Coast Defense
Study Journal

Defending the Narrows

Part I: the muzzleloading Era
1524 - 1890

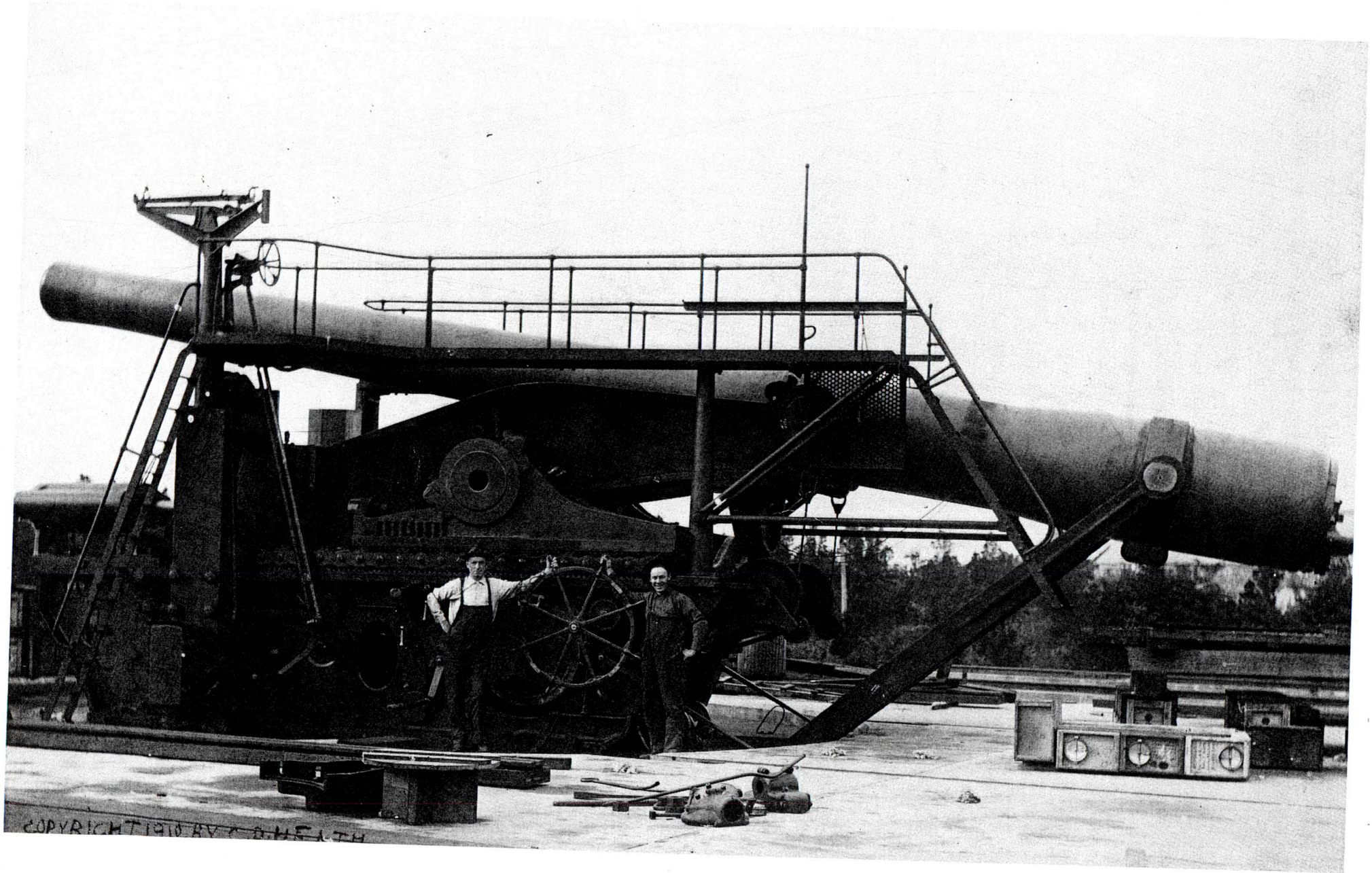
Part II: the Breechloading Era
1890 - 1950

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Defending the Narrows
The Harbor Defenses of Southern New York

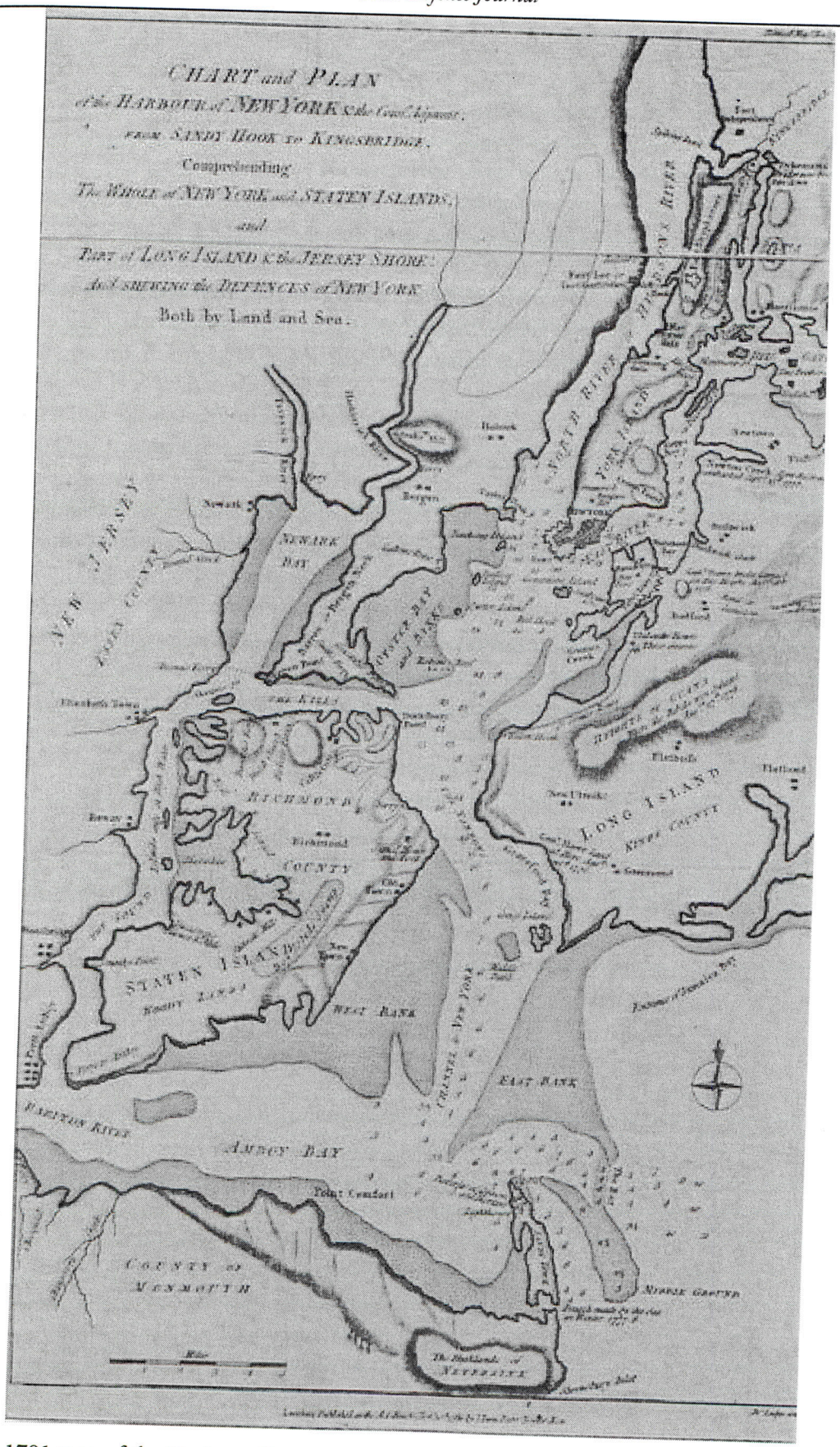
William C. Gaines

Part I: The Muzzleloading Era, 1524-1890

New York has been the nation's commercial center for 300 years, and the waters of Lower New York Bay and the landmasses that bound it were vital to the defense of that port city. The southern entrance to New York Harbor included a number of sometimes shallow and often treacherous channels that wound through the tidal flats between Sandy Hook and the barrier island that would become known as the Rockaways. Lower New York Bay is made up of several smaller bays, fed by the "North" River, later named the Hudson, as well as by the numerous rivers and streams that drain the interior of New Jersey and Long Island. Chief among these are Sandy Hook, Amboy, Raritan, Gravesend, and Jamaica Bays. To the north, the span of water between Long and Staten Islands known as the New York Narrows is at no point wider than a mile and a half; its channel is even narrower. The Narrows figured prominently in the history of the nation's commercial capitol and for over 150 years the land on either side of this constricted waterway saw the development of one of the most extensive system of coastal fortifications in the world. More than 40 forts and batteries would guard the four-mile passage into New York's inner harbor. Only after World War II would these seacoast fortifications be abandoned, but even then, the military installations at the Narrows continued to serve, some into the 21st century.

The Colonial Period 1524-1775

In 1524, the Italian explorer Giovanni Verrazano, in the service of Francis I of France, entered the Narrows, becoming the first European to visit New York Harbor. After over-nighting in the shadow of the Staten Island Hills, a storm drove the Italian navigator out to sea. Nearly a century would pass before Henry Hudson, in the employ of the Dutch East Indies Company, would sail his small *Half Moon* through the Narrows in 1609 to explore the lower reaches of the great river that would later bear his name. He named the island bounding the Narrows on the west *Staten Eylandt,* for the States-General of the Netherlands. In August 1613, Dutchmen Adrian Block and Hendrick Christiansen sailed their vessels through the Narrows and up the Hudson River to Manhattan, venturing as far as the future site of Albany, where they established trading posts. Michael Pauw, one of the directors of the West India Company, purchased Staten Island from the Indians, together with an extensive tract in the future Bergen County, NJ, August 10, 1630, and the whole tract received the name of Pavonia. David Pietersen deVries established the first *Staten Eylandt* community in 1631. DeVries erected a blockhouse and signal station on the heights of Staten Island above the Narrows in 1632 in an attempt to afford some measure of protection to the fledgling community. It was a very desirable spot, and the Indians, who seem never to have considered they lost possession by sale and were always willing to convey for a consideration, resold the island about 1638, to Heer Melyn, with the permission of Governor Kieft, and subsequently in 1657 to Baron Van Cappellan. Melyn and Van Cappellan both made improvements.(1)



1781 map of the Harbor of New York, prepared by John Lodge. *NYPL Collection*

The Dutch colony of *Ould Dorp* on Staten Island had been the site of these initial weak defenses, the chief intent to ward off marauding Indians. The colony collapsed, however, when many of its inhabitants were massacred, and the remainder carried off captive by the Indians in 1655. A subsequent blockhouse measuring 18 by 20 feet was armed with two small cannon. A new colony named *Niewe Dorp* was established at the later site of Miller Field.(2)

The Long Island side of the Narrows was known as Najack in May 1643, when the pirate Antony Jansen Van Salee was granted about 200 acres near a cove that would become known as Gravesend Bay. The earliest attempt to settle the area on Long Island that would later become Fort Hamilton came in 1652, when Corneilius Van Werckhoven secured a patent to a tract of land there. That venture proved unsuccessful, however, and the first recorded evidence of defenses was a blockhouse erected in the middle 1650s as protection against marauding Indians by Jacques Cortelyou, the founder of the town of New Utrecht.

In December 1664, the English, having claimed the area, named it for the Duke of York, the brother of the king. They sent four warships and 450 men under Col. Richard Nicholls to seize New Amsterdam from the Dutch. Nicholls landed at Najack Cove (Gravesend Bay) and soon afterward the Dutch surrendered the colony to the English. Both the Dutch in the 1660s and the English during the late 17th and 18th centuries made proposals for fortifying the heights overlooking the Narrows. In 1701, Colonel W. Romer's recommendation for a battery of thirty 4-pounders on New Utrecht Heights was rejected by the British Royal Governor. The French threat in 1702 again raised the issue of defending the Narrows, but the threat subsided and no work was done. Even the more serious French and Indian War failed to result in the erection of defenses at the Narrow. Not until the late 1770s were any substantial measures taken to fortify the passage into New York's inner harbor.(3)

Southern New York's Defenses in the Revolutionary War 1775-1783

Early in the American Revolution, Signal, or Flagstaff, Hill on Staten Island was used as a lookout and signal station, with a detachment of colonial militia on watch for the Royal Navy. Across the Narrows on Long Island, two cavalry troops of Kings County Militia patrolled between New Utrecht and Rockaway. By the spring of 1776, Col. Edward Hand's Pennsylvanians (1st Continental Infantry), 470 officers and men, were already on Long Island, having come from Boston in advance of the rest of Brig. Gen. Nathanael Greene's well armed and disciplined brigade. Hand's men scouted and patrolled at the Narrows and along the coast. Greene's Brigade, consisting of Hand's Pennsylvania riflemen, two Rhode Island regiments under Cols. James Mitchell Varnum and Daniel Hitchcock, and Col. Moses Little's Massachusetts regiment arrived in April and took up positions on the Long Island hills overlooking the Narrows.(4)

On the approach of British ships to Sandy Hook, black and white kegs hoisted on the flagstaff atop Signal Hill warned Washington's Continentals in Manhattan. On July 4, 1776, the initial British troops landed on Staten Island, where they established their primary base for the capture of New York City. The only opposition was a small battery on the Long Island shore near the future site of Fort Hamilton, which fired on HMS *Asia*, a 64-gun third-rate ship of the line, inflicting some damage, and killing one British tar and wounding nine others.

On June 25 and 26, three or four more large ships anchored off Sandy Hook, one being the 44-gun 6th-rate frigate HMS *Greyhound*, with Gen. William Howe, British commander-in-chief in America, aboard. At Sandy Hook, Howe met with New York's royal governor, William Tryon, and other loyalists on board *Greyhound*, where they provided substantial information regarding the state of the American army then strongly entrenched on Long Island, noting that more than 100 cannon were emplaced to defend the town against an attack from the sea.(5)

By June 29, a fleet of 45 sail had arrived off the Hook, joined four days later by another 130 vessels when the fleet from Halifax arrived with Howe's 6,155 troops from Boston. General Howe had originally intended to disembark his army on the Long Island coast near the Narrows, but finding that the Americans were posted along a ridge of hills known as the Heights of Guian not far inland, Howe landed his troops on Staten Island and went into camp to wait the arrival of Admiral Lord Richard Howe, his older brother, enroute from England with additional troops. In mid-July, Admiral Howe arrived with some 11,000 more troops crowded into nearly 215 warships and transports. These troops joined those on Staten Island. On August 1, there was an unexpected arrival in the shape of the discomfited Charleston expedition, about 2,000 more troops under Generals Clinton and Cornwallis, who before the war's end would finally gain a foothold in the South. Finally, on August 12, 1,000 troops from the British Brigade of Guards and 7,800 Germans organized into four brigades commanded by Lt. Gen. Leopold Phillip de Heister arrived after a tedious voyage of 13 weeks from Portsmouth, via Halifax. Thus completed, the Howe's force eventually reached 31,626 troops and over four hundred vessels.

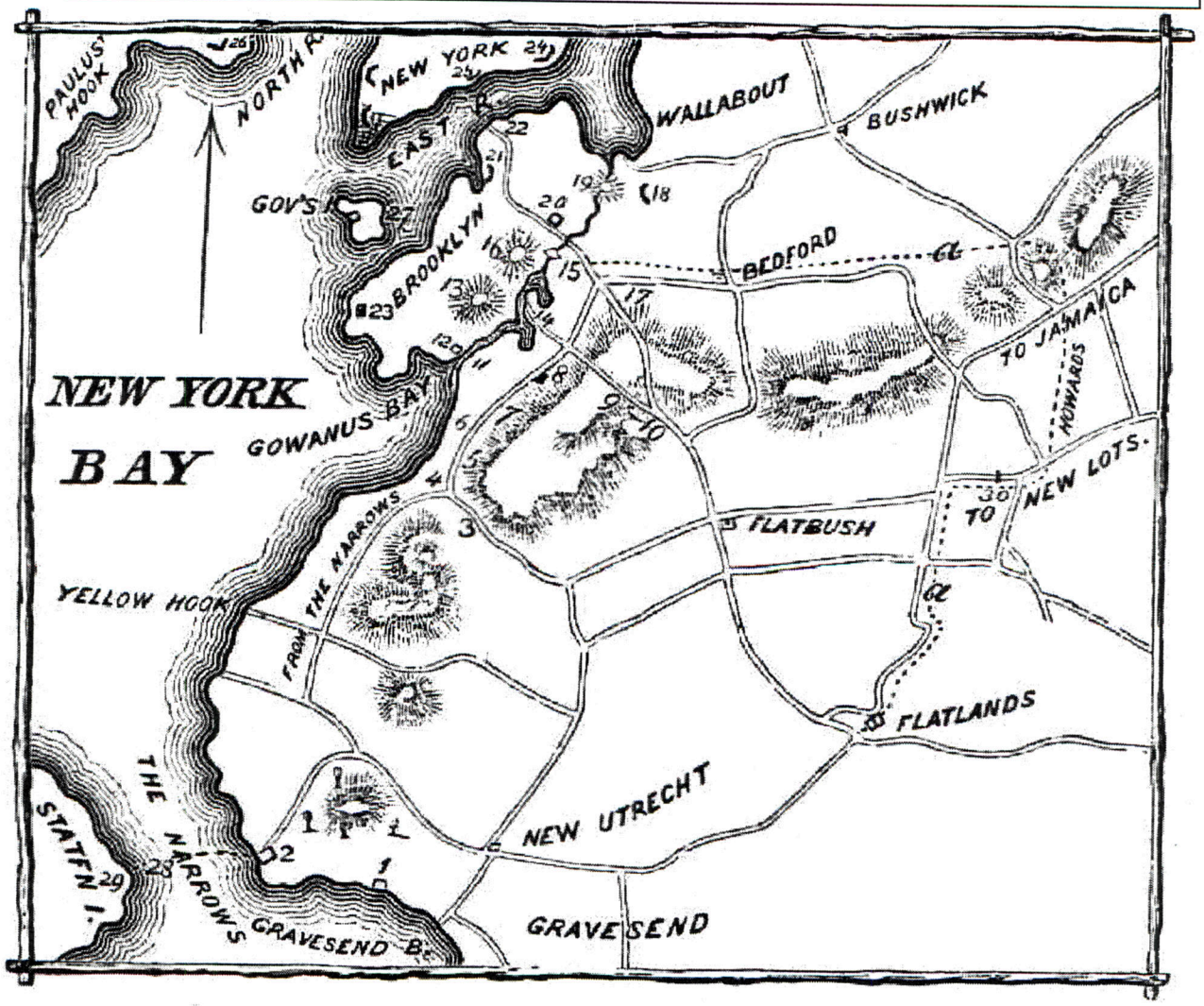
After assembling their army, the Howe brothers lost little time moving against the colonists. While Howe's army was getting organized, two British frigates, HMS *Rose* and HMS *Phoenix*, took advantage of a brisk breeze and running tide. With their tenders, they moved up through the Narrows on July 12 and ran by the meager American batteries in the inner harbor and up the North (Hudson) River unscathed. They kept as much as possible to the Jersey shore, more distant from American batteries on Manhattan, which did them little damage. The two frigates, however, managed to instill considerable terror among the citizens of New York as they bombarded Manhattan with their 24-pounders. Finally, on July 16, the Americans sent two fire-rafts downriver, one of which managed to set a tender ablaze. An expected repeat encouraged the two vessels to withdraw July 18 to the shelter of the British fleet occupying New York Bay.

Across the Narrows on Long Island, Colonel Hand's riflemen and other elements of Greene's Brigade maintained a close observation of the Narrows and the British camps on Staten Island from near New Utrecht, reporting any suspicious movements of the fleet. When word was brought in on August 9 that a large number of British regulars were assembling at the Staten Island ferry landing, General Greene immediately alerted his brigade.

Lord Howe had carefully developed his plan to suppress the rebellion, and decided to advance by crossing over to Long Island, and after landing at Gravesend Bay, to move against the American works at Brooklyn guarding the land approaches to New York proper. A portion of his fleet had been sent through Long Island Sound to approach the city by way of the Hell Gate. This force, accompanied by a flanking move through Westchester County, would force Washington to evacuate New York even if the British were unable to dislodge the American from their lines at Brooklyn.(6)

Colonel Hand's outpost sent word that the British were preparing to cross to Long Island from Staten Island at dawn on August 22. After days of expectation and suspense in the American camp, the British commenced their move against Washington's Army. At dawn three frigates - HMS *Phoenix*, *Greyhound* and *Rose*, with bomb-ketches HMS *Thunder* and *Carcass* – entered Gravesend Bay to cover the landing, while Sir George Collier in the 44-gun frigate HMS *Rainbow* moved opposite Denyse's Ferry, the future site of Fort Hamilton, to silence a suspected American battery.

Later in the morning, the British began transporting troops from Staten Island to Gravesend Bay, a mile east of the Narrows. On Staten Island, 15,000 fully equipped British and Hessian troops, with 40 artillery pieces, had been brought up, and a portion were re-embarked on transports in the lower bay for transit to Long Island Sound. On the beach at Staten Island were two galleys, 11 bateaux, and some 75 flatboats manned by the Royal Navy. A second British force, some 4,000 men under Sir Henry



Long Island showing the Narrows and the locations of the British landings. *Author's Collection*

Clinton and Lord Charles Cornwallis, including Von Donop's corps of Hessian jaegers and grenadiers, crossed in small boats to Denyse's Point, where they landed, supported by the fire of HMS *Rainbow*.

The British landing at Gravesend Bay was unopposed and at Denyse's Point only about 200 men of Colonel Hand's 1st Pennsylvania offered brief opposition before retreating to Prospect Hill, burning or otherwise destroying any property or supplies. The British boats returned to Staten Island and took almost 5,000 more men and about 40 cannons to Gravesend Bay by noon. The Americans, unable to prevent the landings, were pushed back.

Later that day, Sir William Howe landed at Gravesend Bay with an additional 5,000 troops. The British force on Long Island, which had grown to about 22,000 men, struck the Continentals between Gravesend Bay and Brooklyn, inflicting severe losses in a series of blows along the Heights of Guian on August 27. The Americans were driven back into their strong entrenched line on Brooklyn Heights, the high ground that extended from Wallabout Bay to Gowanus Creek, while Howe commenced formal siege operations against Washington's small army. While adverse winds and tides prevented the British fleet from taking an active role in the siege, one 44-gun frigate, HMS *Roebuck*, engaged Fort Defiance on Red Hook briefly on August 27. After a council of war with his subordinates on August 29, General Washington withdrew from Long Island to Manhattan, leaving the British in command of

both sides of the Narrows and ultimately New York City. The absence of adequate defenses at the Narrows and the loss of New York would be indelibly etched in American military minds for decades.(7)

The first efforts to construct viable fortifications along the shoreline of the Narrows were made by the British on Staten Island soon after seizing New York. Numerous redoubts were also thrown up on the hilltops behind the shore batteries to protect their land approaches. The first, completed about 1778, was designed by British engineer Captain-Lieutenant John Montressor. The earthen redoubt atop Signal Hill was armed with four 18-pounders, covering a battery of some twenty-six 24-pounders on the slopes below the redoubt. Over time, this came to include two more redoubts and a four-bastion fort named Fort Stag Stake, along with several more supporting barbette batteries projected to mount about 65 guns. Eventually, 15 or more earthwork redoubts and batteries would become the first significant works to occupy what would become the Fort Wadsworth Military Reservation of the 19th and 20th centuries. The British occupied Staten Island until 1783.

Across the Narrows on Long Island, Montressor also planned and built a pair of small lunettes on New Utrecht Heights early in 1778 to prevent the Americans from recapturing New York. One, for 10 guns, was built south of the Cortelyou wharf and homestead while the other, for 15 guns, was north of Denyse's wharf and home. A third battery of 10 guns was about midway between the two lunettes. These works remained in British hands through the remainder of the war.(8)



The Narrows showing the system of fortification planned by Montressor. *Author's Collection*



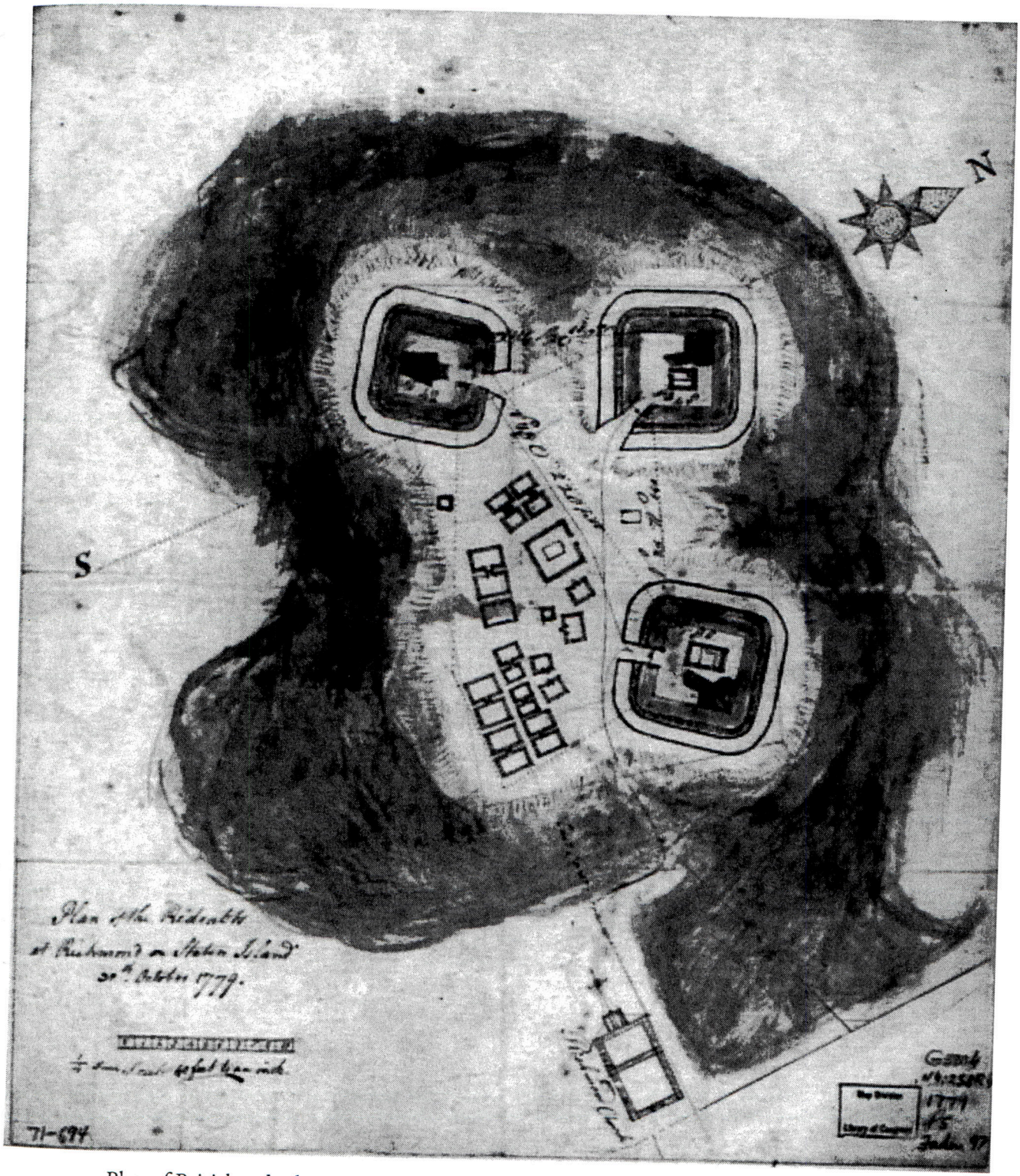
British engineer Captain-Lieutenant John Montressor. *Author's collection*

Early in the Revolutionary War, the authorities in New York decided the lighthouse at Sandy Hook should be destroyed or its lighting apparatus dismantled, to prevent its falling into British hands. In March 6, 1776, Maj. William Malcolm received orders to "take the glass out of the lantern, and save it if possible; but if you find this impracticable you will break the glass. You will also endeavor to pump the oil out of the cisterns into casks, or not being able to procure casks, you will pump it out onto the ground. In short, you will use your best discretion to render the lighthouse entirely useless." Malcolm must have had some success, as a letter to Col. George Meade dated March 12 states: "Received from Wm. Malcolm eight copper lamps, two tackle falls and bocks [sic], and three casks, and a part of a cask of oil, being articles from the lighthouse on Sandy Hook."

The British found Sandy Hook invaluable when they landed on Staten Island in 1776. Their presence at the harbor's southern entrance gave them a firm foothold on the northeastern Jersey shore. Less than three months after Malcolm's raid, the British had repaired the lighthouse, placed it back in operation, and provided a small garrison on the Hook. Another American effort to destroy the Sandy Hook Light with cannon fire came in June 1776. Lt. Col. Benjamin Tupper of the 21st Continental Infantry bombarded the lighthouse with cannon fire, but after an hour, he "found the walls so firm that the cannon fire could make no impression." Because of stiff resistance by the British troops and supporting fire from a frigate in Sandy Hook Bay, Tupper was finally forced to withdraw. The lighthouse was provided with fortifications and a small garrison of Loyalists that kept the Lighthouse Fort, or "Refugee Tower" as it was sometimes termed, in British hands until the end of the war, along with the lighthouse and Sandy Hook.

The British Army withdrew to the vicinity of Sandy Hook after their defeat at the Battle of Monmouth, June 28, 1778. Fearful of being trapped on the Hook, the British were evacuated to New York.

The 1778 alliance between America and France soon brought a large French expedition to America. A massive French fleet under the Comte d'Estaing arrived off Sandy Hook on July 11, threatening Admiral Howe's much smaller British squadron in the lower bay, as well as the British Army concentrated in the New York area. Howe's 17 vessels were draw up in three lines of battle to block the two channels into the harbor. To augment their defenses, Howe also had some 14 guns in eight batteries along the north end of Sandy Hook to enfilade the channel should the French attempt to engage the British fleet. In this case, nature offered a better defense: the French ships drew more water than the channel depth at low tide, and shoals and d'Estaing's lack of enterprise saved British fortunes. On July 22, the French sailed away for Narragansett Bay.(9)



Plan of British redoubts at Richmond, S.I., later the site of Fort Smith, Oct. 30, 1779.

At the end of the Revolution, the works on both Staten Island and Long Island were evacuated by the British, who withdrew into Manhattan preliminary to departing for home. The large crowd of civilians gathered on the ramparts of Fort Stag Stake's on Staten Island's Signal Hill, November 25, 1783, jeered as the departing British troops sailed down the Narrows. Smarting from their defeat and the derision of the Staten Islanders, the crew of one of the British warships fired a round at the crowd on Signal Hill, but it fell far short of the intended target.(10)

First System Works Planned for the Narrows 1794-1805

By the 1790s, the works built during the Revolution were in an advanced state of deterioration. On April 1, 1794, Secretary of War Henry Knox appointed a French émigré military engineer, Charles Vincent, temporary engineer in the service of the United States, to plan and oversee fortifications at New York. In 1794 Vincent surveyed the fortification needs of New York Harbor for the War Department and recommended new fortifications above the Narrows on Long Island's west end and on Hendricks Reef off the Long Island shore. A comprehensive system of works for Staten Island was also recommended near the signal station and Stag Stake Fort on Signal Hill.

Vincent identified the Narrows as the harbor's first line of defense. A signal station equipped with two guns should be erected near the Sandy Hook Lighthouse to provide early warning of an enemy's approach. He also proposed a second station at the site of the old British works above Sandy Bay at the Narrows on Staten Island to repeat the signal to "Beatles" in Manhattan. This signal function associated with the defenses was later improved by installing a semaphore signaling system.

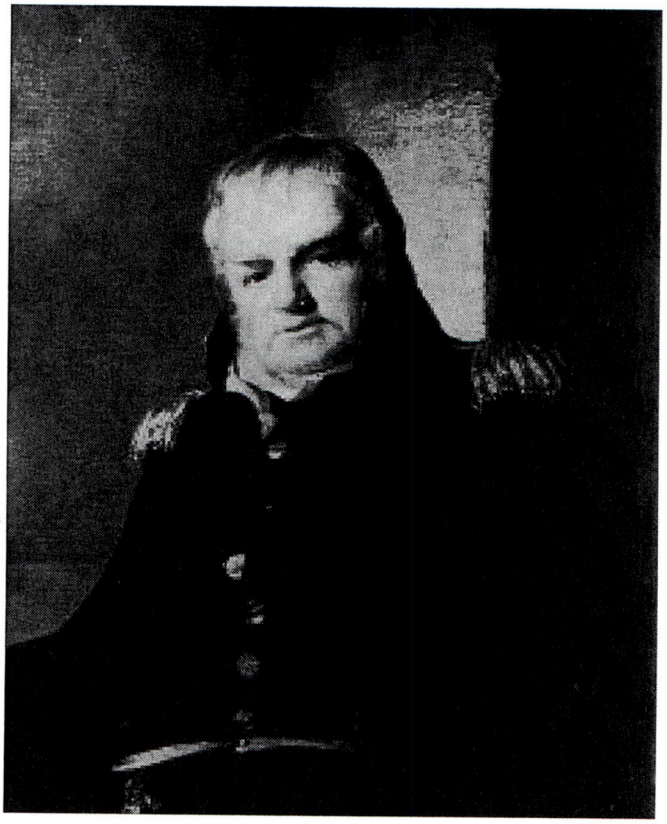
At Sandy Bay, Vincent called for an enclosed battery of 15 guns and four mortars at the shoreline. This proposed work would have an enclosed gorge and two 4-pounders to give flanking protection to the gorge, and would be covered by the guns of a fort on the heights of Signal Hill above. A redoubt in advance of the fort at the edge of the cliffs above the Sandy Bay fort, armed with six guns, would be connected to the Signal Hill fort by a covered way armed with mortars. Another redoubt to be erected in time of war on the crest of Cherry Hill would cover the rear approaches to the Staten Island fortifications. The Cherry Hill redoubt would also be connected to Signal Hill fort by a double covered way.

For the Long Island side of the Narrows, Vincent recommended a battery of 15 guns "of the largest caliber on seacoast carriages," along with four 10-inch mortars, on Hendricks Reef, a shoal some 400 yards off the Long Island shore. The gorge of this battery was also to be closed and commanded by a redoubt, to be built wartime, on the heights behind the battery. Farther down the Long Island shore at New York Bay, Vincent proposed a battery for two guns on traveling carriages, possibly protected by a small redoubt, to discourage enemy landings below the Narrows. He also called for an entrenched militia camp on Long Island between the battery at New York Bay and Hendricks Reef.(11)

Scarcely had Vincent completed his preliminary study of the harbor's defense needs when he modified his recommendations, probably as a result of pressures from the governor and local officials. An additional blockhouse, to be built during time of war, was added to the Staten Island plan. These proposed works remained on the drawing board, however, as the limited funds appropriated in the 1790s and early 1800s were allotted to the defense of the inner harbor.

The concept of fortifying the Narrows was not abandoned, however, and during the early years of the 19th century, a number of additional surveys and studies were undertaken. Bureaux Pusy and Joseph Mangin examined the defenses of New York Harbor for the Engineer Department in the autumn of 1801. In a lengthy memoir later that year, they pointed out that the existing works on Governor's Island and the Oyster Islands in the inner harbor were too close to the city to adequately defend it from a hostile squadron. Even the proposed works at the Narrows would fail to meet the defense needs of the

harbor as they could be circumvented by landing an army on Long Island or Staten Island below the Narrows and taking the proposed fortifications from the rear. Perhaps recalling the British occupation of Sandy Hook in the Revolution, Pusy further recommended, for the first time, a series of works at the southern entrance to New York Bay, between Rockaway Point and Sandy Hook, on the East Bank and Middle Ground shoals on either side of the channel, supported by a large fort on Sandy Hook with exterior batteries.(12)



Col. Jonathan Williams. *Corps of Engineers*

A. Laiarriere, a civilian engineer employed by the City of New York, studied New York Harbor and on December 23, 1804, submitted his report to Mayor DeWitt Clinton, who forwarded the proposals to the secretary of war. After considering the southern entrance to the lower harbor between Sandy Hook and Coney Island and the shoals on either side of the channel, Laiarriere recommended the Narrows as the principle place of fortification. There, near Long Island on a shoal known as Hendricks Reef, Laiarriere called for a powerful semi-circular battery of 32 heavy guns, protected in its rear by an angled front armed with smaller guns and mortars and loopholed for musketry. On the Long Island high ground behind this battery, he proposed a fort with the trace of a bastioned parallelogram, with a dozen mortars and 21 guns to cover the battery on the reef.

Across the Narrows on Staten Island, Laiarriere recommended another curved battery mounting some 60 heavy guns, probably at Sandy Beach below Signal Hill. On the heights of Signal Hill, a work of the same type as proposed for the heights on Long Island would command the battery below it. When completed, the projected works on either side of the Narrows would cross their fire with more than 100 heavy guns and mortars, making it virtually impossible for a hostile fleet to sail into the upper harbor without severe losses. The cost of these works was estimated at $2,000,000. In closing, Laiarriere, called for a detailed survey and for sounding the waters between Coney Island and Sandy Hook and of the Narrows itself.(13)

Second System Works are Planned and Built 1806-1812

In the later part of September 1805, Secretary of War Henry Dearborn following up on a New York State proposal, wrote Col. Jonathan Williams, the army's chief engineer, requesting he determine the precise width of the Narrows, as well as the exact distances between the harbor islands and between the islands and the Manhattan Battery.(14)

Williams, accompanied by a small party of engineers and cadets from West Point, carried out his study of the harbor later in September and reported to Dearborn:(15)

> The width of the Narrows in various parts within one thousand yards, nearly the length of the bases measured on each side, is from 1847 to 1916 yards according to the various deflections of the shore; in the course of the shoal the width will not exceed nineteen hundred yards from the edge of the water on each side. It may therefore be concluded that this reef reduces the width of the ships channel to 1350 yards.
>
> As the shore on one side and reef on the other are very bold the addition of five or six feet at high water would cause but little spread in the width of the channels; it is besides only at half tide that an enemy would make an attempt in order to have the full strength of the current and to prevent taking ground with the tide at the highest.

Improvement of the harbor fortifications took on a greater urgency on April 25, 1806, when the coastal sloop *Richard* was fired into by HMS *Leander* only a quarter-mile off Sandy Hook, killing the sloop's master, John Pierce. This was only one of several provocations by the Royal Navy in the early years of the 19th century that would prompt a second war with Great Britain and new works at the Narrows.(16)

Signal Hill, where the British had built Fort Stag Stake and the two Fort Tompkins, would later be built, continued as a semaphore station to relay shipping arrivals from a station at Sandy Hook to the Battery at Manhattan. Although measures were taken to strengthen the works in the inner harbor, the Committee for Defense of the Corporation of New York continued to express its concern that no efforts were being made to fortify the Narrows, and voiced this concern to Colonel Williams. In the meantime on March 20, 1807, the New York Legislature conveyed title and jurisdiction for two acres on Hendricks Reef Shoals to the United States. Williams responded to the committee on July 25, 1807, reassuring them that he, Vice President George Clinton (a New Yorker), and Secretary Dearborn had in no ways rejected defenses at the Narrows, and only the limited funding and the necessary planning was delaying development of a strong battery on Hendricks Reef. Nothing was said regarding Sandy Hook.(17)

New York State Erects Fortifications on Staten Island 1808-1812

The various surveys carried out by Charles Vincent in 1794, by Mangin and Pusy in 1801, Laiarriere in 1803, and Jonathan Williams in 1805, consistently recommended defenses on both sides of the Narrows. During the spring of 1807, the legislature authorized ceding the federal government lands for fortifications at the Narrows on Staten and Long Islands, and a State Board of Fortifications was appointed, composed of DeWitt Clinton, James Fairlie, Jacob Morton, Peter Curtenuis, and Arthur Smith. This board called upon Colonel Williams to prepare an extensive plan for fortifying New York and its harbor. In April 1808, the legislature appropriated $100,000 to expedite the erection of defenses called for by the governor and the Board on Fortifications. Upon succeeding Henry Dearborn as secretary of war, William Eustis lost little time taking charge of the War Department. On May 4, 1808, Eustis instructed Williams to lend his good offices to the governor and provide his full assistance to the state by preparing plans and drawings, and sharing defense plans, etc, but to avoid advice on how the funds were to be expended.(18)

In 1807 the State of New York ceded "lands covered with water between Long and Staten Island" and on Bluffs Point on Staten Island to the federal government for fortifications. However, it was not until the latter months of 1808 that measures were finally taken to commence the proposed fortifications.(19)



Daniel D. Tompkins, Governor of New York.
Author's Collection

On September 27, 1808, Secretary [illegible] wrote Governor Tompkins with orders for Colonel Williams to attend the governor in an examination of potential fortification sites on Staten Island at the Narrows. In conformity with those orders, Tompkins and Williams traveled down New York Harbor to the Narrows aboard the latter's cutter. The weather was so "boisterous" that the trip consumed four days. Landing at Staten Island, Colonel Williams and Governor Tompkins examined the remains of the old British Fort Stag Stake and its redoubts on Signal Hill, as well as the Sandy Beach site suggested for fortifications by the secretary of war. Williams and the governor concurred with the secretary as to the location for the new works proposed for Staten Island. Returning to the city, Colonel Williams prepared a drawing of the projected work. While its form differed from that formulated by Secretary Eustis, Williams believed it would answer Eustis' purposes.(20)

Williams' initial plan for the defenses was comprehensive, addressing the need for works on both sides of the Narrows. He recommended two circular towers of the type under construction at the west end of Governor's Island (Castle Williams), connected by a curtain wall on Hendricks Reef, all for between 200 and 300 guns. A simple redoubt on the high ground to the rear on Long Island would be sufficient to protect the rear approach to the works on the reef.

Across the channel on Staten Island, Williams proposed building another pair of towers connected by a curtain on Sandy Beach. South of the towers, he recommended an additional battery along the slopes above the Narrows. To secure the Staten Island forts against attack from the rear, Williams noted the importance of Flagstaff Hill. He proposed a strong fort there that could hold out against a land attack, with the usual assortment of ramparts, parapets, scarp, ditch, counterscarp, and glacis on its land fronts, and a low parapet on its Narrows front that would be armed with heavy ordnance to supplement the fire of the towers on the reef. To conserve money, he proposed flanking defenses in the form of half-bastions rather than full bastions at all the salient angles of the work except for the southeast angle, where he would place a circular tower, as there was insufficient ground for a bastion. Williams also noted that there was but one location from which a fort on Flagstaff Hill might be "annoyed," a hillock to the southwest. He recommended acquiring additional land south along the shoreline of the Narrows and the ridge above it, where additional batteries could further increase the firepower bearing on the channel leading into the harbor.(21)

After receiving Williams' report, the state legislature appropriated $100,000 to initiate construction on Staten Island. Williams' plan underwent considerable alteration in the meantime. The twin multi-tiered towers connected by a curtain were transformed into one single-tier curvilinear "marine" casemated battery of red Newark Sandstone, with a gorge enclosed by a curtain. There were no flank-

ing defenses of the gorge scarp. The battery was capable of being increased to two tiers at some future date; in the interim it was to be provided with the shed-type roof over the casemates that had been employed at Castle Clinton off Manhattan's Battery. The work was to be supported by an additional earthen battery extending south down the shoreline.

Instead of the 200 to 300 guns initially envisioned by Williams, the marine battery would be single tier, mounting a mere 25 to 30 cannon supported by another 40 or 50 guns in the battery to the south. The first work undertaken was the marine battery on Sandy Beach at the foot of Signal Hill. Little time was lost beginning construction on the proposed forts and batteries, but progress was slow and it was not until December 28, 1808, that the fort's cornerstone was laid with appropriate ceremony.(22)

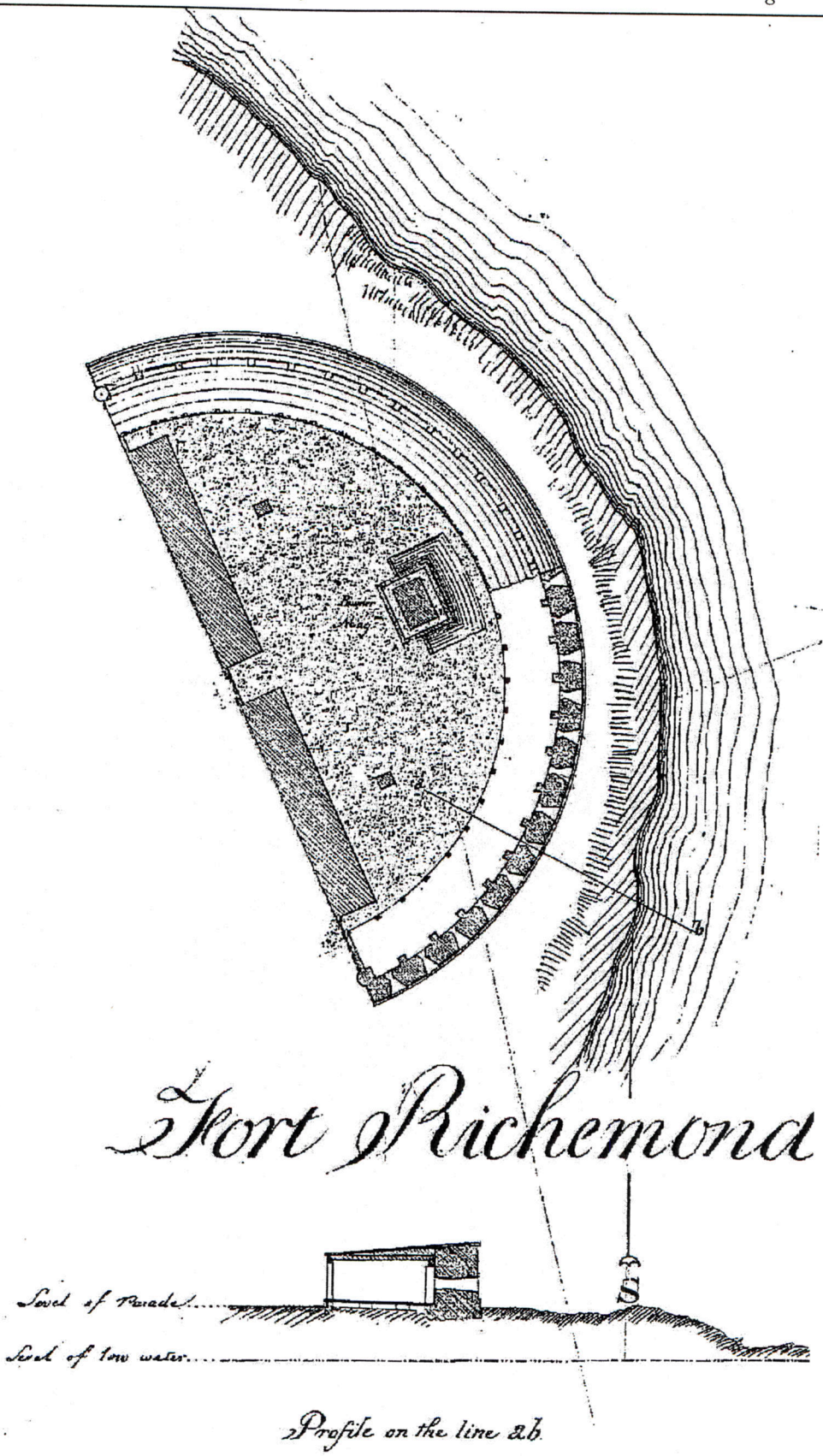
On January 21, 1809, Governor Tompkins wrote President Thomas Jefferson requesting the federal government supply the necessary ordnance for the Staten Island works. In his letter, Tompkins gave a good description of the progress made on Staten Island:(23)

> "...operations have been begun at and near Signal Hill on Staten Island. A Water Battery on the beach directly under the Hill will be soon so far completed, as to receive from 25 to 30 cannon. Excavated retiring batteries at the Southerly point of the high ground are progressing rapidly, and will be prepared in about thirty days to mount 40 or 50 cannon. A few rods southerly of the observatory an open work calculated for 12 guns will be finished during the ensuing week. All the preceeding are commanded by a redoubt to be established on the eminence at Signal Hill. As the latter work is to be of masonry, the only measures which can be taken there until the opening of the Spring are procuring materials, digging the ditches and sinking a Well in which the Commissioners are rapidly progressing. Barracks sufficiently capacious to accommodate 200 mechanics and laborers, have been erected and a wharf constructed for the convenience of landing materials. Upwards of 100 men are at present employed at the works at 25 cents and one ration per day, and in the course of the next week, the number will be augmented to 200.

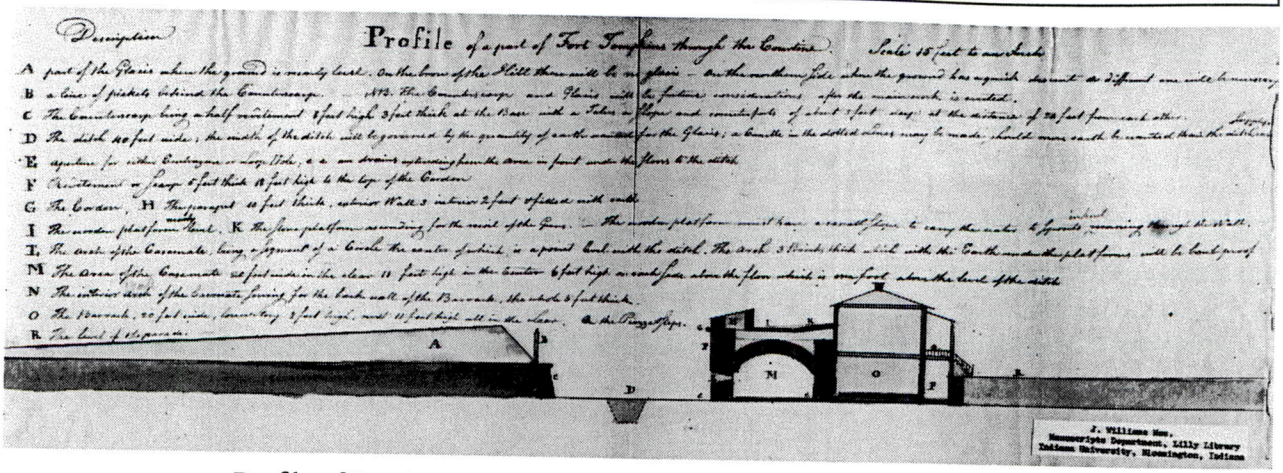
The works begun by the state on Staten Island in December 1808 did not, however, progress as rapidly as the governor had intimated to the President. Tompkins suggested that numerous persons left unemployed and otherwise "out of business," as a result of Jefferson's Embargo be employed on the fortifications projects at Staten Island. By mid-February 1809, according to the State Board on Fortifications, this early 19th century "public works" project was providing employment for some "two hundred to two hundred and fifty persons who are deprived of the ordinary means of subsistence, by the critical state of our national affairs."

DeWitt Clinton, chair of the State Board of Fortifications, reported construction of the works on Staten Island was being advanced sluggishly. On the summit of Signal Hill, the principal work, named for Governor Tompkins, was less well advanced than the battery on the shoreline below. Fort Tompkins was built on the site of old Fort Stag Stake and a British redoubt from 1781. To prepare the site, the west front of the older work was removed and a part of the ditch was excavated "extending from the flanked angle of the bastion and salient angle of the counterscarp of the southwest bastion to the circular tower, and reentering and salient angles about the tower, with a corresponding part of the glacis. The excavation of the tower, [would be] ready for laying the foundation as soon as the season will admit of the materials being procured." Clinton also noted that the well between the southwest rampart and the south wing of the west barracks had been dug to a depth of more than 60 feet.(24)

Before the next session of the legislature, in January 1810 Governor Tompkins called on De Witt Clinton for a report on the state of the works then under construction at the Narrows. Clinton in turn requested Colonel Williams provide him with information on the state of those works. During the next legislative session, additional funding of the state's fortifications was to be considered.



Plan and section of Fort Richmond. *NARA*



Profile of Fort Tompkins through the courtine [sic]. *Williams Papers*

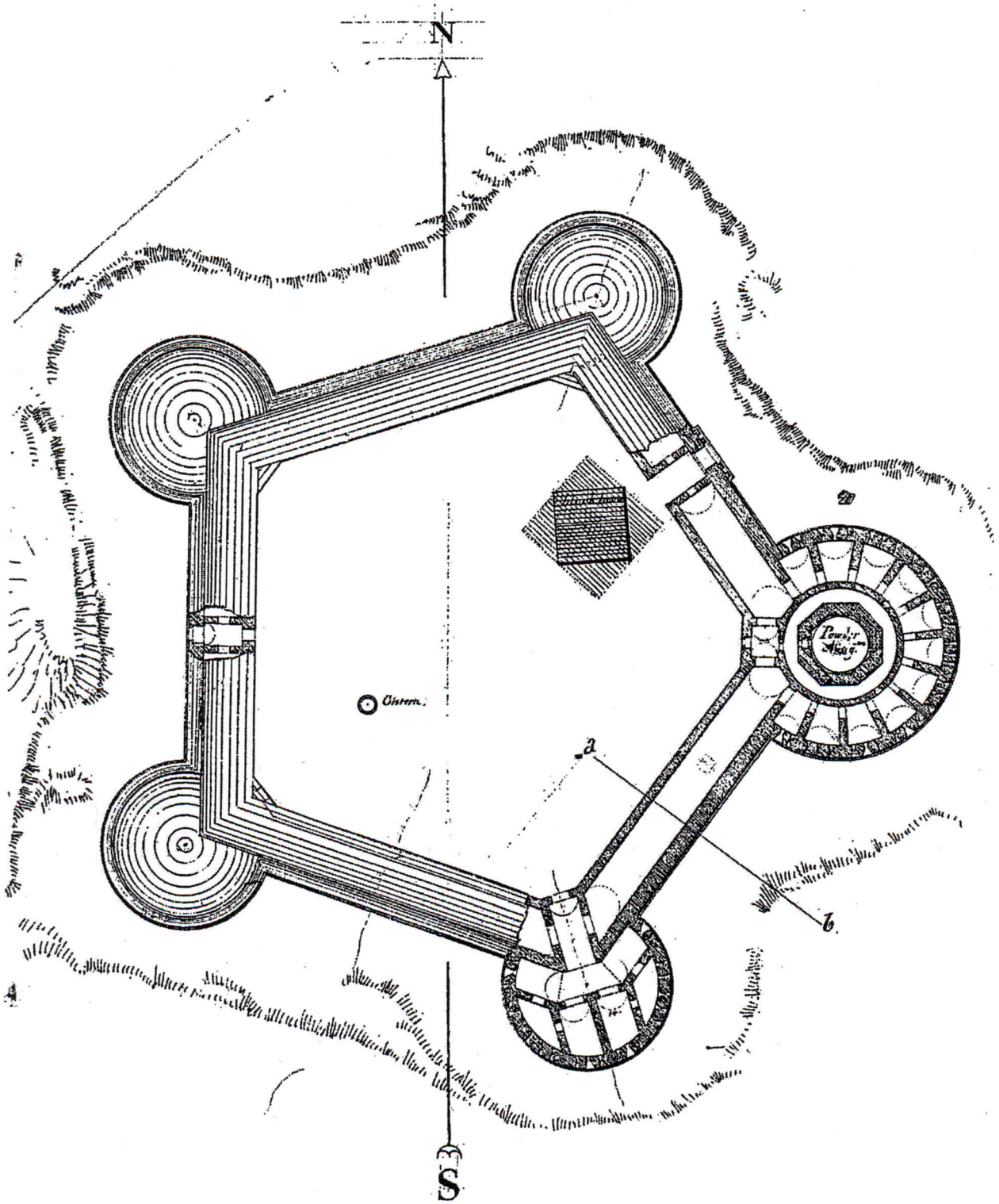
Williams provided a good description of the progress of the plan he had presented to the governor in October 1808 for the defense of the Staten Island side of the Narrows. Fort Tompkins was still far from complete in 1810. Its scarps and two circular bastions of Newark sandstone, however, formed a strong redoubt that protected the rear approaches to the marine battery and the ancillary lower batteries that guarded the Narrows.(25)

Upon completion, Fort Tompkins would be pentagonal in trace, with circular bastions at the salient angles connected by curtains, all of which were casemated. It would measure 1,368 feet along the line of the interior crest of the parapet. The scarp of native brownstone would be five feet thick and 19 feet high. The curtains would be 21 feet wide. A powder magazine would be in the center of the east, and largest, of the five bastions. The first Fort Tompkins had many deficiencies, however: The round towers forming the bastions were poor flank defenses. The fort was subject to plunging fire on its land fronts from the heights to the rear of the fort. The fort had no glacis, covered way, or ditch. The stone parapet was already obsolete. The casemates in the curtains were poorly ventilated, making them unsuitable as quarters, and without embrasures, they could not house armament. The scarp rested directly on the arches of the casemates and had no relieving arches. There were no advanced works to cover the land approaches. Although work continued through the War of 1812, the fort was still incomplete at the end of that war.

The "marine battery" on Sandy Beach below Signal Hill had been named Fort Richmond, the name of the county encompassing Staten Island. By February 1809, the trench for the foundation had been excavated and the parade ground had been raised one foot above the plane of the site. By 1810, it was ready for its red-sandstone foundation and walls. The fort's crescent-shaped 430-foot waterfront was deemed sufficient for 27 guns *en casemate*. Because the fort's main battery would be so close to the water, ricochet fire would give the fort a decided advantage over higher works.(26)

Williams believed Fort Richmond was in the "best possible position and so fully exposed to fire of the protecting works intended for erection on the hill in its rear, that it will be totally impossible for an enemy, however, numerous to hold it long enough to do any injury whatever."(27)

Because of the manner in which Fort Richmond would be constructed, it would be possible to add a second tier of guns with no greater additional expense than an additional height of some 12 feet and another platform for artillery. However, the Second War with Great Britain resulted in the deferral of the second tier and the casemated tier was provided with a timber roof covered with slate, similar to that at North Battery and at Castle Clinton.

