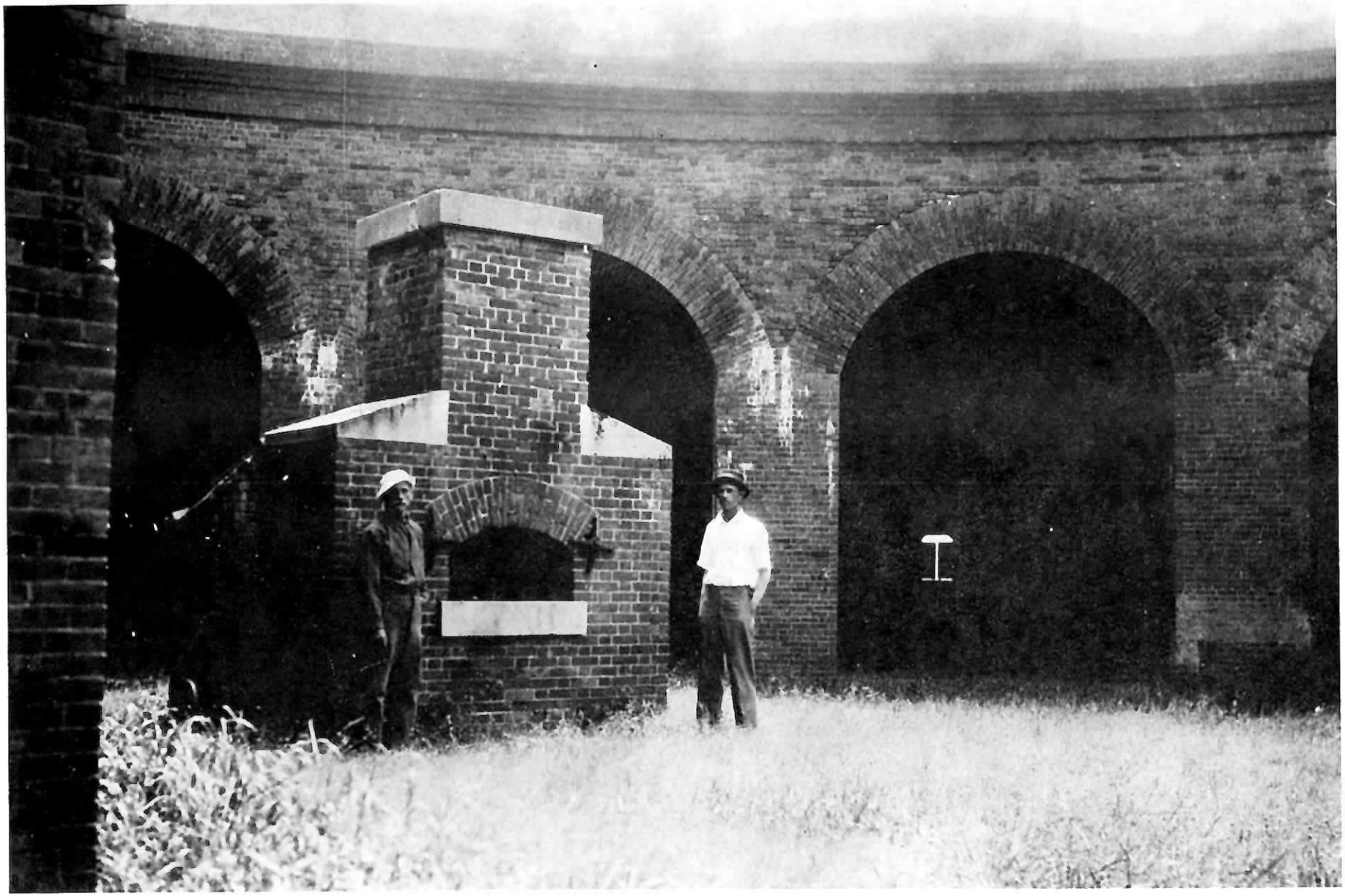


Illustration 15.

Entrance to Magazine. Note Double Doors and Graffitti, circa 1925.

Courtesy National Archives, Naval Observatory, 77-F-84-46-1084.



Illustration 16.

First Tier Casemate and Embrasure with Totten Shutters and Tongue, circa 1925.

Courtesy National Archives, Naval Observatory, 77-F-84-46-1085.