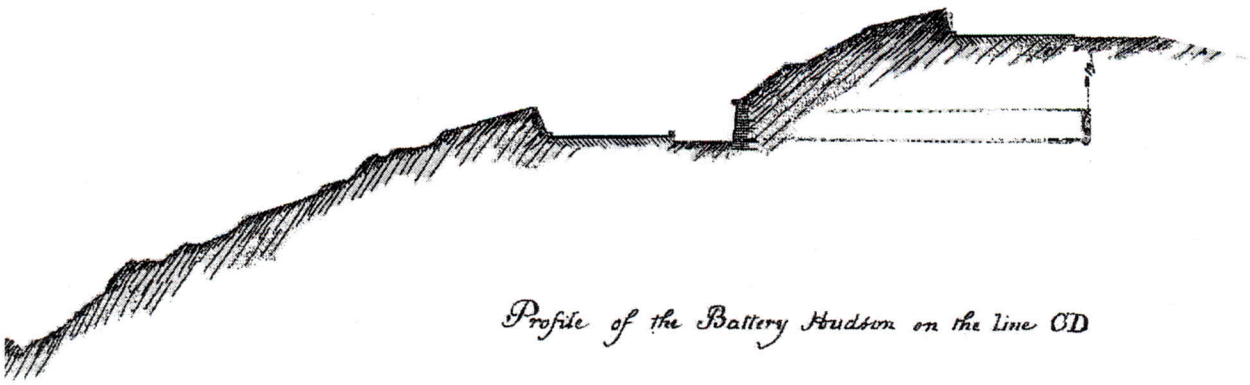


Fort Tompkins

Plan of Fort Tompkins. *NARA*



Plan of the works on Staten Island, ca 1819. *NARA*



Profile of Battery Hudson's two tiers. *NARA*

Williams felt that there was room on either flank of Fort Richmond for additional batteries mounting another 10 to 15 guns. These works would also protect the approaches to Fort Richmond by either flank and would in turn be protected by the guns of the fort. Williams recommended that two traverses be thrown up on the parade ground inside the fort to protect the interior from ricochet fire, with a magazine between these traverses in the rear of the fort. Two shot furnaces were suggested to occupy the space between the rear of the battery casemates and the traverses.(28)

To the south of Fort Richmond along the Staten Island shore, curving around the southern point of the entrance to the Narrows, Williams recommended a second battery some 670 feet long, mounting 48 guns 68 feet above high water. This work was subsequently named Fort, and later Battery, Hudson. The board noted that the excavation for this southernmost earthen battery on the hill was:(29)

> "...nearly half complete including two hundred and fifty eight feet of its epaulement; and should the ensuing season prove favorable; will in all probability in the course of two months be ready to mount thirty five pieces of cannon."

Fort Hudson was initially composed of two earthen barbette batteries terraced one above the other. The lower tier was 68 feet above high water and 670 feet long, for 47 smoothbore guns in 1810. Above and to the rear of this lower battery was the 480-foot upper battery for another thirty-two 24-pounder smoothbore guns. Both earthworks were faced and revetted with stone. The upper tier had a parados in its rear.

In the immediate rear of this battery and another 41 feet farther up the slope was a 173-foot earthen "cavalier" battery for 12 guns. This work, slightly curved, was named Fort Morton upon its completion and later Battery Morton. Fort Morton fully commanded Fort Hudson and supplemented its direct fire on the Narrows. Its parade had been fully excavated and its 173-foot parapet was complete. As soon as weather conditions permitted, it was proposed to lay the platforms for its 12 guns.(30)

Because of the talus of the slope down to the shoreline, no enemy vessel could successfully pass beneath the guns. To prevent the erosion of the parapets on the hillside, Williams called for construction of a stone revetment on the superior slope of the parapets, with spouts to direct heavy rains down the slope without damaging the works.(31)

When the State Board of Fortifications made its report to Governor Tompkins in February 1811, it noted Colonel William's view of Fort Hudson's importance and concluded that its upper tier should be finished "in the best manner; and . . . accordingly faced with a wall of solid masonry." The parade grounds of both the upper and lower tiers of Fort Hudson were now finished and foundations for 82

gun platforms had been laid. Fort Richmond had a pair of shot furnaces and a parade wall along the rear line of the casemates, "as well as for the protection of the men who may be stationed in the fort, as for securing the platforms and gun carriages from injuries of the weather." Fort Richmond was armed with 24 iron 24-pounders, on old garrison carriages no longer considered fit for service, with 500 round shot. Additionally, there were two 12-pounder brass pieces on travelling carriages.(32)

Still another battery of 12 guns to command the channel was projected by Williams some 374 yards north of Battery Hudson and 308 yards east of Fort Tompkins, to command both this new battery and Fort Richmond from the heights of Flag Staff Hill. A battery on this site, however, was not begun until 1872, when the Glacis Mortar Battery was undertaken.(33)

The War of 1812

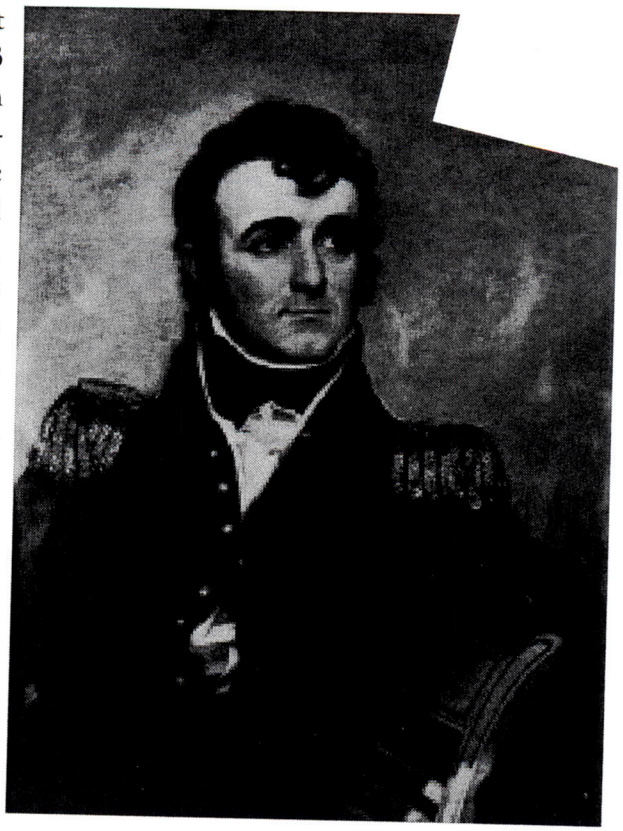
When hostilities opened between Great Britain and the United States on June 18, 1812, the defenses covering the southern approaches to New York Harbor, while considerable compared to other harbors, were hardly overwhelming. Since 1807, $115,000 had been expended on Staten Island's Fort Richmond and Batteries Hudson and Morton that constituted the harbor's first line of defense. These works were armed with twenty-four 32-pounder and fifty-three 24-pounder smoothbore guns. Beyond the long abandoned Revolutionary War earthworks on Denyse's Heights at New Utrecht, there were no works on the Long Island side of the Narrows. Construction of the fort on Hendricks Reef, projected for many years, had not yet begun. Below the Narrows, there were no defensive works at the Navesink Highlands or Sandy Hook, NJ, or at Rockaway on Long Island. The signal station between Staten Island and the Brooklyn Navy Yard had quickly been placed in service by June 23.

At the beginning of the war, Secretary of War William Eustis considered 3,000 men necessary to man the works inside New York Harbor, exclusive of those at the Narrows. There, several militia artillery companies and 500 infantry from New York, and for a brief period, New Jersey, manned Staten Island's batteries. The militia was soon joined by a brigade of Regular Army infantry.(34)

The fortification of New York's Harbor was upset by Colonel Williams' July 31, 1812, resignation from the army over the right of engineer officers to command troops of other branches. Colonel Williams had been more than a little disturbed by the appointment of New Jersey Governor Joseph Bloomfield as brigadier general on March 27, 1812, to command in New York Harbor. Williams considering himself the better choice, and Bloomfield, a former officer in the Continental Army who continued to hold office as Governor of New Jersey, ill equipped for such an important command. As a consequence, Williams tendered his resignation from the army on July 10, 1812. While Williams' resignation was under consideration by the President, Secretary Eustis wrote Williams that the Committee of Defense at New York had appealed to him to "prepare a report stating whether it is practicable, by sinking a pier of stone on Hendricks Reef, and by means of hulks & a suitable counter pier, on Staten Island, to suspend the chain now lying at Governors Island, across the channel at the Narrows: and if it be practicable, in what time it may be effected, together with an estimate of the expense."(35)

The next ranking officer in the Corps of Engineers was Col. Joseph G. Swift, then engineer in charge of the defenses along the Carolinas and Georgia. Swift was promoted to chief engineer and ordered to New York to succeed Williams. Williams' principal assistants at New York, Maj. George Bomford and Lt. William Cutbush, continued to supervise the various fortification projects underway in the harbor pending the arrival of Colonel Swift. In September 1812, Capt. Samuel Babcock arrived in New York and assumed temporary command of the New York fortifications. He succeeded Major Armistead as engineer in charge in New York Harbor when Armistead was ordered to the Niagara Frontier as chief engineer of the forces in the field.(36)

The first six months of the war went somewhat calmly in New York. It was not until early in 1813 that Admiral Warren arrived off Sandy Hook with three, third-rate, 74-gun ships of the line (HMS *Ramilles*, *St. Domingo,* and *Dragon),* a 38-gun frigate HMS *Satira,* and two 18-gun brigs HMS *Sophie* and *Colibri,* to begin the blockade of New York Harbor. Concerned that the British would attempt passage into New York Harbor, the Staten Island batteries went on alert. Shot furnaces in Batteries Hudson and Morton were fired up and the garrison bolstered with additional militia. Initially, however, the Royal Navy limited its activities to a loose blockade, conducting minor incursions into the lower bay to interfere with fishing and prevent American intelligence gathering, as well as to obtain their own intelligence.



Col. Joseph G. Swift. *Corps of Engineers*

New York's Harbor was probably better protected by nature than military force. The shoals on either side of the constricted and shifting channels in the lower bays and the Narrows made maneuvering large ships of the line difficult, and the constantly shifting Middle Ground Shoal at the entrance to the lower bays made entering the harbor a complicated venture. An American flotilla that eventually grew to 40 shallow-draft gunboats and barges was manned by about 1,000 "Sea Fencibles." This force was assembled in New York Harbor under Capt. Jacob Lewis, USN. A portion of Lewis's command was kept in the lower bay to oppose any attempt by Admiral Warren to enter Sandy Hook Bay. Lewis was later ordered to reduce the number of gunboats to 15 because of the expense of manning them, much to the consternation of city and state authorities. When the blockading British appeared to be moving against the lower waters of the bay in January 1813, Lewis moved down the harbor to oppose them, but turned back because of thick ice in the lower harbor. The weather and other natural obstacles apparently forestalled the British efforts as well.

Additional works were erected on Sandy Hook. Governor Tompkins reported to the legislature March 13, 1813 that "work had also been begun on Sandy Hook." Two or three cannon were located at the lighthouse, primarily as signal guns in the event of an enemy approach and to fend off small raiding parties from the blockading squadron, but the fortifications were generally insignificant. A large fort on Telegraph Hill at Navesink Highlands some three miles from the Lighthouse was in direct communication with Signal Hill at Staten Island. By the end of March 1813, the Telegraph Hill fort was manned by five companies of artillery with 32-pounders, and three companies of infantry.(37)

Colonel Swift Continues Colonel Williams' Projects

On April 1, 1813, Colonel Swift arrived in New York from the Carolinas and on April 6 reported to Brig. Gen. George Izard, who commanded the United States forces in New York City. Izard, who had succeeded Bloomfield, placed Swift in command of Staten Island and a brigade composed of the 32nd and 41st Regiments of U.S. Infantry. In addition, Swift also assumed direct charge of the engineering works at the Narrows on Staten Island and at New Utrecht on Long Island.(38)

On April 15, Swift began to repair all the forts in the harbor and to erect blockhouses at Denyse's Hill near New Utrecht in the rear of Hendricks Reef, at Jamaica Bay on Long Island, Princess Bay on Staten Island, and Sandy Hook, NJ, to deter raiding parties from Admiral Warren's blockading squadron off Sandy Hook. The construction of these blockhouses was undertaken by a "very industrious and intelligent" local mechanic by the name of Cropsy, who resided in New Utrecht. These blockhouses were armed with wall pieces from West Point and manned by detachments from Gen. John Swarthout's brigade of New Jersey Militia based at Perth Amboy. In addition, Capt. Jacob Lewis, commanding the naval forces in the lower harbor, had gunboats and barges to patrol the waters inside Sandy Hook and to interdict the intercourse between spies in the city and Admiral Warren's flagship HMS *Ramilles*. By May 25, Swift had the temporary defenses reasonably well in hand for the protection of the city. In addition to the increased garrison in the Staten Island works, some 89 additional pieces of artillery were moved to the island.

The British blockade of the southern entrance intensified at the end of May 1813. Barges from the frigate HMS *Satira* frequently chased small vessels in the vicinity of Rockaway. The blockade of the southern entrance to New York Harbor was so strict by autumn 1813 that part of the 3rd US Infantry Regiment was sent down to reinforce the defenses on the Hook.(39)

Jonathan Williams' Fort on Hendricks Reef Is Commenced

After laying out his plans for Staten Island in the early 1800s, Colonel Williams turned his attention to shallow Hendricks Reef, only a scant two hundred yards from Long Island. As a result of his 1805 survey, in 1808 Williams' reiterated to the state legislature his suggestion for a battery there and in 1810 again recommended a castle similar to Castle Williams on Governors Island for the reef.

No action was taken until war with Great Britain came in June 1812. Finally, a diamond-shaped work was planned for Hendricks Reef. The construction on Hendricks Reef was delayed by Colonel Williams' resignation.(40)

Many in New York City considered the fortifications defending the harbor grossly inadequate. By June 25, the city Committee of Defense was requesting the federal government to begin construction of the long-considered battery on Hendricks Reef, as well as a covering work at Denyse's Heights on Long Island. Apparently, a blockhouse or small fort of earth and timbers was erected at the site of Montressor's 1778 lunette on Denyse's farm. This work was named Fort Lewis, most likely for Maj. Gen. Morgan Lewis of New York. In addition, other blockhouses at Long Island's west end were also proposed for Bath Beach, New Utrecht, Princess Bay, Jamaica Bay, and Rockaway.(41)

On March 15, 1813, Lt. William Cutbush, superintending construction of the works on Hendricks Reef and at Sandy Hook, reported to Secretary of War Armstrong that the troops and workers occupied far more space than was available for that purpose and requested authority to purchase additional tracts on Long Island to house the troops and laborers assigned to the Hendricks Reef project. Cutbush considered 60 acres of farmland owned by William Dinin and D. Dinin overpriced.(42)

While Commodore Lewis' gunboats and the considerable force of New York and New Jersey Militia, bolstered by a few regiments of regulars, guarded the lower reaches of New York Harbor, the armament at the Narrows was increased. The number of guns at Forts Richmond, Hudson, and Morton rose to 90. Atop a hill on Staten Island, some 400 yards southwest of Fort Tompkins and about 540 yards west of the Narrows, the State of New York leased a tract for a square earthen redoubt for four 18-pounders. Named Fort Smith, for Arthur Smith of the State Board of Fortifications, it was situated to prevent an enemy landing at Princess Bay and to occupy the hill that commanded unfinished Fort Tompkins. Although a barracks was built at the site, Fort Smith's armament was not immediately pro-

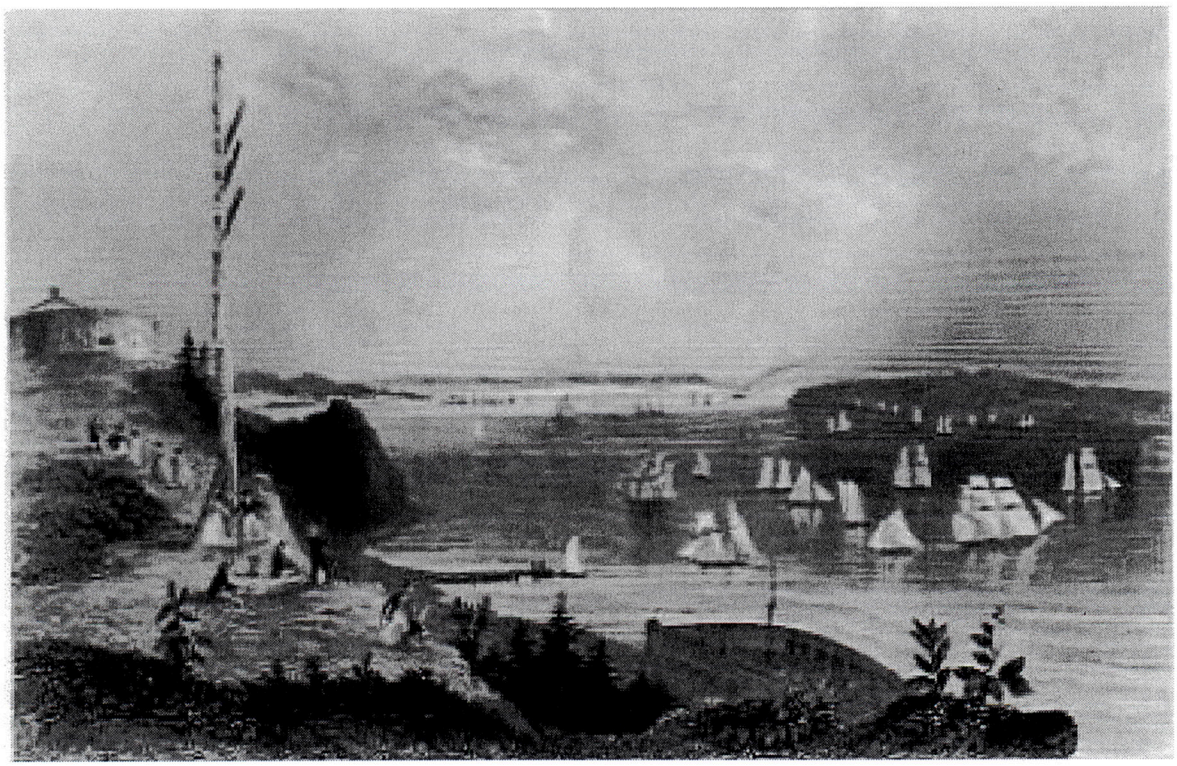
vided. Leased for the duration of the war, the legislature failed to allot funds to purchase it at the end of the war and the work was dismantled.(43)

Fort Tompkins was never completed during the war and remained unarmed. Its scarps and two circular bastions of sandstone, however, formed a strong redoubt that protected the rear approaches to the lower batteries that guarded the Narrows. Following the War of 1812, the Staten Island batteries were all but abandoned, falling into an advanced state of disrepair.

In August 1813, the 24th US Infantry Regiment and a regiment of New York Volunteers arrived to further strengthen the Staten Island defenses. Governor Tompkins obtained additional funds to complete Fort Richmond and advance the construction of Fort Tompkins. By 1815, the Staten Island batteries were armed with twenty-five 32-pounders, forty-four 24-pounders, four 18-pounders, seven 9-pounders, and more than 800 smaller artillery pieces.(44)

Major Bomford was still in Albany in late July when he received orders to apply to the state for title to the lands on Long Island that the government had selected for a work to cover the battery on Hendricks Reef.(45)

Chief Engineer Swift, like his predecessor, also served as superintendent of the Military Academy, and made regular trips to West Point to oversee the academy's operation. However, by the end of July 1813, he was seeking active service on the northern frontier. Finally, by August 9, Swift received orders to join the field army being assembled at Sacketts Harbor, NY. He departed August 17. After nearly three months in upstate New York, Swift returned to New York City on November 27 to resume his duties. On November 30, accompanied by General Dearborn, commanding the Department of New York, Gen. William Henry Harrison, and Secretary of War John Armstrong, Swift inspected the works on Staten and Long Islands, and observed the British squadron off Sandy Hook.(46)



The Narrows, ca 1850, with bastion of Fort Tompkins at far left background, semaphore pole and Fort Richmond in right foreground. *Author's Collection*

Samuel Babcock Advances the Battery on Hendricks Reef

In an October 1, 1812, report to the secretary of war, Captain Babcock noted that the sinking of blocks on Hendricks Reef was about one-third complete. On November 6, the legislature ceded the "parcel of land covered with water in the town of New Utrecht on the easterly side of the Narrows at the entrance of New York Bay under a reef commonly called Hendricks Reef containing thirty acres."(47)

On March 15, 1813, Lieutenant Cutbush wrote Secretary Armstrong regarding the work projected for the heights behind the battery on Hendricks Reef, noting that the site designated by Major Bomford was not large enough for the purposed work. Major work on the fort proposed for the hill at the west end of Long Island overlooking Hendricks Reef was suspended and in its stead an open battery was planned. Swift noted, however, that it would still be necessary to occupy the high ground in the rear of the covering battery with two stone towers, each armed with a 32-pounder and a 10-inch mortar.(48)



Maj. George Bomford. *Corps of Engineers*

By early December 1813, the foundation for the castle on Hendricks Reef was well advanced, the cofferdam around the site built, and the foundation blocks laid. A dock was built to land materials. The first floor of the channel faces of the work was also laid. The work was planned for two tiers of casemated guns with the possibility of a third tier being added. Were a third tier to be added, Cutbush questioned whether there would be sufficient space in the castle to accommodate the men required to garrison it. On the Long Island heights behind the work on Hendricks, the lightly armed stone infantry redoubt proposed in earlier plans was to be replaced by a covering battery for artillery.(49)

On February 14, 1814, Colonel Swift reported the progress on the casemated castle at Hendricks Reef to Secretary Armstrong, with a plan of the work as well as elevations and sections. A wharf had been built at the west end of Long Island to communicate with the casemated work on the reef.

On February 23, 1814, Colonel Swift was promoted to brevet brigadier general for meritorious service at the battle of Chryslers Farm, Upper Canada, on November 11, 1813. The City of New York purchased 60 acres, one rod, and six perches from Jaques Cortelyou Denyse at New Utrecht, at the west end of Long Island. On May 30, 1814, the "Mayor, Aldermen, and Commonality of the City of New York" ceded and granted this land to the federal government for fortification purposes in exchange for certain U.S. properties in the city.(50)

Secretary Armstrong, having received a new estimate on the cost of the castle at Hendricks Reef in February 1814, wrote Swift that he was much disturbed that the cost had continued to increase. Bomford's August 1812 estimate to construct a two-tier battery surmounted by an open barbette tier on the reef and covering works on Long Island, with a chain of logs across the Narrows and a covering work on Staten Island, had only come to $160,000. The sum of $100,000 had already been spent on the reef castle alone. Now the most recent estimate for the completion of the works on Hendricks was

set at $120,000 for a two-tier work and $181,000 if built to three tiers. Armstrong voiced his lack of "confidence in estimates," a concern that would be echoed by future secretaries of war and Congresses for another century regarding the nation's seacoast defenses. He then instructed Colonel Swift to erect the castle on Hendricks Reef in accordance with the least expensive two-tier plan. Strong works were also under construction on Brooklyn Heights east of Governors Island, and on the heights southwest of the navy yard.(51)

On the reef, once construction of the foundation had been sufficiently advanced, a temporary battery with three heavy guns was constructed of timbers on that part of the cofferdam's upper surface at the angle facing directly across the Narrows. No further fortification of the reef was undertaken until the end of the War of 1812. About one-third of the stone blocks that formed the sub-foundation of the battery had been sunk. Babcock expected the sub-foundation to settle and felt an additional two hundred boatloads of stone would be required to complete the foundation.(52)

On August 31, 1816, Swift sent his statement of expenses for engineering work done during August to William H. Crawford, who had succeeded General Armstrong as secretary of war. On Hendricks Reef, some $5,101.24 had been expended for stone, lime, and lumber. During September, Swift expected to spend $7,400 there.(53)

In May 1817, as a result of difficulties with Colonel Hindman, commanding Governor's Island, over supervision of troops improving and repairing the various forts on the island, Capt. Rene E. DeRussy shut down all engineering work in New York Harbor with the exception of the Hendricks Reef project and some work at Sandy Hook. The issue would not be resolved until late October.(54)

On October 12, 1818, General Swift reported in his annual report to Secretary of War John C. Calhoun that the only work still under construction in New York Harbor was the castle at Hendricks Reef. As projected in 1818, the work, now about half-complete, was to be for 96 guns and cost $275,000. Swift noted that if $110,000 were appropriated the work could be completed in 1819. Swift added that additional fortifications were required at Sandy Hook, at the Narrows on Staten Island, and on the heights above Hendricks Reef on the west end of Long Island. In addition, the chief engineer pointed out the importance of enhancing the lines on Brooklyn Heights. On November 30, 1819, Col. Walker K. Armistead, who had succeeded General Swift as chief engineer on November 12, 1818, was able to report to Acting Secretary of War Maj. Christopher Vanderventer, that the fort on Hendricks Reef was nearly finished.(55)



Col. Walker K. Armistead. *Corps of Engineers*

In a comprehensive report of its operations between 1818 and early 1821, the Board of Engineers noted that the object of defensive works on the Hudson and East Rivers was to cover the city of New York against attack by land or water, to protect its shipping, and prevent the blockade of the harbor as much as possible. As the forts projected for the Narrows and at Throgs Point on

the East River would force an enemy to land at a distance from the city, that would place the lines of fortification on Brooklyn Heights on Long Island and Harlem Heights on Manhattan Island on the interior curve of a frontier extending from Sandy Hook eastward and northward to the Hudson River.

The forts projected for the East Bank and Middle Ground would "complete the defense of the city, by depriving an enemy of the landing place in Gravesend Bay, the only spot on the south shore of Long Island where he can safely land to march on Brooklyn." These works would also prevent an enemy establishing himself on Staten Island, and prevent a hostile force from anchoring in the outer harbor and blockading the inner harbor. The board considered the works developed in the inner harbor to be "scarcely at all defended against a sea attack; and not at all defended against an attack on land."

The board believed that works of the first class were immediately required at the Narrows on Staten Island and at New Utrecht on Long Island. To guard the eastern approaches to the city, the Board also called for works at Throgs and Wilkins [Willets] Point on the East River. The works at the Narrows were estimated to cost $910,983, those on the East River $928,026. Once these works were in place, the overall plan called for constructing the projected works in the outer harbor on the Middle Ground and East Bank. These works would be exceedingly expensive - each was estimated to cost $1,681,411. (56)

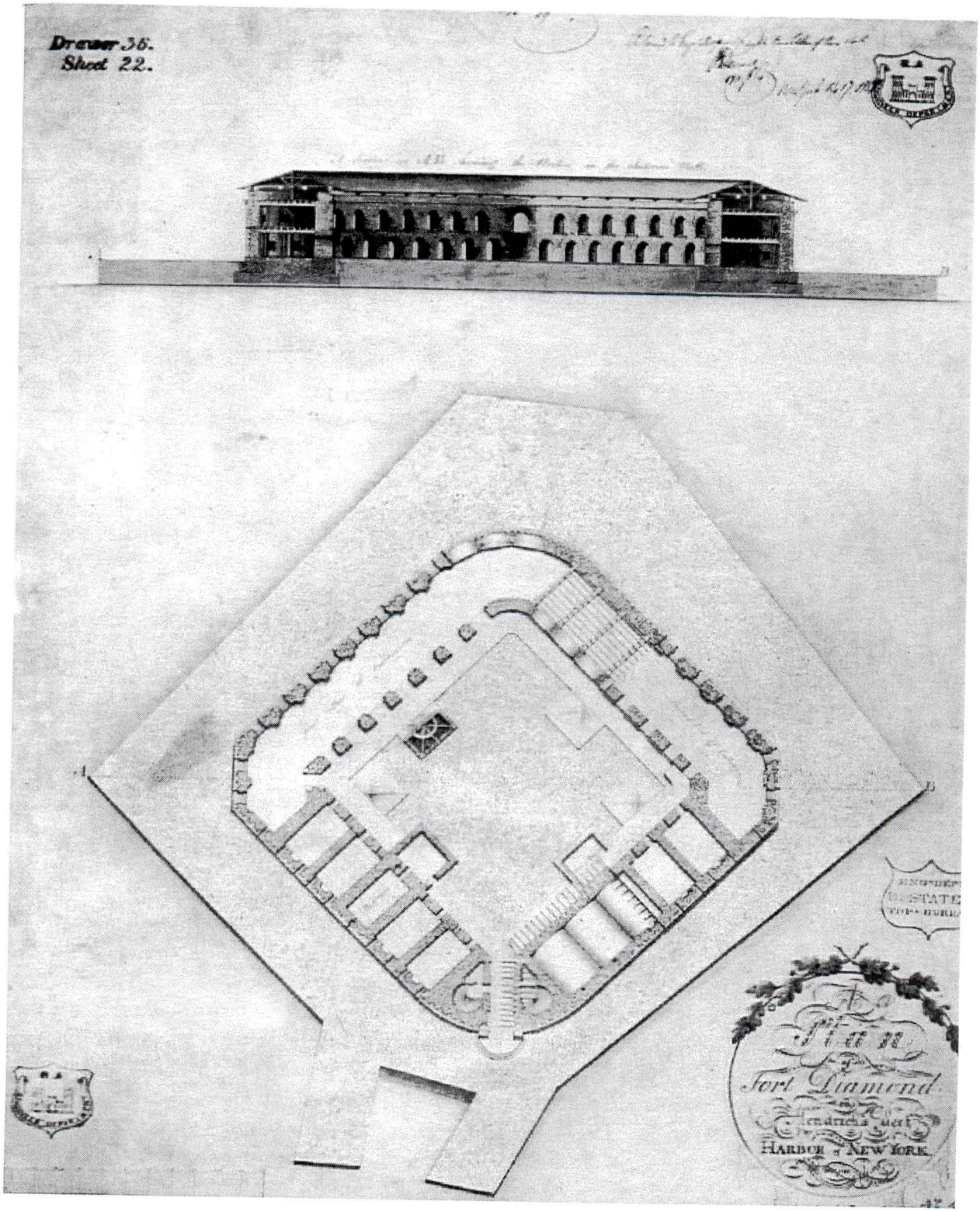
Fort Diamond, as the work on Hendricks Reef was initially named, ostensibly because of its shape, although occupied by a small garrison since 1820, was finally completed in 1822 after an expenditure of $318,305.89. The three-tier stone castle measured 214 yards around. The fort was provided with seventy-two 32-pounders. According one source, however, it may have been capable of receiving 93 guns if fully armed. This powerful battery on the Narrows was projected for a wartime garrison of 500 officers and men. Although in peacetime it was planned to accommodate a garrison of 80 men, in 1822 it was occupied by only 55 men.(57)

Founded on the stone foundation built on Hendricks Reef, Fort Diamond was a brick and Newark Red Sandstone quadrangular masonry work, with one of its principal faces directed down the Narrows and the other facing toward the city. The work was three tiers high and its two landward faces contained quarters for the garrison as well as additional armament. The sallyport was in the angle of the two land fronts. A wharf and landing were adjacent to the sallyport. The three tiers of the fort were floored with heavy timbers supported by oak trusses. The initial armament was on the lower and middle tiers. Magazines in the interior of the fort housed the gunpowder. The upper tier was provided with a shingled wooden shed-type roof that quickly weathered. Cisterns beneath the casemates stored water for the garrison.

Beyond the completion of Fort Diamond, little tangible progress was made in New York's seacoast defenses. However, by November 1822, plans and estimates were being developed to replace the state works on Staten Island with new ones built by the federal government. A new Fort Tompkins estimated at $420,826.14 was to replace the old sandstone fort built during the War of 1812. In advance of the new fort, a redoubt costing $65,162.44 was to be built to protect the land approaches to the fort. Across the Narrows on Long Island, a new fort at New Utrecht overlooking Fort Diamond was projected to cost $371,970.60. Beyond this fort, a redoubt costing an additional $53,024.72 was planned for the heights commanding the land approaches to the new fort.(58)

In March 1823, during the visit of the Marquis de Lafayette to the United States, President James Monroe directed Fort Diamond renamed "Fort La'Fayette" in commemoration of the marquis' distinguished service as a major general in the Continental Army during the Revolutionary War. Secretary of War Calhoun noted in a November 29, 1823, letter to the President that the fort at New Utrecht to cover Fort Lafayette could be commenced during 1824 if appropriations were granted by Congress.

(59)



Elevation and plan of Fort Diamond (Fort Lafayette), ca 1822. *NARA*

Fort Hamilton Built on Long Island

While the various surveys conducted by United States and the State of New York in the 1790s and early 1800s had pointed out the significance of the Narrows, it was not until after the War of 1812 that specific plans for the projected fort at New Utrecht Point were finalized and implemented. On November 29, 1823, Secretary of War Calhoun advised President James Monroe to request appropriations from Congress to commence a work at New Utrecht to cover Fort Lafayette. Once title and jurisdiction to the land had been secured, $50,000 was appropriated to collect material for the fort's construction. On April 25, 1824, Lt. Andrew Talcott of the Engineers was ordered to New Utrecht to conduct surveys and prepare the wharf for the construction materials.(60)

The site selected for the new fort was on the southwest shore of Long Island, where it curves to the west along the left (east) bank of the Narrows. The work was to be in the village of New Utrecht, about six miles below Manhattan's Battery. From here the fort would command the channel through the Narrows, with a "fine view of not only the Narrows, but a portion of the inner bay and in a southerly direction across the outer bay, the highland[s] of New Jersey are visible by day and the lighthouses of Sandy Hook by night. Nothing separates Fort Hamilton from the Atlantic but a narrow strip of sand called 'Coney Island.'" On the landward side of the proposed fort, the topography was rolling, with a series of hills and depressions that would ultimately require advanced fortifications to secure the land approaches.(61)

It is believed that Maj. and Bvt. Lt. Col. Joseph G. Totten, member of the Board of Fortification and early proponent of the polygonal or German School of Fortification, was instrumental in planning this one of the few polygonal early Third System forts. The plans for the fort were approved August 25, 1824. In his report to the secretary of war in November 1824, Maj. Gen. Alexander Macomb, who had succeeded Armistead as chief engineer of the army, reported that the fort at New Utrecht had been begun, although the only work accomplished was the collection of material and erection of the construction plant. Although the greater part of the site some 55 feet above the Narrows was already owned by the United States, $50,000 had been appropriated to purchase additional tracts and for the collection of construction material. During the work season, the wharf had been repaired and a railway built and extended from the wharf to the construction site some 45 feet above. When the owner of the required tracts at New Utrecht asked an inflated price, the good offices of the City and State of New York were enlisted by the engineers to achieve an equitable solution.(62)

Ground at the fort was broken and work commenced April 26, 1825, under Capt. George Blaney of the engineers, with Lt. Joseph K.F. Mansfield in immediate charge of the project. On June 11, 1825, the cornerstone was laid for the fort, named in honor of Maj. Gen. Alexander Hamilton, an artillery officer from New York and aide-de-camp to General Washington during the Revolution, and later the nation's first secretary of the treasury before being killed by Aaron Burr in a duel in 1804. Land acquisition at New Utrecht dragged on as the remaining parcel required had still not been acquired by the government. This second parcel of some 16½ acres was acquired through condemnation and finally ceded to the federal government by the New York Legislature on November 27, 1824. A resurvey of this second parcel, however, resulted in the discovery that a purchase of still more land would be necessary. An additional "seventeen acres, fourteen perches, and one hundred and five yards of land" were obtained through condemnation and duly ceded to the United States government by the legislature on April 17, 1826. During FY 1824-1825, a substantial seawall was built and foundations for about half the enceinte and its counterscarp, exclusive of the gorge and a caponnier in the ditch, had been laid. The scarp was also raised several feet on one side of the work.(63)

The additional land for Fort Hamilton was finally acquired in 1826, but not until late in the work season. Consequently, the only substantial construction on the fort was on the portion of the tract already in government hands.

The pace of construction increased at New Utrecht Point during the work season of 1827, according to General Macomb, who visited the site in September. He found the fort about half complete. By the end of the month, $207,690.51 had been expended on the work.(64)

While the allotment of funds for Fort Hamilton in 1828 was less than anticipated by Major DeRussy, the new superintending engineer at New Utrecht, considerable progress was made. More than 32,000 cubic yards of earth were excavated and placed in proper locations; 3,233 cubic yards of stone were laid, and another 2,193 cubic yards of brick were used to build the arches of the casemates and piers. In addition, some 36,013 feet of freestone was cut and dressed.(65)



Joseph K.F. Mansfield in latter life. *Author's Collection*

Progress on the fort in 1829 was such that Col. Charles Gratiot, who had succeeded General Macomb as chief engineer in 1828, believed it likely the work could be finished during 1830. The workmanship was considered exceptional, as were the materials used. It was discovered in 1828 that some repairs were required at Fort Lafayette. There was, however, difficulty obtaining sufficient workmen because of the "unhealthiness of the situation during the summer which deters workmen who can find advantageous employment elsewhere." This disadvantage not withstanding, much was accomplished and the repairs were slated for completion during the winter of 1829/1830 and the following spring. (66)

The cost of materials used in constructing Fort Hamilton between 1828 and 1829 was only slightly higher than the cost at Fort Adams in Newport, RI: (67)

	1828	1829	1830
Stone, per perch	$2.74	$2.43	$2.46
Bricks, per thousand	$7.33	$7.35	$7.21
Hydraulic cement, per cask	$2.74	$2.40	$2.46
Lime, per cask	$1.22	$1.08	$1.02
Scantling pine, per thousand feet	....	$14.53	$22.48
Timber, oak, per cubic foot	$0.12	$0.16	$0.12
Masons' wages, per day	$1.62	$1.40	$1.47
Carpenter's wages, per day	$1.76	$1.76	$1.52
Smith's wages, per day	$1.45	$1.48	$1.49
Laborer's wages, per day	$0.95	$0.94	$0.94

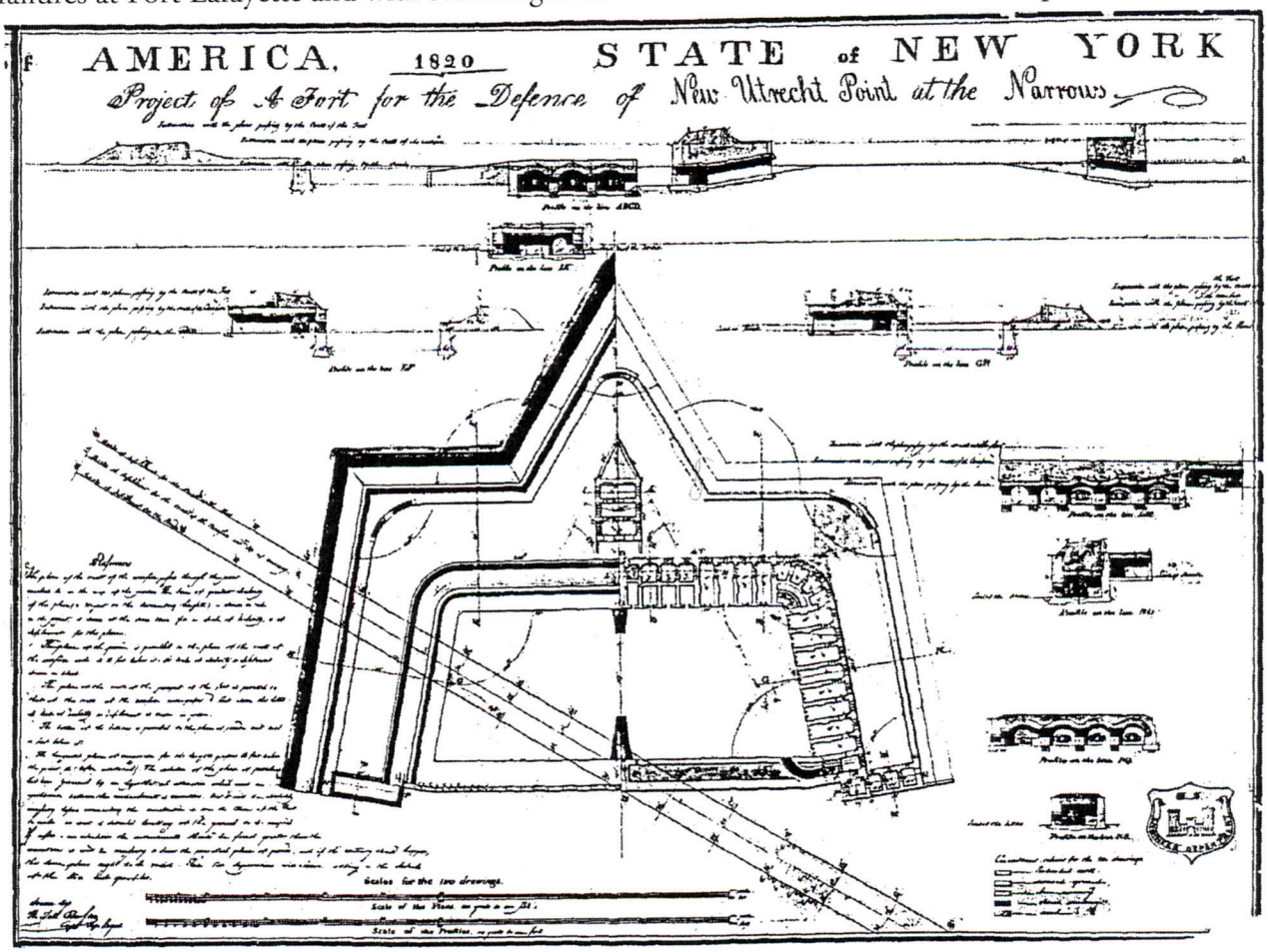
The chief engineer noted in his 1830 annual report that Fort Hamilton would be finished in a few months and repairs had been completed at Fort Lafayette. Typically, by the early 1830s there were upwards of 220 persons employed at Fort Hamilton. In addition to two engineer officers and four overseers, there were 59 mechanics, and 159 laborers and boatmen.(68)

Additions to the project at Fort Hamilton were completed by the end of November 1832. These included drains for the casemate roofs and traverse circles for the gun platforms. Any unexpended funds were to be retained to deal with defects that became apparent after the fort was declared finished. In addition to his duties at New Utrecht, Major DeRussy also supervised repairs to the work on Governors Island.

Capt. John Lind Smith, the engineer in charge at Fort Macon, Beaufort, NC, and Fort Caswell at the mouth of the Cape Fear River in that same state, was ordered to New York in 1832 to supervise engineer activities in New York Harbor, succeeding Major DeRussy, who was transferred to West Point.

Fort Hamilton's first garrison, two officers and 52 enlisted men of Company F, 4th Artillery, commanded by Capt. Levi Whiting, arrived from Fort Columbus on November 1, 1831. Fort Hamilton appears to have been a sub-post of Fort Columbus until 1847. At the end of November 1833, New York Harbor was still garrisoned by the 4th Artillery, and Bvt. Maj. and Capt. Benjamin Patrick Pierce with two companies, four officers and 94 men, manned Forts Hamilton and Lafayette.(69)

As finish work at Fort Hamilton continued in 1834, failure of the masonry bond used to construct the seawall at Fort Lafayette and uneven settling of the wall were discovered in many places. The small amount of money remaining in the account for Fort Hamilton was spent dealing with these structural failures at Fort Lafayette and with some slight defects at Fort Hamilton that were repaired.(70)



Plan and sections of the fort at New Utrecht, Long Island, later named Fort Hamilton. *NARA*

Upon completion, the fort was described as follows: (71)

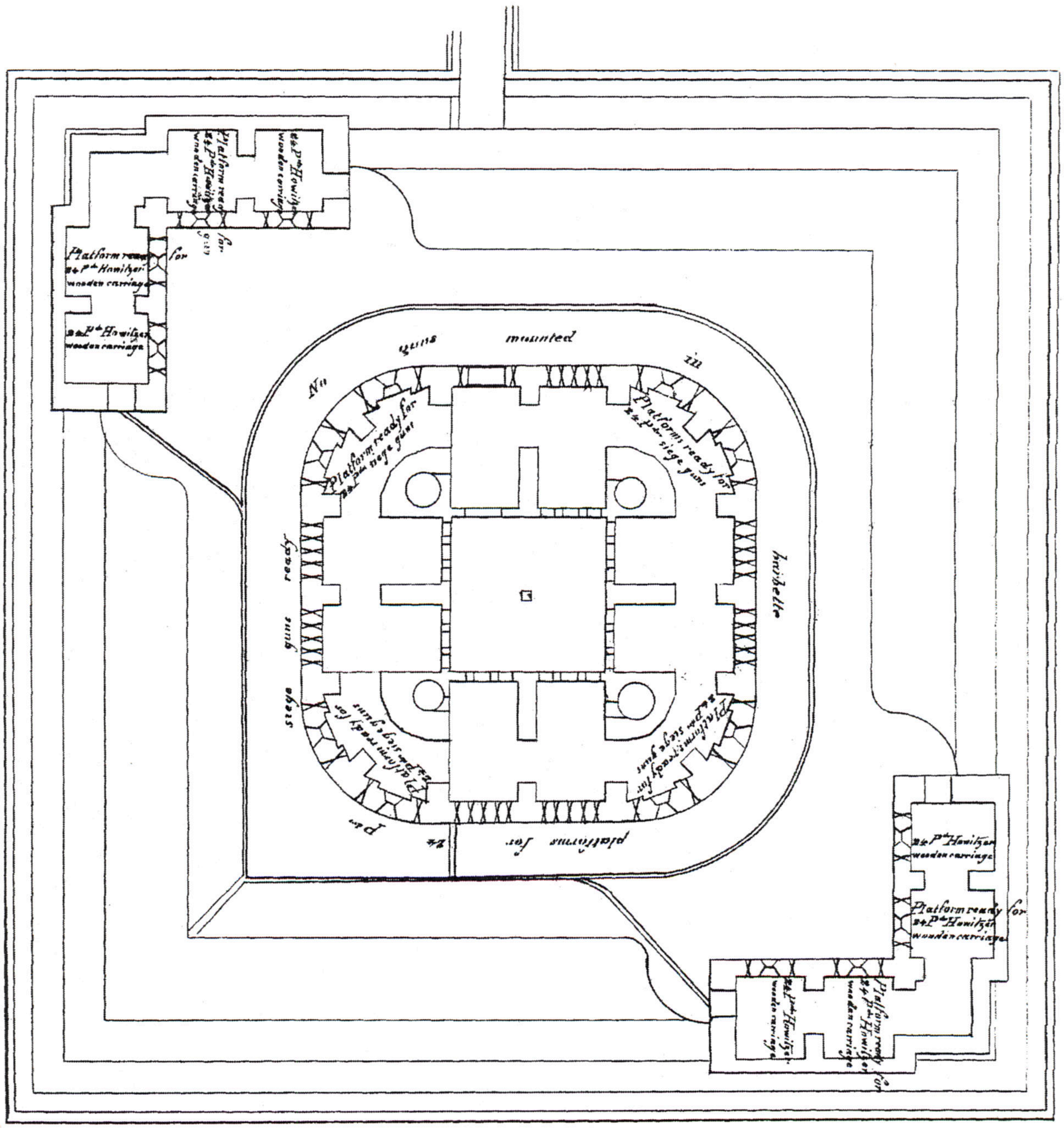
> The fort is built of gray granite with a trace or outline after the German system; and is quadrangular in form. An escarp or granite wall protects the casements [sic], guns firing through embrasures or ports, and is surrounded by a parapet or earthen bank. This parapet serves as a shield for the barbette defense or guns mounted on the ramparts on top of the casements [sic]. The entire work is surrounded by a dry ditch. On top of the counter scarp or outer wall of the ditch is a covered way or earth rampart several feet below the level of the glacis or natural slope leading away from the fort. Its purpose is to serve as a protected place for the organization of a sortie or counterattack in time of siege. In the center of the eastern or principal land front there is a caponniere or V shaped structure for the resistance of attack. This flank defense, although entirely separate from the main fort, is within the protecting line of the ditch and covered way.

The sallyport was in the channel face of the work, facing the Narrows, with a semicircular segmental-arched *voussoiur* bounded on each side by a pair of elegant neo-classical demi-columns or pilasters supporting an architrave and pediment. The channel front contained 14 casemates on each side of the sallyport, each having a brick embrasure. The outworks of Fort Hamilton consisted of the dry ditch and *cunette*, a covered way, and a glacis on the land faces conforming generally to the trace of the enceinte. A semi-detached caponnier occupied the dry ditch at the middle of the north, or principal land front. This caponnier, accessed from the enceinte, was fitted out with platforms for six carronades or 24-pounder flank howitzers mounted *en casemate* to sweep the ditch on the north side of the enceinte. The ditch was enclosed at its south, or Narrows ends by caponniers, each containing three reverse-fire casemates covering the ditch in each flank. A fourth reverse-fire casemate on each of these caponniers covered the channel front of the enceinte. These caponniers extended beyond the channel front, forming a kind of "demi-bastion" at each end of Fort Hamilton's channel front. Access to the ditch was from outside the fort at the juncture of the east front and the south or channel front. A postern in the fort's north front opposite the caponnier also afforded access to the enceinte.

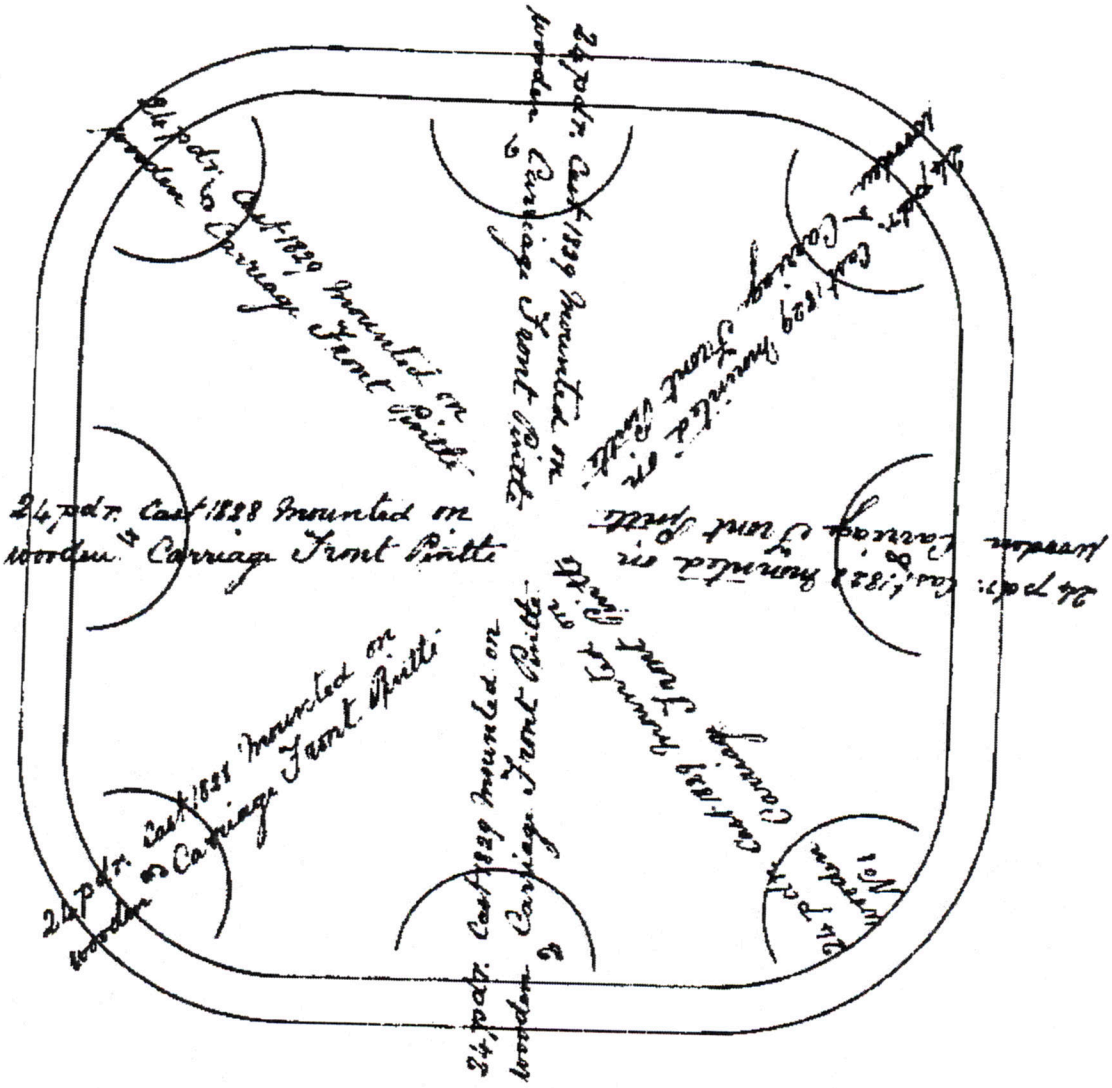
The four curtains of the polygon forming Fort Hamilton's enceinte were casemated. The west curtain casemates served as officers quarters and mess room. The enlisted men were housed in the east flank and south curtain casemates. Engineer, ordnance, quartermaster, and artillery storerooms, a hospital, three casemates fitted out as prison cells, two guardrooms, two magazines, and a postern occupied the north front of the enceinte. The caponnier in the ditch of the north front contained a bake oven. A shot furnace was on the parade ground adjacent to the east flank curtain. Paved walkways abutted the parade wall on all four sides of the enceinte.(72)

In addition to the main work of Fort Hamilton, an advanced redoubt was built on the heights northeast of the enceinte, with a dry ditch, covered way, counterscarp, and glacis. The square redoubt was constructed of brick and granite. Each face was 108 feet along the cordon. The work consisted of a casemated tier surmounted by a barbette tier with a four-foot-thick stone parapet. The armament was composed of 24-pounders, of which eight were mounted *en barbette* on front-pintle wooden carriages on the terreplein behind the parapet. The four curved salient angles of the redoubt were arranged for eight 24-pounder siege guns *en casemate* on wooden front-pintle carriages. The four curtains were each pierced with 10 loopholes or rifle ports. The counterscarp, with reverse-fire casemates in opposing angles, sustained a glacis. Each casemate was arranged for a 24-pounder flank howitzer on a wooden front-pintle carriage and a loophole flanking each embrasure. Engineer 1st Lt. James St. Clair Morton was unimpressed with the Fort Hamilton Redoubt, which he considered "insignificant in size." He noted in 1858 that its guns took up "about half the room on its contracted terreplein, leaving space for

perhaps thirty or forty men, in two ranks, to fire in either direction. Its parapets are but four feet thick, and are of masonry, which a short cannonade would knock down, leaving the terreplein open to a rifle fire, which would soon clear it of its defenders."(73)



Interior of Fort Hamilton Redoubt showing arrangement of casemates and reverse fire casemates in the counterscarp. *NARA*



Arrangement of 24-pounder armament on barbette tier of Fort Hamilton Redoubt. *NARA*



Fort Hamilton Redoubt with glacis, reverse fire casemates, and counterslope. *NARA*

Although completed and provided with a peacetime garrison, Fort Hamilton still lacked about half of its armament. The fort's projected armament was fourteen 32-pounders for the casemates overlooking the Narrows. On its barbette tier, another forty-eight 32-pounders were to be mounted on front-pintle barbette platforms, most bearing on the Narrows as well. The traverse of these guns were somewhat restricted, however, as the guns fired through embrasures. In addition, Fort Hamilton was to be provided with six heavy and six light 10-inch mortars. Fort Lafayette was to be armed with forty-seven 32-pounders and two heavy 10-inch mortars. In time of war, the garrison was to be increased to about 200 officers and men and the armament to about 130 guns and mortars.(74)

By the end of November 1836, the 4th Artillery had been replaced by a company of the 3rd Artillery, about 55 men commanded by Capt. David H. Vinton, who also commanded Fort Lafayette. This assignment was short lived, as the troops were ordered, with most of the Regular Army, to Florida during the Second Seminole War.(75)

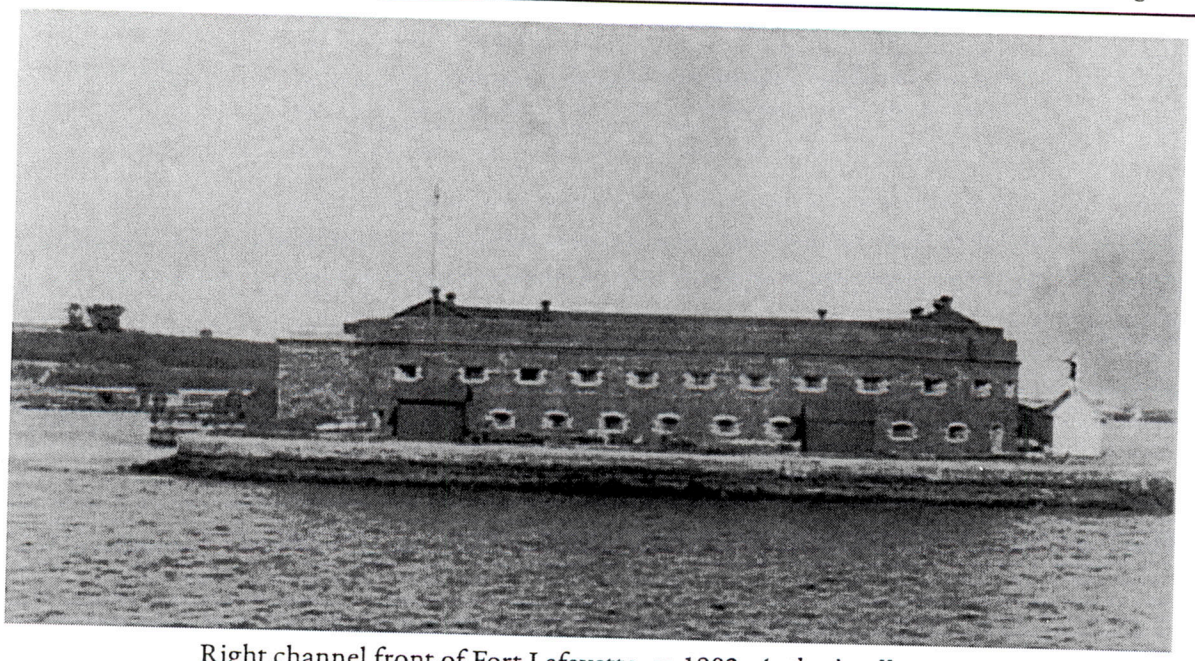
By the mid 1830s, even though its forts had not been provided with their full allotment of 503 guns and mortars, New York Harbor's eight forts and batteries made it the nation's most heavily armed seaport, the first line of defense at the Narrows was the most heavily armed element of the defenses.

Improvements at Forts Hamilton and Lafayette, 1839-1861

In the spring of 1841, 2nd Lt. Robert E. Lee of the Corps of Engineers arrived from North Carolina in the midst of a late-winter storm. Colonel Totten promptly assigned the lieutenant to duties at the Narrows. He was to modify Fort Hamilton's parapet for barbette-mounted guns. He was also to make extensive repairs to Fort Lafayette. The garrisons having been withdrawn, Lee was able to carry out the various repairs unhindered by their presence. Plans were made to replace Fort Hamilton's rotted wooden drains along the water front of the fort with "substantial masonry" re-laid in hydraulic cement. Leaks had been found in the casemate arches of the fort and their repair was considered indispensable. The Board of Engineers considered this a proper time to alter the terreplein battery for the new barbette seacoast gun carriages by converting the embrasured parapet to barbette. The two lower tiers of Fort Lafayette were considered efficient, but the shed roof of the upper battery was considered a fire hazard and unsuited for the uppermost tier armament. Consequently, the upper tier being adapted for the new seacoast carriage, the terreplein was to be rearranged to shed rainwater. Fort Hamilton's leaking casemate arches were repaired and the original embrasured parapet along the water front was replaced by a barbette battery in 1840 and 1841, while the terreplein was regraded and paved with brick and the platforms for the guns built except for the iron traverse rails. Although the barbette tier remained unarmed, the lower casemated tier was armed and a company of artillery arrived to take charge of the fort.

The work at Fort Lafayette focused on replacing the wooden planking of the upper and middle-tier floors with Kyanized timbers and replacing the wooden lower-tier flooring with brick laid in cement, installing stone gun platforms and iron traverse circle irons, and preparing the upper tier for its armament. Before this work could be completed, the funds allotted were exhausted. Like Fort Hamilton, Fort Lafayette now quartered a company of artillery.(76)

As repairs and modifications were planned for Fort Hamilton, it was still far short of its authorized armament. In 1840, it was actually armed with only fourteen 42-pounders, eighteen 32-pounders, eight 8-inch seacoast howitzers, six field pieces, two 13-inch seacoast mortars, four 10-inch siege mortars, and one stone mortar.

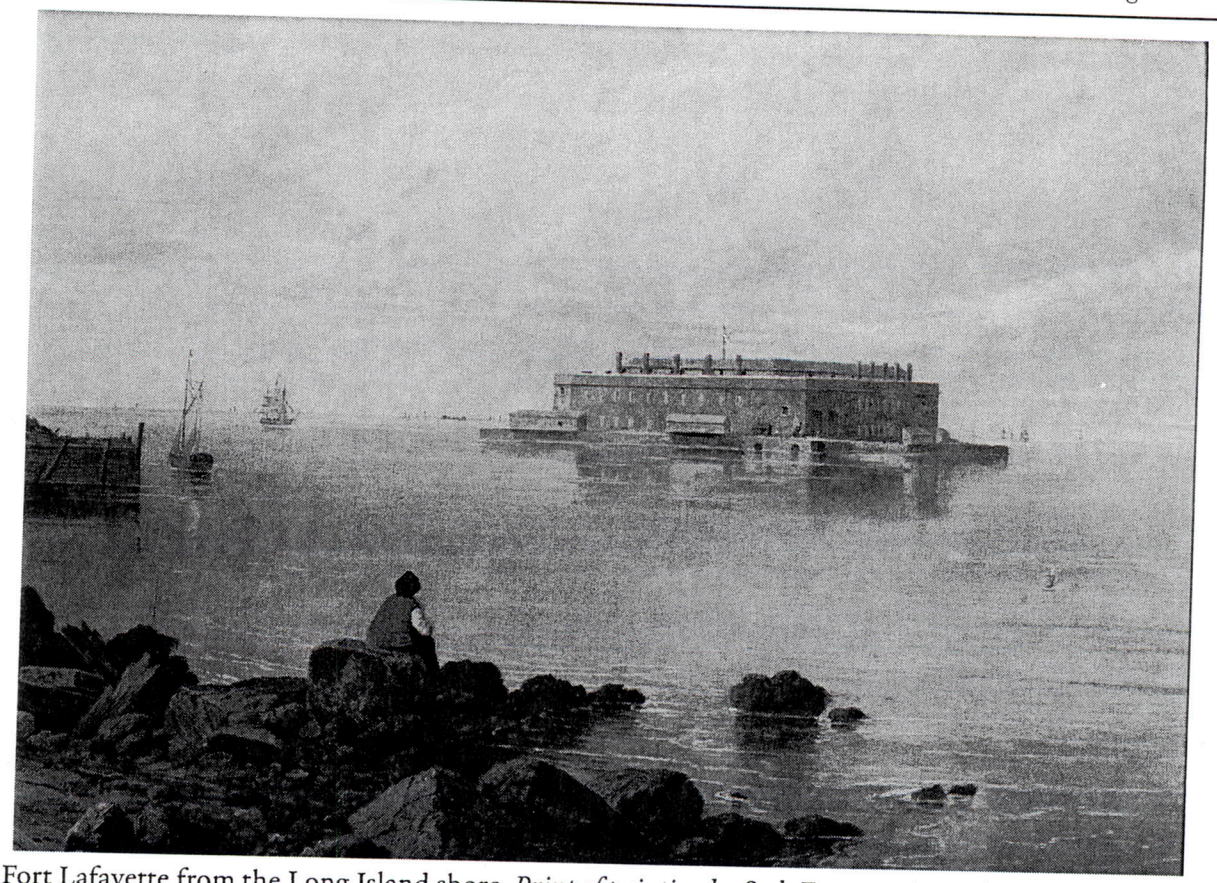


Right channel front of Fort Lafayette, ca 1902. *Author's collection*

Repairs to Forts Hamilton and Lafayette continued in 1842. The flooring of Fort Hamilton's casemated tier was broken up and replaced with hard paving bricks. The old wooden gun platforms were replaced with stone. The brick walls on either side of the west sallyport were replaced with iron gates to improve the ventilation of the casemated battery and allow free communication between the two branches of the curtain on either side of the sally port. On the barbette tier, the half embrasures of the parapet were filled in and the parapet was raised as required for the new barbette carriages. Leaks in the casemates were repaired and drainage improved. The earthen slopes of the covered way between the fort and the redoubt were regraded to a gentler slope and resodded. The armament was then remounted and placed in "perfect order."(77)

With the repairs to Fort Hamilton complete, at least for the present, the engineering efforts in 1843 centered on the advanced redoubt. The casemate woodwork of the advanced redoubt also required renewal. Additionally, its parapet was considered too low. The decayed wooden floors and linings of the casemates were removed and the rooms paved with brick on a bed of concrete. Granite gun platforms and iron traverse rails were provided for the 24-pounder flank howitzers. Doors and windows were Kyanized and repaired. The magazines were thoroughly ventilated and given new timber floors and ceilings of Kyanized wood. Leaks in the casemates were repaired and drainage improved. The earthen slopes of the covered way between the fort and the redoubt were regraded to a gentler slope and resodded.

At Fort Lafayette, the girders of the two wooden upper floors were strengthened and wooden gun platforms for 26 guns were laid on the uppermost tier. The woodwork was painted, along with other minor repairs. The middle and lower-tier batteries were armed and ready for service and the guns of the upper tier were in position but without carriages. The parapet wall was raised an additional two feet, and the masonry was repointed with cement and asphalt, while the wharf and seawall were repaired. This placed the fort in very good condition, requiring only painting the new woodwork to complete the repairs to the powerful battery. Plans for modifying the magazines at a future date were prepared. (78)



Fort Lafayette from the Long Island shore. *Print of painting by Seth Eastman in Author's Collection*

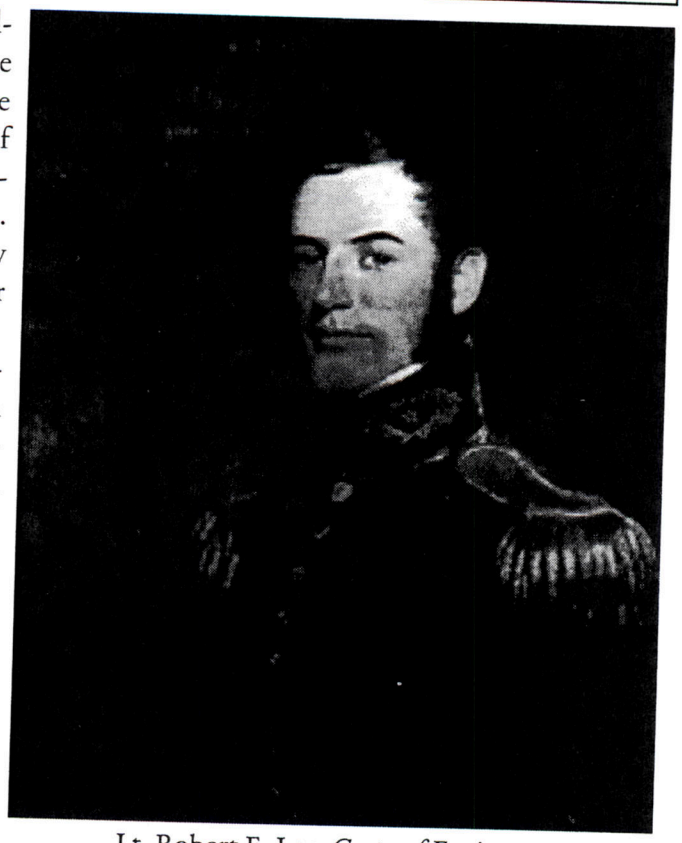
Repairs and alterations to the Long Island forts continued into 1845. Leaking casemates continued to plague Fort Hamilton. Finally, it became necessary to rebuild the scarp of the southeast front. Repairs were made to the officers' quarters in the fort, and the casemates quartering the enlisted men were placed in good condition as far as health, comfort, and accommodation were concerned. A postern was cut into the ditch from the gallery of the north flank caponnier, closed with double oaken doors. On the exterior of the sallyport, the original wooden ramp was replaced with stone. To improve the security, the flank caponniers were modified, a postern was cut into the ditch from the gallery on the south front of the fort, and the gorge of the covered way was closed with palisades. A ditch was excavated through the covered way at the south extremity of the south caponniers in front of the east sallyport.

The superintending engineer also recommended remodeling the casemates on the east front and rebuilding the piazza in front of the casemates. Both caponniers of the west or water front also required reconstruction. This work was continued into 1846 and brought to near completion by November. Additionally, the eastern sallyport opposite the caponniers in the east ditch was also thoroughly repaired and general repairs were made to the scarp, where inferior brick was replaced by "brick of the best quality." Fort Lafayette's upper-tier battery was partially armed when a portion of the gun carriages were provided. Magazine improvements were deferred because the removal of their munitions was not deemed prudent during the war with Mexico.(79)

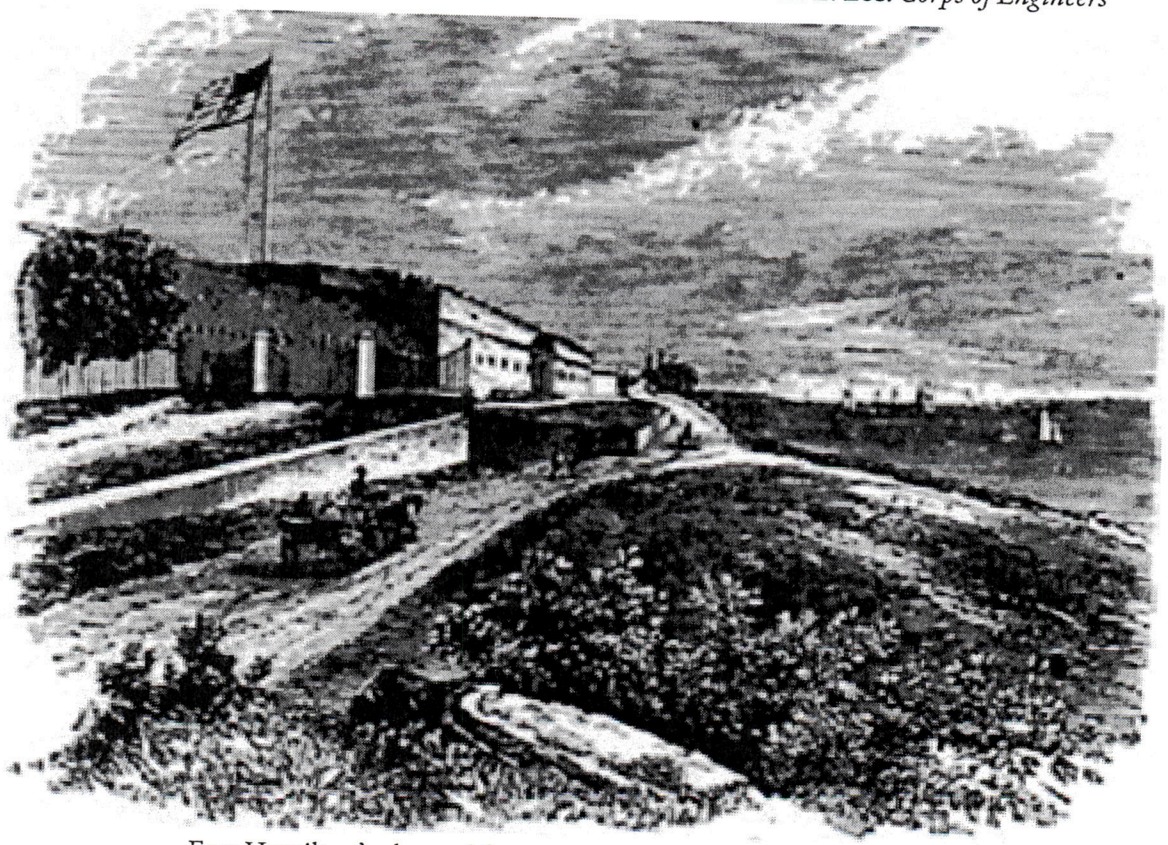
By the end of 1846, $1,034,570.95 had been expended on construction and repairs to Fort Hamilton and an additional $652,568.82 on Fort Lafayette. The costs would continue to rise over the following decades with still more repairs and improvements at the Long Island forts.(80)

Before engineering operations at Fort Hamilton were suspended during the war, an esplanade wall was constructed on the water front, drainage was improved on the western front, casemates of the southern caponniers were paved, and copper roofs were installed on three shot furnaces. Meanwhile, the post became a station for New York Volunteers and training installation for Regular Army recruits.(81)

When repairs resumed following the war, attention again focused on the perennial problem of leaking casemates. To alleviate the water filtering down through the parapet and terreplein and through the casemate arches, asphaltic mastic was applied over the exterior arches and beneath the superior slopes of the parapet and terrepleins. Drainage improvements were also completed and the galleries on the north, east, and south interior faces of the rampart were complete. Updated pintles and traverse circles were installed on the land fronts.



Lt. Robert E. Lee. *Corps of Engineers*



Fort Hamilton's channel front, ca 1840s. *New York Public Library*

After years of exposure to frost and heavy seas, the seawall at Fort Lafayette required extensive repairs. The mortar joints all required renewal, as well as the seawall copings, in addition to those of the fort's scarp. Work on the seawall commenced in May 1848 and was finished in September. Large numbers of decayed brick were cut out and replaced with new brick and the exterior masonry surfaces were "saturated with three coats of boiled linseed oil and then painted with three coats of best mineral paint" to preserve the brick from further injury.(82)

During the Mexican War, Fort Hamilton had been garrisoned by various organizations. The New York Volunteers were joined by volunteers from Massachusetts and even some so-called California Volunteers. These units were forwarded to the seat of the war and replaced by elements of the U.S. Marine Corps. With the end of the war, the Regular Army returned to Fort Hamilton. The 2nd Infantry under Lt. Col. Bennet Riley returned from Mexico and took up station at the fort until November 9, 1848, when three companies left for California. Riley's command was succeeded by elements of the 1st and 2nd Artillery that occupied the fort until December 1851. The 2nd Artillery continued to serve in the New York forts until April 1861.(83)

With the repairs to Fort Hamilton well in hand, the engineers turned to completing the mounting of armament on the land fronts. There, platforms and traverse circles for 12 guns, mostly 24 and 32-pounders, were built in 1849 and 1850. Improving the habitability of the casemates continued, and an iron-roofed piazza was built. A cunette was excavated in the ditch and a drain was laid to it from the parade ground. The replacement of the earthen parapet continued, and another 100 feet were embanked and sodded. Eight platforms and traverse circles for 24-pounders were also built on the barbette tier of the redoubt. Down on Hendricks Reef, two new shot furnaces were erected at Fort Lafayette and a masonry wall to protect the entries to two magazines was built in 1850.(84)

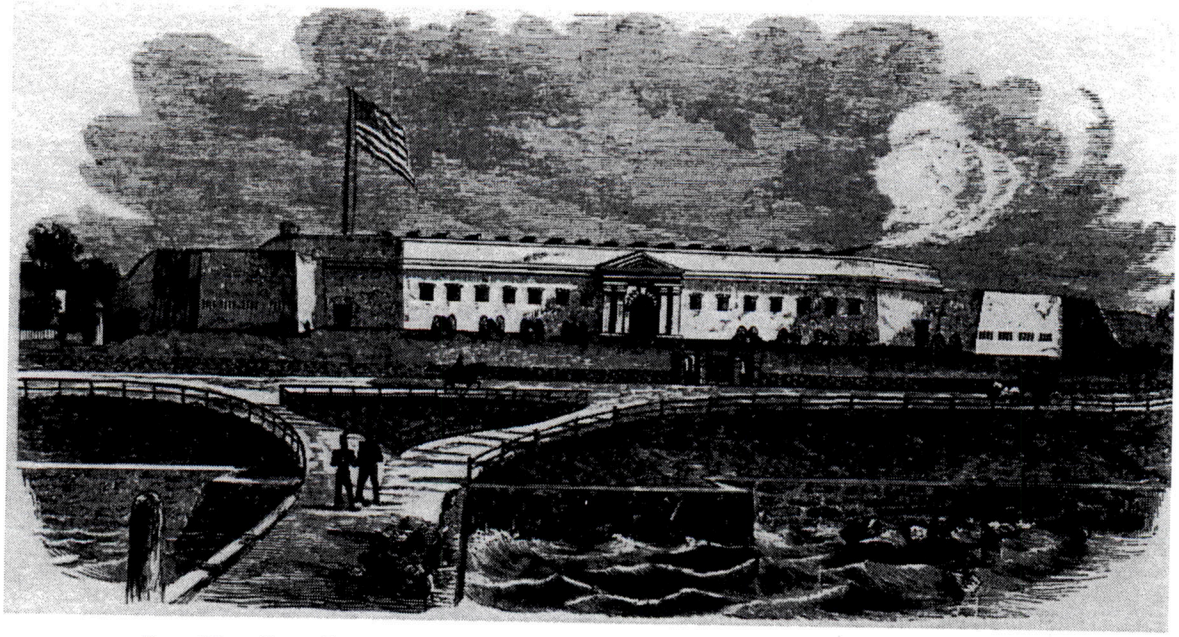
In the early 1850s, the remodeling of Fort Hamilton continued. The main ditch was graded and its cunette formed. The walks in front of the quarters and magazines and of the north and south caponniers and their passages were flagged completed and the magazines bombproofed. The piazza around the three land fronts was finished and several more casemates were fitted out as quarters, while others were refitted as hospital rooms. Two cisterns were constructed on the terreplein.

At Fort Lafayette, the four cisterns were repaired and two magazines were paved with flagstones. The wooden roof over the upper tier continued to be set alight by cinders from the fireplaces and the roof of the piazza required renewal. An act of Congress approved February 14, 1851, altered the boundaries of the Fort Hamilton reservation. Eleven acres, 3 rods and 24 perches near the northwest edge of the reservation was exchanged for an equal area of land closer to the fort owned by George and Marie Antoinette Gelston of New Utrecht.(85)

Capt. George Dutton was superintending engineer in New York Harbor from April 1854 until September 30, 1856, when he was relieved by Bvt. Maj. John G. Barnard as pressure continued to mount to further improve the defenses of New York Harbor. Work finally commenced on a new and permanent wharf at Fort Hamilton in 1857, and by the end of the work season most of the piers had been set. This project was almost complete on June 30, 1858, requiring only a small amount of floor paving and a little stone coping. While Fort Hamilton was prepared for its full armament, the barbette gun platforms required modification to receive the new seacoast carriages. The casemates again leaked, requiring repairs to the roofs and covering the casemate arches.

At Fort Lafayette, Major Barnard examined the barbette tier and its wooden roof, concluding it would not be necessary to expend funds to place the roof in good repair, nor would it be worth the expense to adapt the upper tier for the new model columbiads. Consequently, only a small permanent wharf was constructed to replace the old one that had become unfit.(86)

By the late 1850s, the Board of Engineers had considered increasing the armament on the Long Island side of the Narrows. Fort Hamilton could only bring to bear a mere 44 guns on the channel and this was considered inadequate to bar an enemy fleet. Further, Gravesend Bay was uncovered and entirely open to landing parties. The acting chief of engineers, Lt. Col. Rene DeRussy, strongly recommended $150,000 to secure the necessary land and construct batteries along the bluff east of Fort Hamilton. Major Barnard reiterated his concerns regarding the vulnerable state of Fort Lafayette in 1859. While the fort occupied one of the most important positions in the harbor, the wooden floors of the middle and upper tiers were highly susceptible to being set afire by explosive shells, or the "carelessness of a match," which would render the work useless when needed the most. An estimated $120,000 was needed to place its casemated guns under adequate bombproof shelter.(87)



Fort Hamilton from wharf after renovations in the 1850s. *Author's Collection*

Old Works Repaired and New Works Constructed on Staten Island

Following the War of 1812, the old works erected by the state during the war had been seriously neglected. At Fort Richmond, the gun carriages had decayed and 32 and 24-pounder guns had sunk into the equally rotten timber casemate floors. If fully armed, the Staten Island forts would have boasted 114 guns and mortars; Fort Richmond's casemates alone could be armed with twenty-seven 32-pounders and its parade ground with three heavy and two light 10-inch mortars. Battery Hudson was to be armed with twenty-five 32-pounders and five mortars. On the summit of Signal Hill behind Fort Richmond, Fort Tompkins was in no better condition. Its 50 guns and two mortars commanded both the works below and the Narrows. Its casemates were to be armed with thirty 32-pounders and its barbette tier with twenty 24-pounders. On its parade were to be platforms for two heavy 10-inch mortars. By now, however, New York State's forts on Staten Island could no longer be relied upon or considered effective defensive works.(88)

While the works in the inner harbor had remained armed and even garrisoned when there were sufficient troops available, by the mid-1830s they were relegated to secondary importance for the defense of New York. The United States Forts Lafayette and Hamilton on Long Island now constituted the harbor's primary seacoast fortifications. In his annual report to Secretary of War Joel R. Poinsett,

the new chief engineer, Col. Joseph G. Totten, called on the administration of Martin Van Buren, asking that "some arrangement . . . be made whereby these works may be placed gradually, if not at once, either by the State of New York or the United States, in proper condition."(89)

Authorizing legislation was passed by Congress in 1836 for the purchase of the New York State property on Signal Hill. On February 15, 1847, the State of New York conveyed to the federal government ownership and jurisdiction to 47½ acres of land, upon which stood the State Forts Richmond and Tompkins, as well as Batteries Hudson and Morton, together with the waterfront and lands under water. It was upon this land that construction of a new fort on the site of New York State's Fort Richmond was planned. (In the ensuing years nearly 200 more acres would be added in Richmond County, Staten Island.) This action cleared the way for the U.S. to pull down the old sandstone forts and build new works on Staten Island.(90)

In the first comprehensive study of the nation's seacoast defenses since 1836, the Board of Engineers considered the defenses of New York Harbor. On Staten Island, the board reiterated earlier recommendations for the "repair" of Forts Richmond and Tompkins and Batteries Hudson and Morton. The board contemplated no new works other than a small redoubt on the hill southwest of Fort Tompkins, probably the same heights occupied by Fort Smith during the War of 1812.(91)

Lieutenant Lee Repairs Batteries Hudson and Morton

Lt. Robert E. Lee had scarcely been at Fort Hamilton a week when Totten assigned him to also repair Batteries Hudson and Morton on Staten Island. Lee commenced his repairs on Staten Island in June 1841.(92)

By November 1841, Lee had rebuilt Batteries Hudson and Morton's breastheight wall, graded and sodded the parapets, laid the barbette gun platforms, and prepared the batteries for their armament. The following year he intended to extend the battery and equip it with several shot furnaces. Battery Hudson was to be connected to the main battery with one or two small traverse magazines.(93)

Cognizant of the importance of Signal Hill, the site of the first Fort Tompkins, Lee seconded the recommendations of Colonel Totten urging Congress to gain possession of the old state forts. Totten finally authorized Lee to prepare plans for a new Fort Tompkins. The first Fort Tompkins, as well as the casemated marine battery at Sandy Beach known as Fort Richmond, were in Totten's opinion ruinous and useless.

During the 1842 work season, the repairs to Batteries Hudson and Morton continued. Three shot furnaces were built at Battery Hudson and a south branch that refused the battery to the right (west) was built, which also embraced the lighthouse and increased its armament by 13 guns. At the end of the year, the battery was in service, although two or three more traverse magazines were considered necessary along its length. The work at Battery Morton completed in 1841 included a 15-foot shot furnace, but the battery still lacked a small magazine.

Lee continued on duty at the Narrows into 1845, making such minor repairs as were necessary and as a member of the Board of Engineers for the Atlantic coast defenses he played a role in planning and locating seacoast fortifications. Fort Gansevoort, a Second-System work on the Hudson River built during the War of 1812, had by the 1840s been encroached upon by the growth of the city to such an extent that it was no longer a viable defense work. Colonel Totten advanced the idea of selling Fort Gansevoort and using the moneys realized to purchase the fortification sites on Staten Island not already owned by the federal government.(94)

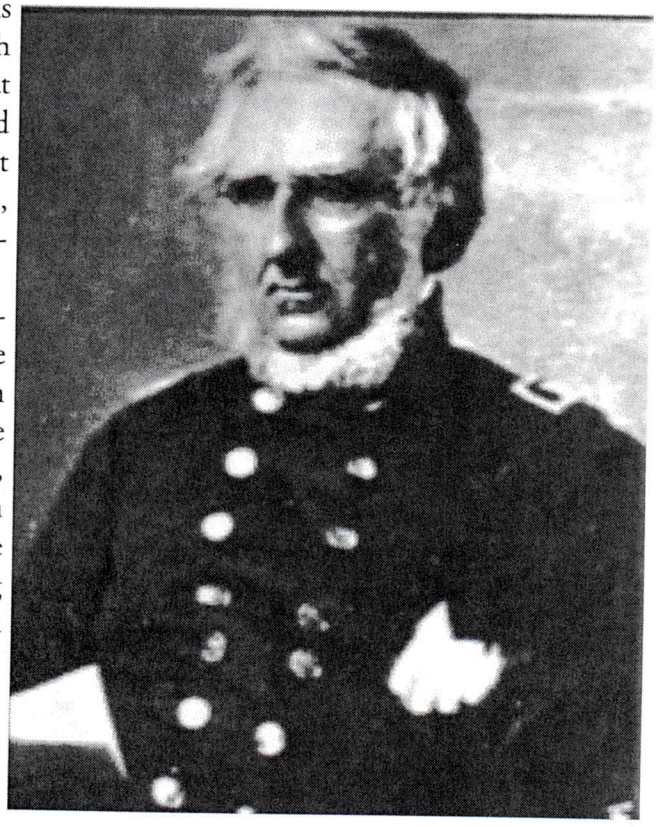
Lee found that the old state-owned works on Staten Island had been leased out as pastureland. To protect their slopes from grazing animals it was necessary to enclose Batteries Hudson and Morton

with fences in 1844. A general upgrading of Batteries Hudson and Morton was also undertaken that year when all the pintle blocks of the gun platforms were strengthened and banquettes were formed between the platforms and sodded. While the batteries were considered ready for service, their armament remained un-mounted. Thirty-eight guns were on the ground at the batteries, their carriages in a shed. An additional 22 guns would be required to fully arm the two batteries.

In 1846, progress was made toward selling obsolete Fort Gansevoort. By 1847, negotiations with the state for the acquisition of the Staten Island forts had been completed, and preparations were soon underway to construct new works on the sites occupied by Forts Richmond and Tompkins.(95)

Second Fort Richmond Constructed

The first project following the purchase of the fortification sites was the replacement of Fort Richmond, the old marine battery at Sandy Beach. To oversee the construction of the new fort, Totten chose Maj. Richard Delafield, one of the Corps of Engineers' preeminent engineers and superintendent of the Military Academy, to succeed Lee at the Narrows. Delafield was both a leading fortification engineer and an able executive. Preliminary surveys were conducted in 1847 and workshops and construction plant were set up. The old sandstone casemates were pulled down and the collection of granite begun. By September 1847, 3,695 cubic feet of granite had been cut and dressed for building the scarp of the new fort. A cofferdam 815 feet long, 15 feet wide, and between 11 and 18 feet high was built to enclose the foundations of that portion of the new work that would be standing in the water. Machinery included a steam hydraulic rotary pump, cranes, etc. Delafield made considerable progress in the 1848 season. Excavations were made for the foundations of the channel fronts, their scarps, and the connecting piers. The scarps themselves had been raised six feet above low water and between May 15 and September 1, all foundations and masonry below water had been secured with the exception of the southwest tower bastion that required driving pilings. The work accomplished was impressive: 95,407 square feet of stone cut and dressed, plus 39,520 bricks laid for culverts, drains, and sewers incorporated in the fort's foundations.(96)



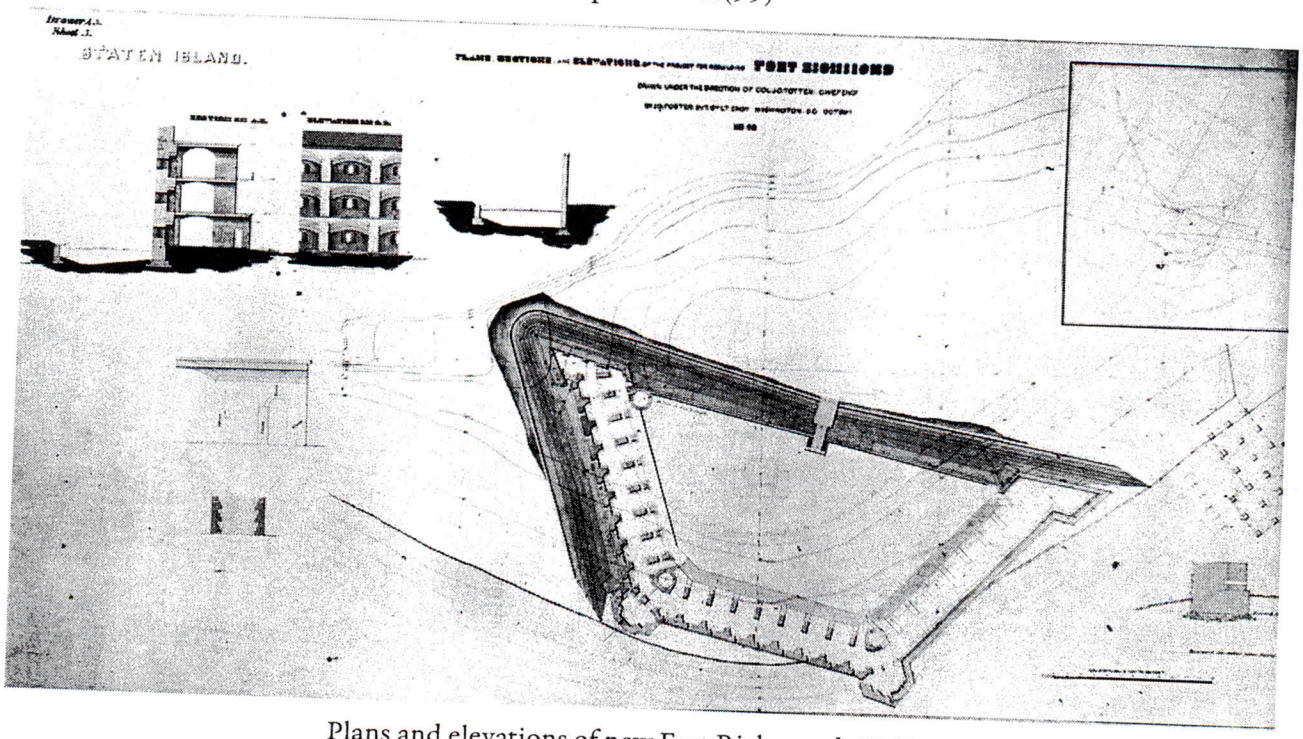
Maj. Richard Delafield. *Corps of Engineers*

During the 1849 work season, the work progressed steadily in proportion to the funds made available. By September 30, the scarp had been raised an average of two feet. All of the casemate piers on two fronts, half of those on a third front, and half of the magazines on the gorge had been raised about 11 feet above the foundations. The seawall had been built 240 feet. The following year, the ditch along the gorge front was dug; a magazine was commenced, and wharf construction continued. Considerable effort was made to cut and prepare the granite to be used in raising the scarp to the level of the parade ground. The gorge scarp had been raised to three or four feet above the parade. The parade itself had been filled with earth to its proper level.(97)

Progress during the 1850 season was retarded by the late appropriation of funds, coupled with increased demands for labor and materials in New York City. Major Delafield also noted that the location of the fortifications on Staten Island was threatened by increased expansion of settlements and he urged Congress to purchase a buffer zone between the federal property and a public road.(98)

In both 1851 and 1852 fiscal years, Congress withheld appropriations and work at Fort Richmond was carried on only because there was a small balance of funds from previous appropriations. By the end of the 1852 season, the last remaining funds were expended for masonry work on the arches of the first tier and the floor of the second tier. Fort Richmond had been raised high enough to form the arches of the second tier of casemates. The scarp of the gorge curtain had been raised to 34 feet above the foundations. Pending restoration of funding, construction of the fort was suspended in October 1852, the masonry leveled as uniformly as possible and the concrete covered with mastic and boards.

Funding was finally restored in August 1854 and construction was resumed. Tools and machinery were put in order and partly renewed, and stock was purchased. The coping of the land-front curtain was resumed and the land-front counterscarp was excavated, its foundations laid, counterscarp built, and coping laid during the winter as weather permitted.(99)



Plans and elevations of new Fort Richmond. *NARA*

With the coming of spring 1855, work was resumed on the arches of the lower tier of casemates; these were all completed with the exception of the four conical arches and the arches of the two tower bastions on the channel fronts. Difficulty procuring stone delayed the building of the permanent wharf until the spring of 1856, when Capt. George Dutton took over from Major Delafield, pending arrival of Maj. John G. Barnard in September 1856. With the largest appropriations yet in 1855 and 1856, Dutton was able to push the project forward energetically. The arches covering the lower-tier casemates were completed and the traverse stones and flagstones of the lower tier were laid. Thirty-three "New American" embrasures developed by Colonel Totten were installed in the lower tier. The piers of the second tier were mostly carried up to the spring lines of the third tier and the scarp was carried up more than 23 feet all around. A portion of the second-tier embrasure sills were also laid.(100)

Under Major Barnard's oversight, the construction of Fort Richmond was actively prosecuted. The north curtain scarp was raised an additional 20 feet, to almost 46 feet above the foundations and the east and south curtains to a height of 40 feet. The second-tier embrasures were constructed, as well as most of the embrasures on the third tier and their sills, and embrasure irons were set. The pan-coupes of the north and east channel tower bastions were arranged and their second-tier gun and flank howitzer embrasures constructed. All of the second-tier communication and main casemate arches, including those of the north channel tower bastion and the north gorge bastion, were commenced, as was the magazine of the second-tier service magazine. A portion of the flagging of the gunroom recesses was also laid.(101)

By 1858, Fort Richmond was rapidly approaching completion. The piers of the third-tier casemates had been raised to their full height and the arches of the south gorge bastion and the four arches in the south channel face and two in the north channel face were turned. The permanent wharf was finally commenced; the piles were driven, and the stone for the superstructure and its piers was collected and mostly dressed. The ironwork was on hand, awaiting installation in the superstructure.

During FY 1858/1859, the third tier of arches was completed; the scarp was raised to its full height, and the cordon and blocking course were laid, as well as the concrete roofs of the arches. About three-quarters of the roof surfaces were covered with asphalt, dry bricks. Gutter arches and manholes were made, and a portion of the earth covering applied to the casemate arches. The flagstone pavements of the second and third-tier floors were laid and the iron rails of the traverse circles procured for installation. In addition, a large portion of the masonry was pointed.



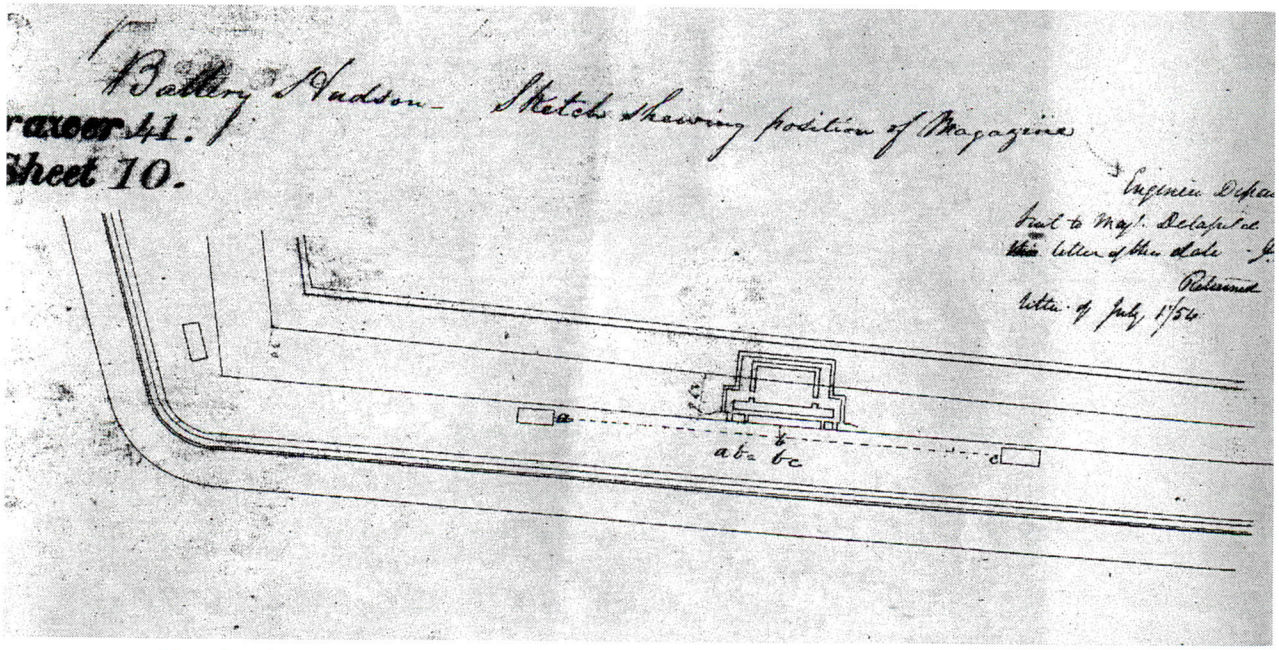
Fort Richmond from the Narrows, with South Cliff Battery at left. *Author's Collection*

As the earth covering was placed on the barbette tier, the stone for the columbiad gun platforms was cut and dressed and the iron rails etc., provided. The stone for the breastheight walls of the barbette tier was cut in preparation for installation. The stone stairs in the two central towers were also built. The permanent stone wharf resumed in 1858 was completed and equipped with an iron crane to replace the wooden crane used during construction. The cost of enlarging the principal magazines abutting the gorge curtain on either side of the sallyport entry and hanging their doors and shutters was estimated at $15,000. Barnard noted that the work was ready for three-fourths of its armament, and could be completed by the end of the 1859-1860 fiscal year. The final work involved completing the roofing of the third-tier arches, forming the terrepleins and parapet, laying the columbiad platforms, completing the pointing of the masonry, putting up the drawbridge and gatehouse, completing the counterscarp, grading the parade, and excavating the dry ditch on the fort's land front.(102)

In November 1860, Fort Richmond was structurally complete, ready in all respects to receive its 116 heavy channel-bearing guns. Fifty-eight of these were to be barbette 8-inch columbiads, with an additional fifty-eight 42-pounders in the fort's three casemated tiers. In addition, twenty-four 24-pounder flank howitzers were to be in the flanks of the tower bastions. The remaining arches of the third tier were asphalted. The additional columbiad platforms were laid on the barbette tier and their iron rails and pintles installed; the breastheight wall was completed and the terreplein and parapet formed and sodded. The exterior magazines had been built up to their copings. Finish work proposed for the following year consisted of equipment sheds over the magazines and penthouses over the circular stair towers. Some minor additional work was still planned for 1861: completing the counterscarp on the channel fronts, constructing traverses around the magazine entries, and building shot furnaces. Barnard planned to complete the arrangements for the guardhouse and the drawbridge over the dry ditch, finish the counterscarp and seawall, and lay its external rip-rap protection.(103)

Additional Improvements at Battery Hudson

When Congress restored funding for seacoast fortifications in August 1856, Major Delafield undertook a minor project that had been laid aside some years earlier, the service magazines at Battery Hudson. In the waning days of FY 1853/1854, construction commenced on the first of two magazines for the extensive barbette battery. Excavations were made, foundations laid, and the North Service Magazine facing the Narrows was completed in late winter of 1855. In April 1855, the second or South Service Magazine in the right-most angle of Battery Hudson was built by late September. Both structures were to the rear of the battery line and of the same design. Each consisted of a main arch of brick masonry with an offset entry and window "blinds" to safely permit lantern illumination of the magazine interior. The concrete over the primary brick arch in turn had a thick earthen cover, rendering the magazine bombproof. When completed, Delafield reported both magazines perfectly dry and serviceable. When Captain Dutton temporary succeeded Major Delafield in September 1856, he continued the finish work in the magazines, fitting up and hanging composition doors to keep them dry and ready for use.(104)



Sketch of Battery Hudson showing position of the service magazine, 1856. *NARA*

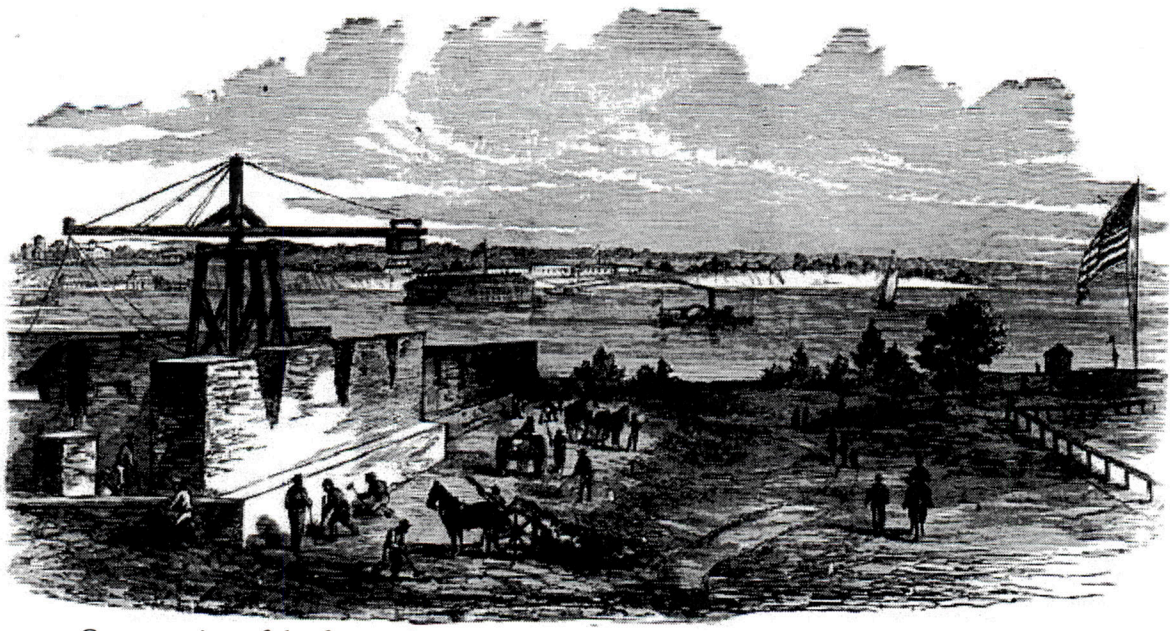
Batteries Hudson and Morton were ready for their armament, Battery Hudson for forty 42-pounders and ten 8-inch columbiads, smaller Battery Morton on the hill behind Battery Hudson for nine more 42-pounders.(105)

Fort Richmond Renamed

On November 7, 1865, shortly after the 1st Artillery arrived on Staten Island, War Department General Order No. 161 renamed Fort Richmond for Brig. Gen. James Samuel Wadsworth. A New York native, he had served as volunteer aide-de-camp to General McDowell in 1861 and had been appointed brigadier general of volunteers in August 1861. He was posthumously brevetted major general of volunteers for his gallant conduct in the Battle of Gettysburg and at the Battle of the Wilderness, where he was mortally wounded May 6, 1864.(106)

A New Fort on the Site of Fort Tompkins Authorized and Built(107)

Essentially abandoned following the War of 1812, the site occupied by Fort Tompkins I atop Signal Hill commanded Fort Richmond and Batteries Hudson and Morton. Loss of Signal Hill would result in the loss of the batteries below and contribute to opening the Narrows to a hostile fleet. This had been fully recognized by the Board of Engineers when it reported on the defenses of the Atlantic seaboard in 1840. The need to acquire the property from New York State had been regularly brought to the attention of secretaries of war through much of the next decade. When negotiations with New York State were completed in February 1847 and the 47.5-acre tract was ceded to the United States, the first priority had been to secure the channel by placing Batteries Hudson and Morton in good order and building a new and more powerful Fort Richmond. As that four-tiered battery's construction progressed in 1851, attention turned to planning a new fort on the summit of Signal Hill and protecting the fortification sites from encroachment by the expanding communities. Additional property acquired in 1856 for $43,300 enabled the War Department to proceed with planning the new Fort Tompkins.(108)



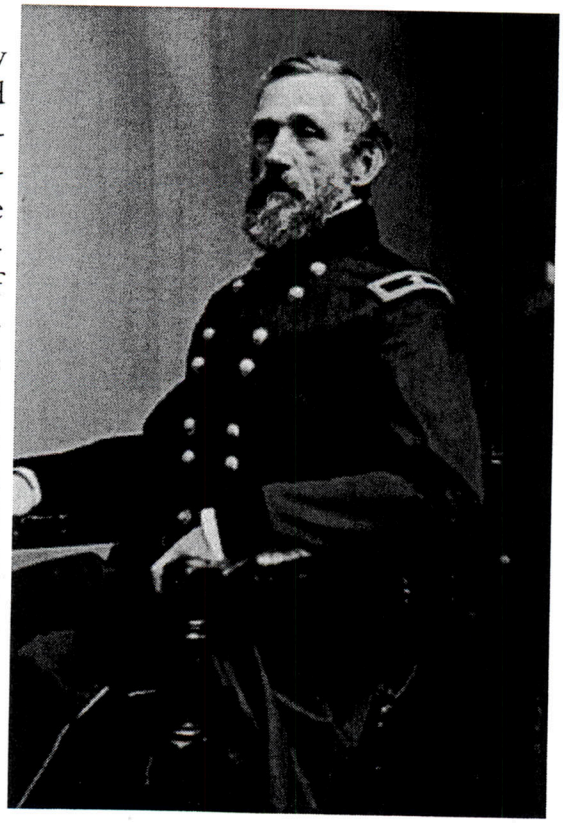
Construction of the fort at the site of Fort Tompkins, ca. 1860. *Author's Collection*

In 1857, Congress appropriated $150,000 to initiate construction of the new fort. Major Barnard, engineer in charge of the fortifications at the Narrows and Inner Harbor, reported that as the plans for the new fort had not yet been completed and approved by the Engineer Department, little was accomplished before the onset of winter. The plans were completed over the winter and approved by Colonel Totten at the end of April 1858. It was not until July 8, 1856, that a large work gang could begin demolishing the old sandstone fort. Pulling down the old work and grading the site occupied the remainder of the summer and autumn.(109)

While the bricks in the old fort were saved and cleaned for reuse, the sandstone scarps of the old work were used in part to form the north, northwest, and south glacis and the area to be occupied by the new fort was lowered several feet to 138 feet above the water. The excavated earth, nearly 100,000 cubic yards, was applied to the glacis slopes. By the end of July 1859, the construction plant was in place. This included a tram-like machine powered by a steam engine that moved up and down an inclined plane from the Fort Richmond wharf up some 125 feet to the plateau adjacent to where the fort was to be built. Construction materials were moved up the incline to the plateau, where they moved by rail to where cranes in the ditch of the new fort could pick them up and distribute them. Little time was lost laying the foundations of the scarp, counterscarp, and rifle gallery walls in the north and west flanks, as well as a portion of the south flank foundations. During FY 1859/1860, the foundations were completed and the scarp was raised on the north, northwest, southwest, and south fronts up to the lintels of the first tier loopholes. The casemate piers behind them were built up to the corbelling of the second floor. The concrete of the counterscarp galleries was brought up to the spring lines of the gallery arches, their supporting piers were built, and about half of their communication arches were turned. The rear wall of the counterscarp was raised to the same height as the counterscarp. By the end of July 1860, 100 linear feet of main culvert had been laid as well, and the revetment at the site of the caponnier was formed.(110)

Noting the relatively meager allotment for the new Fort Tompkins in FY 1860/1861, Major Barnard urged Totten to request $200,000 for FY 1861/1862 to complete the masonry. Fort Richmond was ready for its armament, and barracks casemates would be needed to house the garrison. Completion of the fort on the hill was urgently needed to bring New York Harbor into a state of "defensibility." Using the last of the small allotment, Barnard spent the last six months of 1860 turning the arches of the counterscarp gallery and adding a few more courses of granite to the scarp and counterscarp. Bernard's request for funding became all the more urgent with the outbreak of the Civil War. Although Colonel Totten sympathized with his engineer at the Narrows, was only able to allot $50,000 for Fort Tompkins in the next fiscal year. An additional $200,000 was allotted in 1862/1863 and in July 1864, an additional $150,000 was made available.(111)

Civil war brought increased costs and shortages of labor and materials. Since nearly all the engineer officers were in the field with the armies, supervision of the New York fortifications fell to William P. Trowbridge, the agent



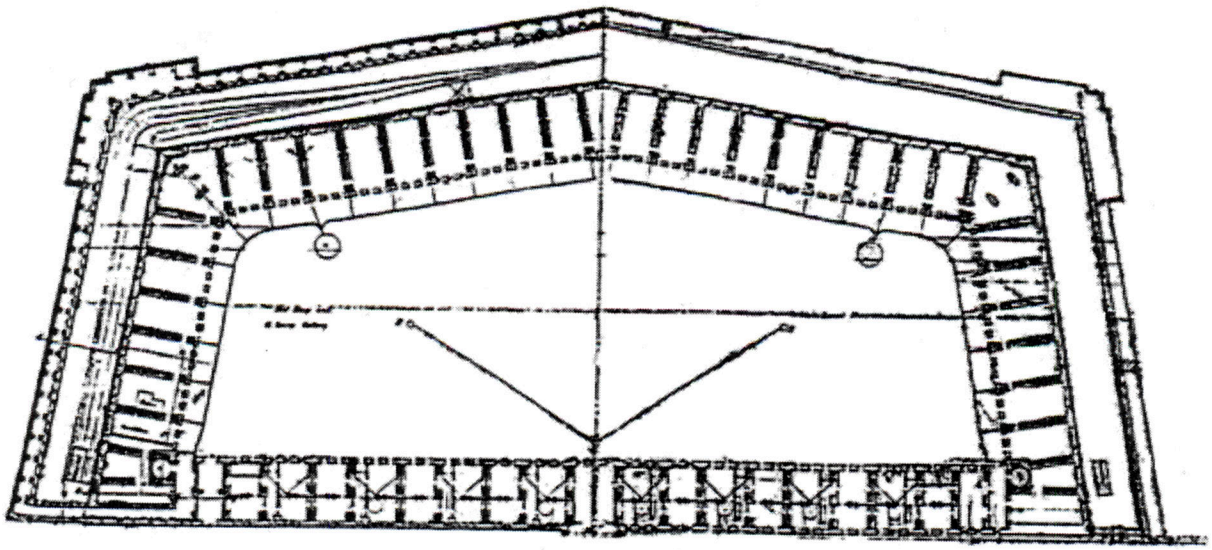
Maj. John G. Barnard. *Corps of Engineers*

of the Engineer Department who maintained his office in the city, and the civilian foremen at the several forts. While steady progress was made at "the fort on the site of Fort Tompkins," it was still far from finished when the war ended in 1865.

Maj. and Bvt. Col. Fredrick E. Prime relieved Trowbridge as engineer in charge at New York Harbor in 1865. The counterscarp and its galleries were complete, but the glacis on those fronts had yet to be formed, graded, and sodded. Prime found the fort enclosed on three sides and nearly all the rough concrete work completed. The casemates of the east front overlooking the Narrows, however, remained to be built, along with nearly all the interior finish work on the other three fronts. Improvements in artillery during the Civil War bought the value of vertical masonry scarps into question. Consequently, the decision was made to alter the design of the channel front of the fort on Signal Hill.

With substantial funds and a labor force at hand, Prime made excellent progress in 1865. Much of the work was carried out on the land fronts. Fourteen barbette gun platforms were built on the barbette tier of the south and north fronts, their pintle plants and traverse irons put in place. Sixteen granite chimney caps were set and the parapet and terreplein on the land fronts filled and sodded. The concrete floors of the barbette traverse magazines were also poured. Inside the fort, good progress was made preparing space to house the garrison. Nine casemate floor arches were formed and turned, and all of the first-tier casemates on the land front and seven on the second tier received brick linings. In addition, 116 casemate windowsills, 60 hearthstones, and all the doorsills on the first tier were set in place. Iron doors, windows, and hoisting-sash frames were put in position in all doorways, embrasures, and loopholes of the land fronts. All first and second-tier casemate floors were concreted, nine were floored and whitewashed, and their windows were glazed by the latter part of 1866.

In the north and south flanks the flagstone passageways to the ditch were laid and a part of their walls built. On the south front, the scarp was carried up about two courses and backed; the parade wall was also raised about one course and the gorge front casemate piers were built. Two cisterns in the angles of the parade ground as well as several smaller cisterns under the officers' casemates in the gorge were also built. All drains and culverts in the parade ground and ditch were completed, the parade was graded and cleared of debris, and a concrete sidewalk was laid. The leaking roofs of the second-tier magazines exposed to winter snows were repaired and the first and second-tier floors were repaired and covered with asphalt.



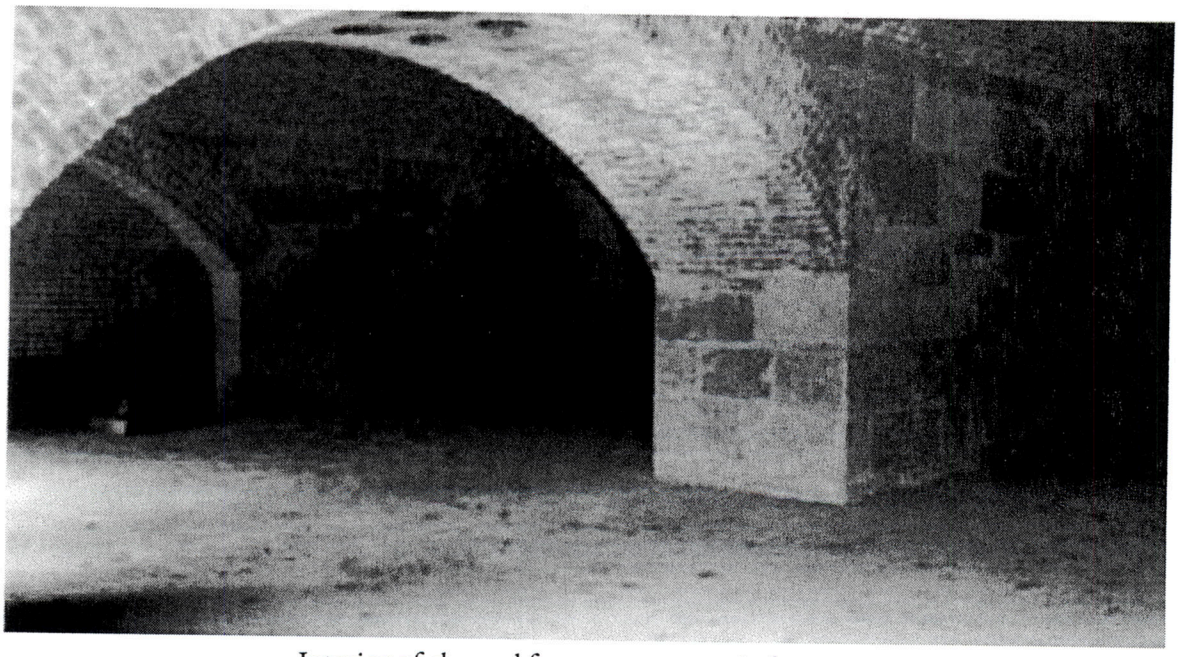
Plan of fort on the site of Fort Tompkins. *NARA*

Outside the fort Prime set a crew to work filling and grading the glacis on the land fronts. A roadway was built and macadamized from the plateau where the fort was sited down the slope to Fort Wadsworth. In August 1865, Prime was relieved by Col. and Bvt. Maj. Gen. John G. Barnard, who returned to Staten Island to resume the construction of the fort on the site of Fort Tompkins.(112)

During FY 1866/1867, five additional casemates were furred, 21 more floored (11 on the first tier and 10 on the second), and nine more fitted up as enlisted quarters (six in the south flank and three in the southwest flank). All doorways in the fort were provided with suitable wrought-iron doors, so very little except glazing remained to render all the casemates in the four land faces ready for occupancy. The gun platforms on the four land faces of the fort were finished and readied for their armament.