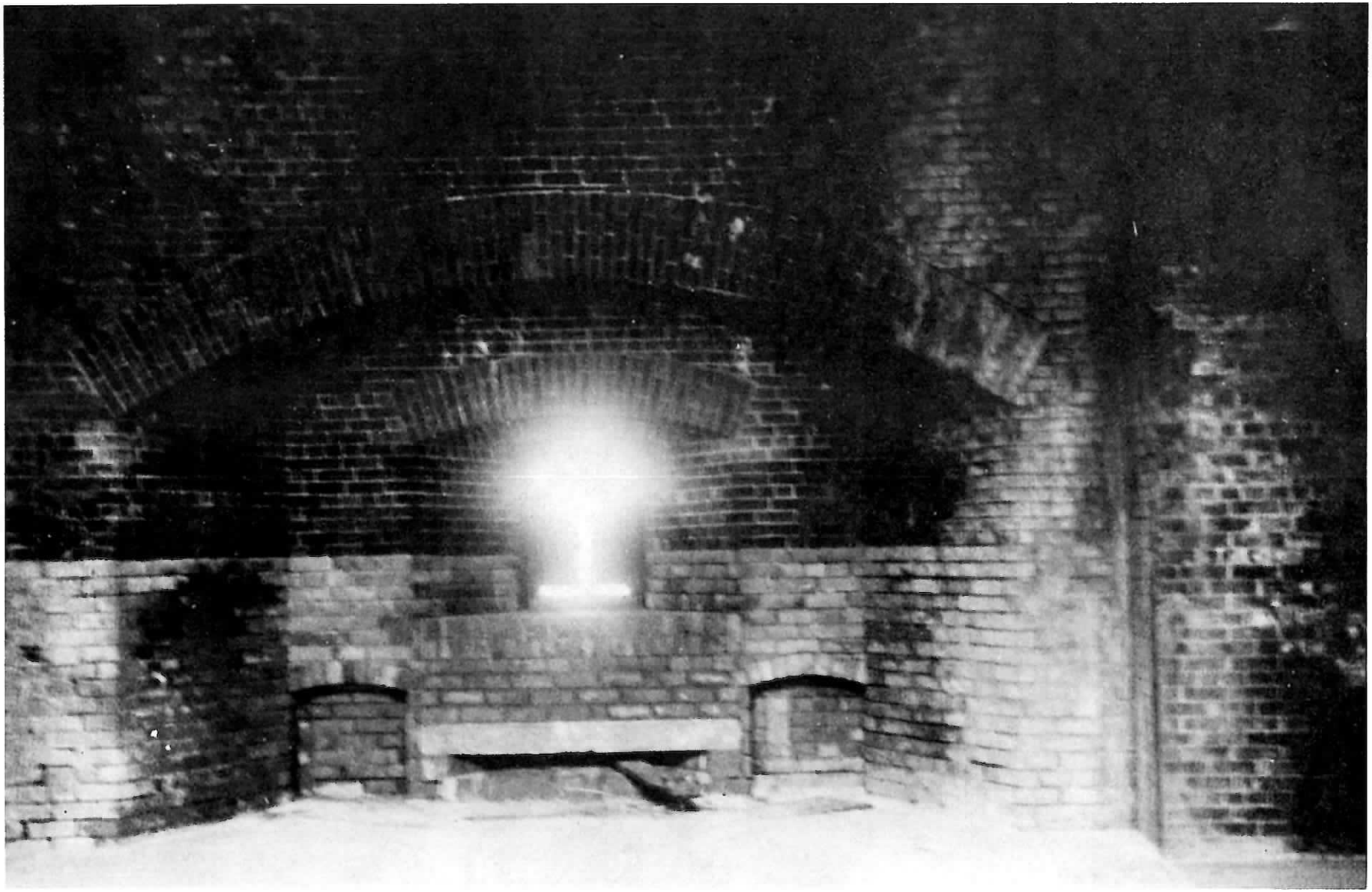


Illustration 17.

Casemate Arches, Piers, and Traverse Irons,
circa 1925.

Courtesy National Archives, Naval Observatory,
77-F-84-46-1087.

Illustration 18.

Sally Port and Gorge Scarp from the East, circa 1925.

Courtesy National Archives, Naval Observatory, 77-F-84-46-1089.



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As the Nation's principal conservation agency, the Department of the Interior has basic responsibilities to protect and conserve our land and water, energy and minerals, fish and wildlife, parks and recreation areas, and to ensure the wise use of all these resources. The Department also has major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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