Outside the fort, the road down to North Cliff Battery had been cut and formed and the slopes on either side brought into shape and partially finished. The extensive rain damage and erosion to the slopes on the channel front was repaired and a 12-inch drain from the South Latrine to the foot of the slope was put in place.(113)

After only about a year at Staten Island, General Barnard was relieved by Maj. and Bvt. Maj. Gen. Quincy A. Gillmore in 1867. Gilmore was superintending engineer at the Narrows for the next 18 years, rising to full colonel of engineers. He would also see completion of the fort on Signal Hill and several other batteries on Staten Island.(114)



Interior of channel front casemates. *Author.*

While little work was done in 1867 and 1868 beyond improving the cisterns, constructing the south latrine, and preserving slopes, etc., by 1869 plans for completing the east (channel) front had been finalized. It was to be completed with a single tier of casemates closed in front with a low masonry scarp behind a coverface, surmounted by a high earthen parapet furnishing a high, elevated battery for six pairs of heavy guns on barbette carriages, separated by traverse magazines. Gillmore estimated that this work would require about $300,000 to complete and requested $60,000 from the next appropriation. He also requested that the unexpended balance of $230,468 for the suspended Casemated Battery be used to complete the new fort.(115)

It was not until 1871, however, that actual progress was made toward completing the channel front. Piers and arches of the 17 bombproofs between the two sallyports, including the foundations for the casemate extensions, were constructed. The scarp between the sallyports was finished with the exception of a temporary gap in the center, left for construction materials. The piers and skewback courses of the sallyport arches were built and the parade wall was carried two feet above the top of the parade arches and the concrete that formed their roof surfaces. These surfaces were also made ready for their mastic coverings. The system for draining rainwater from the terreplein to cisterns beneath the channel front was also completed. The iron balcony for the parade wall of the channel front was ready for installation. Earth excavated from the parade formed the coverface in front of the channel front.

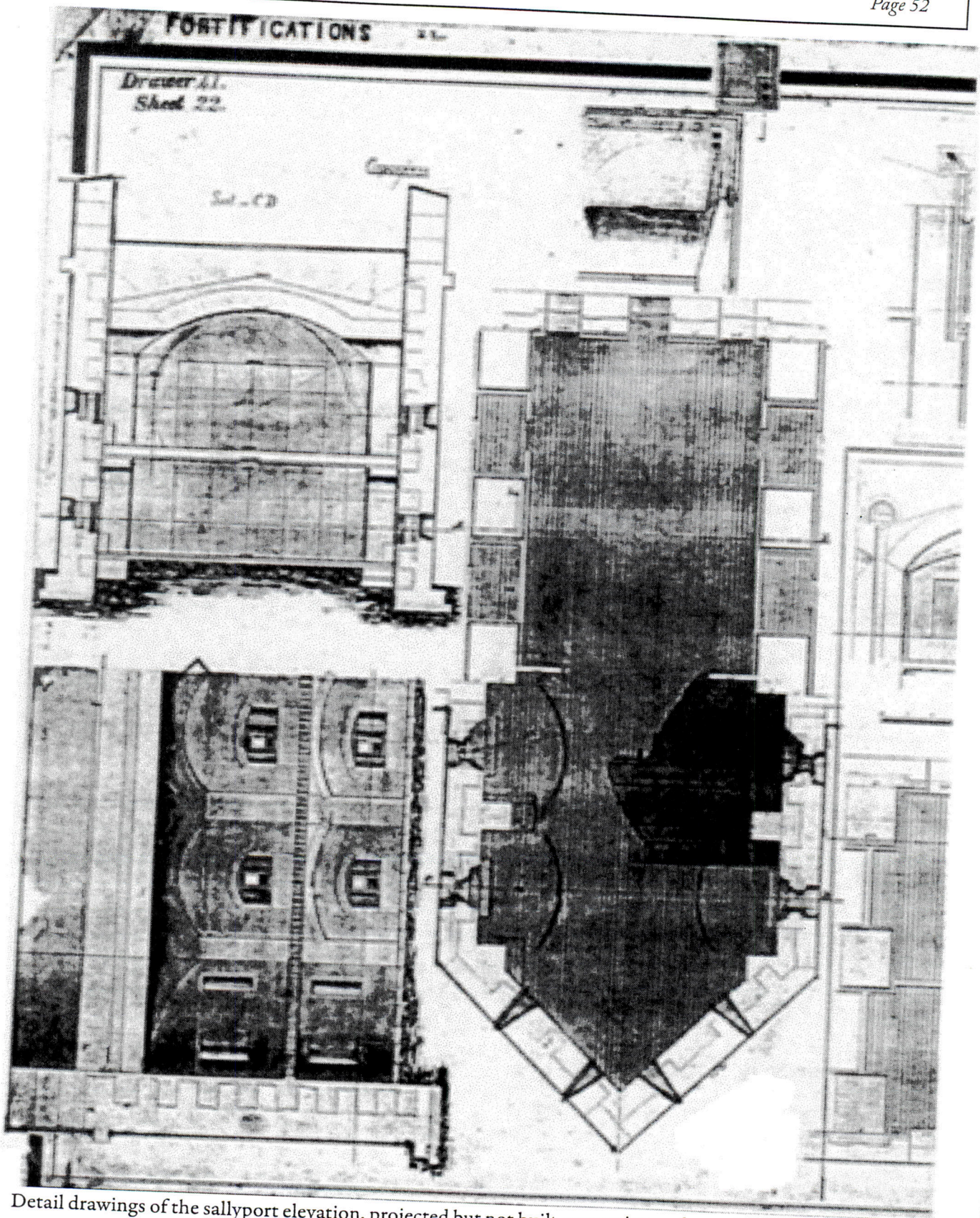
During the 1872 work season, all the masonry of the two gateways and the sallyport arches, and the walls and arches of the passageways through the sallyports were finished and their roofs as well as the casemate roofs covered with mastic. They then received their earth coverings. The gap in the center of the channel front was closed. The scarp was lowered by five feet and the coping re-laid. This increased the protection from the coverface. The granite parade wall was finished with the exception of its coping, and the masonry of the four traverse magazines was carried up to the spring lines of their arches. The second-tier iron balconies and stairs and on the channel front were 90-percent completed. (116)

Finish work on the fort continued into 1876. The earth of the channel-front terreplein as well as the masonry and earthen coverings of the traverse magazines were finished, and the timber gun platforms were constructed and laid. The coping of the channel-front parade wall was laid and the north and south stairways to the iron balconies completed. Solid timber doors were made and hung on the channel front's five service magazines. On the land fronts, the casemate quarters of the south and southwest faces were furred with brick and the wooden ceilings in the second tier begun. The second-tier iron balcony for the four land faces were put up and its four stairways built. As soon as the earth on the terreplein had compacted, 10 timber gun platforms were laid in pairs on their concrete foundations along the channel front and the masonry breastheight wall was constructed in front of the guns. The terreplein was then graded and sodded with grass. Fitting up the casemate quarters on the land fronts also continued until all had their wood ceilings and floors. The cut and dressed granite sidewalls of the sallyports were built and loopholed, their floors paved with granite blocks, and their grated gates made and hung. In 1876, construction of the almost complete fort was suspended when Congress ceased funding seacoast fortifications. In future years, the only funds made available were small amounts for essential repairs and preservation of the fortification sites.(117)

On July 15, 1874, Brig. Gen. Andrew A. Humphreys, chief of engineers, wrote the secretary of war suggesting names for the numerous unnamed fortifications. Humphreys recommended that all the works on Staten Island be named Fort Clinton for George Clinton of New York, an officer of the Revolution and former vice president of the United States. He recommended the new fort on the site of Fort Tompkins be named Battery Tompkins and the former Fort Richmond, later Fort Wadsworth, be redesignated Battery Wadsworth. While the secretary of war viewed with favor a few of the chief engineer's recommendations, he did not approve the recommendations regarding the works on Staten Island.(118)

The Staten Island Garrison in the Civil War, 1860-1865

The completed Fort Richmond was not placed in service with the outbreak of hostilities in 1861, as its armament had not been mounted. Further, troops available on Staten Island were fully occupied manning Batteries Hudson and Morton. Staten Island, however, was turned into an armed camp.



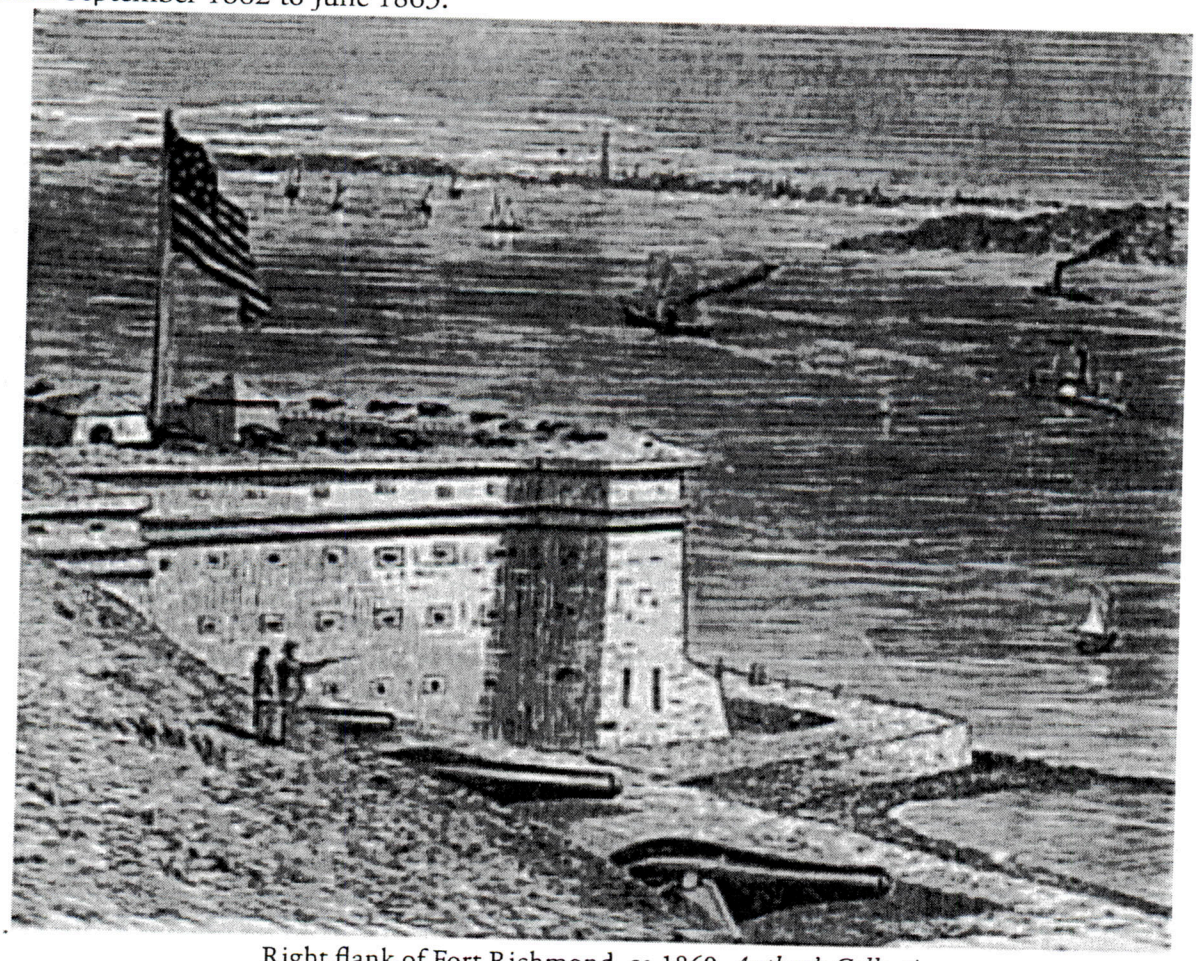
Detail drawings of the sallyport elevation, projected but not built caponnier, and exterior views of loopholes and embrasures. *NARA*

Camp Scott was established as a camp of instruction, where the 3rd, 4th, and 5th Excelsior Regiments were organized as the 72nd, 73rd, and 74th NY Volunteer Infantry Regiments of Sickles Brigade, between July and October 1861. The 2nd NY Heavy Artillery Regiment was organized there between September and December 1861 before departing for Washington, D.C. The 127th NY Volunteer Infantry (National Volunteers), the 145th NY Volunteer Infantry (Stanton Legion), and Companies G, H, I, and K, 169th NY Volunteer Infantry (Troy Regiment), trained at Camp Scott in September 1862 before departing for the seat of the war near Washington, D.C., in October.

The 5th NY Heavy Artillery (2nd Regiment, Jackson Artillery) was organized through consolidation of the Jackson Heavy Artillery, the 2nd Jackson Heavy Artillery, and 3rd Bn, Black River Heavy Artillery. Assigned to New York Harbor's defenses March 11-May 27, 1862, a portion of its eight companies garrisoned Fort Richmond before departing for Baltimore, MD, in late May. In all probability, the 5th NY Heavy Artillery trained and drilled with the guns of Battery Hudson while on Staten Island.

The 4th Bn, NY Heavy Artillery (1st Bn, Black River Artillery), organized at Sacketts Harbor, NY, was mustered in on September 11, 1862, and ordered to Fort Richmond until December 1862, when it was merged into the 10th NY Heavy Artillery Regiment.

The 10th NY Heavy Artillery (Black River Artillery, also known as the "Jefferson County Regiment,") was organized on Staten Island by consolidating the 4th, 5th, and 7th Bns of Black River Artillery on Dec. 31, 1862. Companies B, D, E, and M were assigned to Ft. Richmond and Sandy Hook from September 1862 to June 1863.

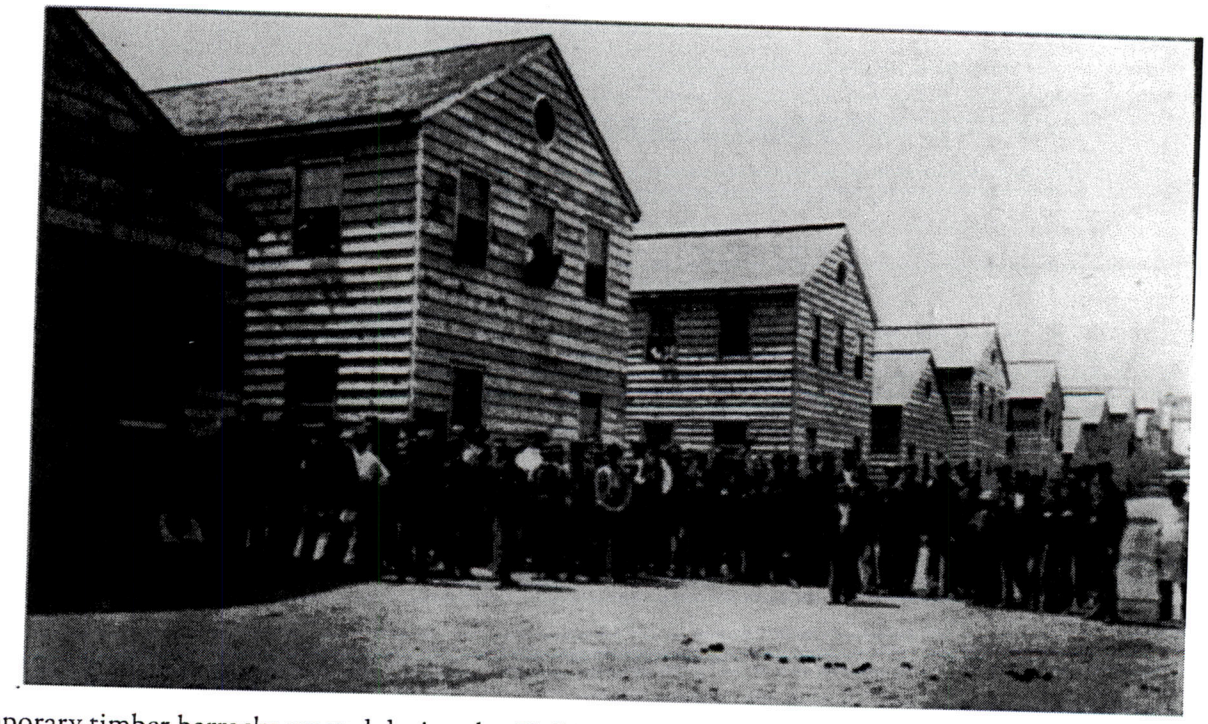


Right flank of Fort Richmond, ca 1860. *Author's Collection*

In July 1863, four companies of the 11th NY Heavy Artillery were stationed at Fort Richmond and Sandy Hook. Later that year, the 14th NY Heavy Artillery (3rd Bn, German Heavy Artillery) was organized. Companies A through F were assigned to forts in NY Harbor in October 1863. Companies I and K were posted at Fort Richmond December 24, 1863, where they were joined by Companies L and M in January 1864. The four companies served at Fort Richmond until April 1864, when the 11th NY Heavy Artillery was forwarded to the Army of Potomac.

The Regulars returned to New York Harbor with the end of the war and Batteries A, B, and E, 1st US Artillery, arrived at Fort Richmond in October 1865. The 1st Artillery manned the fortifications on Staten Island until 1872, when the regiment was transferred to the Southeast in exchange for the 3rd Artillery.(119)

Col. Henry S. Burton, commanding the 5th US Artillery, established regimental headquarters at Fort Richmond from late July 1864 until October 25, 1865, when it moved to Fort Monroe, VA. (120)



Temporary timber barracks erected during the Civil War to house the garrisons of Fort Richmond and the exterior batteries. *NARA*

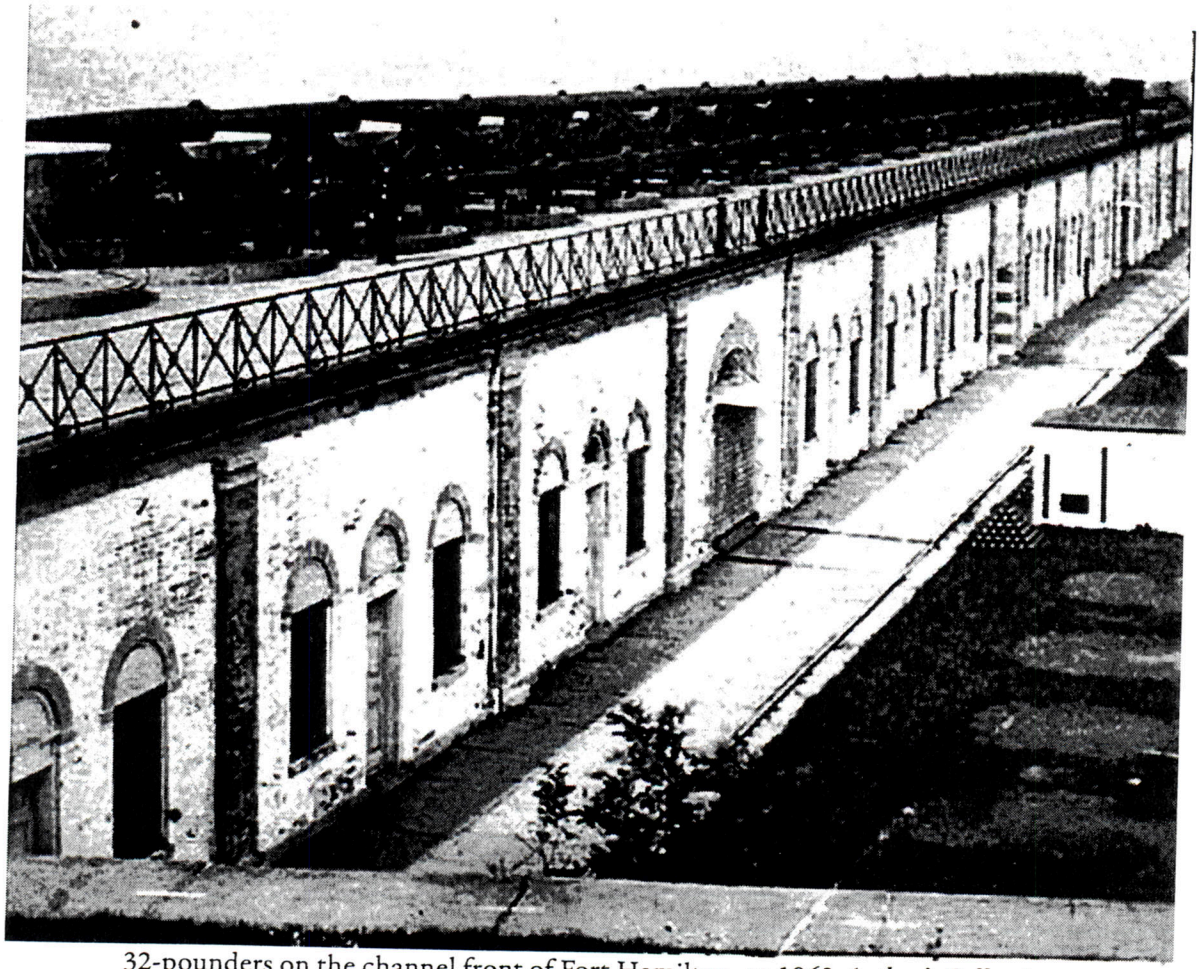
Forts Hamilton and Lafayette in the Civil War

Companies H and K of the 2nd US Artillery, commanded by Col. Harvey Brown, was still garrisoning Forts Hamilton and Lafayette in 1861, on the eve of the Civil War. Company D, evacuated from Texas early in 1861, was briefly posted at Fort Hamilton before being ordered to the US Arsenal at Fayetteville, NC. Brown's regiment was soon ordered to Washington, D.C., and the 2nd Artillery was replaced on April 19 with the arrival from Charleston, SC, of the headquarters and five companies of the 1st Artillery under the command of Maj. Robert Anderson, who had been forced from Fort Sumter there. A few days later, five companies, B, D, G, H, and K, of the 3rd Infantry, arrived from Texas to bolster the Fort Hamilton garrison.(121)

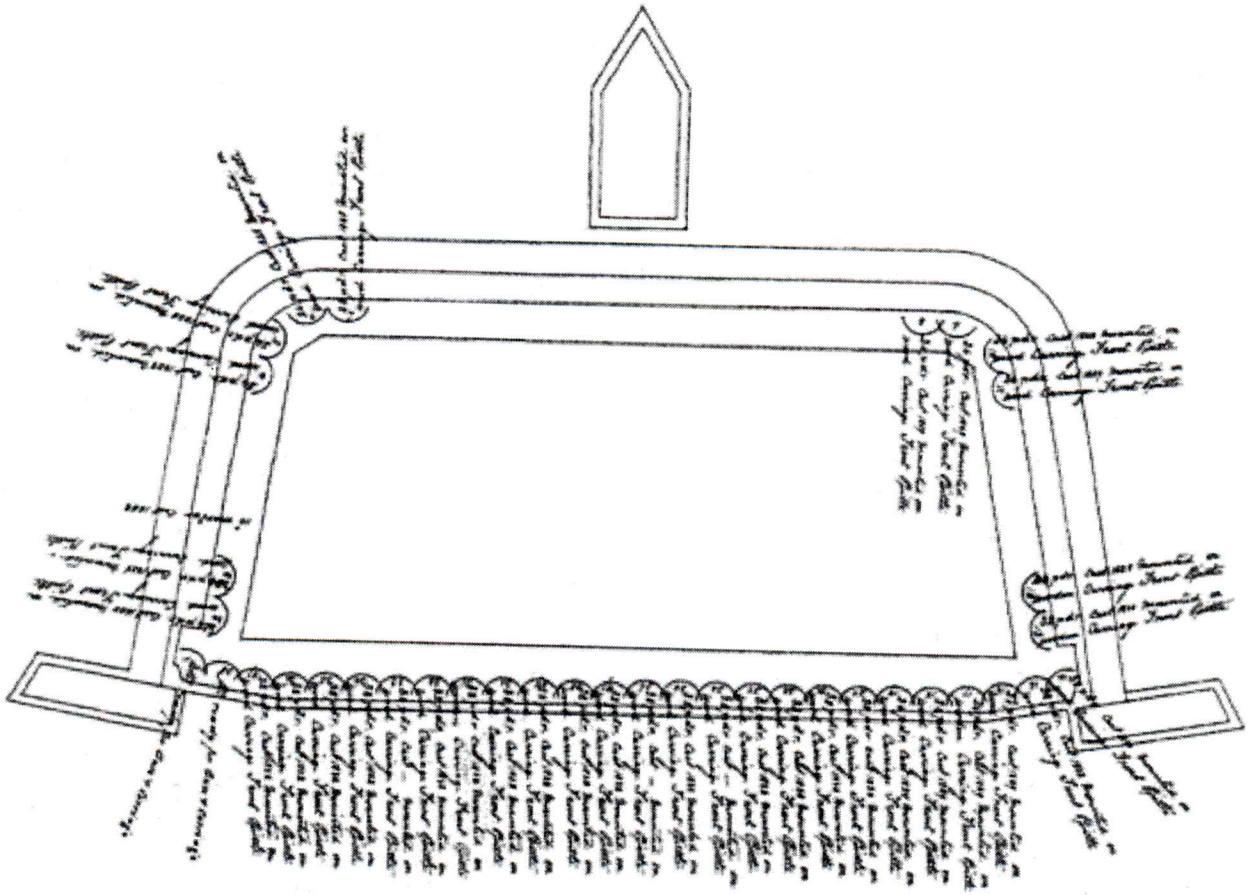
On May 4, 1861, the 5th US Artillery was constituted. While most of its elements were organized at Camp Greble in Pennsylvania, Battery G was organized at Fort Hamilton and remained stationed at the Narrows until December 18, 1862, when it was transferred to the Department of the Gulf.(122)

Fort Hamilton also became a rendezvous for new recruits and regiments of New York Volunteers during the first year of the war, and Regular Army recruits were organized into a battalion of the 12th Infantry at Fort Hamilton on October 20, 1861. Elements of the 12th Infantry remained at the fort until March 1862, when the regiment departed for Washington D.C. The garrison increased rapidly until there were about 1,000 men from the newly organized 5th US Artillery Regiment and the 12th Infantry posted on the Long Island side of the Narrows. A succession of officers commanded at the Narrows during the war. Companies G and H, 14th NY Heavy Artillery, were assigned to Ft. Hamilton until April 1864, when they were transferred to the Army of the Potomac.(123)

Following the Civil War, Fort Hamilton's armament was gradually reduced. The guns in the casemates and most of those along the barbette tier, relatively small and on old-style platforms, were dismounted and replaced to some extent by heavier guns in the forts exterior batteries. By the late 1870s, the sole armament of the enceinte of the fort was three 10-inch and two 8-inch seacoast mortars mounted on the barbette tier of the channel front, all on decayed wooden platforms. The fort's east front was officers' quarters, the embrasures cut down to form doorways accessing the earth closets in the ditch. The redoubt east of the enceinte was in good repair but its 24-pounder flank howitzers had been dismounted and the structure was in use as the post bakery.(124)



32-pounders on the channel front of Fort Hamilton, ca 1863 *Author's Collection*



Arrangement of armament of Fort Hamilton. *NARA, Drawer 40, Sheet 47, Archives II.*

Fort Lafayette Becomes a Prison for Confederates

Almost at the outset of Civil War the fort had had been pressed into service as one of the first seacoast fortifications in the North to hold political prisoners. Some of the first inmates had done nothing more than express sympathy for the South: members of the Maryland legislature; Baltimore's police commissioners; James W. Ball, a New Jersey Democrat later elected to the US Senate; and Francis K. Howard, a Baltimore newspaper editor and grandson of Francis Scott Key. The war had not progressed long before Fort Lafayette's role was expanded to include military prisoners. In particular, all officers who had resigned commissions in the US Army to join the Confederacy were, if captured, automatically sent there.

On July 15, 1861, Fort Lafayette became a military prison when Edward D. Townsend, assistant adjutant general, ordered Maj. Gen. Nathaniel P. Banks to take prisoners captured by General McClellan in West Virginia to New York to be kept in Fort Lafayette. Townsend advised Banks, "A permanent guard will be ordered to the fort in time to receive the prisoners." Fort Lafayette was manned by one or two companies from Fort Hamilton's garrison. These units formed the guard detail for prisoners during the Civil War. The first Confederate prisoners arrived at Fort Hamilton on July 22. They were searched and had their names entered on the roll of prisoners before being marched down to the wharf to the boat for the quarter-mile trip to the fort on Hendricks Reef.

The prisoners were confined in the fort's two principal casemated fronts and in four casemates of the lower tier on the Long Island side of the fort. All had been converted into prison rooms by brick-

ing up the open entrances. The casemates were lighted by five embrasures measuring about 2 feet by 2 feet, covered with iron gratings. Five large doorways, 7 or 8 feet high, with solid folding doors, opened to the parade ground from the prison casemate walls. The four vaulted casemates of the lower tier on the Long Island side were eight feet at their highest, 24 feet deep, and 14 feet wide. Each was lighted by two small loopholes in the outer wall and one on an inner wall. The large wooden doors of the casemates were shut and locked from 9:00 p.m. until daylight. Although the rooms remained dark and damp most of the time, they had fireplaces, which the gun casemates on the principal fronts lacked. Later, stoves had to be installed in the gunrooms to combat the cold. The only furniture in either was a few beds.

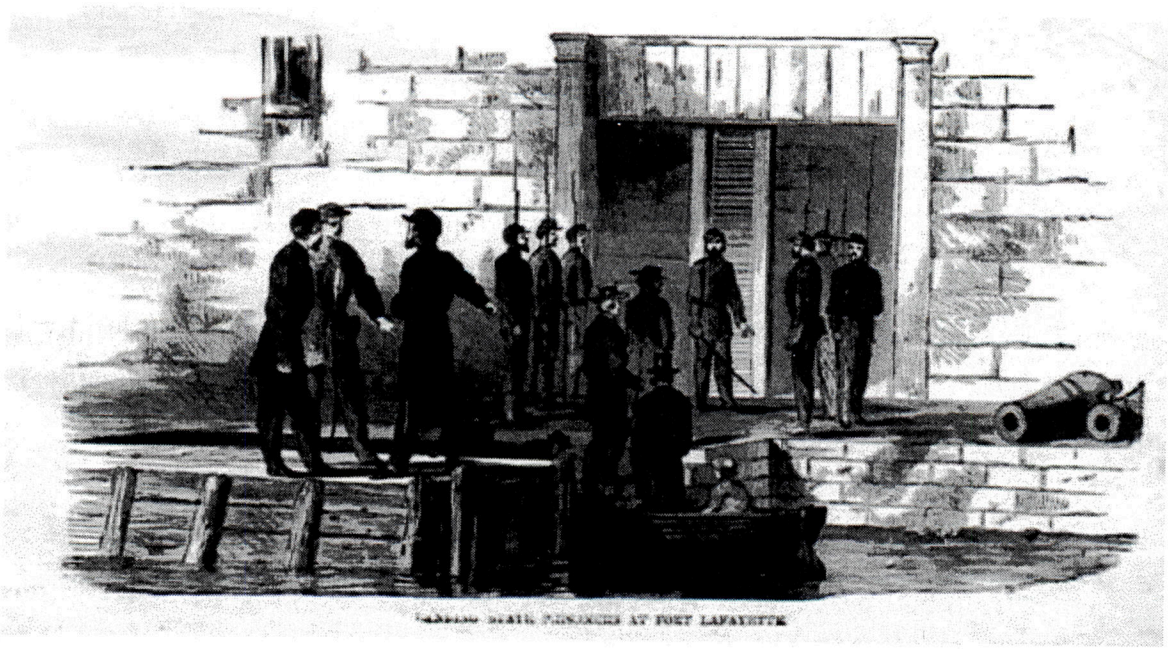


Fort Lafayette viewed from Long Island, south of Fort Hamilton. *Author's Collection*

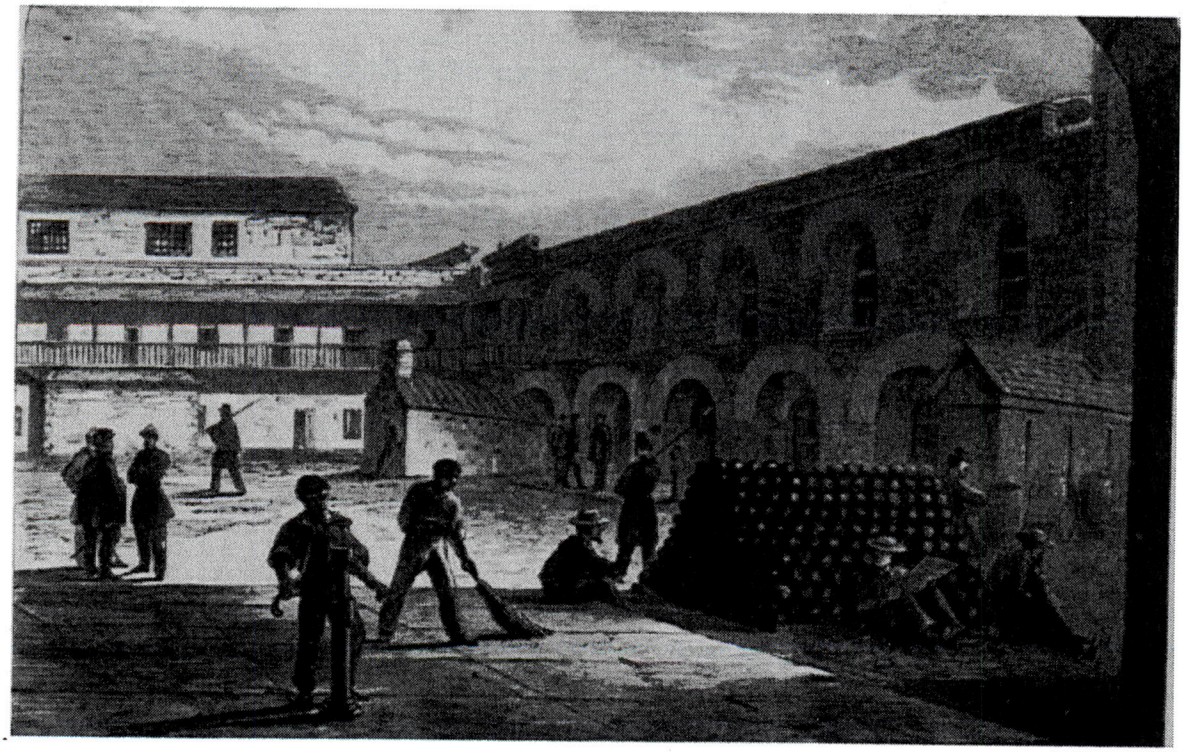
In immediate charge of the Fort Lafayette prisoners was Lt. Charles 0. Wood, described as "brutal" by many of the prisoners. He had been a baggage handler on the Ohio and Mississippi Railroad before the war and it was said he received his commission from President Lincoln as a reward for successfully smuggling Lincoln's baggage through Baltimore before his inauguration.

Originally, the fort was believed capable of holding up to 50 POWs. From the beginning, however, 20 were held in each gun casemate, with nine to ten in each land front casemate. Before the war ended there were often 35 to a gun casemate and up to 30 in a lower-tier casemate.

Captured blockade runners, initially imprisoned in the Tombs in Manhattan (New York City's civil prison), were transferred and kept in shackles, confined both day and night in the lower casemates of the fort. However, regular prisoners of war and political prisoners were allowed to exercise in the open area of the compound twice each day-from six to seven a.m. and from five to six p.m. This usually meant simply walking along the pavement around the inside of the fort several times. As the prison became more crowded, these walks were limited to one half hour twice a day and then, finally, eliminated altogether. At dark, the prisoners were confined to their rooms and all candles were extinguished



Political prisoners arriving at Fort Lafayette. *Author's Collection*



Fort Lafayette's parade ground during the Civil War. *London Illustrated News*



Confederate prisoners in one of Fort Lafayette's land-front casemates. *London Illustrated News*

at nine. Later, candles were also eliminated and, according to one prisoner's account, "the night to us now is nearly 15 hours, counting from lock-up time to the opening of the cell in the morning."

Kitchen facilities were also bad; meals were often served only half-cooked. For those who could afford it, there was also a mess under control of the fort's ordnance sergeant and his family. For these meals, prisoners were charged one dollar per day, credited against what the prisoners had turned over to Lieutenant Wood when they arrived at the fort. They were denied the use of their own funds to make food purchases from a sutler outside the fort or to receive food sent by friends, thereby eliminating all competition with the ordnance sergeant's service. "Dinners," complained one prisoner, "consisted of fat pork and beans, a cup of thin soup and bread, or of boiled beef, potatoes and bread on alternate days.... The coffee was a muddy liquid in which the taste of coffee was barely perceptible, the predominating flavor being a combination of burnt beans and foul water."

The fort's water was indeed foul. The prisoners often complained that the cistern contained dirt and "animalcules." There were also several periods during which prisoners had to go without water altogether. The health of the prisoners in Union hands has remained a matter of controversy. Although official records show only two deaths at Fort Lafayette during its use as a prison, prior to July 7, 1862, there was no War Department requirement to report such matters or keep records. Contemporary sources present a picture different from official records. Newspapers reported that a typhoid fever epidemic at the fort in late 1861 caused prisoners to die so rapidly "as to arouse public attention and produce an outcry of indignation."(125)

There were still 40 prisoners at Fort Lafayette as late as October 1865. By November, most of the POWs were released, but a number of political prisoners continued to be held. The last four were released in the ensuing months, one in January 1, 1866, two the following February, and the last one in March, making this facility the last major Union prison to hold wartime prisoners.

Fire Destroys Fort Lafayette

The last of the prisoners had been gone for only a short time before the engineers returned to make necessary repairs and begin the conversion of the fort back to its primary mission of seacoast defense. Repairs had been progressing for some two years when catastrophe struck. Workmen had finally undertaken some of the repairs the upper-tier roof had needed since before the war. On December 1, 1868, carpenters were making roof repairs. As a reporter for the *New York Times* noted:(126)

> Owing to the extreme coldness of the weather, they lighted a fire, and the sparks from the chimney fell upon the shingles of the roof of a temporary building, inside the fort, close to the casemates. No sooner had the first shingle caught than the flames began to spread, and in about three minutes there was a flame occupying a circle of about twenty feet, continuing to extend each way.
>
> The workmen, seeing that there was danger, immediately set to work to remove their tools and tool-chests; but before they had dragged them far they felt the necessity of making their escape without their tools, and at this point they realized the awful fact that they were hemmed in so as to render escape by any ordinary exit impossible. In this plight they had to extemporize means of being let down over the outer wall, and by that means they escaped, leaving the flames to gather strength and to extend with fearful rapidity without let or hindrance. So far as could be ascertained there were but two soldiers in the fort and one woman in charge.
>
> It is usual at this season of the year to keep no greater force than this in that fort, the main force being in Fort Hamilton. This slender garrison escaped as soon as possible thereafter, the Metropolitan police boat under the command of Captain Hartt, made its appearance off the fort, and in a short time a powerful stream of water was directed upon the burning and defenseless defense of New York Harbor, but to little purpose, for the strong northwest wind that blew at this time dissipated the water into spray almost as soon as it left the nozzle of the hose on board the boat.
>
> Two tug boats came to the aid of the Police boat, one of which sent another powerful stream toward the burning pile, but to as little purpose as the first one; the second tugboat got aground and the crew exhausted their energies getting back into deep water, and in a short time, owing to the imminent danger of explosion, all the boats left. This course was adopted more particularly because their efforts in throwing water were of so little consequence. Their good intentions not being enough, they left with their best wishes. Thus abandoned, the immense quantity of timber in the fort continued to burn with vigor. The leaving of the boats and the continuance of the fire began to be a subject of comment in the neighborhood. It began to be rumored that from fifty to sixty tons of powder were in the magazines and that this immense charge was in danger of exploding any moment should the flame reach it; and this danger was asserted to be certain. This danger gained additional credence by an officer, name not known, coming from the direction of the fort, and exclaiming "We'll all be in hell in twenty minutes."
>
> . . . Fort Hamilton is under the command of Major Madier. Fort Lafayette was in charge of a corporal's guard, detailed daily. The family of Mr. Church who reside on the bluff which commands a view of the harbor at that point, is about the only one having the temerity to brave all the dangers. They did not leave, and Mr. Church stated that he intended to remain and take his chances. As we left the scene at nearly 11 o'clock last night, the conflagration was still in progress, illuminating the whole region for miles, and constituting a terrible beacon to ships inward bound. The tall and stately flagstaff which stood in the center of the fort yard was, as we left the scene behind us, a column of fire, its flame paying such veritable pranks as were incited by the wind which was still lowing fresh. We were assured that all danger of the magazine exploding was over, and that, instead of fifty or sixty tons of powder being in store, there were about ten tons or less.

Fort Lafayette was left a gutted ruin, the 80 obsolescent seacoast guns in the fort ruined. Although the site of the fort was considered the "best of all positions for the defenses of New York Harbor," the decision not to repair the fort was based upon the presence of the much stronger and more heavily armed Fort Hamilton. The Board of Engineers projected plans in 1875 for construction of an entirely new casemated fort on Hendricks Reef to be armed with thirteen 80-to-100-ton guns behind iron shields. The project would incorporate a portion of the old work for use as bombproof quarters, storerooms, etc, at an estimated cost of $784,212. The Engineer Department recommended funding the project and requested an initial allocation of $200,000 to begin work. The Board of Engineers developed a second project in December 1884 for two wrought-iron turrets, with the necessary quarters, magazines, engines, boilers, etc., to occupy the same site. No funds were forthcoming for either project. The gutted ruins of Fort Lafayette were cleaned up and a portion of the old fort used for storage well into the 20th century. Fort Lafayette stood until the eastern pedestal of the Verrazano-Narrows Bridge was built on the old fort's site in 1960.(127)

Steam-powered warships created new defensive problems for the army in the 1840s. No longer could the defenders count on adverse tides or winds to impede hostile vessels. A narrow channel no longer formed the obstacle it had in the days of sail. Further, steam-powered vessels drew less water than sail-powered warships and their armament, while considerably reduced in numbers, was far more powerful. The guns of Forts Richmond, Lafayette, and Hamilton, while once a potent deterrent, were no longer considered powerful enough to prevent an enemy fleet running by into the inner harbor.

Staten Island's Supplementary Batteries

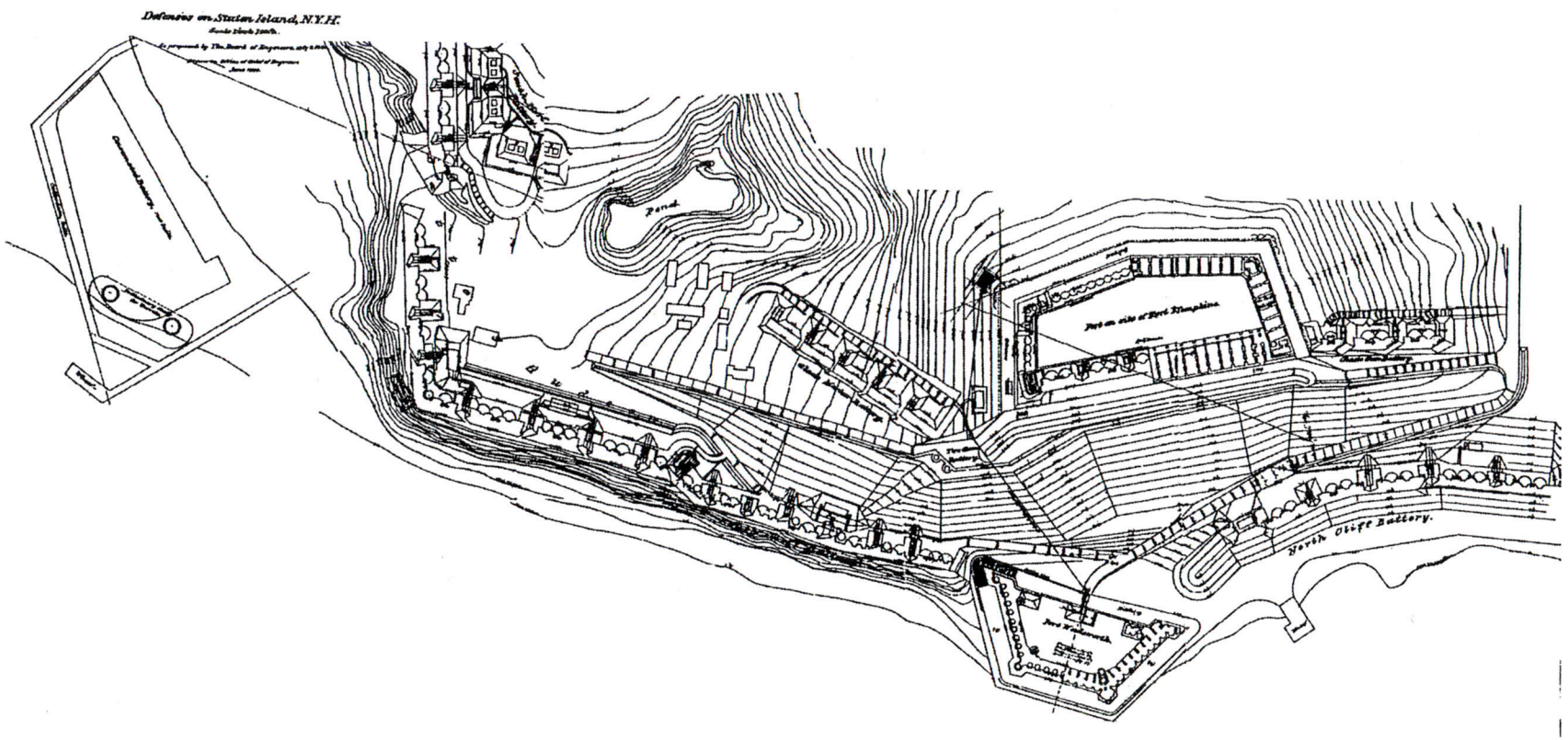
As Fort Richmond neared completion in 1858 and the replacement for Fort Tompkins on the crest of Signal Hill was beginning, planning an increase in the weight of armament along the Staten Island shore of the Narrows was also being completed. Between 1860 and 1876, six additional batteries would be added to the Staten Island defenses, to be eventually arranged for an additional 96 guns.

The Casemated Gun Battery

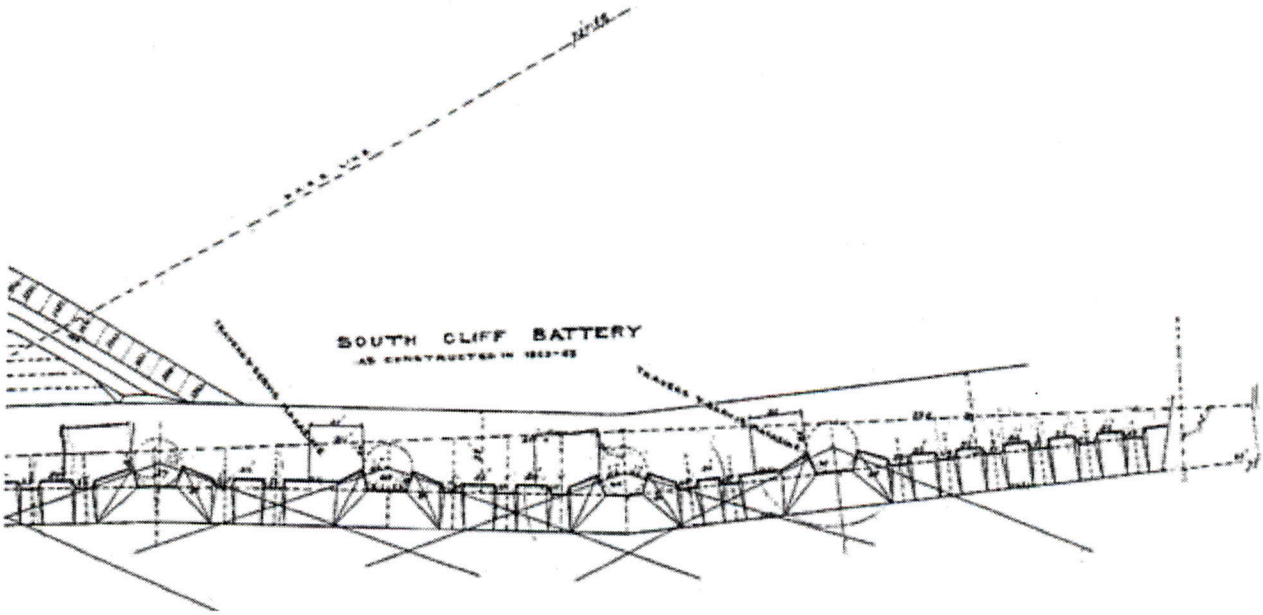
By 1860, plans were completed for a massive casemated gun battery on the shoreline immediately below Battery Hudson's south angle. The Board of Engineers considered this proposed battery the "most important work yet undertaken for the defense of New York." In his 1861 annual report, the chief of engineers requested $100,000 to commence this defense. No funding was provided, however, and the project was eventually suspended. The proposed site of the casemated battery was selected several years later as the preliminary location for a pair of turret batteries. Like the casemated battery, the turrets never progressed beyond the drawing board.

South Cliff Battery

The first supplementary battery to be built was South Cliff Battery, begun about 1858. Although the southern end of the battery was generally complete by 1861, work continued through the Civil War. By 1865, the north end of the battery was finished and a road had been built behind the battery from Signal Hill down to Fort Wadsworth. The principal magazine at the south end of the battery was built into the east slope of Signal Hill, directly south of Fort Richmond. The earthen barbette battery and its magazine were originally planned for thirty-one 10-inch Rodman smoothbore guns to supplement the fire of Forts Tompkins and Richmond and Battery Hudson. Later, a number of the platforms were armed with 200 and 300-pounder Parrott rifled guns.(128)



The primary forts and their ancillary batteries as developed by the 1880s. Left to right: The casemated battery with its proposed turrets; the adjacent Battery Hudson Extension and its mortar battery; Battery Hudson proper; the South Cliff Battery; Fort Wadsworth; and the North Cliff Battery with Fort Tompkins in the rear. *NARA*



Layout of South Cliff Battery as built 1858-65. *NARA*

The slopes were regraded in the late 1860s and a new magazine built in 1867. New plans developed in 1869 called for modifying the battery for 15-inch Rodmans. In 1873, 22 guns were emplaced in the battery. The plan called for constructing four new traverses, two of which would have magazines, and modifying two existing traverse magazines. These changes required a reduction in the number of gun platforms. Work was delayed on the modifications, however, pending the completion of Fort Tompkins' channel front and the extension of Battery Hudson. The battery was provided with principal magazines at its northern and southern ends in FY 1874-1875 and two service magazines were built near the battery's mid-point. Because of ordnance shortages, the South Cliff Battery never received its full complement of guns.(129)

In 1875, work began on part of the alterations to the battery. A new traverse magazine with covered passage near the north battery and a solid traverse were constructed; five gun platforms were taken up preparatory to constructing two other traverses. Covered passages were added to the two old traverse magazines near the center of the battery and their earth covering was increased. Some work was done to close up old entries to a principal magazine and build a new one accessed from the covered passage at the rear of the magazine. Before any additional work could be done, funding was suspended in 1876 and no improvements were made to the south portion of the battery that still had seven guns in place.(130)

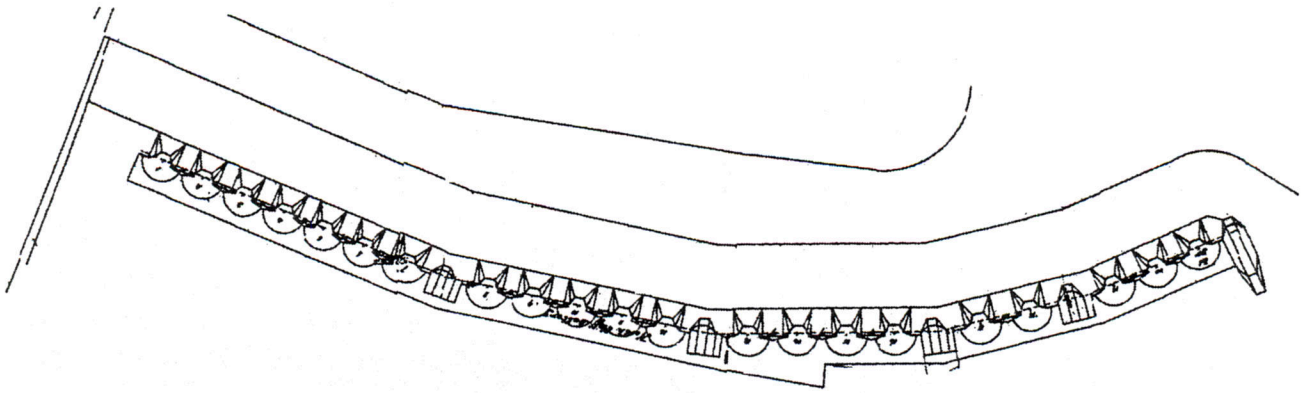
Over the next 10 years, the battery was preserved in its arrested state of modification. In 1885, eleven 5-inch pintles and the south principal magazine were refurbished. The project was again suspended with four other traverses and a traverse magazine remaining to be constructed, as well as a rubble seawall at the foot of the exterior slope of the parapet. In addition, the principal magazines had yet to be lined with timber, and the parapet had to be thickened.(131)

In the 1890s and early 1900s, South Cliff Battery was again rebuilt, this time to accommodate eight 3-inch (15-pounder) rapid-fire guns. It was then redesignated Batteries Bacon and Turnbull.

North Cliff Battery

On the slopes of Signal Hill north of Fort Richmond, this earthen barbette battery was initially planned for about twenty-one 8 and 10-inch Rodman guns to supplement the direct fire of Fort Tompkins and Fort Richmond. Construction began in 1862 and continued haltingly through the Civil War, but was still incomplete at the end of the war.

Like South Cliff Battery, the work was to be provided with storage magazines at the northern and southern ends of the battery, a large bombproof personnel shelter, and five traverses, two containing service magazines, separating groups of gun platforms. A parados at the south end of the battery protected the guns from enfilade fire and contained a bombproof shelter. The north storage magazine was completed in 1868 and the south storage magazine was begun in the South Parados. Before the battery could be completed and its armament mounted, plans were modified in 1870.(132)

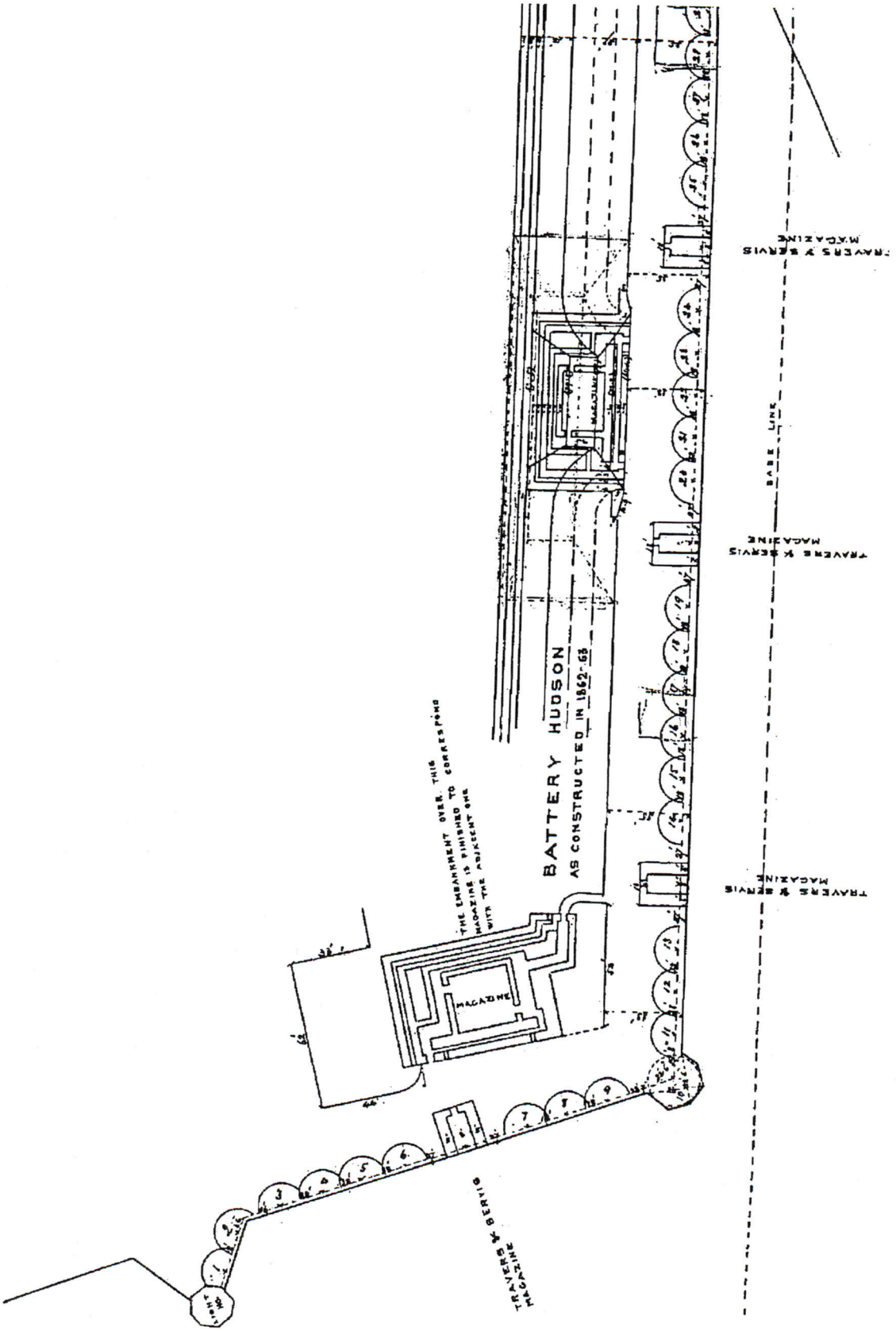


North Cliff Battery as originally designed in 1862. *NARA*



Entrance to one of the 1870s-Project traverse magazines. *Author*

These modifications called for eliminating the large bombproof, changing the projected armament to a dozen 15-inch Rodmans, and increasing the number of traverses separating the guns. In 1873, six Rodmans were mounted and six more awaited emplacement. From 1871 until work was suspended in 1875, two earth-and-concrete principal magazines were built, as well as two traverse service magazines. A passage through the solid traverse was cut and provided with a stone passageway and wing walls. Four concrete foundations for the six-gun battery were laid and their timber gun platforms put in place. When reconstruction was suspended in 1875, a considerable amount of work remained: Replacing wooden gun platforms with concrete, constructing stone breastheight walls in front of each pair of emplacements, adding concrete bonnets to the two service magazines in the traverses, lining the principal magazines with timber, increasing the thickness of the



Battery Hudson and its Return as built, 1862-65. *NARA*

parapet; and constructing a seawall and rip-rap at the foot of the parapet's exterior slope. In the early 1900s, emplacements for six 3-inch RF guns were built here and named Battery Catlin.(133)

Battery Hudson

This battery, originally dating back to the early 1800s, underwent considerable reconstruction in the 1840s, with additional improvements in the 1850s. It was in good condition at the beginning of the Civil War, and during the war, its 8 and 10-inch columbiads were partially replaced by newly developed 200 and 300-pounder rifled Parrott guns. Beyond maintaining the battery in good order, nothing more of import was done during the war and the battery was a major element of the defenses of the Narrows, but as the conflict wound down in 1865, Battery Hudson was included with the proposed improvements for the North and South Cliff Batteries. Because it was already a powerful battery, work on the cliff batteries was deferred until Battery Hudson could be nearly complete. As part of the tests to determine the effect of "modern" artillery, an experimental casemate was constructed near the south end of the battery as a target.

In 1867, the old shot furnaces were removed from the terreplein and in the following years, leaks in the roofs of the storage magazine were repaired. The intense rainstorms of 1869 caused the entire rear slope of Battery Hudson to slide down onto the terreplein. This necessitated re-grading of slope and removing the upper portion of Battery Hudson. Repairs were undertaken at considerable expense, including rebuilding the slope on a gentler grade. In addition, the two storage magazines were lined with wood.

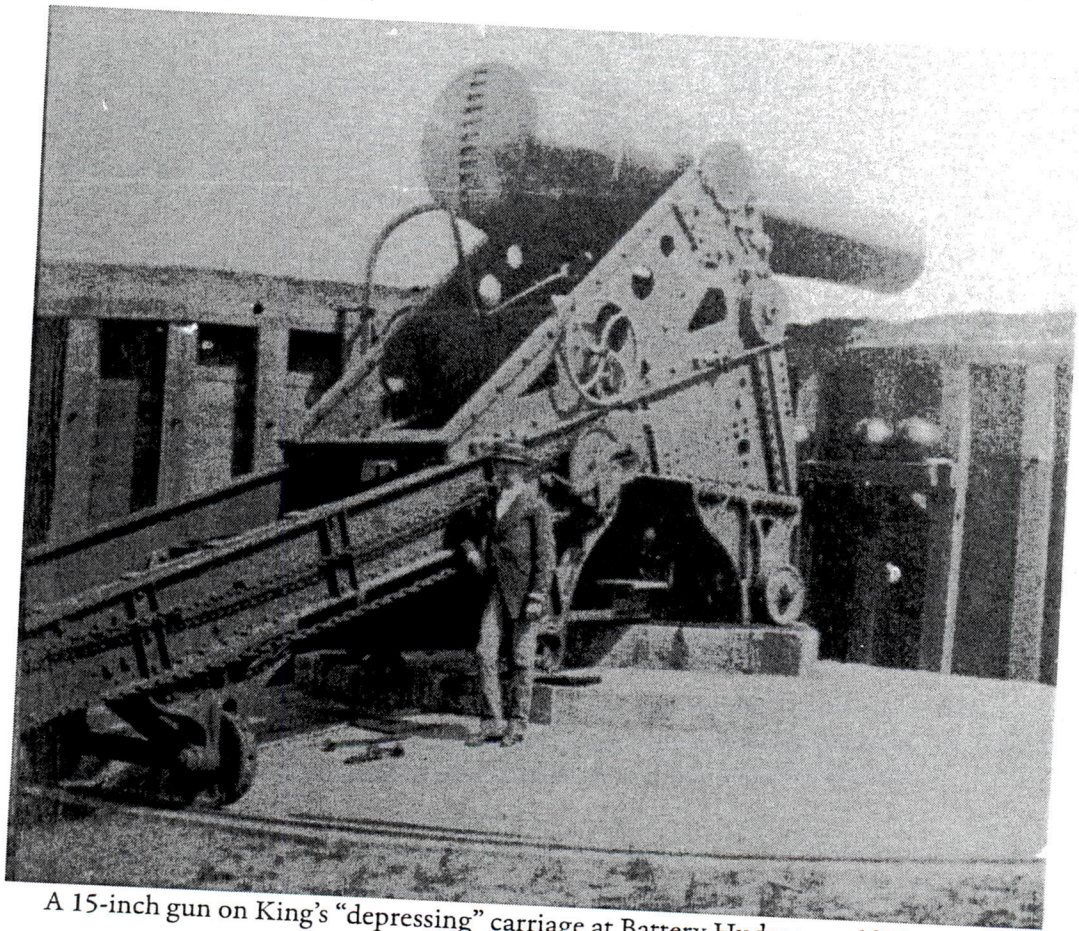


Remains of Battery Hudson's Parrott-gun platforms, ca 1860s. *Author*

New plans were approved to modify the older part of Battery Hudson and add an earthen extension with traverses and platforms for heavy 15-inch Rodman guns west of the battery terminus, designated the Battery Hudson Extension. In addition, a reserve magazine was projected for the Extension.

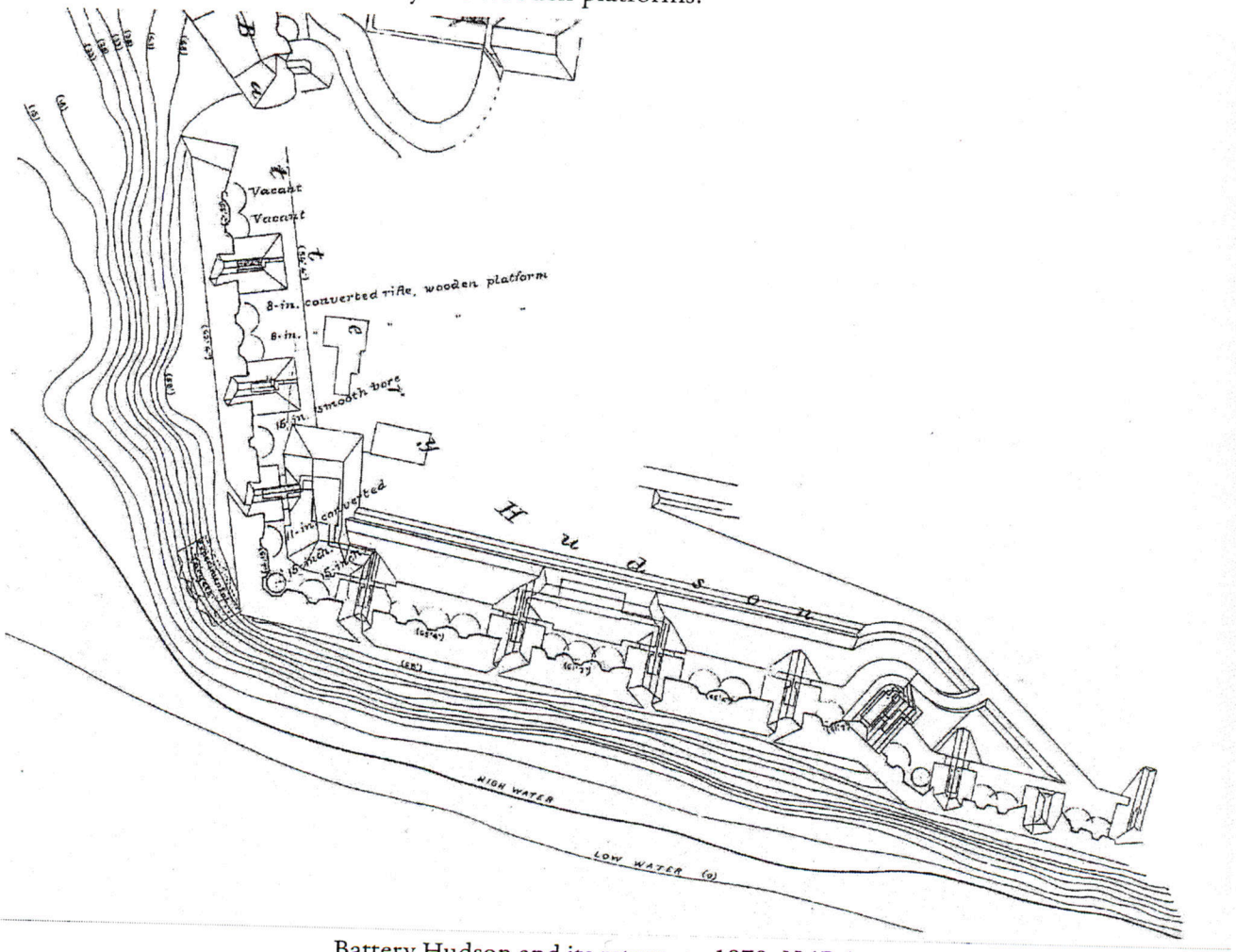
In 1870, a dry stone wall was laid over the arch of the experimental casemate and in front of the center-pintle platform for the 15-inch Rodman; the space between them was filled with earth to secure the foundation of the platform. In 1871, most of the work was concentrated on the west return of Battery Hudson, where two service magazines were built except for their doors, earthen covering, and the wing-wall coping. This area west of the center-pintle Rodman platform was cleared to make room for more 15-inch Rodman platforms. In the Battery Hudson Extension, the masonry for two more service magazines and a principal magazine was complete except for the wing wall coping. Their earth coverings were well advanced and nearly ready to be sodded.(134)

Progress on that part of the battery extension bearing on the lower bay was delayed by slowness creosoting the timber Rodman platforms in the battery's west return. This was partially due to the inconvenience of working around the platform of the King's counterpoise carriage under construction and the experimental firing that followed. The wing walls of the two traverse magazines were finally completed and covered with earth, but not sodded. The lighthouse in the west return of the battery was removed late in 1873. Capt. William R. King initially set a 15-inch gun on his "depressing" carriage at Fort Foote, MD, on the Potomac River and began experiments in February 1869. During the first trial, he fired 22 rounds from the 15-inch gun. After two more firing sessions at Fort Foote, King moved his experiments to Battery Hudson in 1871 because of the problems clearing the Potomac River before shooting and the limited field of fire. Three additional firings were held by King at Battery Hudson between August 1871 and January 1873. In general, the officers of the 1st Artillery who participated were favorable impressed with the carriage, as were the various boards of general officers who observed the firing trials.(135)



A 15-inch gun on King's "depressing" carriage at Battery Hudson, ca 1872. *NARA.*

In 1872, the principal magazine of the battery extension was sodded. The two traverse magazines were covered with earth but not sodded. The terreplein was graded and a cottage in the rear of the extension was removed. This work continued into 1873, when the earth was regraded to gentler slopes and preparations were made to lay five wooden platforms.

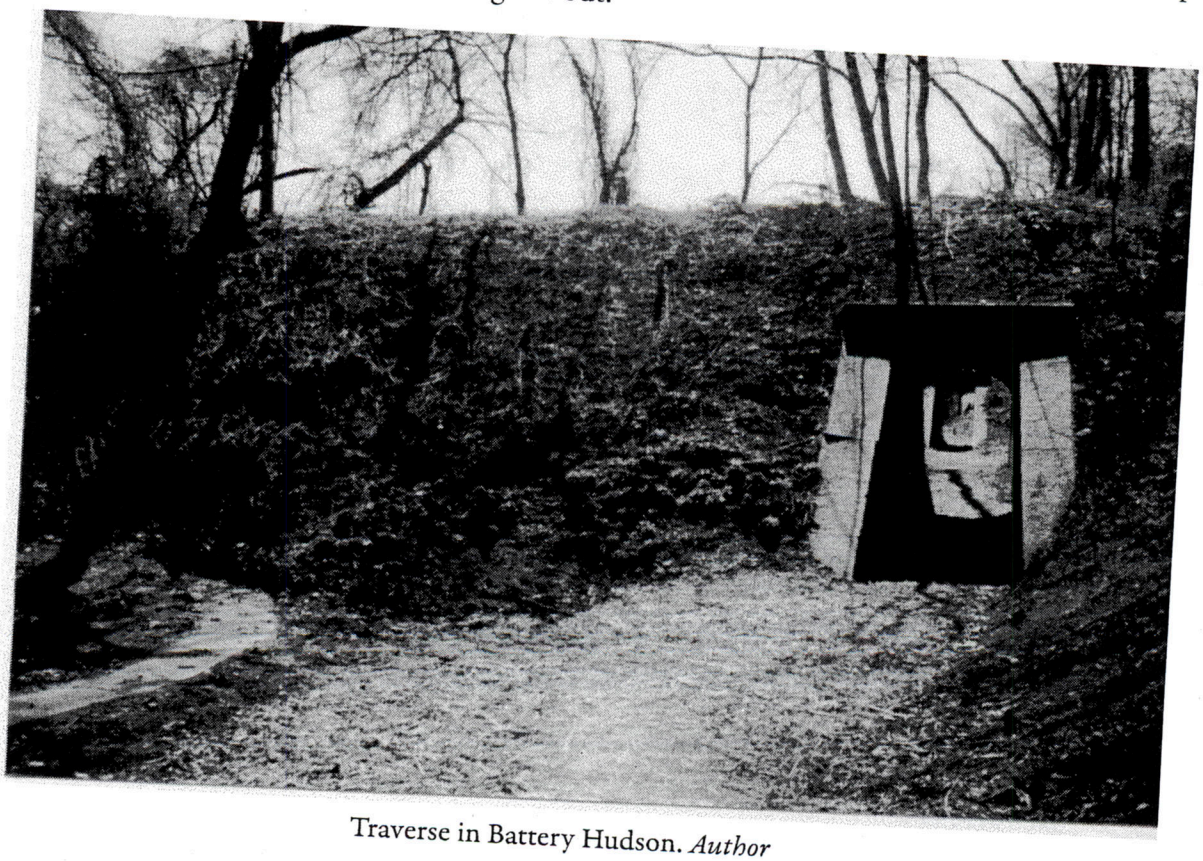


Battery Hudson and its return, ca 1870. *NARA*

While work was being advanced on the west return of Battery Hudson and the Extension, plans were underway to modify much of the old east front of the battery for 15-inch Rodmans. Some 16 platforms mounting 10-inch columbiads and 200 and 300-pounder Parrott rifles were to be replaced by nine 15-inch Rodmans, separated by traverses. In 1873, three 10-inch columbiads were dismounted from the east front and their platforms removed. Six permanent platforms of stone and concrete were laid on the east front and an arched passage south of the north principal magazine was finished. In 1874, six more guns and platforms were removed and the breastheight wall was rebuilt to accommodate five permanent Rodman front-pintle platforms with low traverse rails. Nine more timber platforms with high traverse rails were laid, four in the west return of the battery and five in the Extension, where the breastheight wall was temporarily revetted with sod.

In 1875 and 1876, work on Battery Hudson continued until funding was exhausted. The earthen covers and sodding of the northern and southern principal magazines on the battery's east front were finished and the concrete floors of the covered passages to their new entrances were poured. The

modification of the armament on the east front continued. Seven 200-pounder Parrott rifles were dismounted and their 10-inch gun platforms and breastheight walls taken up. A new traverse magazine was completed near the north end of the battery and the foundations for two new permanent gun platforms laid. In the Battery Hudson Extension, 12 platforms were ready for their armament and 10 more were being altered. Six 300-pounder Parrotts had not been replaced with three permanent platforms for 15-inch Rodmans when funding ran out.

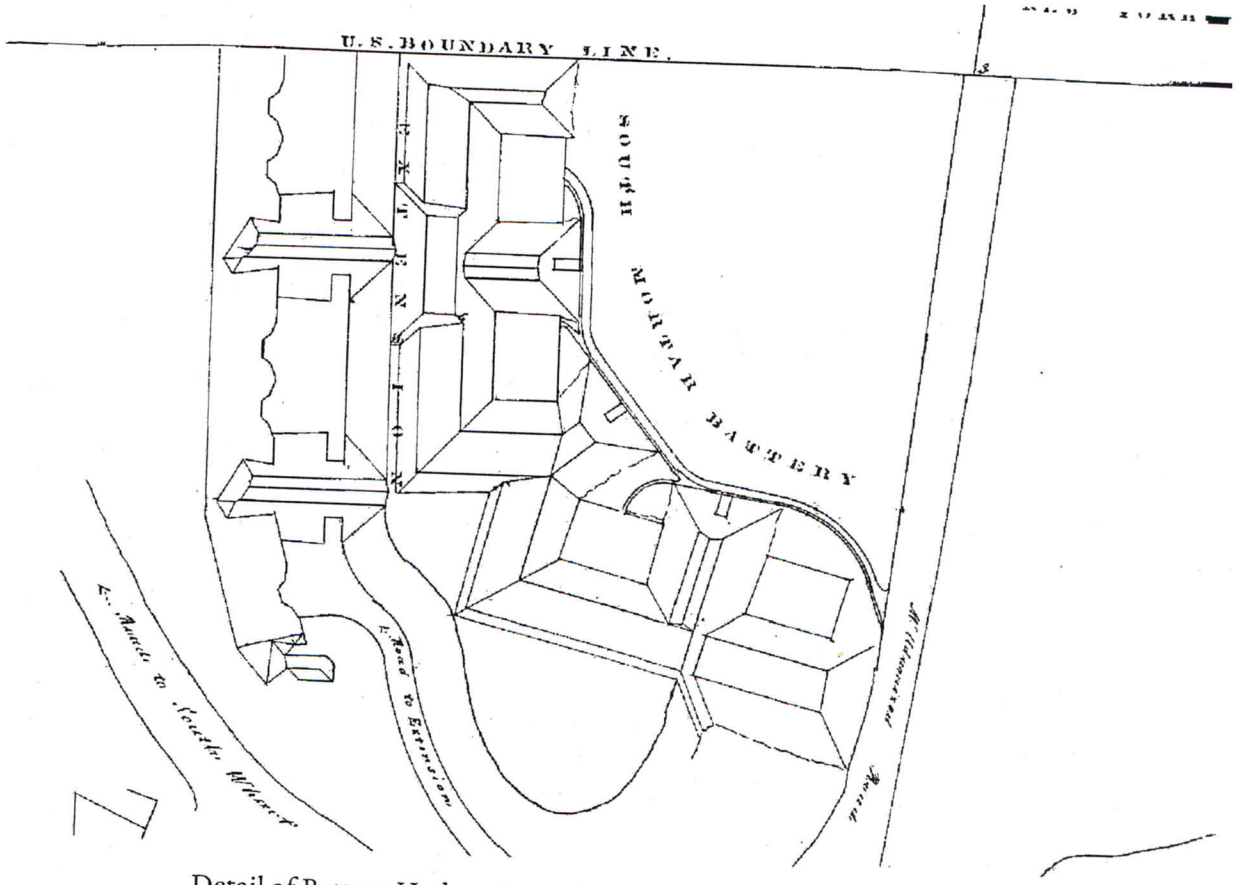


Traverse in Battery Hudson. *Author*

Using the small amount remaining from previous appropriations, the parapet of the Battery Hudson Extension was roughly formed and the outer traverse rails for five 15-inch Rodman platforms were laid. On the east front of the main battery, parapets were strengthened and outer traverse rails were placed for permanent Rodman Platforms Nos. 2 and 3. When work was suspended, it was estimated that an additional $36,200 would be required to complete the modifications to the main battery, its return and extension.(136)

South Mortar Battery 1872-1875

In the rear of Battery Hudson Extension, this earthwork battery and its masonry magazine was commenced in 1872 and nearly completed in 1873. The battery was for ten 13-inch seacoast mortars on timber platforms laid on concrete foundations. In 1874, the battery was ready for its armament, except for laying the timber platforms and hanging the two inner doors in the magazine. Each pair of mortars was to be enclosed within a high earthen parapet on three sides, leaving the rear open to the service the weapons from the magazines in the traverses between the mortar platforms. The project was suspended in 1875 before completion, and emplacements for only eight of the projected ten mortars were completed.(137)



Detail of Battery Hudson Extension and South Mortar Battery. *NARA*

Glacis Gun Battery

A barbette battery for five smoothbore 15-inch Rodman guns on high-traverse front-pintle carriages was sited on the north glacis of Fort Tompkins to supplement the fire of the fort's channel front. Begun in 1872, it was provided with three traverses, two containing service magazines. The oak gun platforms were laid on concrete foundations. At the end of 1872, it was estimated that a single month's work would have the battery ready for its armament. The remaining work consisted of hanging the magazine doors and completing the lamp closets, building the breastheight walls, and laying the timber gun platforms. By 1873, it was ready for its armament. In 1875, the inner grated magazine doors were hung and the grass mowed. In 1877, the cost to substitute stone for the timber gun platforms was estimated at $9,000. As far as is known, no guns were ever mounted in the battery and the platforms were rotting by 1882. Estimates to complete the battery, in addition to the completion of the magazines, required increasing the height of the breastheight wall, had risen to $15,000 by 1885.(138)

Glacis Mortar Battery

This ancillary battery of Fort Tompkins was constructed on the south glacis of the fort in 1872 and 1873 for five pairs of 13-inch smoothbore seacoast mortars on oak platforms, separated by earthen traverses, two of which contained service magazines. The left-most pair of mortar platforms was demolished when Battery Duane was constructed. By the end of 1901, the battery was vacant and the wooden platforms were unserviceable.



Entry to traverse magazine of the Glacis Gun Battery. *Author*

Two Gun Battery

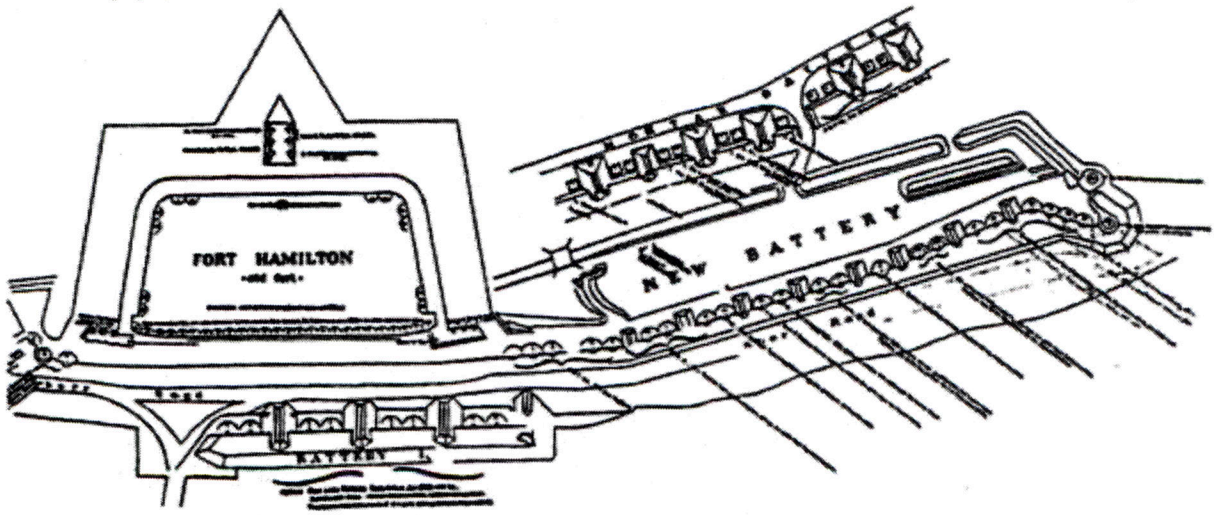
Begun in 1865, this small barbette battery near the angle in the southeast coverface of Fort Tompkins was for two 10-inch Rodman guns on center-pintle stone platforms. No magazine was provided for the battery, and it is doubtful the guns were ever mounted.

Detached Exterior Barbette Batteries at Fort Hamilton

In 1859, funds were requested for two small, detached exterior earthen batteries at Fort Hamilton, each for three guns on barbette carriages. Funding and construction commenced in 1860, but progressed slowly. One battery, for two guns on front-pintle and one on a center-pintle platform, was adjacent to the northeast covered way of the fort. The other three platforms for front-pintle barbette guns were adjacent to the south covered way. The Civil War, however, slowed construction of these exterior batteries, and they were not completed until after the war.(139)

New 15-inch Gun Battery

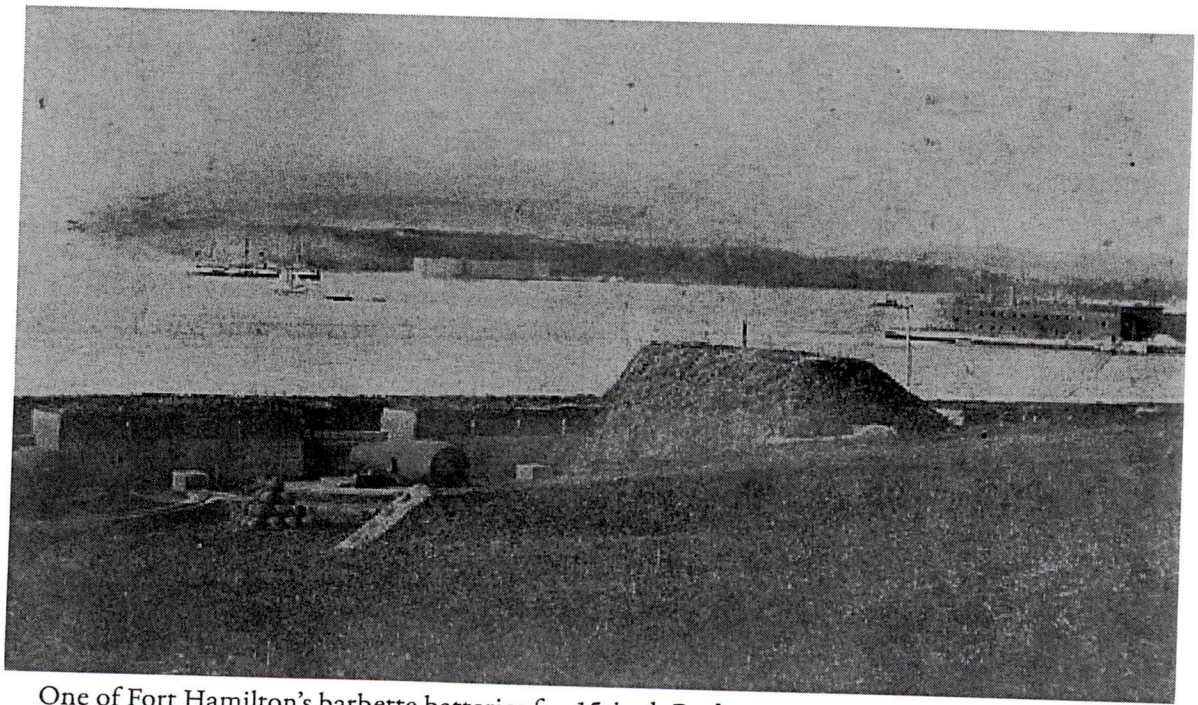
The third Civil War-period battery was begun in 1863 along the shoreline above the Shore Road south of the fort. This open barbette battery was initially arranged for nineteen 15-inch Rodman guns on iron front-pintle barbette carriages. At the far south end of the battery, emplacements for two 15-inch Rodmans on center-pintle carriages covered Gravesend Bay. The battery was extensively modified following the Civil War and eight traverse magazines were constructed, separating pairs of gun platforms. In the late 1860s, two storage magazines were built into the high earthen bank behind the battery, one at the north and one at the south end of the battery. The battery was essentially ready for



Fort Hamilton and its ancillary batteries as they appeared in the early 1890s, prior to construction of Endicott-Era batteries. *NARA*

service at the end of 1867, although the engineers continued to make small improvements and modifications into the 1870s.

An additional center-pintle platform for a 15-inch Rodman was added along with a ninth traverse magazine. In 1874, the 5-inch pintles for the 15-inch Rodman platforms were replaced with 6-inch pintles. By the mid 1880s, the battery was armed with one 20-inch Rodman gun, twenty-three 15-inch Rodmans (three on center-pintle and 20 on front-pintle platforms), in addition to one 11-inch and two 8-inch converted rifles.(140)



One of Fort Hamilton's barbette batteries for 15-inch Rodmans, ca 1880s. *Author's Collection*

Barbette Battery No. 1

An allotment of $25,000 was made to begin a new exterior barbette battery. Designed by the Board of Engineers in 1870 for eight 15-inch Rodman guns or equivalent rifles, it was at the water's edge in front of Fort Hamilton. The initial work by Lt. Col. John Newton of the engineers required a cofferdam 484 feet long and 83 feet offshore. Piles were driven and timbers spiked, forming a grillage for the battery foundation. A stone seawall about 10 feet high was built, with a coping along its top course. The seawall was backfilled with earth to within 2 feet of the top of the wall. Designated Battery No. 1, it stood directly in front of Fort Hamilton's channel front adjacent to the fort's wharf, and was generally complete by 1874, with eight emplacements for 15-inch Rodmans on front-pintle mounts. Pairs of gun platforms were separated by traverse magazines, with a magazine at the south end of the battery. After a few years, however, the pressure of the earth threw the seawall slightly out of alignment and required buttressing by a slope of rip-rap stone.(141)

Mortar Battery

Once Battery No. 1 was well underway, Colonel Newton commenced work on the second battery projected for Fort Hamilton. In 1870, the Board of Engineers had designed a battery for fifteen 13-inch seacoast mortars, initially to be built behind the 15-inch battery. After some slight changes in its layout and location, reducing it to 13 mortars behind a continuous parapet, construction finally commenced in 1871. Six earthen traverses, three containing magazines, separated the pairs of mortar platforms. A large traverse closed off the east end of the battery and protected against flanking fire. The concrete foundation of the mortar platforms was being poured and the timber mortar platforms were being laid when funds were exhausted in 1876, with only 12 wooden platforms set in place. No further appropriations were made for continuing the project. Four 13-inch seacoast mortars on iron carriages were eventually mounted on timber Platforms 1, 2, 3, and 4 (from east to west); the other platforms remained unarmed.

The Board of Engineers' 1870 project had also proposed an extension, or return, for the new 15-inch gun battery, designating this Battery No. 2. In addition it planned a detached battery, designated Battery No. 3, to be substituted for the former, provided the land needed could be purchased by the government. Neither battery was commenced.(142)

Fort Hamilton and Its Batteries Fall into Disrepair

Beyond the most-minor maintenance, no work was done to the defenses on the Long Island side of the Narrows in the decade after 1876. By the early 1880s, the earthen slopes of the 15-inch battery were eroding and the masonry of the fort was failing in several places. Leaks were increasing and the parade wall of the channel front was separating from the arches of the casemates. Repairs were carried out with the small allocations from the Engineer Department's Contingencies for Fortifications Appropriation.(143)

The Regulars Return 1865

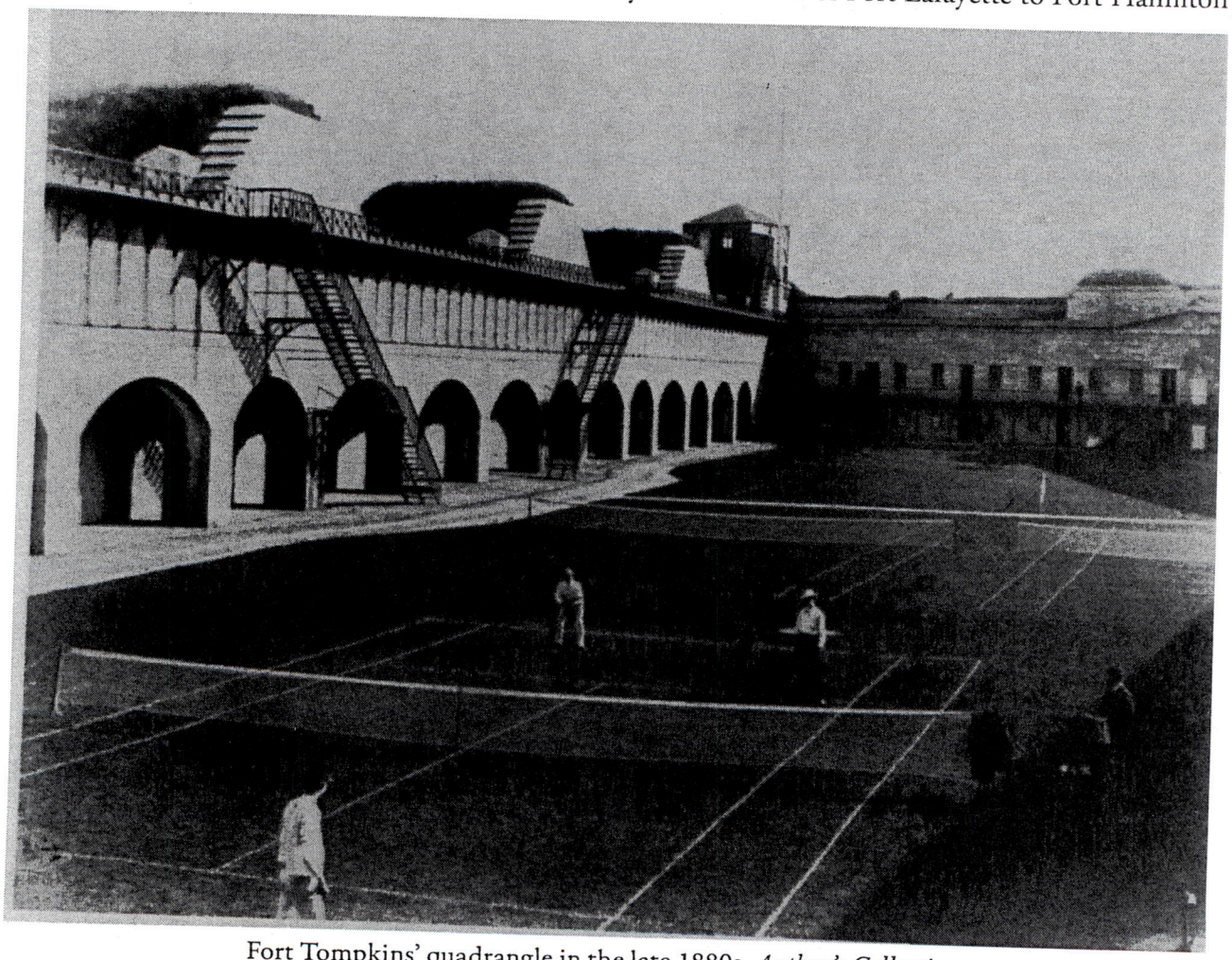
Elements of the 12th US Infantry Regiment returned to Fort Hamilton in November 1864. At the end of the war, the fort was manned by elements of the 1st US Artillery Regiment, who remained until November 1871. The 1st Artillery had been largely posted in the South during the war. However, its field grade officers had been assigned to command functions elsewhere. Col. Justin Dimick had initially maintained regimental headquarters at Fort Warren, in Boston Harbor, but in August 1863

he retired, to be succeeded by the regiment's senior captain, William Silvey, who established his headquarters at Concord, NH, until January 18, 1865, when it was moved to Fort Hamilton.(144)

With the end of the war, all but two of the regiment's batteries were dismounted. The field officers of the regiment who had temporarily held higher ranks while on detached service returned to the regiment, which resumed the regular routine of garrison life. Batteries I and K remained light batteries and went to Fort Brown, TX. The remaining batteries were reassigned to the seacoast forts. Batteries F and G were stationed along the New England Coast, and Batteries A, B, C, D, E, H, L, and M were assigned to forts at New York - Batteries H and L at Fort Schuyler; Batteries A, E, and M at Fort Wadsworth; and Batteries B and D at Fort Hamilton. Battery C was posted at Fort Lafayette.(145)

On January 17, 1866, Battery B was moved across the Narrows to Fort Wadsworth and on May 6, Battery A departed for Fort Trumbull, CT. In the next month, the usual garrison duties were disrupted when most of the regiment was moved to secure the northern New York border in connection with the Fenian raids into Canada. Detachments from Fort Hamilton were also called on in the late 1860s and early 1870s to protect internal revenue officers in their search for illicit whiskey in the Brooklyn slums.

By 1867, the number of batteries manning the works at the Narrows had been reduced to four. Battery B was posted at Fort Wadsworth, while Battery C occupied Fort Lafayette and Batteries D and M garrisoned Fort Hamilton. In May 1868, Battery C moved out of Fort Lafayette to Fort Hamilton



Fort Tompkins' quadrangle in the late 1880s. *Author's Collection*

to enable the engineers to undertake the long-needed repairs to that venerable work. In 1869, Fort Hamilton's garrison was reduced to two companies when Battery D moved to Fort Wadsworth, while Battery E was shifted from Fort Schuyler, giving the Staten Island forts a three-battery garrison. Six regimental batteries were again deployed to the Canadian border for several days in May and June 1870 as a result of another Fenian outburst, leaving only Battery M to garrison the Narrows. In 1871, with repairs to Fort Hamilton completed, the Staten Island forts were again home to a single battery, B, while Batteries C, D, H, and M were quartered at Fort Hamilton.

In 1872, the 1st Artillery's tenure at the Narrows ended in November and the regiment was rotated to the South in stages. The 3rd Artillery arrived to replace it in the last days of November, beginning a posting that would last until November 1881.(146)

During the 1870s and early 1880s, the forts at the Narrows were typically manned by five or six of the twelve batteries of the 3rd Artillery. Typically, Batteries C, E, and G were posted at Fort Hamilton, and Batteries L and M at Fort Wadsworth. Regimental headquarters was at Fort Hamilton, but the batteries were shifted from fort to fort over the decade. One battery was sometimes stationed at Fort Wood in the Upper Harbor, while other batteries were stationed at forts in upstate New York and in Boston Harbor.

On November 15, 1881, headquarters and five batteries of the 5th Artillery arrived under Lt. Col. John Hamilton to relieve the 3rd Artillery, which departed for the Southeastern Coast. Batteries E, F, H, I, and M were posted at Fort Hamilton, while Battery B occupied Fort Wadsworth until 1884. The regiment was ordered to the West Coast in the spring of 1890 and by the end of the year was largely posted in San Francisco Harbor.(147)

Footnotes

1. John W. Barber and Henry Howe, *Historical Collections of the State of New York* (New York: S. Tuttle, 1842), pp. 473-74.
2. *History of Fort Wadsworth Tricentenary 1663-1963* (New York: Fort Wadsworth, 1963), pp. 4-5. Hereafter: *Fort Wadsworth Tricentenary.*
3. Louis Morris, *Military History of the Battery from the Dutch Settlement 1626 to the Razing of Fort George 1790*, NPS, 1963, pp. 35, 37. Copy in the author's collection. Hereafter: Morris, *Military History of the Battery*. Alan and Barbara Aimone, "Pre-Revolution Fortified Places in New York," *Periodical: Journal of the Council on Abandoned Military Posts*, in 4 parts, 60 and 61 (Fall, Winter, Spring, and Fall, 1977-78).
4. Mark Mayo Boatner III, *Encyclopedia of the American Revolution* (New York: McKay, 1966), pp. 454, 484. Hereafter: Boatner, *Encyclopedia of the American Revolution*. *Fort Wadsworth Tricentenary*, p. 3.
5. Before his appointment as governor of New York, Tryon served as Royal Governor of North Carolina colony 1764-71. Boatner, III, *Encyclopedia of the American Revolution*, p. 1126.
6. Hellgate was at the confluence of the Harlem and East Rivers in the passage between New York's Inner Harbor and the Head of Long Island Sound. Its rapids and treacherous currents were city's primary defenses against naval attack from Long Island Sound.
7. *Fort Wadsworth Tricentenary*, p. 5.
8. John Montresor (1736-1799) served as assistant engineer in the British Army, and in 1754 came to America with Maj. Gen. Edward Braddock. He served as an engineer in the British Army in North America between 1754-78. After the French & Indian War, he conducted a partial survey of the St. Lawrence River and built redoubts around British forts in Canada. In 1764, Montresor accompanied Col. John Bradstreet's expedition to Detroit as chief engineer and commander of a detachment of Canadian volunteers. He then returned to Canada and later worked on British fortifications in the present northeastern U.S., as well as helping establish the long-disputed boundary between New York and New Jersey. During the Revolutionary War, until his temporary retirement due

to poor health in 1778, he was the principal engineer of the British Army in America. Asa R. Runyon, *History of Fort Hamilton* (New York: Ft. Hamilton, 1928), p. 3. Hereafter: Runyon, *History*. Morris, *Military History of the Battery,* pp. 37, 40-41. For early fortification efforts on Staten Island, see also: Frederick R. Black, *Historic Resource Study: A History of Fort Wadsworth, New York Harbor* (Boston: NPS, 1983), pp. 21-25. Hereafter: Black, *History of Fort Wadsworth.*

9. Boatner, *Encyclopedia of the American Revolution*, pp. 795-96. Thomas Hoffman, *Fort Hancock* (Charleston, SC: Arcadia, 2007), p. 10. Hereafter: Hoffman, *Fort Hancock.*

10. Black, *History of Fort Wadsworth,* p. 5.

11. Signal Hill on Staten Island was the site of a signaling device more or less continually from about 1711 into the early 19th century to advise Manhattan of the arrival of shipping. Bedloe's, Oyster, and Governor's Islands were known collectively as the "Oyster Islands." James G. Wilson (ed.), *The Memorial History of the City of New-York* (New York: New-York History Co., *1892-93*), Vol. I, pp. 52-53. I.N. Phelps Stokes, *The Iconography of Manhattan Island 1498-1909* (New York: Robert H. Dodd, 1892-1928), Vol. IV, p. 1198. "Instructions to Charles Vincent acting as a temporary Engineer in the service of the United States," *American States Papers,* Series IV, Military Affairs, Vol. I, pp. p. 77. Hereafter: *ASPMA.* "General observations on the defense of the Harbor and City of New York by Mr. Vincent, New York, 1794," *ASPMA,* Vol. I, pp. 78-80.

12. "Memoire on the subject of fortifying the Port of New York...," by Bureaux Pusy, October 9, 1801, Document No. 1, *Buell Collection of Historical Documents Relating to the Corps of Engineers, 1801-1819*, NARA Microcopy Number 417. Hereafter Buell Document. Joseph Mangin, "Catalogue des plans du Project de Defense propose a Sandy Hook pour la protection de la...New York," Buell Document No. 3.

13. "A Project for Fortifying the Harbour of N. York from DeWitt Clinton," January 7, 1805, Buell Document No. 56.

14. H. Dearborn to Lt. Col. Jonathan Williams, September 20, 1805, Williams Papers, Lilly Library, Indiana Univ., Bloomington, IN, hereafter Williams Papers.

15. Buell Document No. 56.

16. R.S. Guernsey, *New York and Vicinity during the War of 1812-'15, Being a Military, Civic, and Financial Local History of that Period....* (New York: Charles L. Woodward, 1889), Vol. I, p. 63. Hereafter: Guernsey, *New York.*

17. Jonathan Williams to Selah Strong, Esq. July 29, 1807, Buell Document No. 117. Lewis W. Call, *United States Military Reservations, National Cemeteries and Military Parks, Title Jurisdiction, Etc.* Revised Ed. (GPO: 1907), p. 220. Hereafter: Call, *Reservations.*

18. Guernsey, *New York*, Vol. I, pp. 64-65. William Eustis to Jonathan Williams, May 4, 1808, Buell Document No. 164.

19. Guernsey, *New York*, Vol. I, p. 64. Call, *Reservations*, p. 220.

20. Jonathan Williams to William Eustis, October 15, 1808, Buell Document No. 182.

21. "Colonel Williams' Comprehensive Plan for the Defences at the Narrows, October 21, 1808," Daniel D. Tompkins, *Public Papers of Daniel D. Tompkins, Governor of New York, 1807-1817* (Albany: J.B. Lyon, 1902), Vol. III, pp. 138-45. Hereafter *Tompkins Papers.*

22. Daniel D. Tompkins to Thomas Jefferson, January 21, 1809, *Tompkins Papers*, Vol III, pp. 185-87. *New York Gazette and General Advertiser*, December 31, 1808, Vol. 5, p. 1499. "A History of Fort Hamilton, Brooklyn, New York," p. 7. This 18-page upublished work was written ca 1884 at Fort Hamilton and later placed in the Records of the Office of the Adjutant General, RG 94.

23. Daniel D. Tompkins to Thomas Jefferson, January 27, 1809, *Tompkins Papers*, Vol. III, pp. 185-86.

24. The Embargo Act of 1807 prohibited trade with all foreign countries, withdrawing nearly all American shipping from the seas. The 1807 Act was replaced with the Non-Intercourse Act of 1809, prohibiting trade only with Great Britain and France. De Witt Clinton *et al* to Daniel D. Tompkins, February 16, 1809, *Tompkins Papers*, Vol. III, pp. 207-10.

25. Daniel D. Tompkins to Jonathan Williams, January 6, 1810; Jonathan Williams to the Commission on Fortifications of the State of New York, January 18, 1810, Williams Papers.

26. "De Witt Clinton *et al* to Daniel D. Tompkins, February 16, 1809, *Tompkins Papers*, Vol. III, pp. 207-10. Richmond Country was named for Charles Lennox (1672–1723), the illegitimate son of Charles II. Lennox was created Duke of Richmond in 1675.

27. Jonathan Williams to the Commission on Fortifications of the State of New York, January 18, 1810, Williams Papers.

28. Ibid.

29. DeWitt Clinton *et al* to Daniel D. Tompkins, February 16, 1809, *Tompkins Papers*, Vol. III, pp. 207-10.

30. Fort Hudson was named for explorer Henry Hudson, Fort Morton for John Morton, signer of the Declaration of Independence, Matthew Adams (comp.), *Designating US Seacoast Fortifications* (Peoria, IL: Self, 2000), pp. 212, 217-18. Hereafter: Adams, *Designating US Seacoast Fortifications.* Ibid. The Glacis Mortar Battery built in the early 1870s is believed to have been constructed on the site of Battery Morton.

31. Jonathan Williams to the Commission on Fortifications of the State of New York, January 18, 1810, Williams Papers.

32. De Witt Clinton to Daniel D. Tompkins, February 26, 1811, *Tompkins Papers*, Vol. III, pp. 261-62. Report of Warlike Stores Belonging to the State of New York, February 27, 1811, *Tompkins Papers,* Vol. III, pp. 263.

33. Jonathan Williams to the Commission on Fortifications of the State of New York, January 18, 1810, Williams Papers.

34. Guernsey, *New York,* Vol. I, pp. 73-74, 76, 98-99.

35. Jonathan Williams to William Eustis, July 10, 1812, Buell Document No. 332. Jonathan Williams to James Madison, July 10, 1812, Buell Document No. 333. William Eustis to Jonathan Williams, July 27, 1812, Buell Document No. 431. Francis B. Heitman, *Historical Register and Dictionary of the United States Army from its Organization September 29, 1789, to March 2, 1903*, Vol. I (GPO: 1903), p. 226. Hereafter: Heitman, *Historical Register.*

36. Maj. George D. Bomford served as both an engineer and as an ordnance officer, on which duty he focused most of his skills during the War of 1812. George Washington Cullum, *Biographical Register of the Officers and Graduates of the U.S. Military Academy at West Point, N.Y., from its Establishment in 1802 to 1890, with the Early History of the United States Military Academy,* 3rd Ed. (Boston: Houghton Mifflin, 1891), Vol. I, pp. 58-59. Hereafter, Cullum, *Biographical Register.*

37. Guernsey, *New York,* Vol I, pp. 166-67, 172-75, 178-81.

38. Swift was a protégé of Williams and had worked frequently with the former chief engineer. Cullum, *Biographical Register*, Vol. I, pp. 51-56. Joseph G. Swift, *The Memoirs of General Joseph Gardner Swift, L.L.D., U.S.A., First Graduate of the United States Military Academy, West Point* (Worcester, MA: Privately published, 1890), pp. 103-04, 109-10. Hereafter: Swift, *Memoirs.*

39. Guernsey, *New York,* Vol. I, pp. 219, 301-02.

40. Jonathan Williams to the Commission on Fortifications of the State of New York, January 18, 1810, Williams Papers.

41. Guernsey, *New York*, Vol. I, p. 6. Although purchase of the Denyse farm was recommended, the initial land was not acquired until after the War of 1812.

42. Cutbush was employed in the field during the War of 1812 and then in the works around New York City. Following the war, he resigned his commission but continued fortification work around New York Harbor until his death at age 69 in 1855. Cullum, *Biographical Register,* p. 109. An 1805 graduate of USMA, Bomford had been engaged in fortification work around New York since 1810. Cullum, *Biographical Register*, Vol. I, pp. 58-59. William Cutbush to John Armstrong, March 15, 1813, Buell Document No. 400.

43. Black, *History of Fort Wadsworth,* p. 52. Guernsey, *New York,* Vol. I, p. 177.

44. Jonathan Williams to the Commission on Fortifications of the State of New York, January 18, 1810, Williams Papers. Black, *History of Fort Wadsworth*, p. 6. Swift *Memoirs*, p. 111.

45. War Department to George Bomford, July 28, 1813, Buell Document No. 442.

46. Swift, *Memoirs*, pp. 112-13, 123. William Cutbush to Joseph Gardner Swift, December 8, 1813, Buell Document No. 452. Cullum, *Biographical Register*, Vol. I, pp. 56-57. Guernsey, *New York*, p. 180.

47. Babcock, an 1808 graduate of the USMA, served in the New York area and in the field during the War of 1812. He was promoted to captain September 20, 1812. "List of all land purchased by U.S. for Military Purposes," *ASPMA*, Vol. II, p. 284. Call, *Reservations*, p. 220.

48. Cutbush to Armstrong, March 15, 1813, Buell Document No. 400.

49. William Cutbush to Joseph Gardner Swift, December 8, 1813, Buell Document No. 452.

50. Joseph G. Swift to John Armstrong, February 23, 1814, Buell Document Nos. 477, 478, and 479. Cullum *Biographical Register*, Vol. I, pp. 51-56. "List of all lands which have been purchased by the United States for military purposes.," *ASPMA*, Vol. II, p. 284. Call, *Reservations*, p. 214.

51. Joseph G. Swift to John Armstrong, February 23, 1814, Buell Document Nos. 478-79. John Armstrong to J.G. Swift, June 5, 1814, Buell Document No. 488.

52. Cutbush to Swift, December 8, 813, Buell Document No. 452. Samuel Babcock to William Eustis, October 1, 1812, Buell Document No. 359. Cullum, *Biographical Register*, Vol. I, p. 81.

53. Joseph G. Swift to William H. Crawford, August 31, 1816, Buell Document No. 671.

54. DeRussy was an 1812 graduate of the USMA and was assigned to New York Harbor as an assistant engineer. Following the war, he was assigned to fortification building on the Gulf coast before returning to New York. Cullum, *Biographical Register*, Vol. I, pp. 109-10. Department Orders, Headquarters Castle Clinton, May 13, 1817, Buell Document No. 722. Swift to DeRussy, May 15, 1817, Buell Document No. 721; Swift to George Graham, May 15, 1817, Buell Documents No. 722, 723, and 724.

55. J.G. Swift to John C. Calhoun October 12, 1818, *ASPMA*, Vol. I, pp. 811-12. Armistead to Vanderventer, November 30, 1819, Buell Document No. 834.

56. Report of the Board of Fortifications, February 7, 1821, *ASPMA*, Vol. II, pp. 305-15.

57. "Table exhibiting the permanent fortifications which have been erected or are now erecting. . . " February 25, 1824; A. Macomb to J.S. Calhoun, February 25, 1824, *ASPMA*, Vol. III, pp. 627-28.

58. Report of the Engineer Department, November 14, 1822, *ASPMA*, Vol. II, pp. 457-60.

59. J.C. Calhoun to James Monroe, November 29, 1823, *ASPMA*, Vol. II, p. 554. Adams, *Designating US Seacoast Fortifications*, p. 2.

60. J.C. Calhoun to the President, November 29, 1823, *ASPMA*, Vol. II, p. 554.

61. Runyon, "History" pp. 5-6.

62. Alexander Macomb to J.C. Calhoun, November 20, 1824, *ASPMA*, Vol. II, pp. 713-16.

63. "Report of the Operations of the Engineer Department during the Year Ending September 30, 1825," November 21, 1825. *ASPMA*, Vol. III, pp. 135-43. Call, *Reservations*, pp. 215-16. Runyon, "History," p. 7. Adams, *Designating US Seacoast Fortifications*, p. xxxi.

64. "Report of the Chief Engineer, November 18, 1826," *ASPMA*, Vol. III, pp. 358-59; November 20, 1827, *ASPMA*, Vol. III, p. 628.

65. "Report of the Chief Engineer, November 19, 1828," *ASPMA*, Vol. IV, p. 12. In July 1825, DeRussy, then on duty at Fort Morgan, AL, and in poor health, was assigned to the works under construction at New York. DeRussy traveled to New York for recuperation and then resumed fortification duties in the harbor.

66. "Report of the Chief Engineer, November 18, 1828," *ASPMA*, Vol. IV, p. 164. Colonel Gratiot had relieved Colonel Macomb in May 1828.

67. Statement of average prices paid for certain material and workmanship at Fort Adams, Rhode Island, and Fort Hamilton, New York, in the years 1828, 1829, and 1830..., March 30, 1832, *ASPMA*, Vol. V, p. 5.

68. "Report of the Chief Engineer, November 19, 1830," *ASPMA*, Vol. IV, p. 593. "Statement Showing Number of Persons Employed under the Engineer Department [at Fort Hamilton]," May 27, 1831, *ASPMA*, Vol. V, p. 98.

69. Annual Report of the Chief Engineer, November 13, 1832, *ASPMA*, Vol. V, pp. 42-43, 55. Annual Report of the Chief Engineer, November 23, 1833, *ASPMA*, Vol. V, pp. 184-85, 199. Prior to arrival at Fort Hamilton, Major Pierce's command had been posted at Fort Delaware, which was consumed by fire in February 1831. "Position and Distribution of the troops in the Eastern Department under the command of Brevet Major General Winfield Scott," November 1833, *ASPMA*, Vol. V, p. 177. Runyon, "History," p. 8.

70. Report from the Engineer Department, November 1, 1834, *ASPMA*, Vol. V, p. 386.

71. Runyon, "History," p. 8.

72. "Drawings exhibiting the progress made upon Fort Hamilton prior to the 1st of October, 1829," Drawer 40, Sheet 9, and "Plan, Fort Hamilton, 1869," Drawer 259, Sheet 71, Fortification Map Files, RG 77, NARA, Archives II, College Park, MD.

73. James St. Clair Morton, "Memoir on the Dangers and Defenses of New York City," September 30, 1858, Appended Document No. 12, Report of the Sec. of War, 1858, Exec Doc. No. 2, Senate and House Exec Docs, 35th Cong, 2nd Sess, pp. 494-581. Plan of Fort Hamilton Redoubt, September 18, 1864; Plan of Barbette Tier 1869, Fortification Map Files, RG 77, Archives II.

74. "Ordnance to Complete the Armament of Forts," February 27, 1836, *ASPMA*, Vol. VI, p. 121. R. Jones to Alexander Macomb, March 5, 1836, *ASPMA*, Vol. VI, p. 167.

75. Statement of Garrisons, November 30, 1836, *ASPMA*, Vol. VI, p. 823.

76. Report from the Engineer Department, November 29, 1839, Senate Exec Doc No. 1, 26th Cong, 1st Sess, pp. 162-63. Report of the Chief Engineer, November 19, 1841, Senate Exec Doc No. 1, 27th Cong, 2nd Sess, pp. 119-20.

77. Report of the Chief Engineer, November 1, 1842, Senate Exec Doc No. 1, 27th Cong, 3rd Sess, pp. 248-49.

78. Report of the Chief Engineer, November 2, 1843, Senate Exec Doc No. 1, 28th Cong, 1st Sess, pp. 98-99.

79. Report of the Chief Engineer, November 1, 1845, Senate Exec Doc No. 1, 98th Cong, 1st Sess, pp. 247-48; November 10, 1846, Senate Exec Doc No. 1, 29th Cong, 2nd Sess, pp. 119-20.

80. "Statement exhibiting the amount of money expended for fortifications in each of the states of the United States prior to September 30, 1840 and the annual appropriations and expenditures from that time to June 30, 1846," Senate Exec Doc No. 79, 29th Cong, 2nd Sess, pp. 1-12.

81. Report of the Chief Engineer, November 18, 1847, Senate Exec Doc No. 1, 30th Cong, 1st Sess, p. 606.

82. Report of the Chief Engineer, November 18, 1848, Senate Exec Doc No. 1, 30th Cong, 2nd Sess, pp. 256-57.

83. Runyon, "*History*."

84. Report of the Chief Engineer, November 9, 1849, Senate Exec Doc No. 1, 31st Cong, 1st Sess, pp. 215-16; November 30, 1850, Senate Exec Doc No. 1, 31st Cong, 2nd Sess, pp. 353-54.

85. Report of the Colonel of Engineers, November 14, 1851, Senate Exec Doc No. 1, 32nd Cong, 1st Sess, pp. 349-50; November 30, 1852, Senate Exec Doc No. 1, 32nd Cong, 2nd Sess, p. 151. Report of the Chief Engineer, November 30, 1853, Senate Exec Doc No. 1, 33rd Cong, 1st Sess, p. 166; November 29, 1854, Senate Exec Doc No. 1, 33rd Cong, 2nd Sess, p. 102. Runyon, "*History*," pp. 8-9.

86. Report of the Colonel of Engineers, November 14, 1851, Senate Exec Doc No. 1, 32nd Cong, 1st Sess, pp. 349-50; November 30, 1852, Senate Exec Doc No. 1, 32nd Cong, 2nd Sess, p. 151. Report of the Chief Engineer, November 30, 1853, Senate Exec Doc No. 1, 33rd Cong, 1st Sess, p. 166; November 29, 1854, Senate Exec Doc No. 1, 33rd Cong, 2nd Sess, p. 102. Runyon, "*History*," pp. 8-9.

87. Report of the Chief of Engineers, November 8, 1859, Senate Exec Doc No. 2, 36th Cong, 1st Sess, pp. 642-43.

88. Runyon, "*History*," pp. 6-7.

89. Report from the Engineer Department, November 29, 1839, Senate Exec Doc No. 1, 26th Cong, 1st Sess, p. 162. Colonel Totten succeeded Colonel Gratiot in 1838 and served as chief engineer until his death in 1863.

90. Lewis W. Call, *Military Reservations*, pp. 242-44.

91. Report on the Defence of the Atlantic Frontier from Passamaquoddy to the Sabine, April 24, 1840, Senate Exec Doc No. 451, 26th Cong, 1st Sess.

92. Douglas S. Freeman, *R.E. Lee: A Biography* (New York: Scribner's and Sons, 1934), Vol. I, pp. 186, 189.

93. Report of the Chief Engineer, November 19, 1841, Senate Exec Doc No. 1, 27th Cong, 2nd Sess, p. 120.

94. Freeman, *R.E. Lee,* Vol I, p. 189. Report of the Chief Engineer, November 1, 1842, House Exec Doc No. 2, 27th Cong, 3rd Sess, pp. 240-41. Lee spent the winter months, when work at the Narrows was on hold, as Totten's assistant at Washington, until he was ordered to take the field in the Mexican War in 1846. Report of the Chief Engineer, November 2, 1843, Senate Exec Doc No. 1, 28th Cong, 1st Sess, p. 100.

95. Report of the Chief Engineer, November 30, 1844, Senate Exec Doc No. 1, 28th Cong, 2nd Sess, p. 171; November 18, 1847, Senate Exec Doc No. 1, 30th Cong, 1st Sess, p. 607.

96. Report of the Chief Engineer, November 18, 1847, Senate Exec Doc No. 1, 30th Cong, 1st Sess, p. 607; November 18, 1848, Senate Exec Doc No. 1, 30th Cong, 2nd Sess, pp. 257-58. One of the leading intellects of the army, Delafield succeeded Totten as chief engineer in 1864. Cullum, *Biographical Register*, Vol. I, pp. 180-86.

97. Report of the Chief Engineer, November 9, 1849, Senate Exec Doc No. 1, 31st Cong, 1st Sess, p. 216; November 30, 1850, Senate Exec Doc No. 1, 31st Cong, 2nd Sess, p. 354.

98. Report of the Colonel of Engineers, November 14, 1851, Senate Exec Doc No. 1, 32nd Cong, 1st Sess, p. 350.

99. Report of the Colonel of Engineers, November 30, 1852, House Exec Doc No. 1, 32nd Cong, 2nd Sess, pp. 147, 151. Report of the Chief of Engineers, November 30, 1853, Senate Exec Doc No. 1, 33rd Cong, 1st Sess, p. 166; November 29, 1853, Senate Exec Doc No. 1, 33rd Cong, 2nd Sess, p. 101.

100. Captain Dutton was in charge of the Engineer Agency at New York, purchasing and shipping materials for public projects, when he was given temporary charge of the defenses at the Narrows. Barnard had extensive fortification and engineering experience in New York Harbor and elsewhere and had served in the field during the War with Mexico. Cullum, *Biographical Register*, Vol. I, pp. 275-76, 530-35. Report of the Colonel of Engineers, November 24, 1855, Senate Exec Doc No. 1, 34th Cong, 1st Sess, p. 195. Report of the Chief of Engineers, November 25, 1856, Senate Exec Doc No. 1, 34th Cong, 3rd Sess, p. 278.

101. Report of the Chief of Engineers, November 24, 1857, Senate Exec Doc No. 11, 35th Cong, 1st Sess, p. 174.

102. Report of the Chief of Engineers, November 22, 1858, Senate Exec Doc No. 11, 35th Cong, 2nd Sess, pp. 817-18; November 8, 1859, Senate Exec Doc No. 11, 36th Cong, 1st Sess, pp. 641-42.

103. Report of the Engineer Bureau, November 14, 1860, Senate Exec Doc No. 11, 36th Cong, 2nd Sess, pp. 259-60. Letter from the Secretary of War in Reference to Fortifications, December 11, 1854, House Exec Doc No. 5, 32nd Cong, 1st Sess, pp. 18-19. Senate Exec Doc No. 1, 36th Cong, 2nd Sess, p. 260. Report of the Engineer Bureau, November 30, 1861. War Department, *War of the Rebellion: A Compilation of the Official Record of the Union and Confederate Armies,* (GPO), Series III, Vol. I, p. 687.

104. Report of the Chief of Engineers, November 8, 1859, Senate Exec Doc No. 11, 33rd Cong, 2nd Sess, pp. 101-02; November 24, 1855, Senate Exec Doc No. 11, 34th Cong, 1st Sess, pp. 195-96; November 25, 1856, Senate Exec Doc No. 1, 34th Cong, 3rd Sess, p. 278.

105. Letter from the Secretary of War in Reference to Fortifications, December 11, 1854, House Exec Doc No. 5, 32nd Cong, 1st Sess, pp. 18-19.

106. Heitman, *Historical Register,* Vol. I, p. 992. Adams, *Designating US Seacoast Fortifications*, p. 21.

107. The new fort on the site of Fort Tompkins was officially termed "the fort on the site of Fort Tompkins" long after completion. In more recent times, the 3rd-System fort assumed the name of its predecessor work.

108. Message from the President of the United States . . . in relation to the military and naval defenses of the country, April 24, 1840, Senate Exec Doc No. 454, 26th Cong, 1st Sess, pp. 52-53. Letter from the Secretary of War in Reference to Fortifications, December 11, 1854, House Exec Doc No. 5, 32nd Cong, 1st Sess, pp. 18-19. Report of the Colonel of Engineers, November 24, 1855, Senate Exec Doc No. 1, 34th Cong, 1st Sess, p. 195. Report of the Chief of Engineers, November 25, 1856, Senate Exec Doc No. 1, 34th Cong, 3rd Sess, p. 278; November 24, 1857, Senate Exec Doc No. 11, 35th Cong, 1st Sess, p. 174. Call, *Reservations*, p. 242.

109. Report of the Chief of Engineers, November 22, 1858, Senate Exec Doc No. 11, 35th Cong, 2nd Sess, pp. 817-18; November 8, 1859, Senate Exec Doc No. 11, 36th Cong, 1st Sess, pp. 641-42.

110. Report of the Chief of Engineers, November 8, 1859, Senate Exec Doc No. 11, 36th Cong, 1st Sess, pp. 641-42. Report of the Engineer Bureau, November 14, 1860, Senate Exec Doc No. 1, 36th Cong, 2nd Sess, p. 260.

111. Report of the Engineer Bureau, November 14, 1860, Senate Exec Doc No. 1, 36th Cong, 2nd Sess, p. 260. War Department, *War of the Rebellion: A Compilation of the Official Record of the Union and Confederate Armies* (GPO), Series III, Vol. I, p. 732, Vol. IV, p. 504.

112. William P. Trowbridge graduated from USMA in 1848 and resigned after two years. He was in charge of the Engineer Agency in New York during the Civil War, which supplied material for fortifications, as well as to the field armies. He also served as superintended fortifications in New York Harbor until the end of the war. Colonel Prime was an 1850 USMA graduate and served on fortification duty until the Civil War. He served with the field armies until returning to fortification duty in the Northeast in mid-1863. He retired in 1871. Cullum, *Biographical Register*, Vol. II, pp. 343, 400-01. *Annual Report of the Secretary of War*, Annual Report of the Chief of Engineers, October 20, 1866 (GPO, 1866), pp. 423-24. Hereafter: ARCE, year.

113. ARCE, 1867, p. 9.

114. Gilmore conducted the successful bombardment of Fort Pulaski, GA, and the artillery siege of Fort Sumter. Cullum, *Biographical Register*, Vol. II, pp. 367-70.

115. ARCE, 1868, p. 13; 1869, pp. 12-13.

116. ARCE, 1871, pp. 14-15; 1872, pp. 11-12.

117. ARCE, 1873, pp. 11-12; 1874, pp. 13-14; 1875, pp. 13-14; 1876, pp. 14-15.

118. Adams, *Designating US Seacoast Fortifications*, p. 251.

119. Fredrick H. Dyer, *A Compendium of the War of the Rebellion* (Cedar Rapids, IA, Torch Press, 1908), Vol. III, pp. 1383-86, 1432-33, 1454-55, 1460, 1467, 1693-94. Hereafter: Dyer, *Compendium.*

120. James C. Bush, "The Fifth Regiment of Artillery," in Theodore F. Rodenbough and William L. Haskin (eds.), *The Army of the United States: Historical Sketches of Staff and Line with Portraits of Generals-in-Chief,* University Microfilms, Ann Arbor, MI, pp. 319, 377, 397, 443. Hereafter: Bush, "The Fifth Regiment of Artillery."

121. Dyer, *Compendium,* Vol. III, p. 1710. W.A. Simpson, "The Second Regiment of Artillery," in Theodore F. Rodenbough and William L. Haskin, (eds.) *The Army of the United States: Historical Sketches of Staff and Line with Portraits of Generals-in-Chief,* University Microfilms, Ann Arbor, MI, pp. 319, 443.

122. Bush, "The 5th Regiment of Artillery," p. 394.

123. Charles W. Abbot Jr., "The Twelfth Regiment of Infantry," in Rodenbough and Haskin, *Army of the United States,* pp. 555-56, 565.

124. Defenses of New York Harbor: East side of the Narrows of New York Harbor, Conditions of Seacoast Fortifications 1886-1887, Drawer 40, Sheet A, 1886, Fortification Map File, RG 77, Archives II. Hereafter: "Defenses of New York."

125. Lonnie R. Speer, *Portals to Hell, Military Prisons of the Civil War* (Mechanicsburg, PA: Stackpole, 1997), p. 3.

126. "Destruction of Fort Lafayette," *New York Times*, December 2, 1868, p. 1.

127. ARCE, 1878, pp. 12-13. "Defenses of New York Harbor."

128. ARCE, 1881, pp. 31-32.

129. ARCE, 1881, pp. 31-32; 1867, p. 10. "Fort Tompkins: A Look at the Great Work at Clifton, Staten Island," *Brooklyn Daily Eagle*, October 18, 1873, p. 6. Hereafter: *Brooklyn Daily Eagle.*

130. ARCE, 1872, pp. 12-13; 1875, pp. 15-16.

131. ARCE, 1885, p. 23.

132. ARCE, 1885, pp. 23-24; 1867, p. 10.

133. ARCE, 1871, p. 19; 1872, p. 12; 1873, p. 12; 1874, p. 15; 1875, p. 15. "Fort Tompkins," *Brooklyn Daily Eagle.*

134. ARCE, 1867, pp. 9-10; 1869, p. 13; 1870, p. 19; 1871, p. 15.

135. ARCE, 1870, p. 19; 1872, p. 12. *Report of the Board on Fortifications or other Defenses Appointed by the President of the United States under the Provision of the Act of Congress Approved March 3, 1885* (GPO, 1886), pp. 374-78.

136. ARCE, 1872, p. 12; 1873, p. 12; 1874, pp. 14-15; 1875, p. 15; 1876, pp. 15-16; 1878, pp. 14-15.

137. "Fort Tompkins," Brooklyn *Daily Eagle.*

138. ARCE, 1872, p. 12; 1873, p. 11; 1875, p. 14; 1877, p. 11; 1882, p. 28; 1885, p. 21. "Fort Tompkins," *Brooklyn Daily Eagle.*

139. ARCE, 1860, p. 259.

140. ARCE, 1867, p. 9; 1874, pp. 12-13. "Defenses of New York Harbor." Glen M. Williford, *The Transitional Coast Defense Generation, American Seacoast Defenses of the 1870s* (Self: Zionsville, IN, 2005). Hereafter: Williford, *Transitional Generation.*

141. ARCE, 1871, p. 14; 1872, p. 11; 1873, pp. 10-11; 1874, pp. 12-13. "Defenses of New York Harbor." Williford, *Transitional Generation.*

142. ARCE, 1872, p. 11; 1873, pp. 10-11; 1874, pp. 12-13; 1875, p. 13. "Defenses of New York Harbor." Williford, *Transitional Generation.*

143. ARCE, 1881, pp. 27-28.

144. Heitman, *Historical Register*, Vol. I, p. 874. William L. Haskin, "The First Regiment of Artillery," in Theodore F. Rodenbough and William L. Haskin, (eds.) *The Army of the United States: Historical Sketches of Staff and Line with Portraits of Generals-in-Chief*, University Microfilms, Ann Arbor, MI, 1966, pp. 308-11. Hereafter: Haskin, "The First Regiment of Artillery."

145. Haskin, "The First Regiment of Artillery," pp. 308-11.

146. The Fenians attempted to invade Canada to pressure the United Kingdom to give Ireland its independence. Haskin, "The First Regiment of Artillery," p. 310.

147. Bush, "The Fifth Regiment of Artillery," p. 398.

Defending the Narrows
The Harbor Defenses of Southern New York

William C. Gaines

Part II, The Breechloading Era, 1890-1950

The Garrison Deploys during the War with Spain

With the departure of the 5th Artillery in 1890, the 1st Artillery returned from the South to occupy the forts at the Narrows, bringing nine heavy and one light battery to New York Harbor. Following the usual pattern, in early 1896 the First Artillery Regiment was distributed as follows: Batteries A, G, and I at Fort Hamilton; C, D, and L at Fort Wadsworth; and Batteries B, H, and M at Fort Columbus. The 1st Artillery returned to the South in October 1896, while the 5th Artillery returned from the West Coast. Lt. Col. William Sinclair, 5th Artillery, commanded Batteries E, K, and L on Staten Island, Maj. Joseph G. Ramsay commanded Batteries A, D, H, and I at Fort Hamilton.(1)

By early 1898, batteries of the 5th Artillery were moving increasingly frequently. As modern batteries were completed at Sandy Hook, Batteries A, C, L, and M moved down to man them in March 1898, joined by Battery C from Fort Slocum. By summer, Batteries D, F, G, and K had been designated to form part of the siege train being organized at Camp Rodgers at Ybor City, in Tampa, FL. Only two batteries of the 5th Artillery garrisoned the Narrows forts through the brief Spanish-American War, Battery I at Fort Hamilton and Battery E at Fort Wadsworth. By September, Batteries F and H rejoined Battery I at Fort Hamilton and Battery M arrived at Fort Wadsworth.(2)

In 1899, two more batteries, N and O, were authorized for each existing regiment of artillery, making 14 firing batteries. Both new batteries in the 5th Artillery were assigned to seacoast defenses.

Modernizing Defenses at the Narrows 1897-1914

Mine Installations

As early as 1887, plans had been made to plant submarine mines in the Narrows channel in the event of war. First, a mine operating room or "casemate" for controlling the minefield in the Narrows was constructed by modifying gun casemates on the lower tier of Fort Wadsworth's northwest bastion. The casemate was afforded the same type of overhead and lateral protection as the other mining casemates in the New York area, including additional masonry on the casemate's scarp side. The operating room contained the electrical switchboard; a battery room housed the wet-cell batteries that powered the mine control boards. A third space housed the oil (kerosene) engine to charge the wet-cell batteries. Cables passed through a cable gallery to the outside of the fort and thence to the minefield. On July 1, 1897, additional submarine mining facilities were begun on Staten Island. A brick torpedo (mine) storehouse with a bridge crane and a cable tank with a movable hoist for handling cable drums had been built behind Fort Wadsworth. (3)

War with Spain Prompts Activation of the Mines

Between 1896 and 1898, a board of engineer officers undertook a study to improve the submarine mine materiél and system for New York Harbor. They had practically completed that study when

hostilities with Spain commenced in March 1898. At the beginning of 1898, a number of mine cases and a small amount of operating equipment were stored at the Engineer Depot on Willets Point, at the East River outlet into Long Island Sound. There was, however, little or no material on hand to swiftly install submarine mines in the nation's harbors. Mines were to be planted in two areas in the southern approaches to New York Harbor. The outer minefield was to be planted in the Ambrose and other channels between Sandy Hook and Rockaway Point and controlled from Sandy Hook. The inner minefield in the Narrows would be controlled from Fort Wadsworth.

Following the destruction of the USS *Maine* in Havana Harbor on February 15, 1898, nearly two million dollars was expended on single and multiple-conductor cable, more than 150 tons of explosives, mine cases, searchlights, circuit closers and regulators, casemate operating apparatus, and other submarine mining materiél.

Because of the proximity of the materiél at Willets Point, it was possible to begin planting the mines in both the outer and inner fields in April 1898. Planting the minefields was hampered by a lack of equipment, but by June 11, 1898, the minefields were planted and until the end of the war, mining activities consisted for the most part of maintenance.

The Narrows minefield was illuminated by a pair of 36-inch searchlights, temporarily mounted on the parapets of Fort Lafayette and Fort Wadsworth. When the order to take up the Narrows minefield was issued in July 1898, all but two of the mines were recovered. Their associated cables were taken up in August and all material was cleaned, overhauled, and stored in the torpedo storehouse at Fort Wadsworth.(4)

Temporary Defenses of the Minefields

In the tense atmosphere crated by the war in 1898, temporary batteries were erected and armed with what could be provided from Ordnance Department stocks, the objective being to utilize any weaponry that could cover the minefields. The Narrows minefield was covered by two 4.72-inch Armstrong quick-firing guns emplaced in South Cliff Battery by July 1898. In addition to the numerous smoothbore Rodman guns and converted rifles mounted in Fort Wadsworth, South Cliff Battery and the original section of Battery Hudson were still armed with a pair of 300-pounder Parrott Rifles and two 15-inch Rodmans. In the original section of the battery, two more emplacements formerly occupied by 15-inch Rodmans were prepared for a pair of M1888 8-inch breechloading guns by modifying the existing gun platforms. By June 1898, one of the platforms had been modified. The second emplacement was modified by July 1898 and the two 8-inch guns were mounted on their carriages in August 1899. Five more pintle plates were set in 15-inch Rodman platforms and five other 15-inch Rodman platforms altered to receive 8-inch converted muzzle-loading rifles (MLR). These were 10-inch Rodman smoothbores re-sleeved to 8-inch rifles, using wrought-iron sleeves. Parrott Rifles, in the seacoast defenses since the Civil War, had an unpleasant habit of bursting unpredictably, and were considered generally unreliable. However, although obsolete, several still constituted part of the armament on Staten Island through the end of the 19th century. In 1901, two 100-pounder and one 300-pounder Parrot rifles were dismounted in the Staten Island batteries and shipped away as historical monuments.

Because of the 1898 emergency, a temporary battery for three 8-inch converted rifles with a sand parapet and magazine was begun in May at Princess Bay on Staten Island; it was completed in June 1898 for just over $4,000. Three 8-inch converted rifles were dismounted at Fort Wadsworth and moved to the Princess Bay battery in July 1898. (5)



15-inch Rodman gun on center-pintle carriage. *Author's Collection*

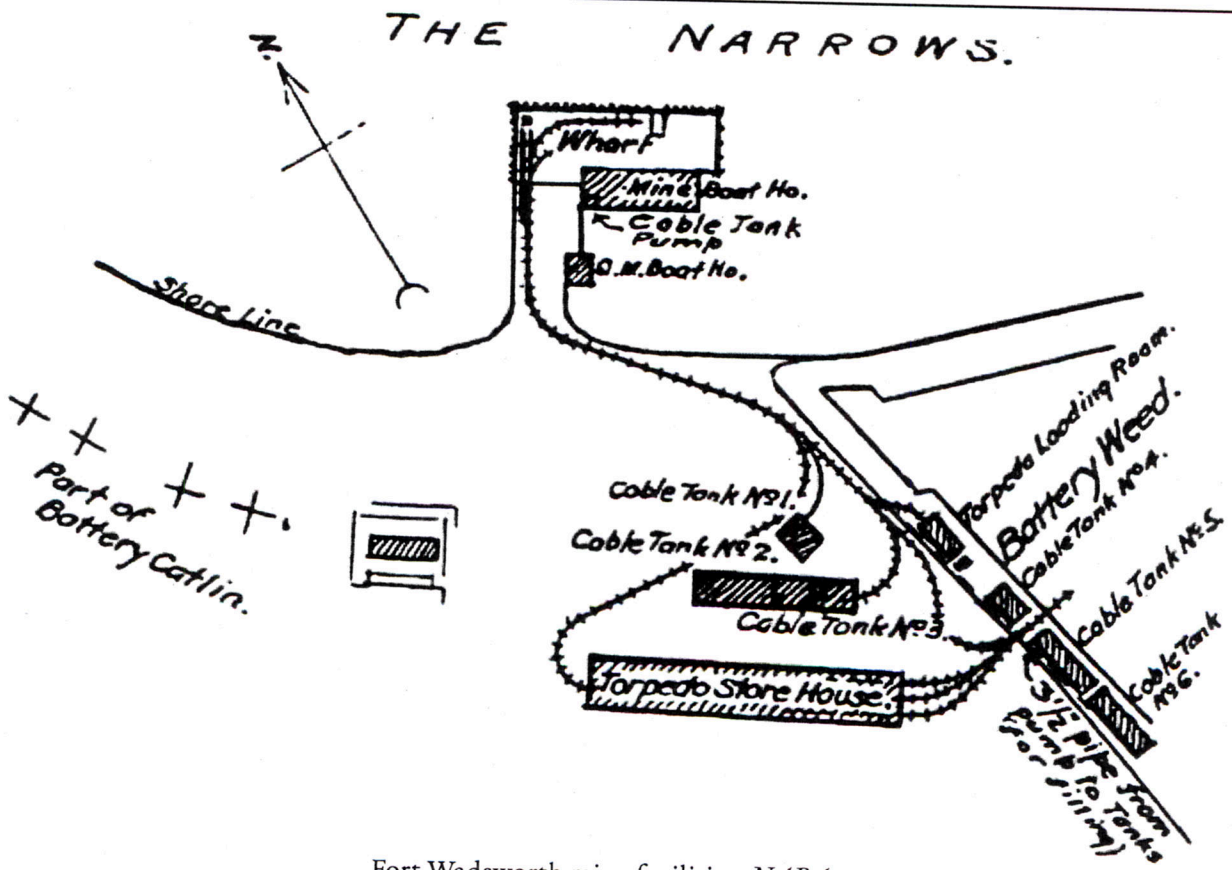
New Mine Facilities on Staten Island

After the war, the mines and cable were taken up and the operating materiél was removed from the casemate and stored in the large torpedo storehouse behind the fort. The two portable 36-inch searchlights and their power plants were also placed in storage. The fort casemate had proven unsuitable for electrical equipment due to dampness. Attempts to improve it were unsuccessful, and although it was finally transferred to the garrison on May 6, 1901, plans were developed to relocate the mine casemate.

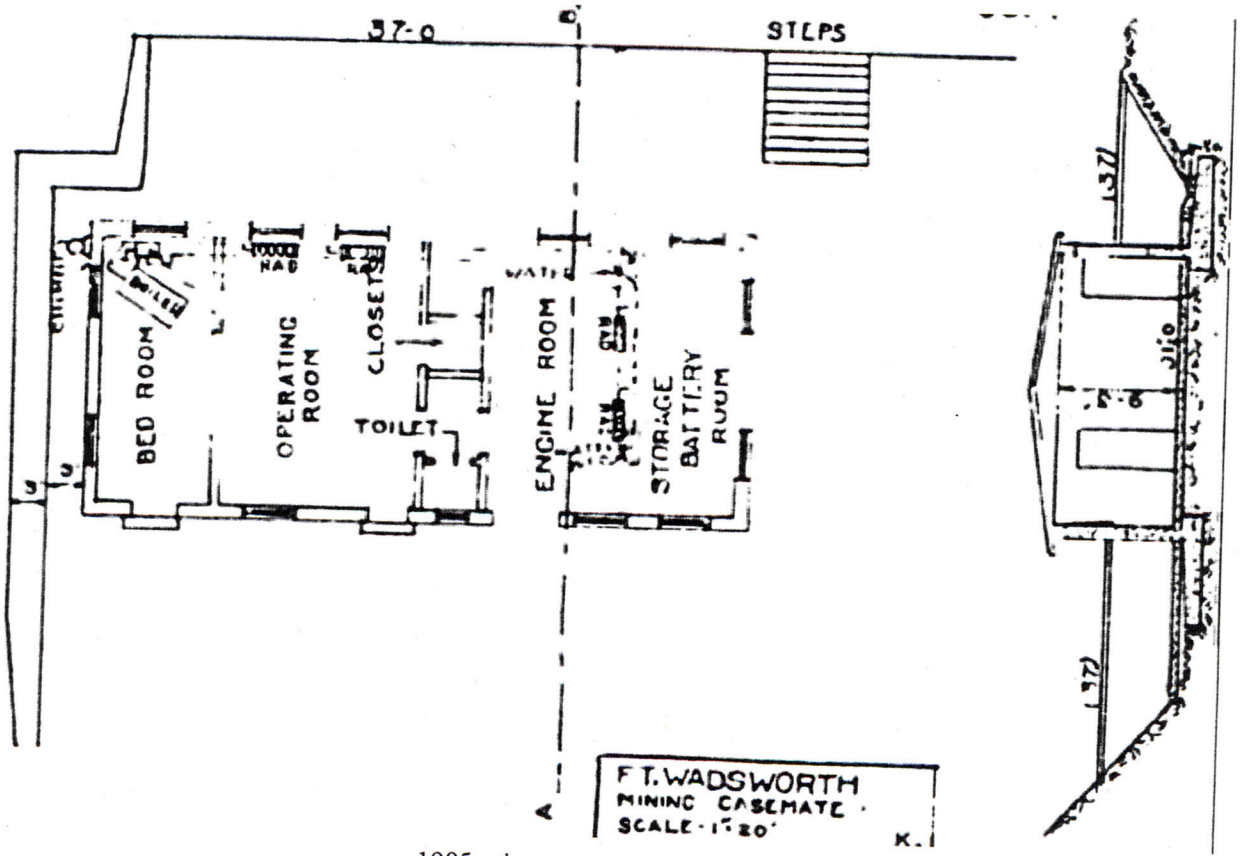
In the latter part of 1898, two additional cable tanks were built in the ditch of Fort Wadsworth's gorge to store the large amounts of submarine cable retrieved from the minefields at the end of the war. A crane served both tanks. All three cable tanks and the torpedo storehouse were formally transferred to the coast artillery garrison on May 6, 1901, although they had been in use for nearly three years. (6)

A new mine casemate was required to replace the original one in the old fort, which was renamed Battery Weed in 1902. The new mine casemate commenced in 1904 was transferred to the coast artillery March 29, 1905. The four-room brick building roofed with copper was near the right-flank of Battery Catlin, some 300 feet northwest of the mine wharf. It contained a storage battery room, an engine room, an operating room, and a small bedroom for personnel assigned to the casemate. The casemate was partially concealed by an embankment formed by a remnant of the old North Cliff Battery parapet at the south end of Battery Catlin.(7)

In addition, a mine loading room was commenced in 1904, adjacent to the cable tanks in the north end of the old fort's ditch. Beyond these additions to the shore facilities of the submarine defenses, little more was done until the Murray Board's recommendations were approved in February 1905. At Fort Wadsworth, the board called for two additional cable tanks and an extension of the tramway to the end of the wharf, along with an extension of the wharf's stonework.(8)



Fort Wadsworth mine facilities. *NARA*



1905 mine casemate. *NARA*

Modern Gun Batteries at Fort Hamilton

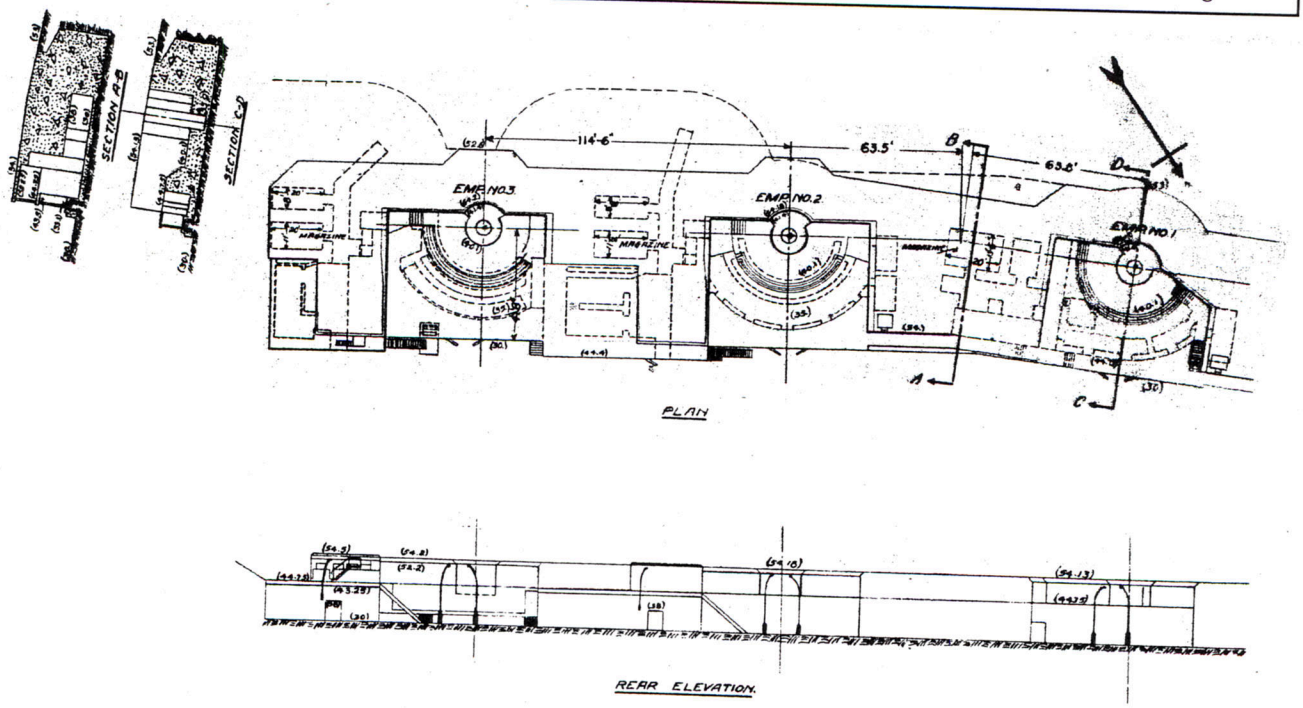
Detailed planning for the first modern breechloading gun and mortar batteries on the Long Island side of the Narrows began in the early 1890s. Eventually 11 batteries would be built at Fort Hamilton, supplanting the outdated muzzleloading smoothbores and rifles. By the early 1900s, six 12-inch, seven 10-inch, ten 6-inch, two 4.72-inch, and two 3-inch breechloading guns, plus eight 12-in mortars, were emplaced. These, with a similar number of guns on Staten Island, would prevent a hostile fleet from passing the Narrows and laying waste to New York City.

Seven-Gun 10-inch Battery Constructed along Fort Hamilton's Shoreline

On July 23, 1892, six years before the war with Spain, the chief of engineers ordered detailed drawings and cost estimates for two massive battery structures to mount seven 10-inch guns on disappearing carriages along the Narrows east of Fort Hamilton. All seven emplacements would be on the site of the new 15-inch Rodman battery, bearing on the Narrows, while Emplacements 6 and 7 would also bear on Gravesend Bay and Lower New York Bay. On October 18, drawings and cost estimates of $413,290.40 were submitted to the chief of engineers. Lt. Col. George L. Gillespie and 1st Lt. Robert McGregor were authorized to begin construction on Emplacement 7, the eastern-most gun emplacement. Once the construction plant had been erected and building materials collected, work began on the initial emplacement. Construction on Emplacement 7 continued until the project was suspended on September 30, 1894, pending completion of the design for the Buffington-Crozier disappearing carriages. Upon completion of the design, the project was to be resumed and the gun platforms built.

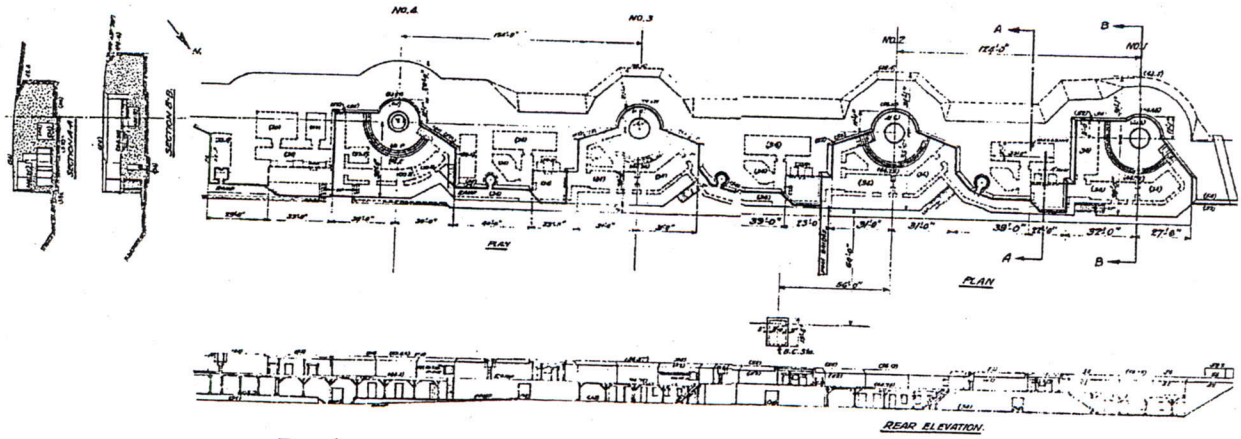
Work on Emplacement 7 was resumed in September 1895 and finished in November. The base rings were received and installed in December. On November 13, 10-inch M1888 gun No. 17 was received and placed on the parapet pending arrival of Buffington-Crozier disappearing gun carriage No. 21 later in 1896. In conjunction with the emplacement, several of the Rodman battery's traverse magazines were converted into casemates for 6-pounder RF guns. By June 30, 1897, Emplacement 7 was complete, its gun and carriage mounted and ready for service.(10)

Emplacement 6 was authorized, with an allotment for its construction in 1895. On June 29, 1896, Emplacement 5 was authorized, along with modifying two more traverse magazines into casemates for 6-pounder RF guns. By June 30, 1897, Emplacements 5, 6, and 7 were complete and ready for service, except Emplacement 5 lacked ammunition hoists. All three emplacements mounted 10-inch model M1888 guns on M1894M1 disappearing carriages. Emplacement 6 was armed with Gun No. 14 on Carriage No. 20, and Emplacement 5 was armed with Gun No. 45 on Carriage No. 23. Emplacement Numbers 6 and 7 were transferred to the artillery garrison on March 12 and No. 5 on May 5, 1898. (11)



Emplacements 5, 6, and 7 of the 7-gun battery originally named Battery Gillmore, renamed Battery Samuel Spear in 1906. *NARA*

Emplacements 1, 2, 3, and 4, built in a separate structure to the right of Emplacements 5, 6, and 7, would eventually constitute a separate tactical battery. Emplacement No. 4 was begun soon after an allotment of $45,000 on May 29, 1897. The National Defense Appropriation Act of March 9, 1898, allotted $25,000 to begin Emplacements 1, 2, and 3. By June 30, 1898, Emplacements 2 and 3 were ready for their disappearing carriages and excavation had started on Emplacement 1. While two of the four emplacements would have M1888 10-inch guns Nos. 38 and 45, all would be mounted on newer M1896 disappearing carriages. Emplacement No. 4 was transferred to the garrison on March 12, 1898. Work was completed by June 1899. The remaining three emplacements were transferred September 26, 1899. The guns for Emplacements 1 and 2, received and mounted in 1900, were newer M1895 10-inch guns Nos. 6 and 4 on M1896 disappearing carriages Nos. 58 and 62.(12)



Emplacements 1, 2, 3, and 4 of Battery Gillmore. *NARA*

On April 4, 1900, the seven 10-inch emplacements were named Battery Gilmore for Col. (Maj. Gen., USV) Quincy Adams Gillmore, Corps of Engineers. Gillmore graduated from USMA in 1849 and was appointed a brevet 2nd lieutenant of engineers. A brigadier general of volunteers in April 1862, Gillmore was brevetted lieutenant colonel of engineers for gallantry and meritorious service in the siege and capture of Fort Pulaski, GA, in April 1862. He was brevetted colonel in March 1863 for his service in the Battle of Somerset, KY, and brigadier general in March 1865 for meritorious service in the capture of Fort Wagner, SC, and brevet major general for the assault on Morris Island, SC, and the subsequent bombardment of Fort Sumter. Gillmore was advanced in the Regular Army to major of engineers in June 1863. He returned to the Corps of Engineers in 1865, was promoted to lieutenant colonel in January 1874 and colonel in February 1883. Colonel Gillmore died on April 7, 1888.(13)

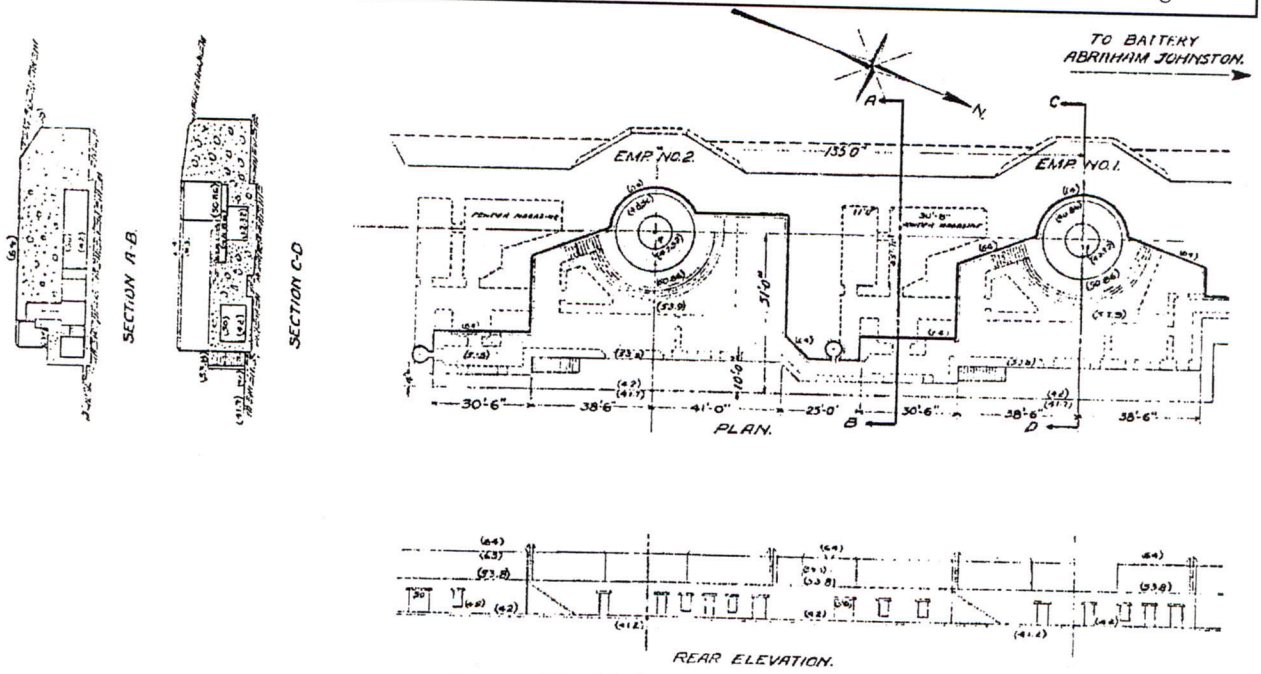
In 1906, Emplacements 5, 6, and 7 of Battery Gillmore were renamed Battery Samuel Spear. Samuel Perkins Spear entered military service in August 1839 as a private in the 2nd Dragoons, rising to sergeant major by October 1848. Discharged in 1859, he reentered the 2nd US Cavalry as a private and had advanced to First Sergeant in Company F when he was appointed lieutenant colonel, 11th PA Volunteer Cavalry in October 1861. Spear was advanced to regimental colonel in August 1862 and brevetted brigadier general of volunteers for gallantry at Darbytown, VA, March 13, 1865. He resigned his commission May 9, 1865, and died May 4, 1875.(14)

Batteries William Neary and Doubleday

A $40,000 allocation was made April 25, 1898, for a battery of two 12-inch guns on barbette carriages. On June 10, 1898, a second $40,000 was allotted for a second pair of emplacements on the left flank of the first set, these for disappearing carriages. Built to the east of the 10-inch gun batteries, the 12-inch guns would face Gravesend Bay and enable the battery to fire directly on Lower New York Bay. Excavation was still underway at the end of June 1898. Work continued rapidly; by June 1899 the battery had been completed and the base rings for the carriage set in place, although the guns and carriages had not been received.

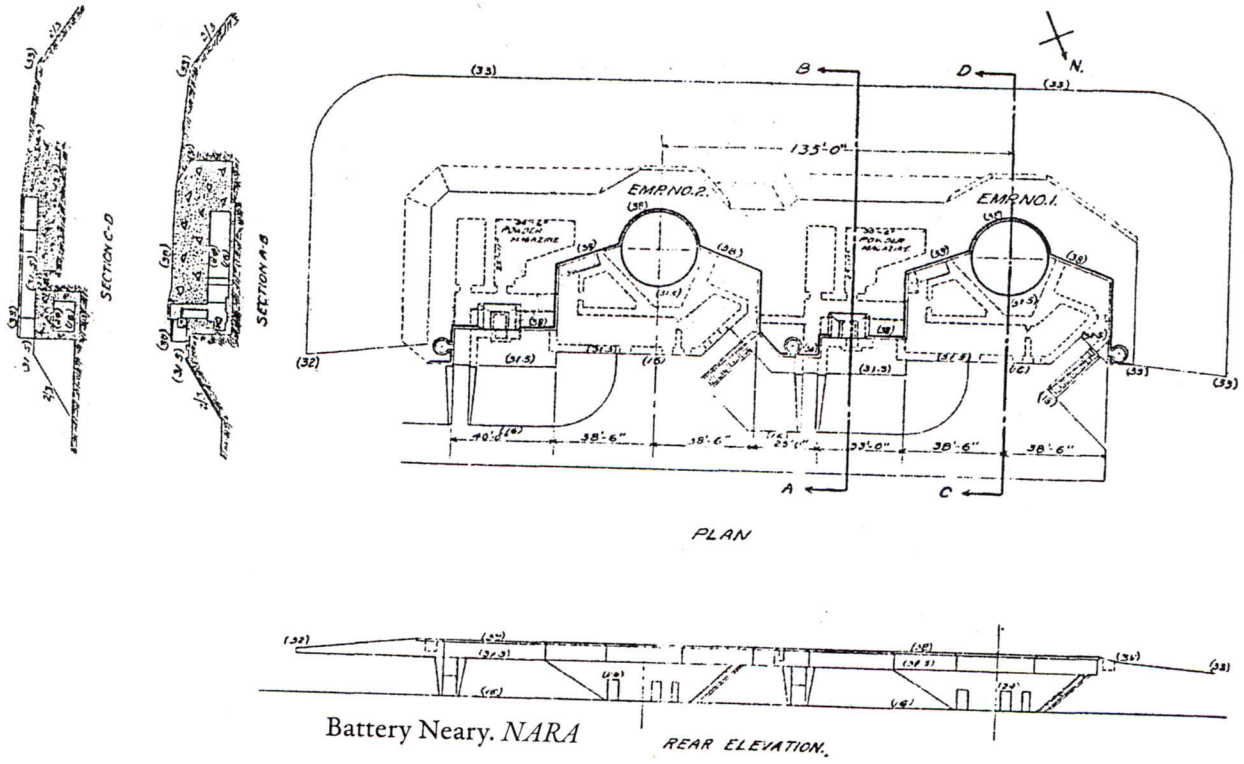
The guns for Emplacements 1 and 2, M1888 12-inch guns Nos. 32 and 46, and M1892 "non-disappearing" (barbette) carriages Nos. 19 and 20 were received by 1900. By June of that year they, and 12-inch gun M1895 No. 17 and its M1897 disappearing carriage No. 12 for Emplacement No. 3, were being mounted. M1895 gun No. 19 and its M1897 disappearing carriage were mounted in Emplacement 4 soon thereafter.(15)

The battery's four 12-inch gun emplacements were named for Col. (Maj. Gen., USV) Abner Doubleday on April 4, 1900. Doubleday graduated from the USMA in 1838 and was commissioned 2nd lieutenant in the 1st Artillery in February 1845. He was stationed at Fort Sumter when it fell in April 1861, after which he was appointed major of 17th US Infantry in May and brigadier general of volunteers in February 1862. He was promoted to major general of volunteers in November 1862 and served through the end of the war. Doubleday was brevetted brigadier general and major general for service at Gettysburg and was promoted to colonel of the 35th US Infantry Regiment in September 1867. He was reassigned to the 24th US Infantry in December 1870 and retired on December 11, 1873. General Doubleday died January 26, 1893.(16)



Battery Doubleday. *NARA*

In 1904, a single-gun battery at Fort Columbia, WA, was named for 1st Lt. William Curtis Neary, 4th US Infantry, who entered the army as a private in Company E of the Engineer Battalion in October 1884. He served as a corporal until March 1888, when he was commissioned 2nd lieutenant in the 3rd US Infantry. He transferred to the 4th US Infantry in February 1895 and served in Cuba during the War with Spain. He died July 9, 1898, of wounds received at the Battle of El Caney, Cuba, on July 1, 1898. In January 1906, the battery at Fort Columbia was made a part of Battery Jules Ord and Neary's name was transferred to Emplacements 1 and 2 of Battery Doubleday.(17.)

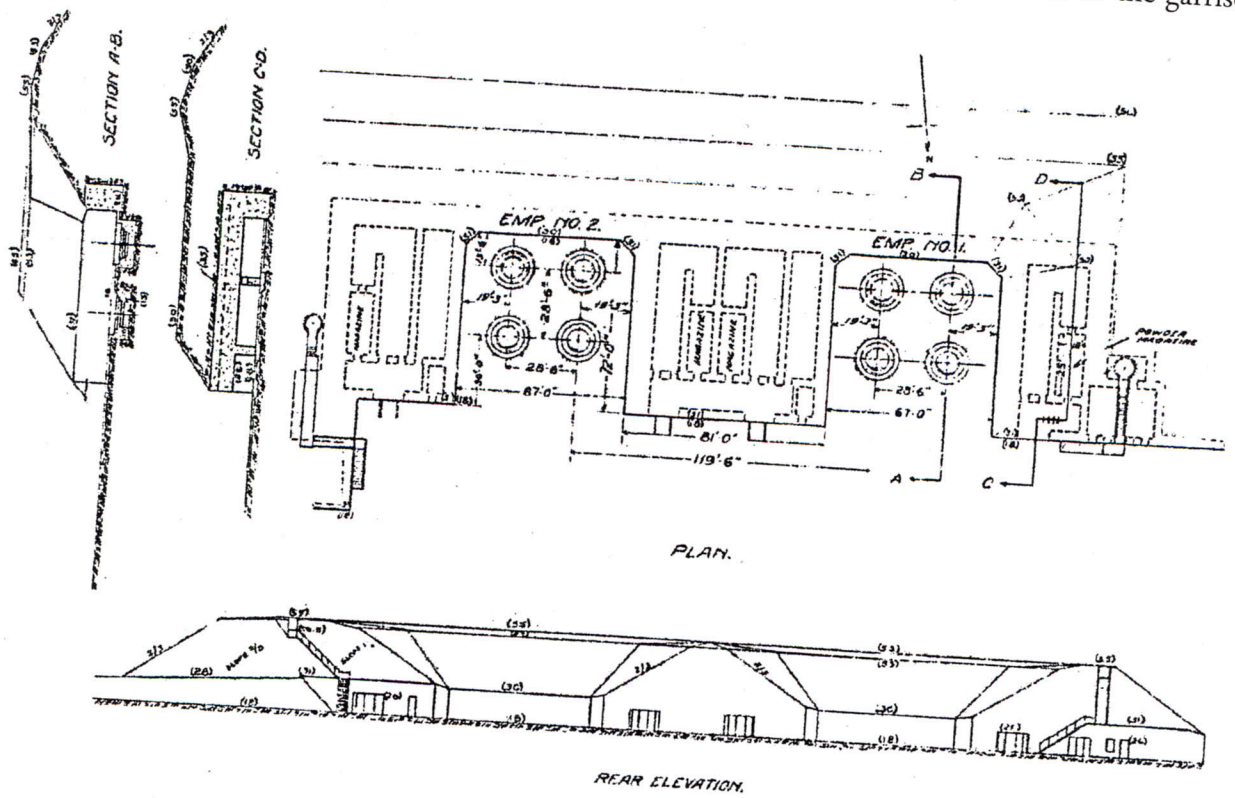


Battery Neary. *NARA*

Battery Piper

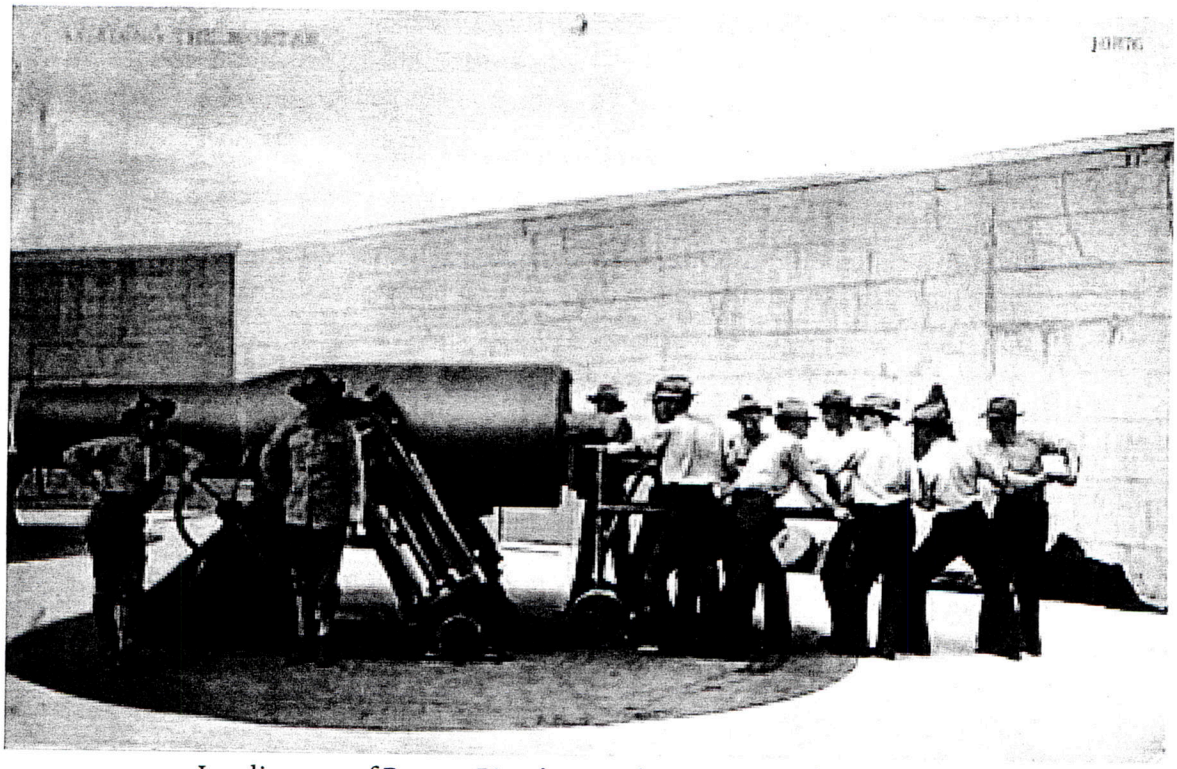
On June 27, 1898, $200,000 was allotted to build a battery for eight 12-inch breechloading mortars some 800 feet behind Battery Neary. The engineers moved forward with planning, and construction finally began in 1899.

Excavation for the mortar battery continued through the remainder of the year. By 1900 some 5,779 cubic yards of earth had been had been excavated and by the end of June 1900, some 8,5621 cubic yards of concrete and masonry had been placed, nearly finishing the concrete work. The eight base rings for the mortars were also set. In addition, 1,000 square yards of sod on the parapets and slopes was also laid. During the 1901 work season, an additional 656 cubic feet of concrete was poured and 5,529 cubic yards of earth formed the parapet and rampart slopes of the battery. The slopes and parapet were sodded, the ditch macadamized, and gutters paved. Water and electricity were supplied to the battery and electric lights installed. The eight 12-inch mortars were mounted on their carriages in the battery's two pits. The ammunition trolley system was installed and stairs were erected to the "crows nest" fire control positions on the battery flanks. The battery was turned over to the garrison on March 4, 1901.(18)



Battery Piper. *NARA*

The battery was armed with eight M1890M1 12-inch mortars (Pit A: Nos. 102, 100, 103, and 101; Pit B Nos. 93, 65, 46, and 89) on eight M1896M1 mortar carriages (Pit A Nos. 225, 227, 203, and 224; Pit B: Nos. 201, 202, 223, and 226). On March 19, 1902, the battery was named Battery Piper for Col. Alexander Piper, 5th US Artillery, who graduated from the USMA in 1847 and was commissioned in the 3rd Artillery. In 1863, he was brevetted major for gallantry and meritorious service in the campaigns of Northern Virginia. In January 1863, he was appointed colonel of the 10th NY Volunteer Artillery and brevetted again in 1864 for gallantry and meritorious service in front of



Loading one of Battery Piper's 12-inch mortars. *Author's Collection*

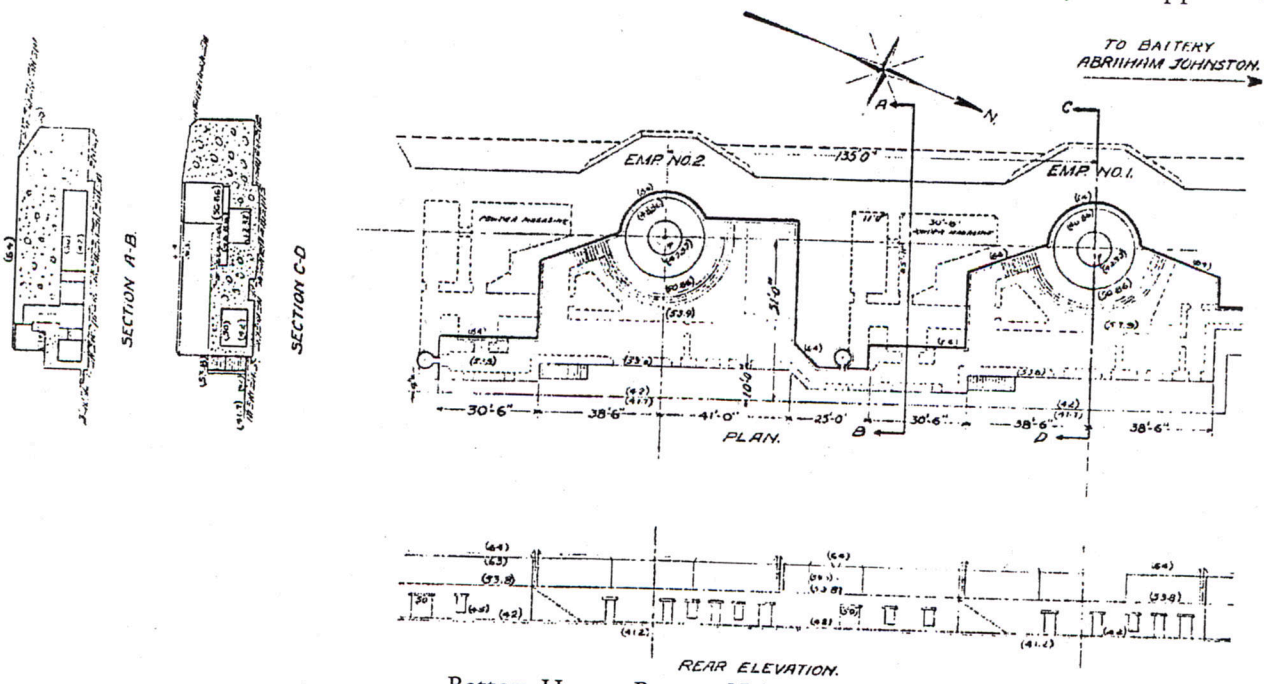


Fort Hamilton's modern ancillary batteries in 1923. Left to right: Batteries Burke, Johnston, and Brown in front of the old fort, with Battery Griffin near the shoreline. To the right of the old fort along the shoreline, left to right: Batteries Gilmore, Spear, Neary, and Doubleday. Batteries Livingston and Mendenhall are visible in the distance. Battery Piper occupies the heights immediately to the rear of Batteries Gilmore, Spear, Neary, and Doubleday. *NARA*

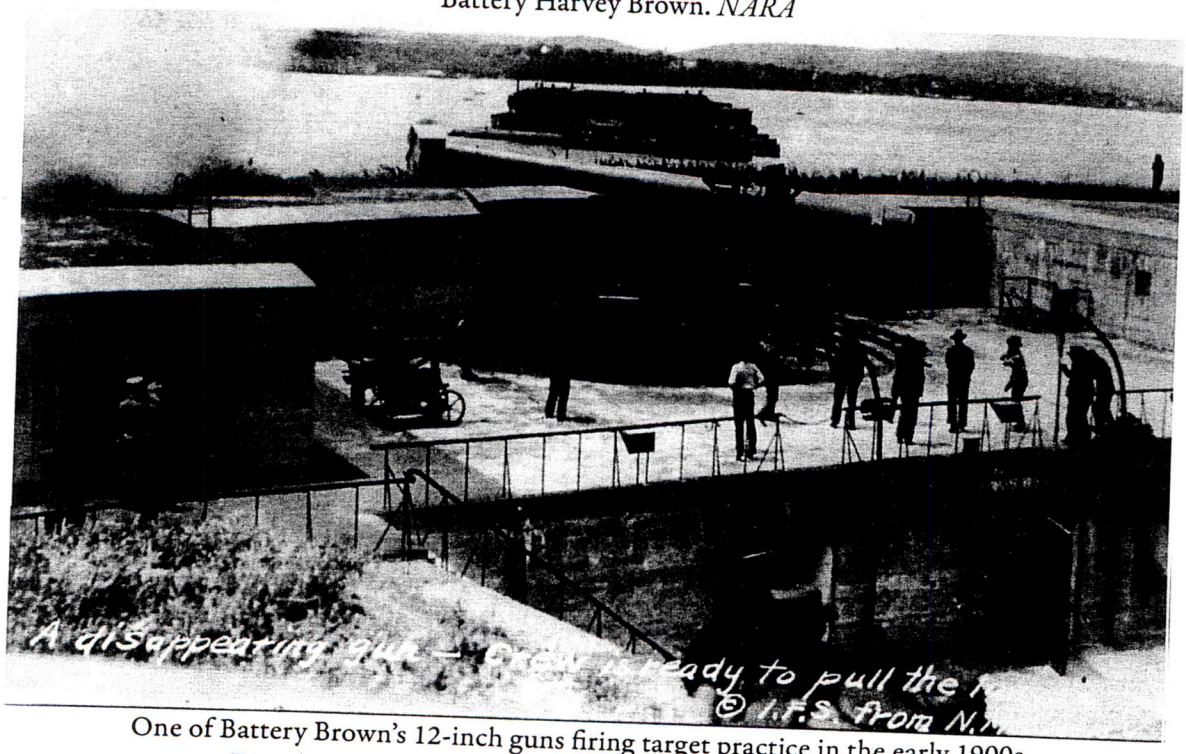
Petersburg, VA. Following the war, he returned to the 4th Artillery, being promoted to major in 1875. He was promoted to colonel and transferred to the 1st Artillery in August 1887. Colonel Piper retired July 1, 1891, and died on February 22, 1902.(19)

Battery Harvey Brown

A second battery for 12-inch guns on disappearing carriages was authorized on April 5, 1898, shortly after the commencement of hostilities with Spain. Detailed plans for the battery were approved



Battery Harvey Brown. *NARA*



One of Battery Brown's 12-inch guns firing target practice in the early 1900s. Fort Lafayette is in the background. *Courtesy of Karl Schmidt*

and preparations were begun to build the battery on the east flank of the pair of 12-inch barbette guns, directly in front of the channel face of the old fort. The project was so close to the scarp of the old fort that 5,998 cubic yards of stone had to be removed. With this removal, excavation for the foundations began and pouring concrete commenced.

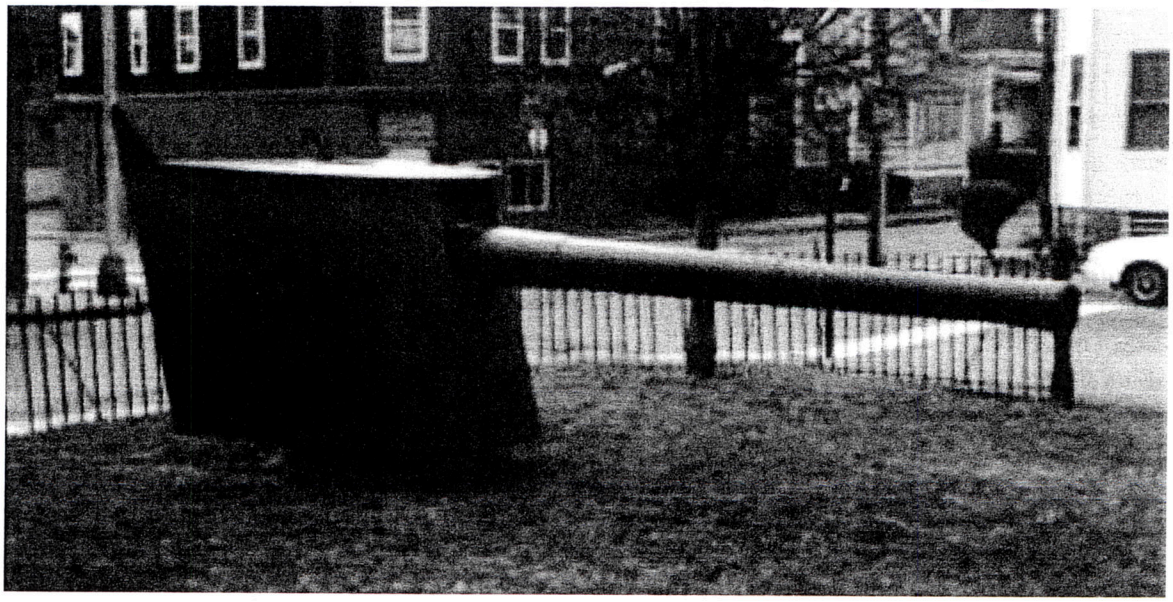
The battery was completed in 1901 and its 12-inch guns were mounted by June 1901. The battery was armed with M1895M1 12-inch guns Nos. 2 and 32 on M1897 disappearing carriages Nos. 29 and 28.

A wooden frame house was erected on the terreplein of the masonry fort's left curtain about 100 feet behind the battery for a battery commander's station. Completed in 1901, it was turned over to the garrison on November 30.(20)

The battery was named for Col. and Bvt. Maj. Gen. Harvey Brown, 5th US Artillery. After graduating from USMA, Brown was commissioned in the Regiment of Light Artillery in July 1818. He transferred to the 1st Artillery upon its organization in June 1821 and was brevetted colonel for gallantry in the Mexican War. Brown transferred to the 4th Artillery in April 1861 and was appointed colonel of the newly constituted 5th Artillery in May 1861. He was brevetted brigadier general for gallantry and good conduct at Fort Pickens in November 1861. He was instrumental in suppressing the draft riots in New York City, for which he was brevetted major general in 1866. He continued to command the 5th Artillery until his retirement August 1, 1863. General Brown died in New York City on March 31, 1874.(21)

Rapid-Fire Guns Protect the Minefields

To defend the controlled minefields from enemy minesweeping vessels, and to prevent torpedo boats and destroyers from penetrating protected harbors, the War Department contracted for 33 British 4.72-inch quick-firing Armstrong guns, early in 1898. By May, they were being delivered.



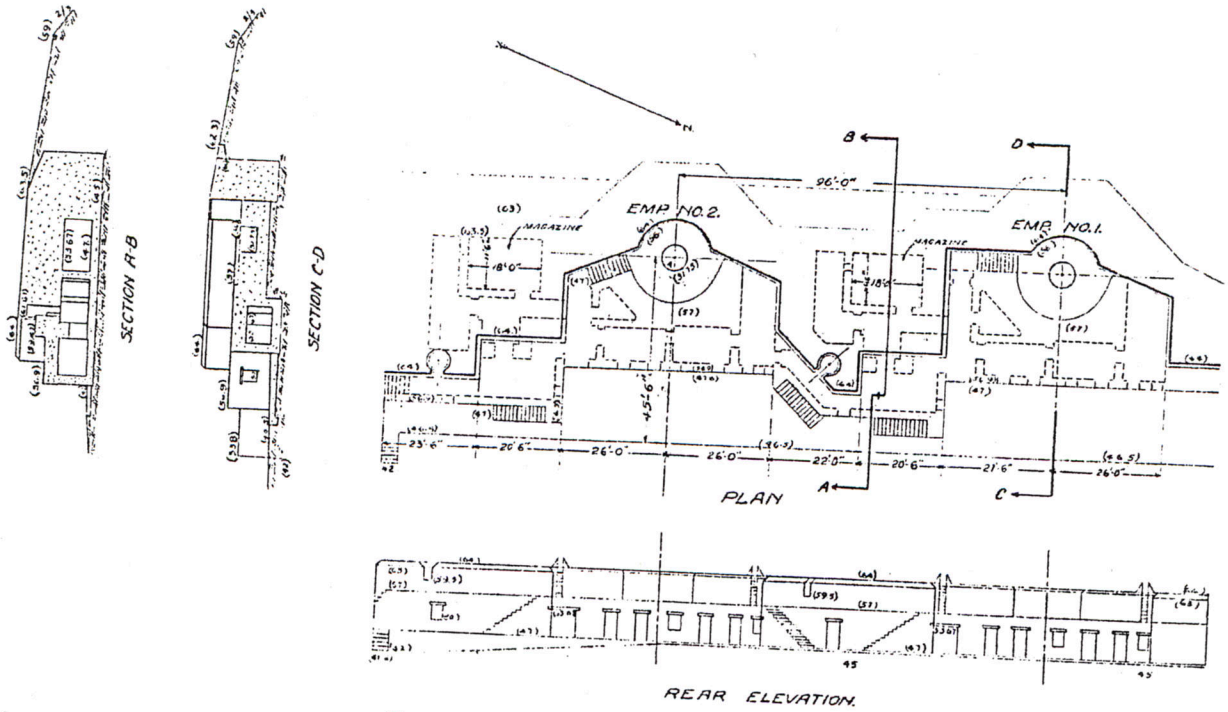
A 4.72-inch Armstrong gun of the type mounted in Battery Griffin. *Author's Collection*

Plans were made for modifying Platforms 7 and 8 of the 1860-70s Barbette Battery No. 1 in front of the old fort to fit the Armstrong guns. On April 6, 1898, $6,000 was allotted for altering the emplacements and by May 17, two model 1898 4.72-inch/45 caliber QF Armstrong guns on pedestal

mounts (Nos. 9081 and 9083) had been mounted in their emplacements. These two emplacements remained unnamed until incorporated into Battery Griffin, when the remainder of the old barbette battery was modified as a 3-inch RF battery in 1899-1903.(22)

Battery Abraham Johnston

Funds from the 1899 Appropriation for Gun and Mortar Batteries for a pair of 6-inch guns on disappearing carriages were granted March 9, 1899, and plans for these emplacements were submitted and approved. This required removal of 428 cubic yards of the old masonry fort's channel front before excavation for the battery's foundations could begin, but by the end of June 1900 the project was ready to pour concrete. In 1901, 4,317 cubic yards of concrete were placed, parapets were formed and graded, ladders and railings installed, and the battery supplied with water and electricity. This battery was built in conjunction with Battery Harvey Brown, on the right flank of the 12-inch battery, and was nearly completed in 1901. M1897 6-inch gun No. 9 was received and mounted on M1898 disappearing carriage No. 1 in Emplacement 2. Finish work was completed and the battery was transferred to the garrison December 2, 1902. M1897 gun No. 1 and M1896 disappearing carriage No. 27 were mounted in Emplacement 1.



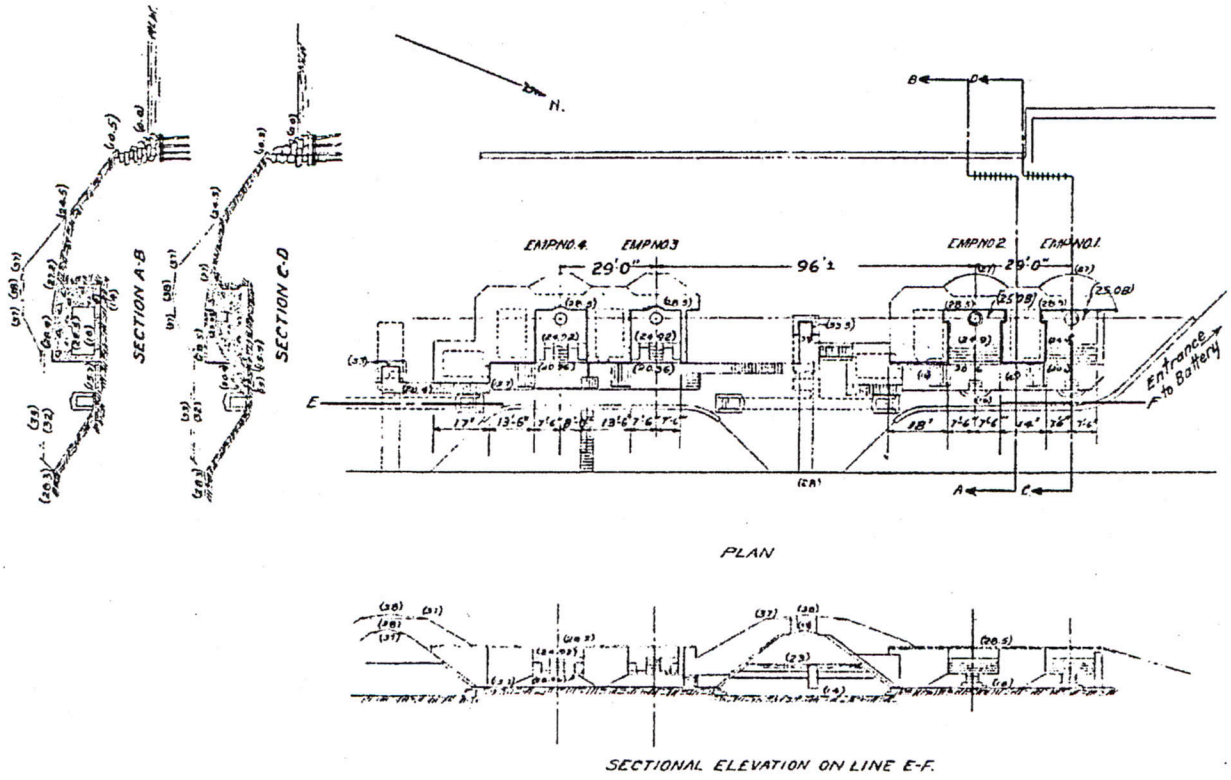
Battery Abraham Johnston. *NARA*

On January 25, 1906, the battery was named for Capt. Abraham Robinson Johnston, 1st US Dragoons. Johnston graduated from the USMA and was commissioned a second lieutenant in the 1st Dragoons in 1835. Captain Johnston was killed in action December 6, 1846, at San Pasqual, CA, during the Mexican War. (23)

Battery Griffin

The initial emplacements of what would eventually be designated Battery Griffin consisted of the pair of emplacements for 4.72-inch QF guns. Two emplacements for 3-inch (15-pounder) Driggs-Seabury RF guns to the right of the 4.72-inch guns were authorized and funded in 1899. This battery occupied the north end of Barbette Battery No. 1 in front of old Fort Hamilton. A pair of 8-inch converted rifles was dismounted from Platforms 1 and 3 for the new emplacements. Construction began in June 1899.

Construction was pursued at a less than frantic pace, and it was not until 1902 that the two emplacements were completed, for 3-inch M1898 guns Nos. 87 and 88 on M1898 masking-parapet carriages Nos. 87 and 88. The battery was transferred to the garrison September 10, 1902.



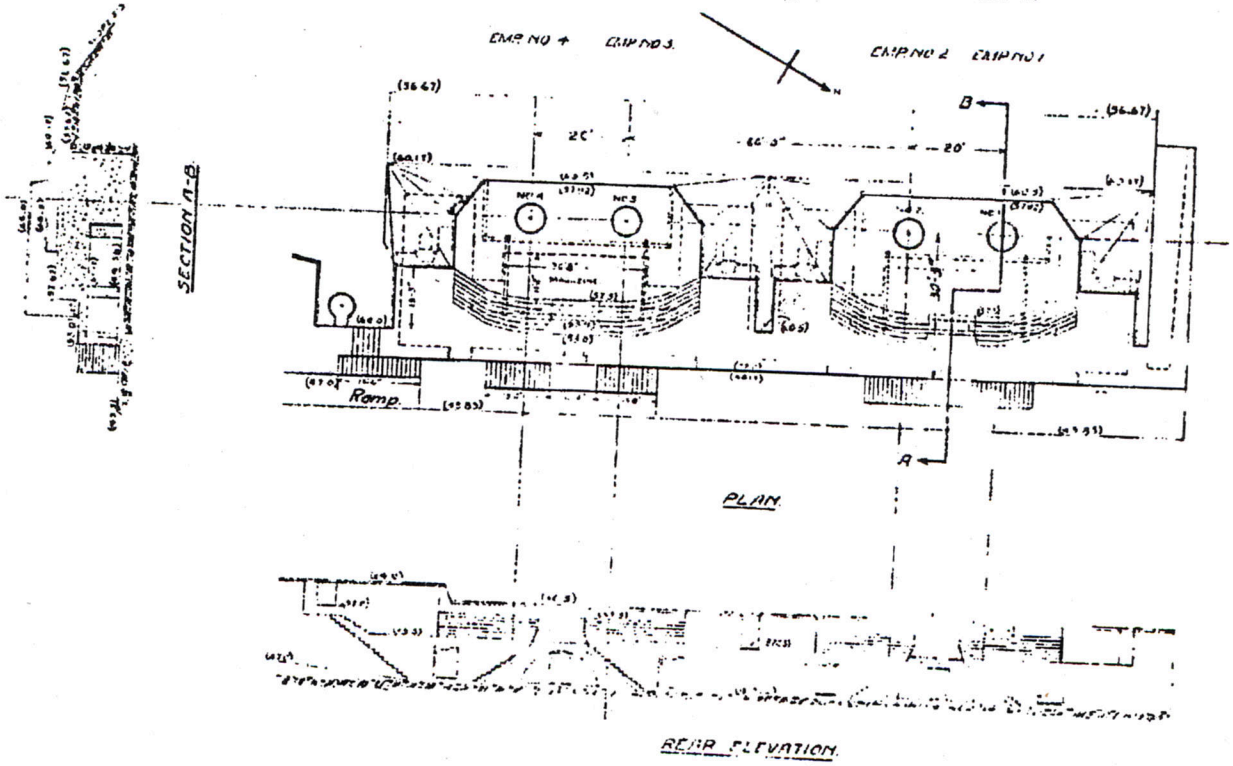
Battery Griffin. *NARA*

In October 1902, the battery was named for Col. (Bvt. Maj. Gen. and Maj. Gen., USV) Charles Griffin, 35th US Infantry. Griffin graduated from the USMA and was commissioned a second lieutenant in the 4th Artillery July 1847. He transferred to the newly constituted 5th Artillery as a captain, receiving a brevet to major for service at Bull Run, July 21, 1861. He eventually commanded a division as a major general of volunteers in 1864. He was repeatedly brevetted for gallantry and meritorious service during the Civil War, culminating in brevet major general March 13, 1865. General Griffin was mustered out of the volunteer service on January 15, 1866, and appointed colonel of the 35th US Infantry in July 1866. Colonel Griffin died September 15, 1867, at Galveston, TX.(24)

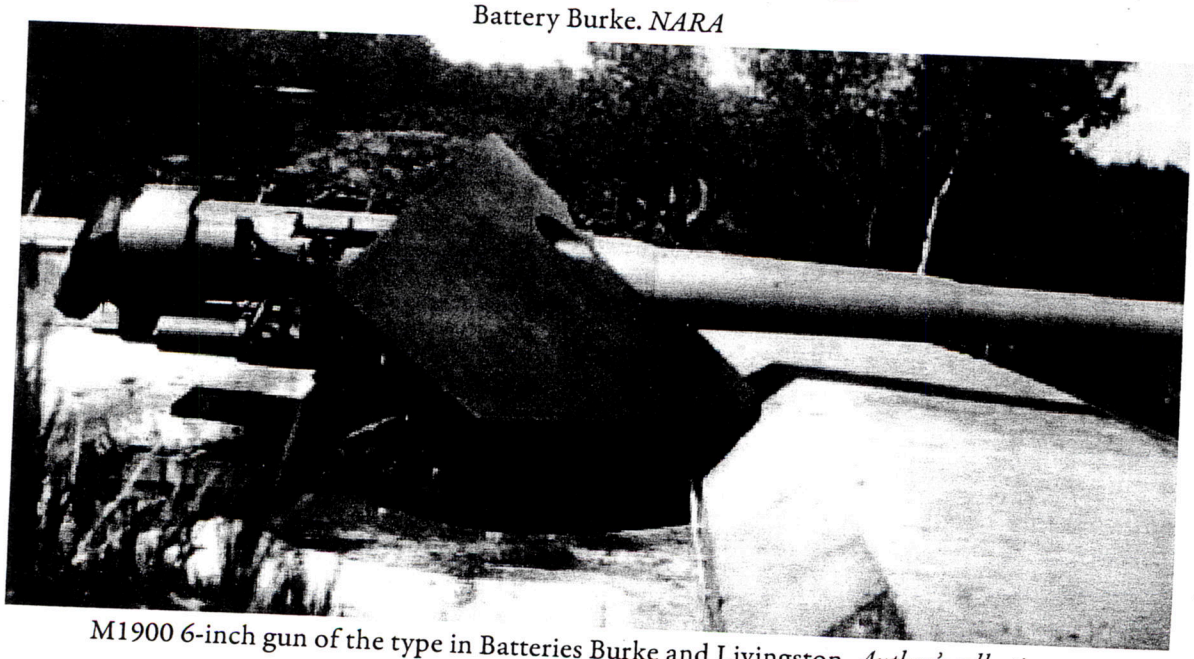
Battery Burke

Two emplacements were funded May 15, 1901, each emplacement for two 6-inch RF guns on pedestal mounts, and construction commenced in August. The site on the right flank of Battery Abra-

ham Johnston, in front of the old masonry fort's right flank, required removal of some 986 cubic yards of masonry of the right flank caponnier as well as part of the glacis. Work progressed well and some 1,499 cubic yards of earth was excavated. They began pouring concrete in the fall; 2,870 cubic yards of concrete and 1,026 square yards of paving were laid in the rear of the battery. By mid-1902, the battery was nearly complete, awaiting its armament and requiring only a little concrete work and preparation of the exterior parapet slopes. The completed battery was armed with 6-inch M1900 RF guns Nos. 24 and 25 on M1900 pedestal mounts Nos. 20 and 21. The battery was transferred to the garrison September 14, 1903. Apparently, guns were only mounted in Emplacements 2 and 4.



Battery Burke. *NARA*



M1900 6-inch gun of the type in Batteries Burke and Livingston. *Author's collection*

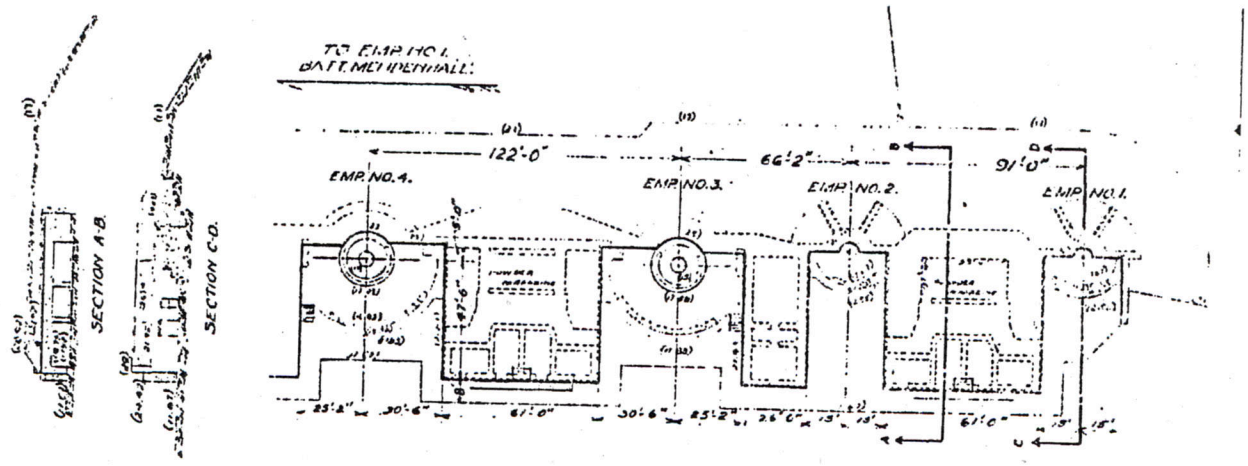
The battery was named October 24, 1902, for Lt. Col. and Bvt. Brig. Gen. Martin Burke. An 1820 graduate of the USMA, he was commissioned in the 8th US Infantry and transferred to the 3rd Artillery in June 1823. He was brevetted major and lieutenant colonel for gallantry and meritorious conduct in the War with Mexico. He was advanced to lieutenant colonel in 1861, serving with the 3rd Artillery until his retirement August 1, 1863. On March 13, 1865, he was brevetted brigadier general for faithful service. General Burke died in New York City April 24, 1882.(25)

Battery Manning Livingston

Four emplacements for 6-inch guns, two on pedestal mounts and two on disappearing carriages, were authorized and funded in 1901. Construction began in August 1901, east of the 10-inch gun batteries overlooking Gravesend Bay. Construction advanced rapidly and the platforms were ready for their armament by the end of June 1902. Little remained to finish at the battery beyond pouring a small amount of concrete, grading and sodding the exterior and rear slopes of the parapet, and completing a roadway in the rear of the battery.

The project was completed in the summer of 1905 and armed with two 6-inch RF guns on pedestal mounts and two on disappearing carriages. Emplacement Nos. 1 and 2 were armed with M1900 guns Nos. 22 and 23 on M1900 pedestal mounts Nos. 22 and 23. Emplacements 3 and 4 were armed with M1903 guns on M1903 disappearing carriages. The battery was transferred to the garrison on November 23, 1905. The disappearing guns and carriages were removed and shipped to USMA November 13, 1907.

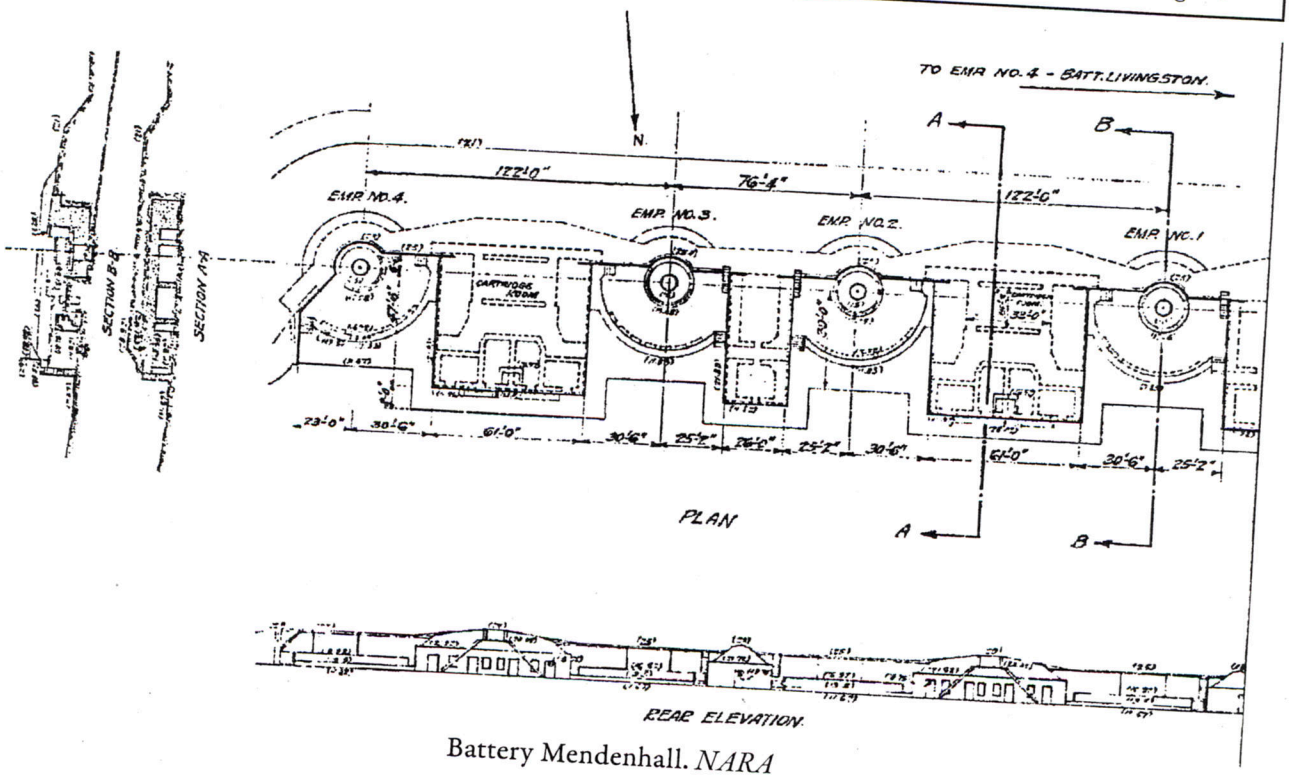
On December 27, 1904, the battery's four emplacements were named for 2nd Lt. and Bvt. Capt. Manning Livingston. Appointed 2nd lieutenant in the 3rd US Artillery February 19, 1862, he was killed in action July 2, 1863, at Gettysburg, PA. For his gallantry and meritorious service, he was brevetted 1st lieutenant and captain.(26)



Battery Livingston. *NARA*

Battery John Mendenhall

Two emplacements for 6-inch RF guns on disappearing carriages were authorized in 1904 and construction commenced later that that year, to the right of Battery Livingston, overlooking Gravesend Bay and the southern approach to the Narrows. Once construction was underway, construction commenced on Emplacements 3 and 4 for the same armament. The project was completed in the summer of 1905 and the battery transferred to the garrison November 23.



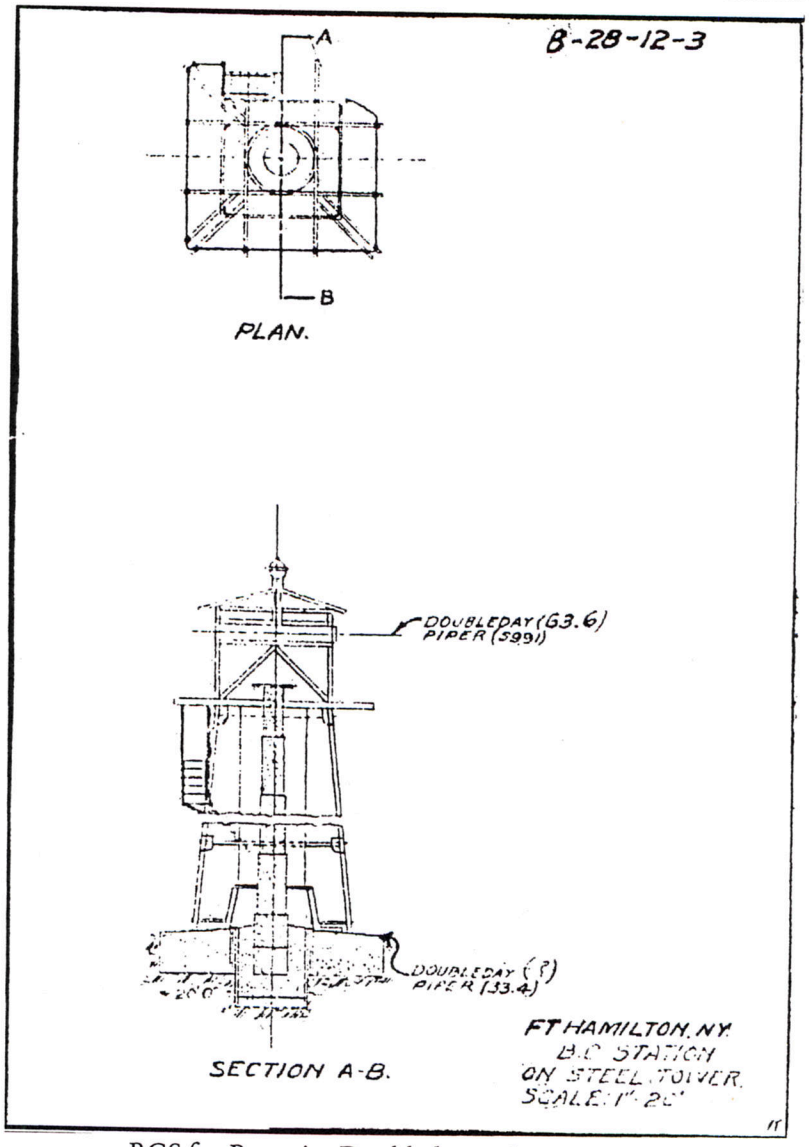
Battery Mendenhall. *NARA*

The battery was armed with M1903 6-inch guns Nos. 43, 44, 49, and 55 on disappearing M1903 carriages Nos. 3, 4, 5, and 6. On December 27, 1904, the battery was named for Col. John Mendenhall, 2nd US Artillery. Mendenhall graduated from the USMA in 1847 and was commissioned in the 4th US Artillery in 1852. He was brevetted lieutenant colonel for gallantry and meritorious service at the Battle of Chickamauga, GA, September 20, 1863. He was appointed major and judge advocate in the volunteers, serving as assistant inspector general from February to September 1864. Honorably mustered out of volunteer service in 1865, he resumed military service in the 1st Artillery with the rank of captain and on December 4, 1888, was promoted colonel of the 2nd US Artillery. Colonel Mendenhall died July 1, 1892.(27)

Fort Hamilton's Initial Fire Control System

Shortly after the end of the War with Spain, planning began for fire control stations. Two "armored range-finding shelters" for the 10-inch guns of Battery Gillmore were authorized April 12, 1899, and plans were submitted to the chief of engineers.

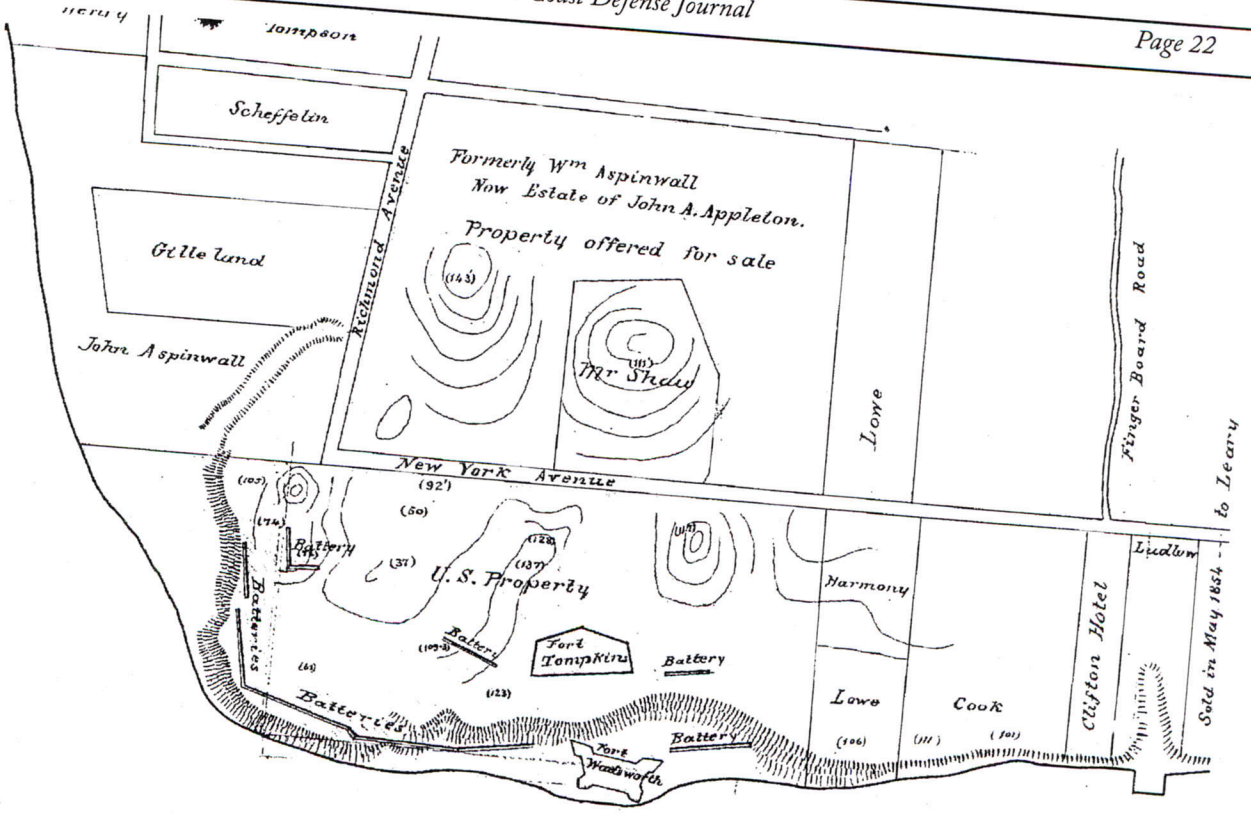
In 1901, a fire commander's station and two battery commanders' stations (BCS) were approved for Fort Hamilton. A 20-foot steel tower surmounted by a one-room frame house was erected 100 feet to the rear of the central traverse of Battery Piper for its BCS. The station was completed in 1901 and turned over to the garrison on November 30. This station was replaced a few years later by a new BCS atop the battery's central traverse.(28)



BCS for Batteries Doubleday and Piper. *NARA*

Fort Wadsworth Enlarged to Accommodate Projected Batteries

Shortly after commencement of batteries at Fort Hamilton, planning got underway for the first modern Endicott-Era batteries at Fort Wadsworth. Lt. Col. Henry M. Robert and his assistant, 1st Lt. William E. Craighill, selected their prospective sites. However, before construction could begin, it was necessary to acquire considerable additional property. Purchases between 1892 and 1901 increased Fort Wadsworth from 90 to 226 acres. First, 78 acres were acquired in March 1892 from Adolfo and Josepha Hegewisch. This was followed on January 5, 1893, by 50 acres from Serena P. Appleton and 26.4 acres from J.J. and J.H. Alexandre. In 1891, the secretary of war authorized $44,000 for about 6.25 acres owned by Mrs. Sarah Schuyler Martin, with 6% interest until the sale was completed. On December 26, 1895, $53,680 was paid for Martin's property, and $60,000 for Joseph Whitney's seven acres. Between 1898 and 1901, an additional $111,266 was paid to Elizabeth Ockerhauser, Joseph Whitney Adeline Hauxtum, and Henry Mouquin for 33.43 acres.



The Narrows.

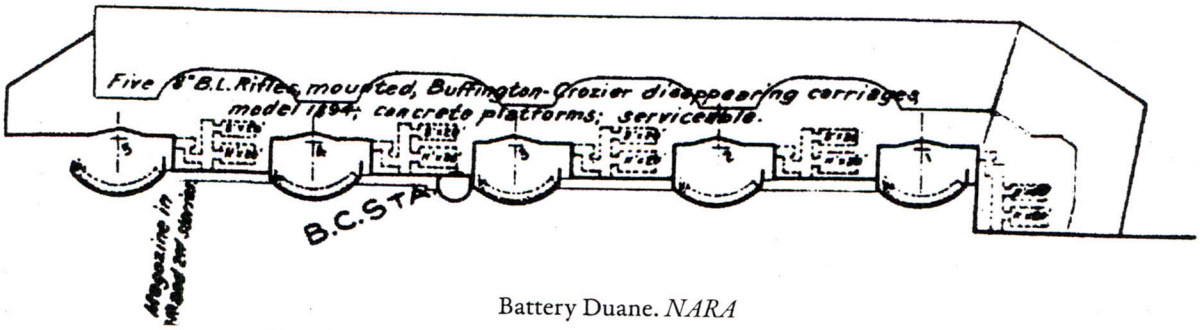
Tracts added to Fort Wadsworth Reservation in the 1890s and early 1900s. *NARA*

Battery Duane Built on Signal Hill

The collection of materials for a battery of five 8-inch guns on disappearing carriages began in 1894 and construction commenced later that year on the first four emplacements. This battery was located on the south side of Fort Tompkins, to the rear of the old 1870s Glacis Mortar Battery. Sufficient funds were not forthcoming, however and the project was suspended pending the allocation of funds on April 1, 1895. Authority was granted for the addition of the fifth emplacement in 1895 and work resumed. By June 1895, the initial four emplacements were well advanced.

In 1896, the battery was completed; 8-inch M1888 guns Nos. 5, 7, 4, 17, and 24 and M1894 Buffington-Crozier disappearing carriages Nos. 1, 2, 3, 4, and 5 had been received and mounted. Up to August 31, 1896, $265,299.41 had been expended on the battery. Installation of projectile hoists, trolleys, cranes, handrails, and lights was completed in 1897.

On April 4, 1900, the five 8-inch emplacements were named for Brig. Gen. James Cheatham Duane. After General Duane graduated from USMA in 1848, he was commissioned 2nd lieutenant of engineers. During the Civil War, he rose to major and was successively brevetted lieutenant colonel, colonel, and brigadier general for meritorious and faithful service. He was progressively promoted until appointed brigadier general and chief of engineers in 1886. General Duane retired in June 1888 and died on November 8, 1897.(29)



Battery Duane. *NARA*

Fort Newton Established Adjacent to Fort Wadsworth

One building, an old hotel known as the King House, belonging to A.L. King, was retained by the army as quarters for noncommissioned officers. On November 24, 1897, at the direction of the President, the tracts southwest of the junction of New York and Richmond Avenues, newly acquired from J.J. Alexandre, J.H. Alexandre, and Sarah Martin, were designated Fort Newton, in honor of Brig. Gen. John Newton. General Newton had spent a portion of his career as engineer in charge of fortification construction on Staten Island. A native of Virginia, he graduated from the USMA and was commissioned 2nd lieutenant of engineers on July 1, 1841. He served on numerous fortification projects including Staten Island until the Civil War. On September 23, 1861, he was appointed brigadier general and then major general of volunteers in March 1863. Newton was brevetted for gallantry and meritorious service at Antietam in 1862, Gettysburg in 1863, and Peach Tree Creek and Atlanta in 1864. He was mustered out of the volunteer service in 1866 and returned to the Corps of Engineers as a lieutenant colonel. Promoted brigadier general and chief of engineers in 1884, he retired August 27, 1886, and died on May 1, 1895.(30)

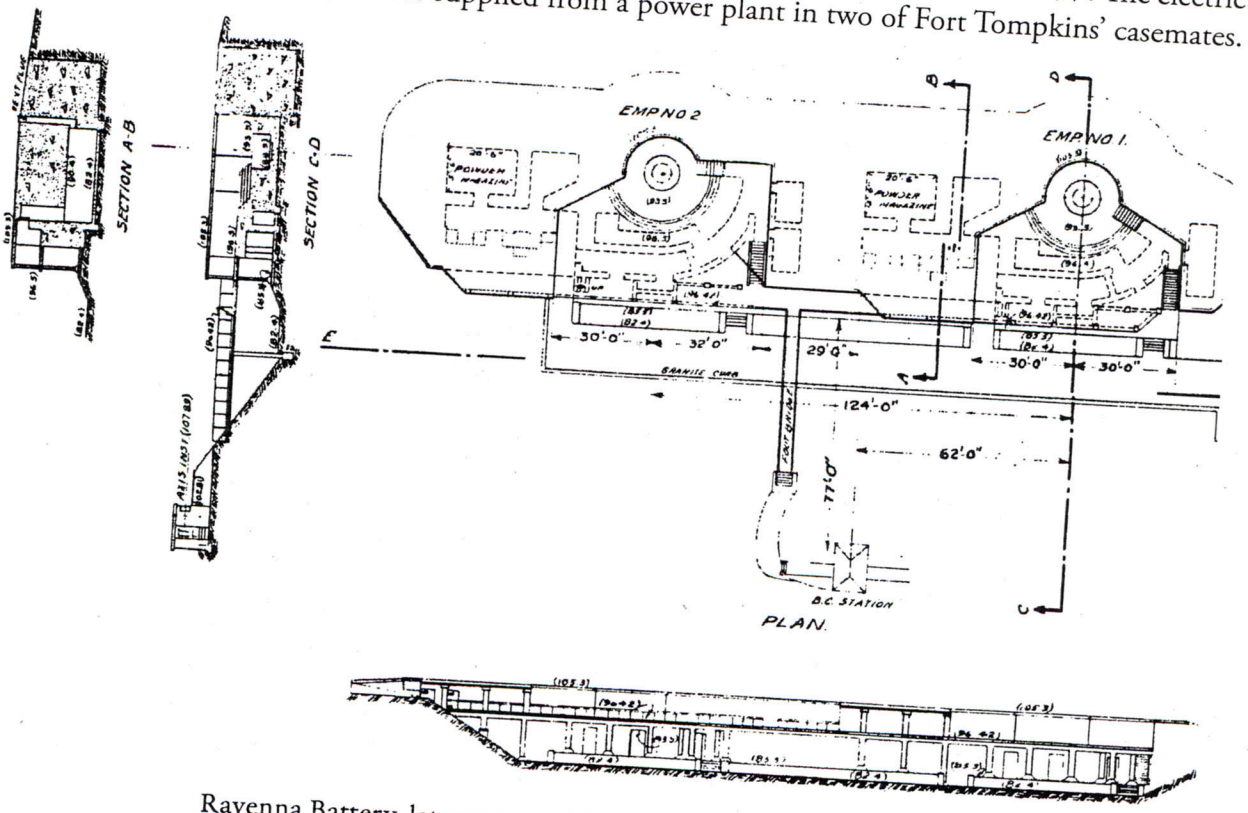
Batteries Emory Upton and Barry

Between 1896 and 1902, four batteries of large-caliber modern breechloading rifles were built on Fort Newton. The 12-inch gun batteries were named Richmond and Ayres, while the 10-inch gun batteries initially designated Ravenna and Clifton Batteries were later renamed Batteries Emory Upton and Barry. In February 1902, the order naming Fort Newton was revoked and the tract was became part of Fort Wadsworth.(31)

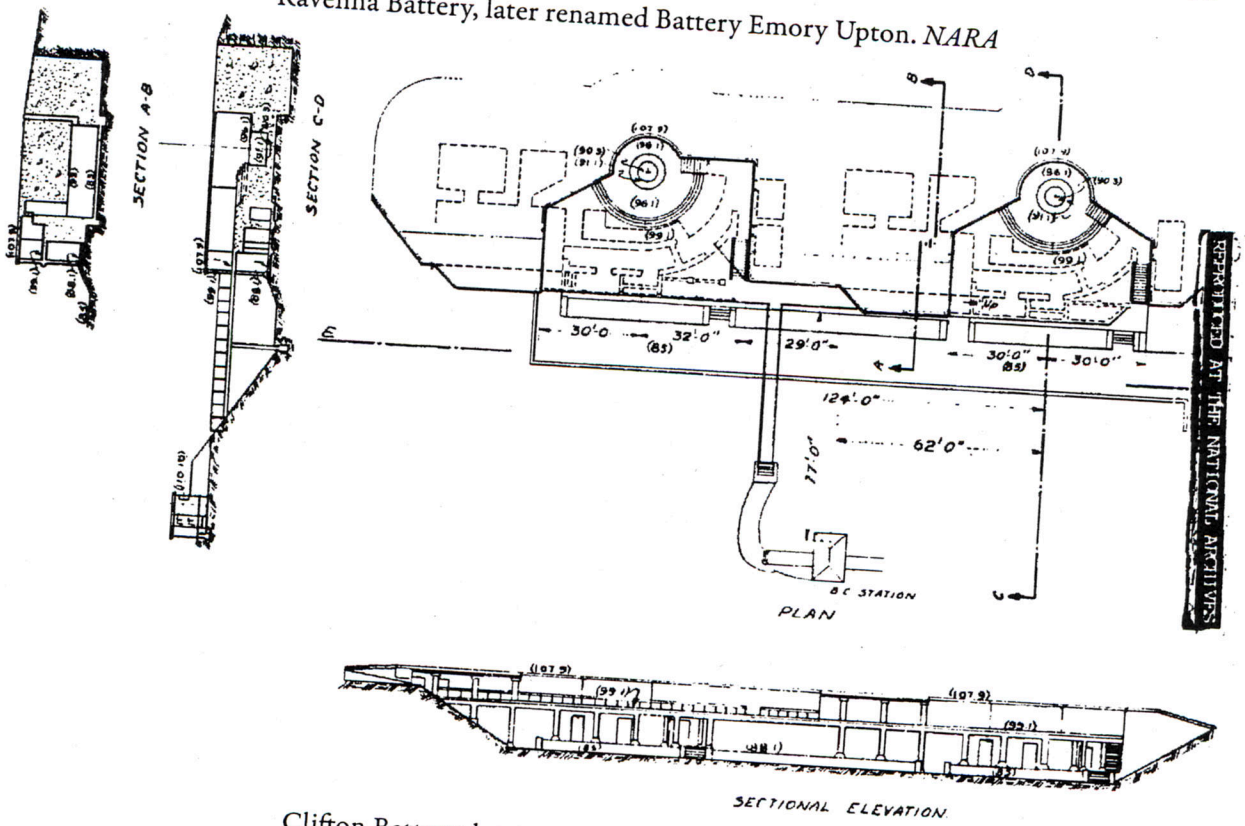
Funds were appropriated June 1, 1896, for four emplacements for 10-inch M1888 guns on M1896 disappearing carriages. Work was quickly started in July and advanced rapidly, so by the end of June 1897 both batteries had been nearly completed and were ready for their armament, at $61,498.66 for each battery. By March 1898, the annual work season was getting underway and with war with Spain in sight, extra gangs pushed completion of the two batteries. In 1898, the finishing touches to the two batteries were completed. Ammunition lifts were installed along with trolleys and cranes. The magazine doors were hung, stairs, handrails, and ladders were set in place, superior slopes and blast aprons of the emplacements were painted, and electric lights installed in the magazines. Telephone booths were built at each emplacement. On December 18, 1898, the two batteries were turned over to Fort Wadsworth's garrison.(32)

Battery Upton was armed with M1888 10-inch guns Nos. 11 and 19 on M1896 disappearing carriages Nos. 23 and 9. The battery was equipped with Hodges back-delivery projectile hoists in December 1897. The battery's powder hoists, however, were not provided until 1911. Battery Barry was

armed with two M1888 10-inch guns, Nos. 23 and 24, on M1896 disappearing carriages Nos 26 and 10. Battery Barry's projectile hoists were Hodges back-delivery type, installed in late 1897. The electric power used in the two batteries was supplied from a power plant in two of Fort Tompkins' casemates.



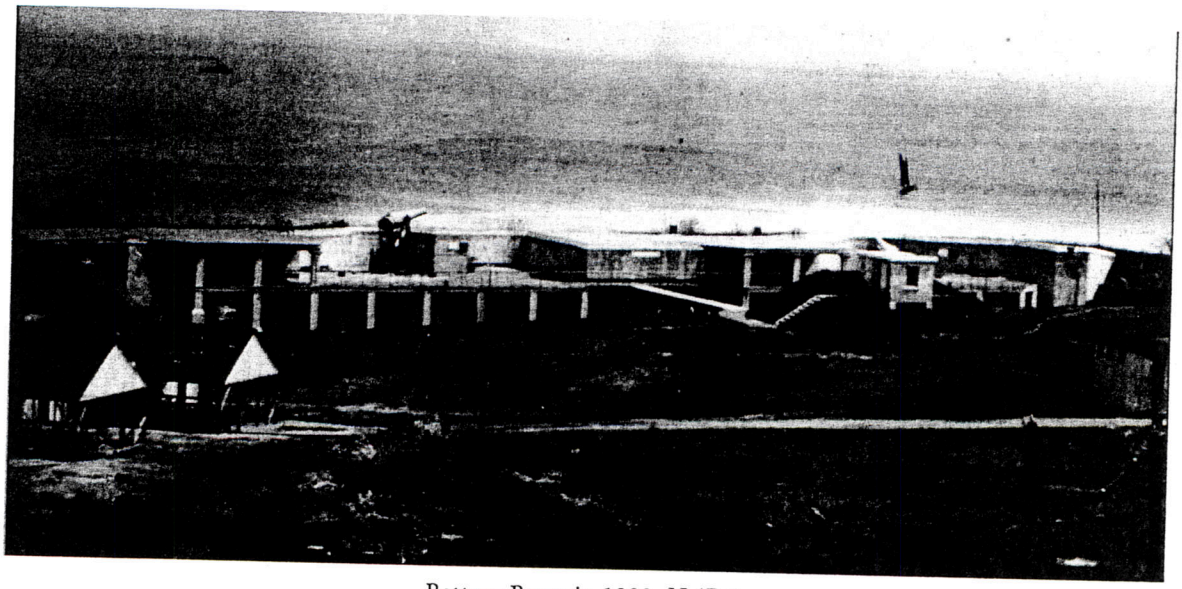
Ravenna Battery, later renamed Battery Emory Upton. *NARA*



Clifton Battery, later renamed Battery Barry. *NARA*

Both batteries were named February 14, 1902. The Ravenna Battery was named for Col. (Maj. Gen. of Volunteers) Emory Upton. Upton graduated from the USMA and was commissioned a second lieutenant in the 4th US Artillery in 1861. In 1862 he was appointed colonel of the 121st NY Volunteer Infantry and brigadier general of volunteers in 1864, along with brevets to major general for gallantry during the Civil War. He was mustered out of the volunteers in 1866 and eventually returned to the 4th Artillery, which he commanded as colonel in 1880. Recognized as one of the leading theorists in the US Army, he died March 15, 1881.(33)

Clifton Battery was named for Col. (Maj. Gen. of Volunteers) William Farquhar Barry. Barry graduated from the USMA and was commissioned in the 2nd Artillery in 1838. In 1861, he was appointed major in the newly organized 5th Artillery. He was appointed brigadier general of volunteers and brevetted major general for gallantry in the Civil War. Chief of artillery under General McClellan, he commanded the artillery in the defenses of Washington, D.C., before serving as chief of artillery under General Sherman. Mustering out of the volunteers, Barry returned to the 2nd Artillery as colonel. After long service as commandant of the Artillery School at Fort Monroe, General Barry died on July 18, 1879.(34)

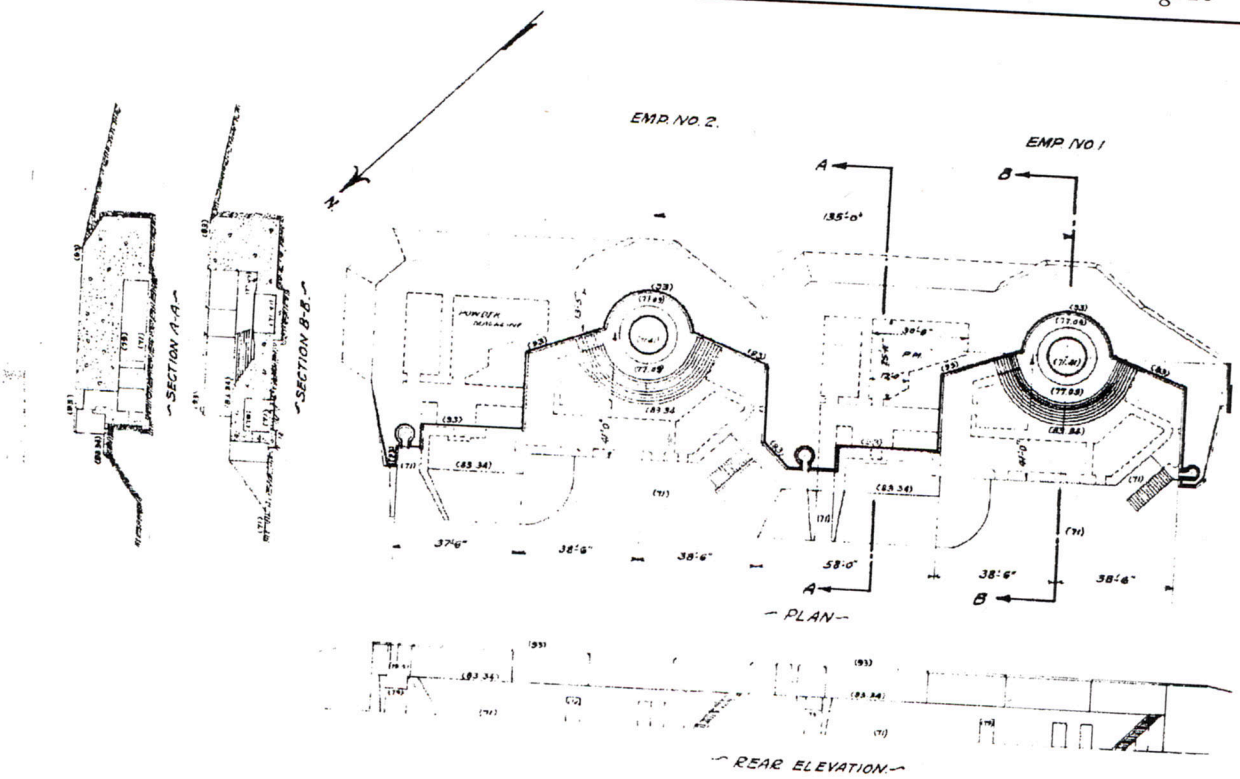


Battery Barry in 1902. *NARA*

Battery Richmond

On March 18 and 23, 1898, $100,000 from the National Defense Act of March 9, 1898, was allocated to construct a battery on Fort Newton. This was the first of four batteries, each mounting a pair of 12-inch guns on disappearing carriages. This first battery was built just to the west (right) of Battery Barry. Work was begun in March 1898 and rapidly pushed in light of the War with Spain that began the next month. The gun platforms were ready to receive their armament by the end of June 1898. The battery structure was completed in 1899 and one of the base rings had been set by the end of June 1899. M1888 guns Nos. 5 and 28 and M1896 disappearing carriages Nos. 26 and 10 were on hand. The battery was transferred to the garrison on September 5, 1899, but remain unarmed until the middle of 1900.

On April 4, 1900, the War Department named the emplacements Battery Richmond for the Staten Island Country of Richmond and for old Fort Richmond, the site of which was now occupied by the Third-System fort that had been renamed Battery Weed. (35)



Battery Richmond. *NARA*

Battery Hudson Built In the Return of Old Battery Hudson

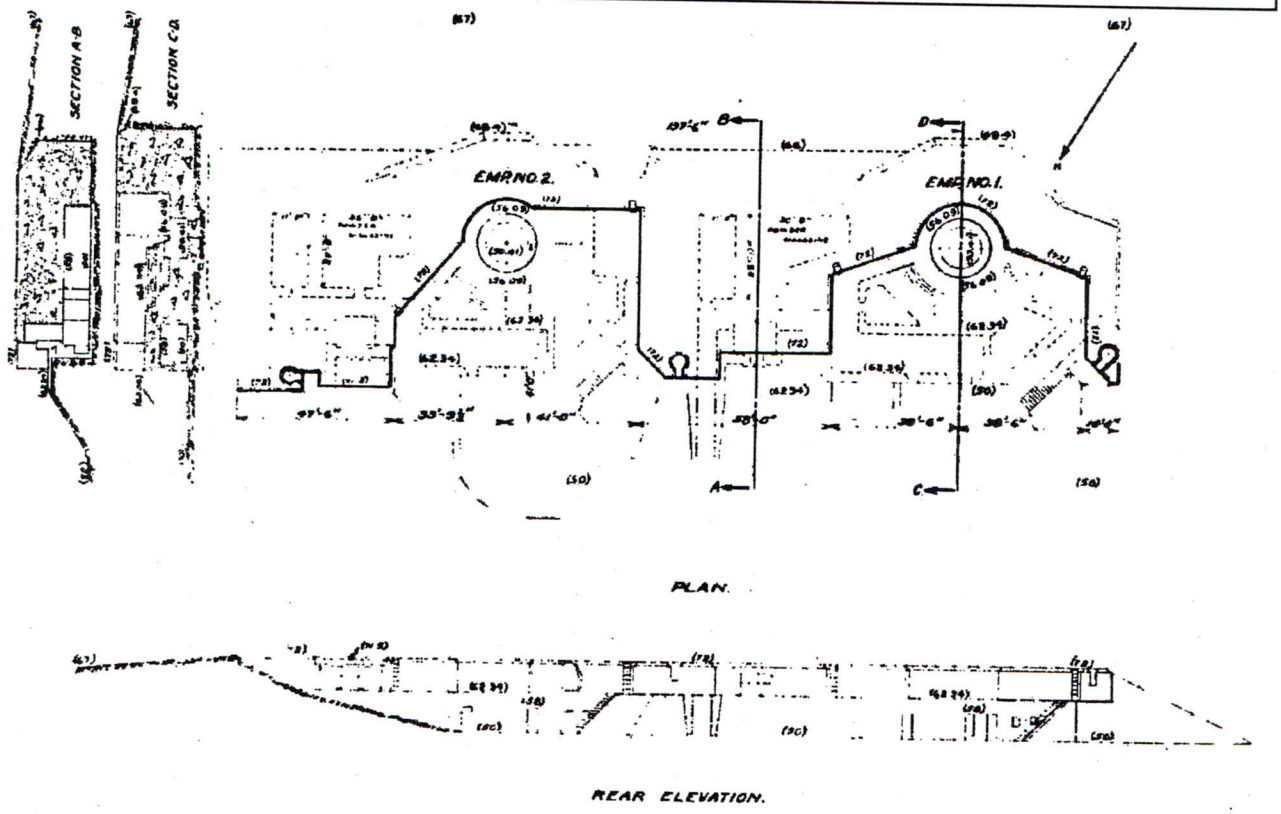
The second battery for 12-inch guns was authorized and funds were allocated from the regular appropriation for gun and mortar batteries on June 18, 1898. The battery was to be between the old lighthouse on the west return of Battery Hudson and the 1870s Battery Hudson. By June 30, 1898, excavations were well underway and the construction plant was being erected. Concrete was poured beginning in September 1898 and the platforms were generally complete and ready for their armament by October. M1896 disappearing carriages Nos. 21 and 11 had already been received at Fort Wadsworth but not been unloaded from their railcars.

The still-unarmed battery was transferred to the garrison on August 18, 1900. While two 12-inch guns, M1888MII No. 20 and M1895 No. 41, arrived in 1900, they were not mounted until 1902.

The battery was named for the earthen Battery Hudson in which it was located. The older battery had in turn been named for the explorer Henry Hudson.(36)

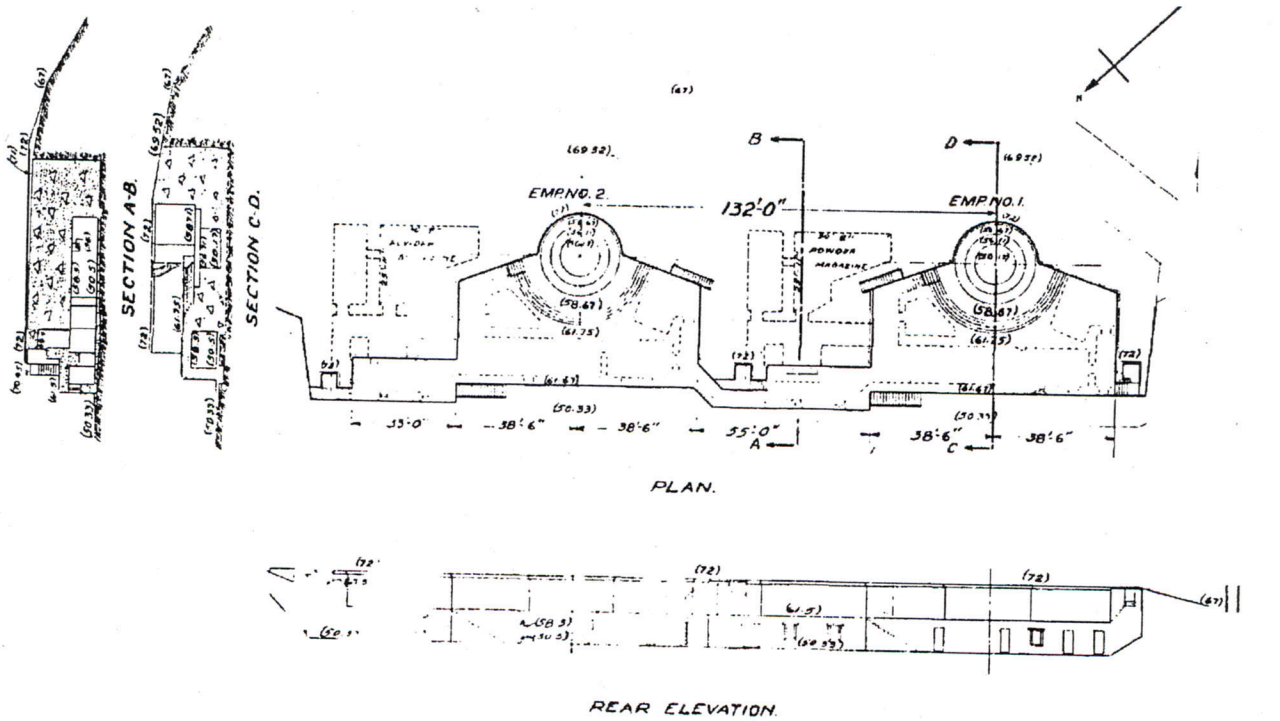
Battery Ayres

The third 12-inch battery was begun at Fort Newton in 1899. It was sited about 100 feet to the right of Battery Richmond. The sense of urgency brought on by the War with Spain in 1898 having passed, the project advanced more leisurely and was not completed until 1902. M1895MI guns Nos. 1 and 10 were mounted on M1897 disappearing carriages Nos. 24 and 25, and the battery was transferred to the garrison July 30, 1902. The battery was named on February 1902 for Col. and Maj. Gen. of Volunteers Romeyn Beck Ayres. Ayres graduated from USMA in 1847 and was commissioned in the 1st Artillery. In 1861, he transferred to the 5th Artillery. During the war, he was brevetted repeat-

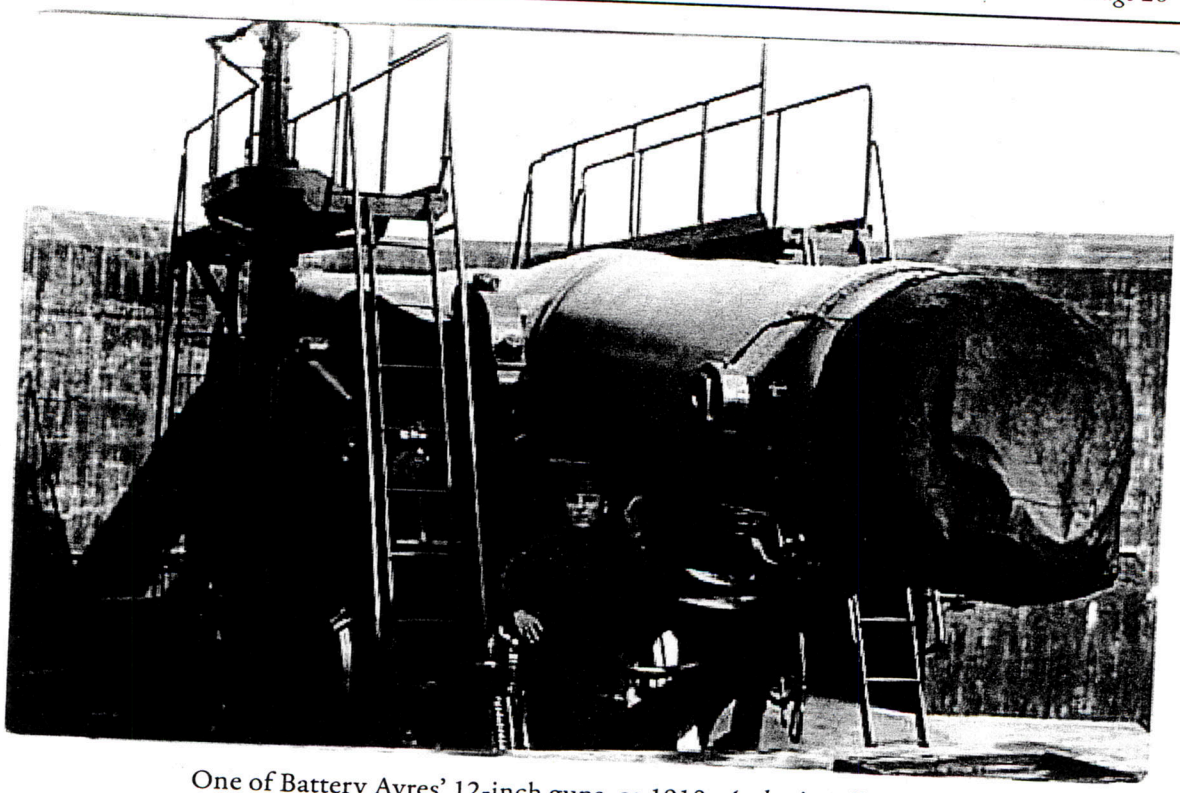


Battery Hudson. *NARA*

edly, reaching major general, for gallantry and meritorious service. Appointed brigadier general of volunteers 1862, when mustered out of the volunteer service, he returned to the 28th US Infantry as a lieutenant colonel. He transferred to the 3rd Artillery in December 1870 and nine years later returned to the 2nd Artillery as its colonel. Colonel Ayres died on December 4, 1888.(37)



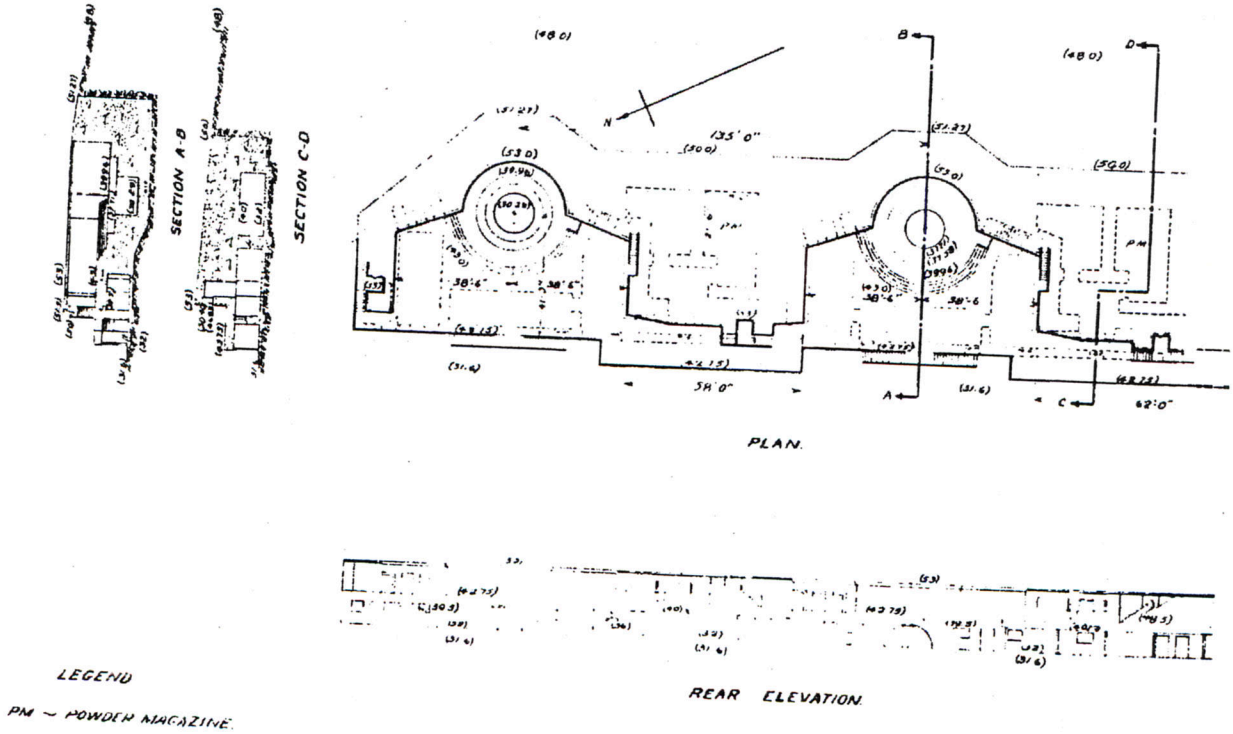
Battery Ayres. *NARA*



One of Battery Ayres' 12-inch guns, ca 1918. *Author's Collection*

Battery Dix

On September 14, 1901, construction was begun on the last 12-inch gun battery at Fort Newton. An allotment of $100,000 enabled it to be prosecuted without major delays, some 300 feet in front of



Battery Dix. *NARA*

Battery Upton and about 500 feet to the right of Battery Mills. Concrete work, about half completed by June 1902, was completed later that year. The battery was armed with M1900 12-inch guns Nos. 6 and 9 on M1901 disappearing carriages Nos. 5 and 6.

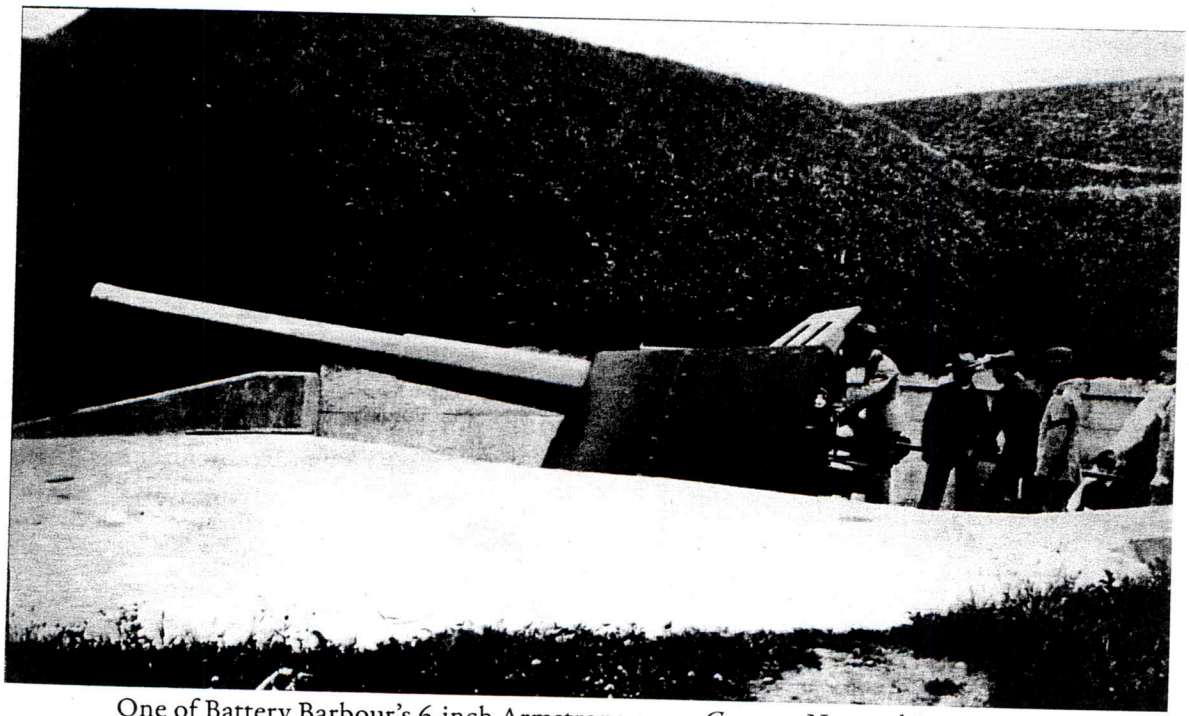
The battery was named for John Adams Dix of New Hampshire, who was appointed ensign in the 14th US Infantry on May 10, 1813. In March 1814 he transferred to the Corps of Artillery, where he was promoted to 1st lieutenant in March 1818. When the artillery was reorganized in June 1821, he was assigned to the 1st US Artillery but transferred to the 3rd Artillery in August 1821. After Dix resigned from the army in 1828, he held many political positions, including senator and postmaster of New York City. He returned to military service in 1861 as a major general of volunteers. He resigned again in November 1865 and died April 21, 1879.(38)

Rapid-Fire Batteries

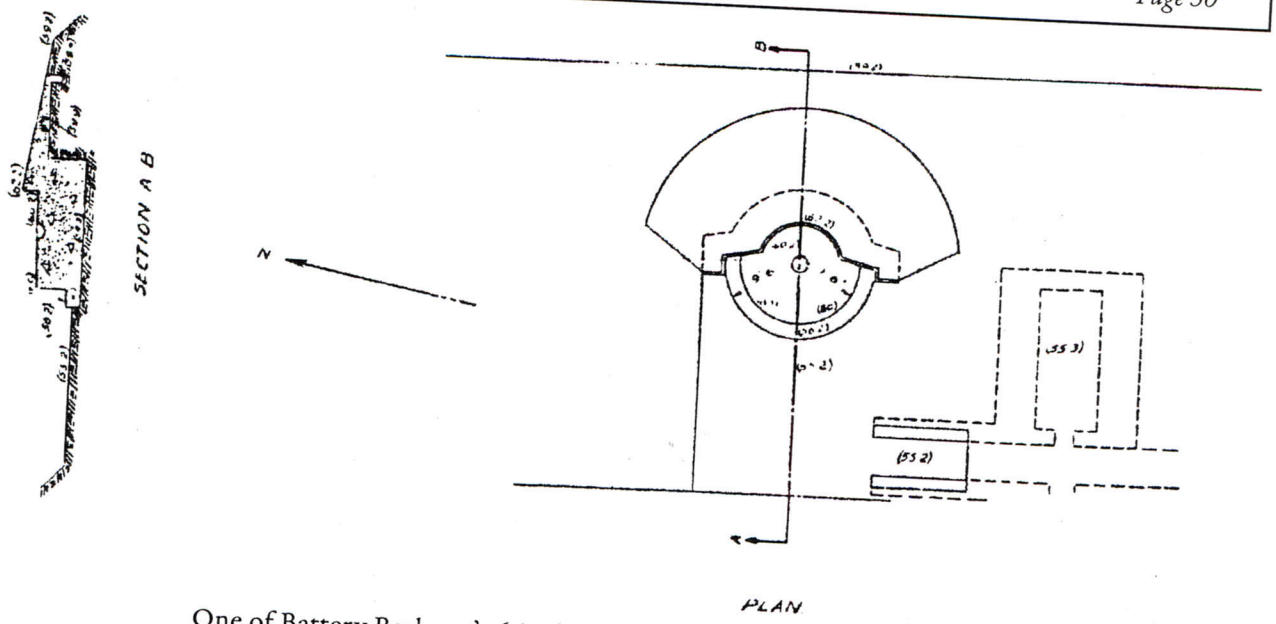
As at Fort Hamilton, RF guns at Fort Wadsworth were necessary to protect the minefields. As part of that protection, emplacements for 6-inch and 4.72-inch Armstrong quick-firing guns, as well as domestic 6-inch and 3-inch RF guns were also prepared in North and South Cliff Batteries and in old Battery Hudson. War with Spain hastened the establishment of these batteries, although construction continued into the early 20th century.

Battery Barbour

The appropriation of March 9, 1898, funded two emplacements for 4.72-inch/40-caliber Armstrong quick-firing guns for minefield defense, one in South Cliff Battery and one in Battery Hudson. Emplacement 1 was in the east section of Battery Hudson while Emplacement 2 was built in South Cliff Battery. Their platforms were completed and pedestal carriages Nos. 10837 and 10840 were emplaced by April 26, 1898. By May 8, the 4.72-inch guns Nos. 9721 and 12135 had been mounted. Some finish work remained to be carried out in the latter months of 1899. Both emplacements became part of Battery Barbour.(39)



One of Battery Barbour's 6-inch Armstrong guns. *Gateway National Recreation Area.*



One of Battery Barbour's 6-inch Armstrong gun emplacements. *NARA*

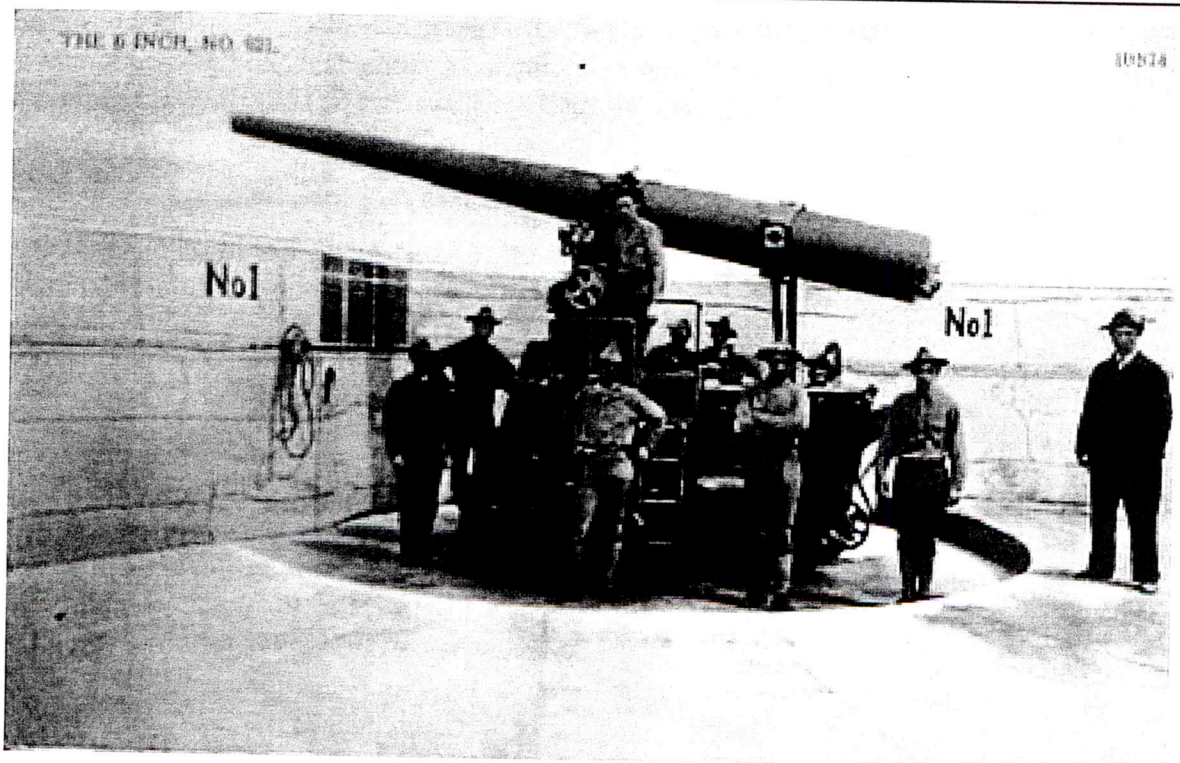
In addition to the 4.72-inch guns, emplacements for two 6-inch/40-caliber QF Armstrong guns was authorized March 9, 1898, and work commenced in September 1898. These guns were widely separated, one overlooking the Narrows near the south end of the 1870s section of Battery Hudson, the other in the south end of the old South Cliff Battery. These two emplacements also became a part of Battery Barbour. Concrete work was completed and the platforms were ready for their armament by November 1898, and 6-inch Armstrong guns Nos. 12135 and 12136 were mounted on pedestal mounts Nos. 11160 and 11161. Both emplacements were transferred to the garrison on December 20, 1899.

In May 1903, the emplacements for the Armstrong guns were named Battery Barbour, for Capt. Phillip Nordbourne Barbour, who graduated from USMA and was commissioned in the 3rd US Infantry in July 1834. Captain Barbour was brevetted major in May 1846 for gallant and distinguished service in the War with Mexico. On September 21, 1846, Captain Barbour was killed at the Battle of Monterey, Mexico.(40)

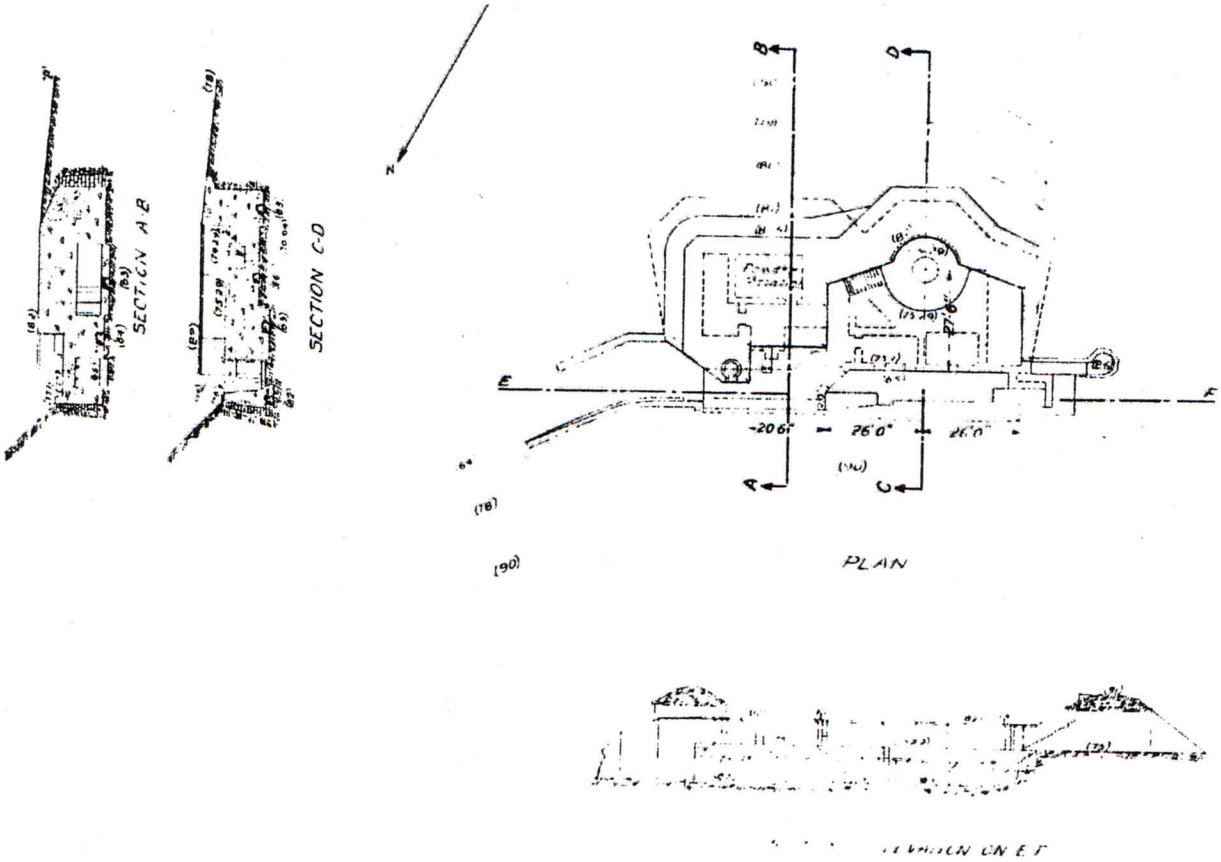
Battery Charles Mills

A second battery for two 6-inch guns on disappearing carriages was authorized in 1898 and work commenced in March 1899 for Emplacement 2 on the right flank of the 12-inch Battery Hudson and Emplacement 1 at the site of the Battery Hudson Extension, some 500 feet west. By the end of June 1899, Emplacement 2 was almost completed and construction on Emplacement 1 had commenced.

Both emplacements were fully completed by mid-1900, and M1897M1 guns Nos. 7 and 8 and M1898 disappearing carriages Nos. 28 and 29 were in place. The two emplacements were provided with hand-powered Hodges shell hoists. The battery was transferred to the garrison on October 26, 1900.



Battery Mills' M1897MI 6-inch gun No. 1 in 1912. *Author's Collection*

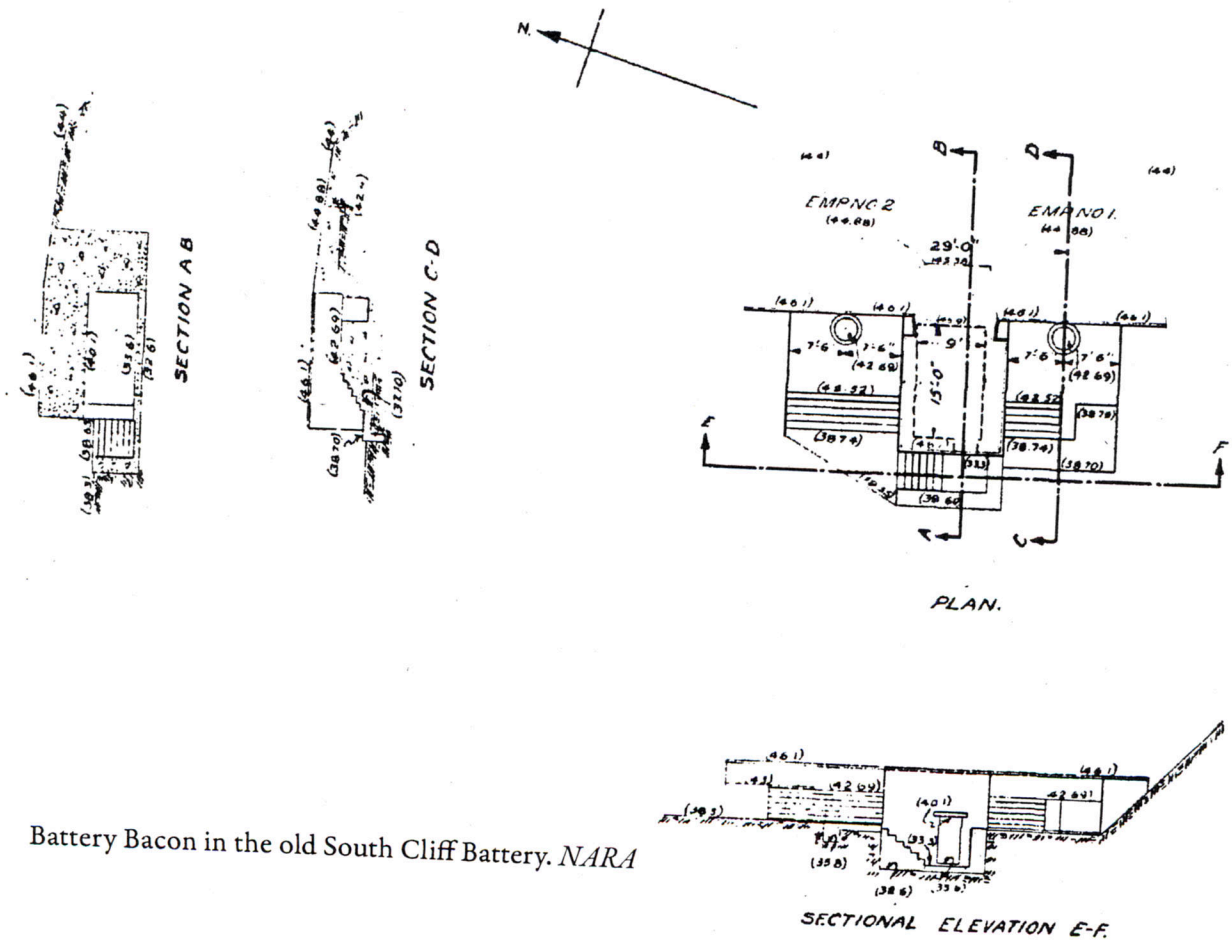


Emplacement No. 1 of Battery Mills in the old Battery Hudson Extension. *NARA*

In January 1906, the two 6-inch gun emplacements were named Battery Charles Mills, for Capt. and Bvt. Col. Charles J. Mills, US Volunteers. Appointed 1st Lieutenant, 2nd Massachusetts Volunteer Infantry, September 5, 1862, and honorably discharged March 18, 1863, he was reappointed adjutant of the 56th Massachusetts Volunteer Infantry September 1, 1863. Assigned as assistant adjutant general in July 1864, he was promoted captain in August 1864. Mills was brevetted major for gallant and meritorious conduct in the Battles of the Wilderness, Spotsylvania Courthouse, Bethesda Church, and the operations before Petersburg, VA, on January 23, 1865. He was killed in action at the Battle of Hatchers Run, near Petersburg, VA, on March 31, 1865. He was posthumously brevetted lieutenant colonel and colonel for his service during the war.(41)

Battery Bacon

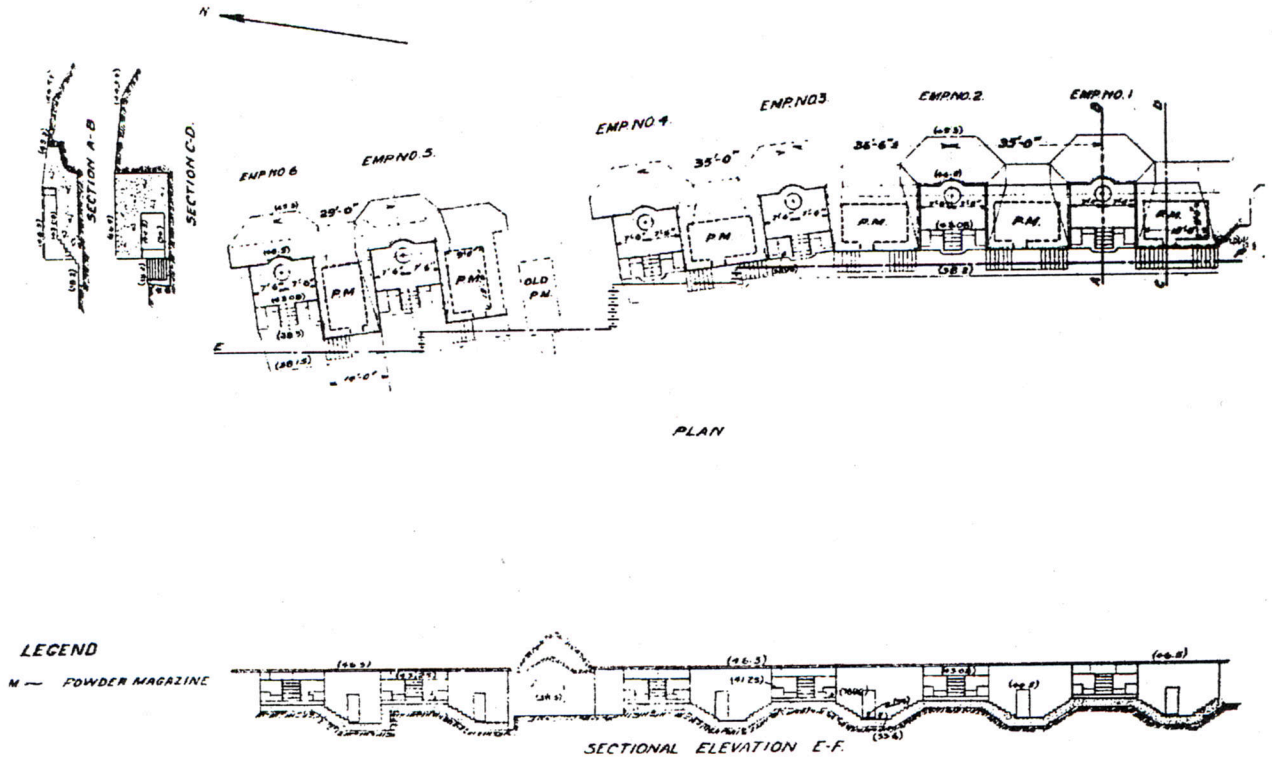
A battery for two 3-inch (15-pounder) RF guns was authorized for Fort Wadsworth in 1899 and a site was selected at the north end of the old South Cliff Battery. These guns would help cover the minefields in the Narrows and prevent the passage of torpedo boats. Construction began in February and it was transferred to the garrison on March 12, 1899. The battery was completed in June 1899. The two M1898 3-inch (15-pounder) Driggs-Seabury RF guns Nos. 91 and 94 on their M1898 masking-parapet mounts Nos. 91 and 94 were mounted when received at the fort. The emplacements were named Battery Bacon in May 1903, in honor of 1st Lt. John Danforth Bacon, 6th US Infantry, who graduated from USMA and was appointed brevet 2nd lieutenant in the 2nd US Infantry in July 1840. He transferred to the 6th US Infantry in December 1840 and was promoted to 1st lieutenant in June 1846. Wounded August 20, 1847, at the Battle of Churubusco, outside Mexico City, he died on October 12, 1847.(42)



Battery Bacon in the old South Cliff Battery. *NARA*

Battery William Turnbull

Soon after completion of Battery Bacon, four additional 3-inch emplacements were planned along the 1870s South Cliff Battery between Battery Barbour and Battery Bacon. This required removing the remaining obsolete muzzleloading artillery pieces as well as most of the remaining barbette gun platforms and traverse magazines. Excavations for the modern RF battery began in the early 1900s and progressed well. An additional pair of emplacements to the left of the four initial emplacements was authorized. By the end of 1902, concrete pouring was generally completed and in 1903 the finish work was completed and the battery was ready for its armament. Four 3-inch M1903 RF guns, Nos. 60, 66, 67, and 68, on M1903 pedestal mounts Nos. 37, 38, 39, and 40 were transferred to the garrison November 19, 1903. Emplacement Nos. 5 and 6 were armed with M1903 guns Nos. 81 and 82 on pedestal mounts Nos. 41 and 42 and transferred a few months later.



Battery Turnbull's six emplacements in the old South Cliff Battery. *NARA*

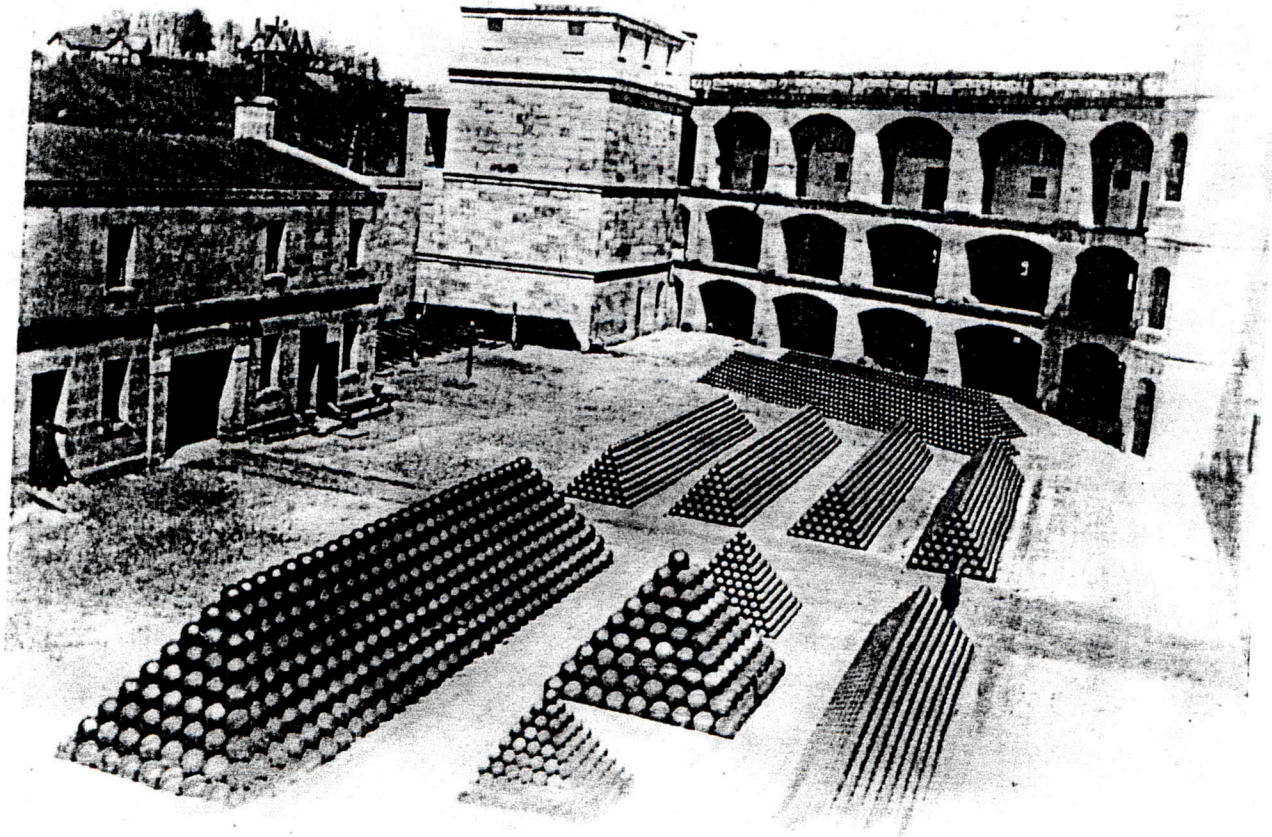
The battery was named in 1904 in honor of Maj. and Bvt. Col. William Turnbull, US Topographical Engineers. Turnbull graduated from the USMA and was commissioned in the Corps of Artillery in July 1819. He was assigned to the 4th US Artillery upon its organization in 1821 and was brevetted captain in the Topographical Engineers ten years later. Turnbull was brevetted lieutenant colonel and then colonel for gallantry and meritorious conduct in the War with Mexico. Colonel Turnbull died on December 9, 1857.(43)

Battery Robert Catlin

Once the heavy-caliber batteries were complete, or nearly so, and RF guns were being emplaced along the length of the South Cliff Battery and in portions of old Battery Hudson, attention was given

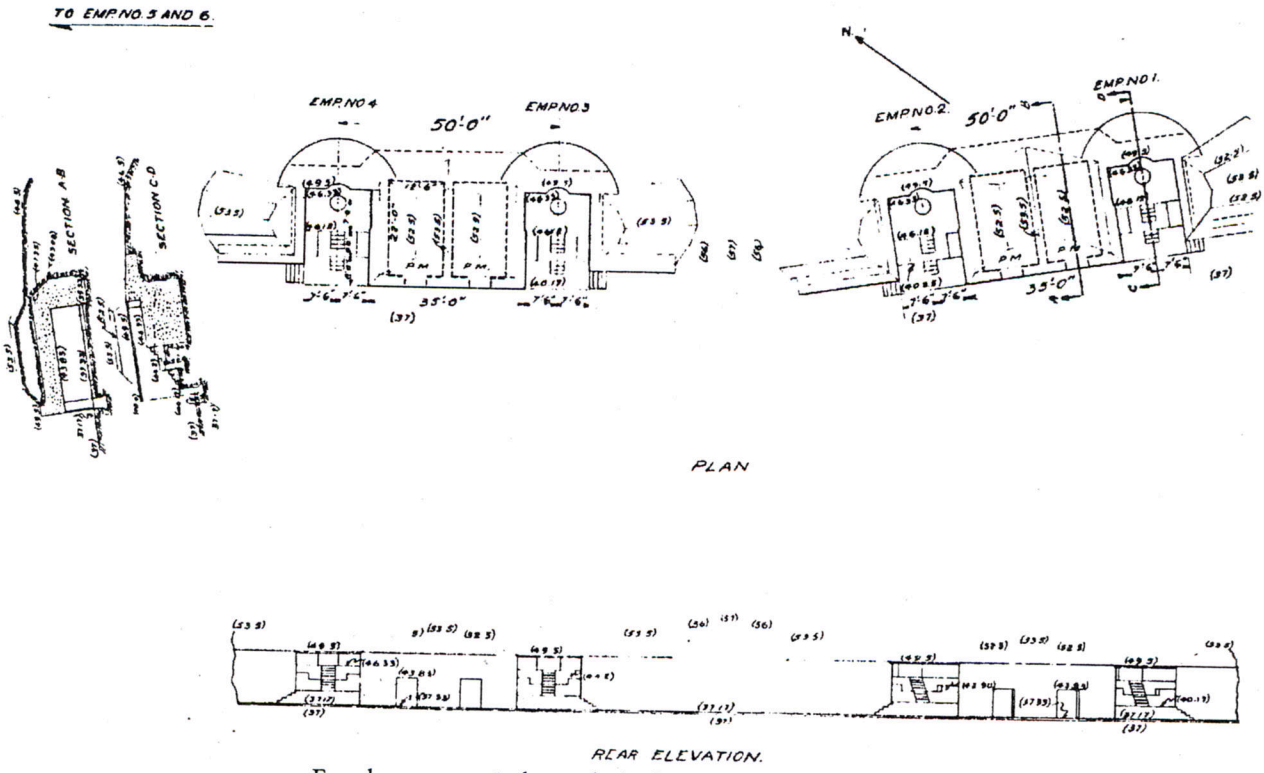


M1902 3-inch rapid-fire gun of Battery Turnbull, ca 1920s. *Gateway NRA.*



Battery Weed. *Author's Collection.*

to modifying North Cliff Battery for RF guns. By 1902, approval had been obtained to construct four emplacements for 3-inch (15-pounder) RF guns on pedestal mounts. Before construction, the old Rodman guns had to be dismounted and placed in storage pending disposal, and substantial amounts of earth had to be excavated for the projected batteries. Once construction was underway, an additional pair of emplacements to the left of the initial four was authorized. The initial four were transferred to the garrison July 22, 1904, Emplacements 5 and 6 a few months later. Beyond a few passageways through the earthen traverses, virtually nothing was left of the old 1870s works other than the old roadway along the battery's rear. The battery was initially armed with six M1902 RF guns and pedestal mounts Nos. 30, 31, 32, 33, 34, and 35.

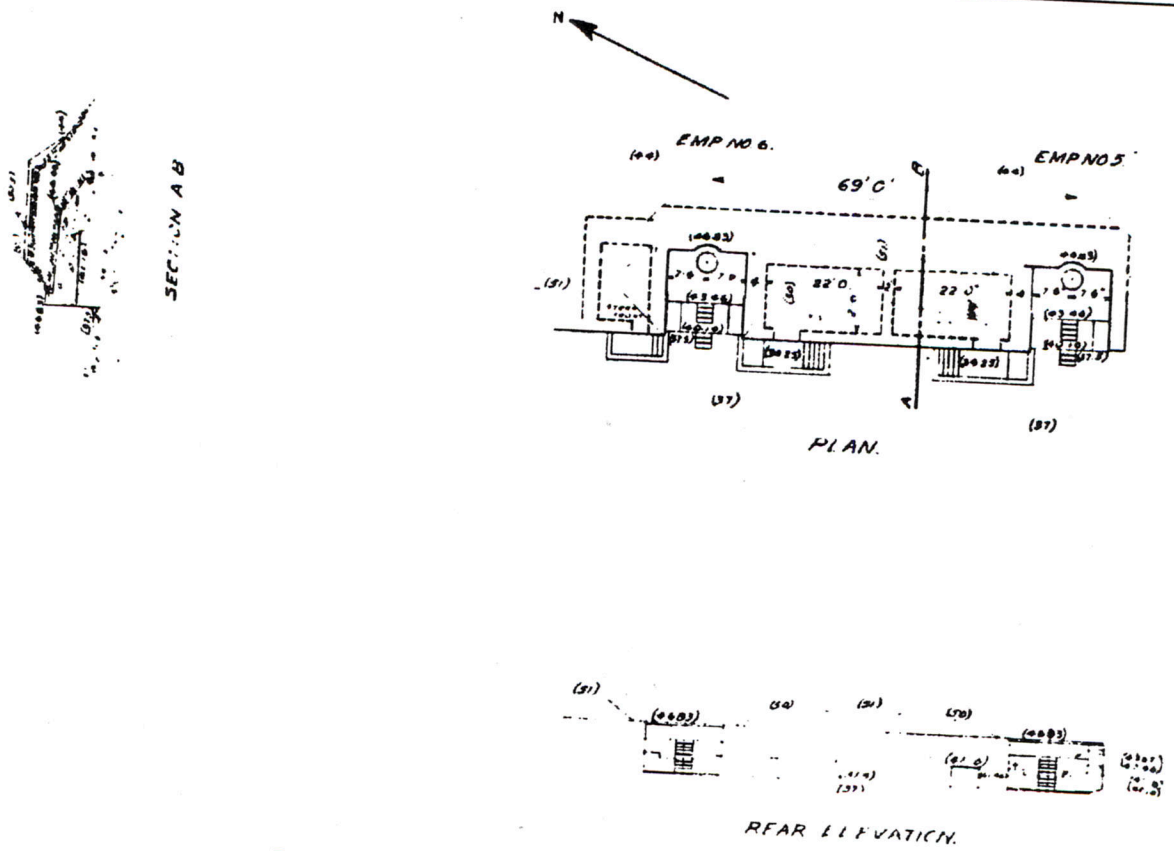


Emplacements 1 through 4 of Battery Catlin. *NARA*

On December 27, 1904, the battery was named in honor of Capt. Robert Catlin, who graduated from USMA and was commissioned in the 5th Artillery in 1863. He retired April 26, 1865, but reentered the Army as a captain in the 43rd US Infantry in July 1866. He retired again on December 15, 1870, and died December 28, 1903.(44)

Initial Fire Control Stations at Fort Wadsworth

The initial fire control structures at Fort Wadsworth were built during 1898 in conjunction with Batteries Emory Upton, Barry, and Hudson. The first, a two-room brick and timber structure to the right of Battery Catlin, later served as command post (CP) of the Second Battle Command. Three more wooden range-finder "shelters" were constructed behind Batteries Upton and Barry. A brick meteorological station was built on the left flank of Battery Duane behind the old site of Two-Gun Battery. All of these buildings were turned over to the Board of Regulation of Seacoast Artillery Fire on November 12, 1897, to evaluate fire control for the Narrows defenses preliminary to establishing a permanent fire control system.



Emplacements 5 and 6 of Battery Catlin. *NARA*

The next fire control structure erected was a battery commander's station (BCS) for Battery Richmond, a one-room brick building commenced at the rear of the battery in August 1898, completed in December, and transferred on September 20, 1899. A BCS for Battery Hudson was commenced in April 1899 and was complete except for its roof by June 30.(45)

In the first decade of the 20th century, a number of fire control stations were built at Forts Hamilton and Wadsworth. What evolved during that decade was the result of a series of studies of fire control requirements in New York Harbor. Two tactical battle commands were formed; the First Battle Command, composed of the First, Second, and Third Fire Commands, was at Fort Hamilton; the Second Battle command, Fourth and Fifth Fire Command and the Mine Command, was at Fort Wadsworth.

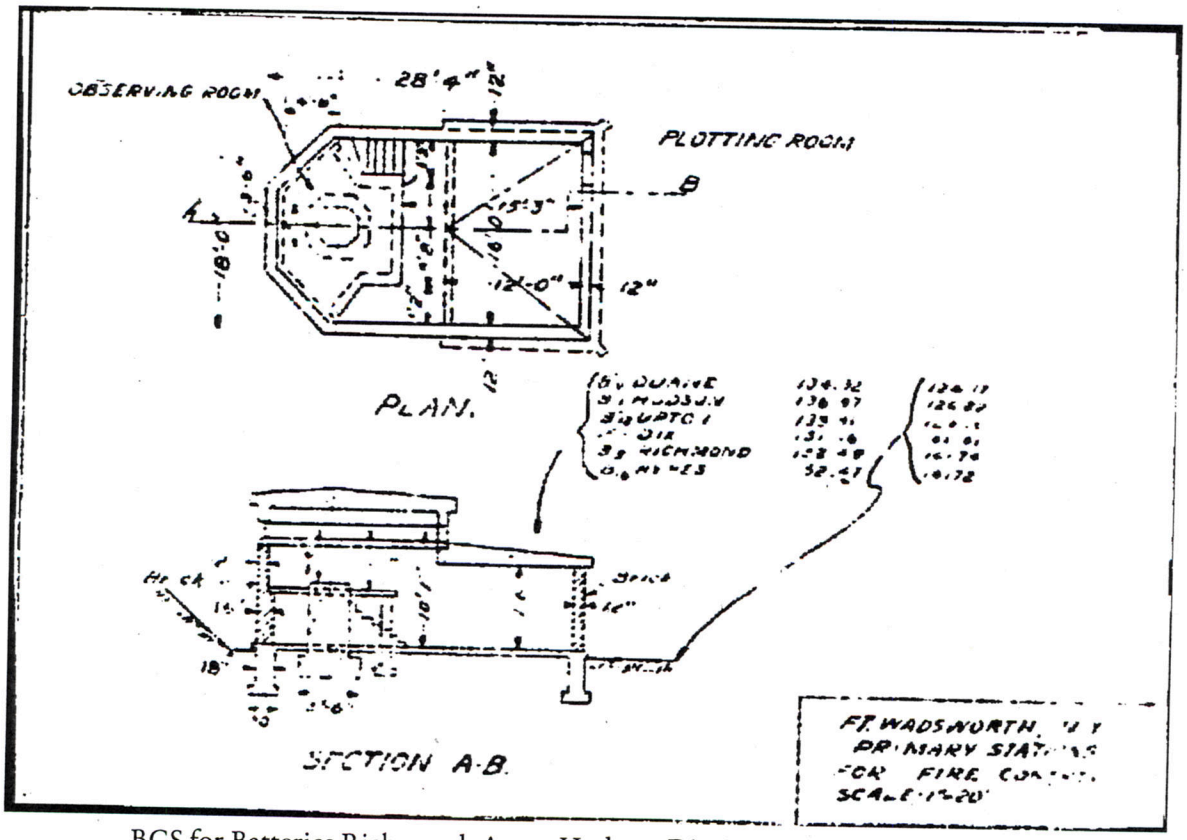
First Battle Command's CP was a splinterproof three-room concrete and timber structure on the east parapet of the masonry fort behind Battery Harvey Brown's left flank. The station was transferred to the garrison July 24, 1906.

The First Fire Command consisted of Batteries Spear (3 x 10-inch), Gillmore (4 x 10-inch), Harvey Brown (2 x 12-inch), Burke (2 x 6-inch), Johnson (2 x 6-inch), and Griffin (2 x 4.72-inch and 2 x 3-inch) at Fort Hamilton. The Second Fire Command, also at Fort Hamilton, consisted of Batteries Mendenhall (4 x 6-inch), Livingston (4 x 6-inch), Doubleday (2 x 12-inch), and Neary (2 x 12-inch). The eight 12-inch mortars of Fort Hamilton's Battery Piper made up the Third Fire Command.

The Second Battle Command CP and the batteries it controlled were at Fort Wadsworth. The CP's observation and plotting rooms were in a two-room brick and timber structure on the right of Battery

Catlin, overlooking the Narrows. This had been among the first fire control structures to be built and was transferred in 1897.

The Fourth Fire Command was composed of Batteries Dix (2 x 12-inch), Barry (2 x 10-inch), Richmond (2 x 12-inch), and Ayres (2 x 12-inch). The Fifth Fire Command was composed of Batteries Mills (2 x 6-inch), Duane (5 x 8-inch), Hudson (two 12-inch), and Upton (2 x 10-inch). The Mine Command consisted of Batteries Barbour (2 x 4.72-inch and 2 x 6-inch Armstrong), Turnbull (6 x 3-inch), Bacon (two 3-inch,), and Catlin (6 x 3-inch).



BCS for Batteries Richmond, Ayres, Hudson, Dix, Upton, and Duane. *NARA*

Construction of fire control stations at the Narrows continued in 1904 with eight primary stations at Fort Wadsworth, across New York Avenue some 600 feet north of Battery Barry. These primary stations were chiefly stand-alone two-story structures of brick and timber, with observation rooms on the upper levels and battery plotting rooms on the lower levels. These primary stations served the Fourth and Fifth Fire Commands and Batteries Mills, Hudson, Upton, Barry, Duane, and Dix. A four-room dormitory behind the midpoint of the line of primary stations housed the men assigned to the stations. Three secondary stations about 800 feet behind Battery Richmond served the First Fire Command and Batteries Gillmore, Brown, and Burke-Johnston at Fort Hamilton. These wooden structures, each with a single observation room, were transferred to the garrison October 10, 1904.(46)

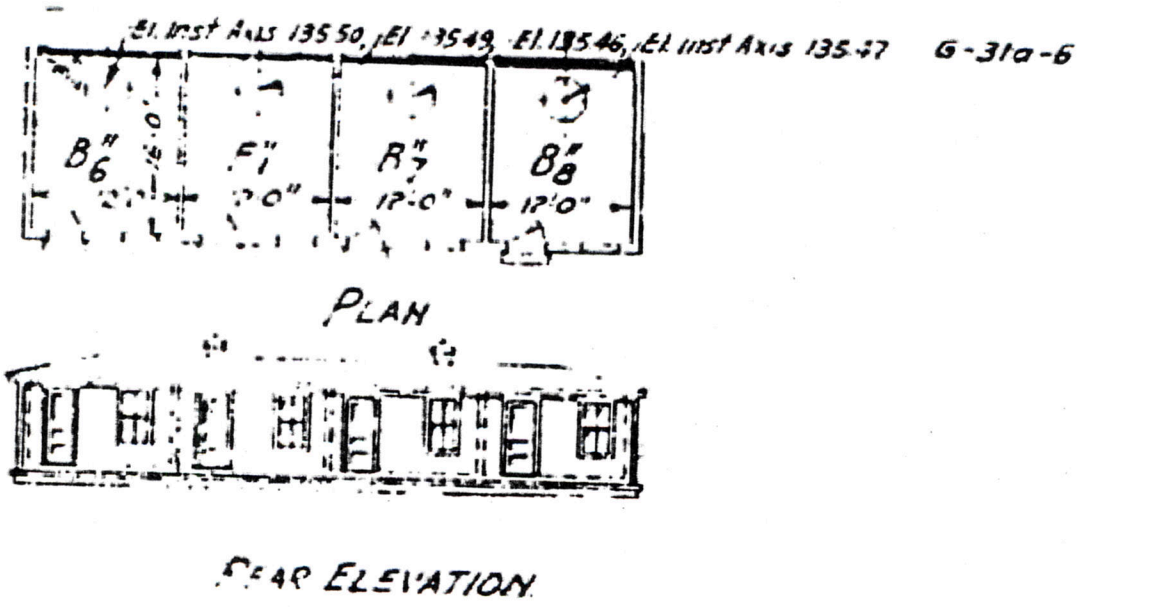
Fire Control Stations at Fort Hamilton

The building program continued for the next three years. In 1905, the primary focus was at Fort Hamilton, where primary stations for the First Battle Command and the First, Second, and Third Fire Commands were built, along with secondary stations for the Fort Wadsworth batteries. The primary

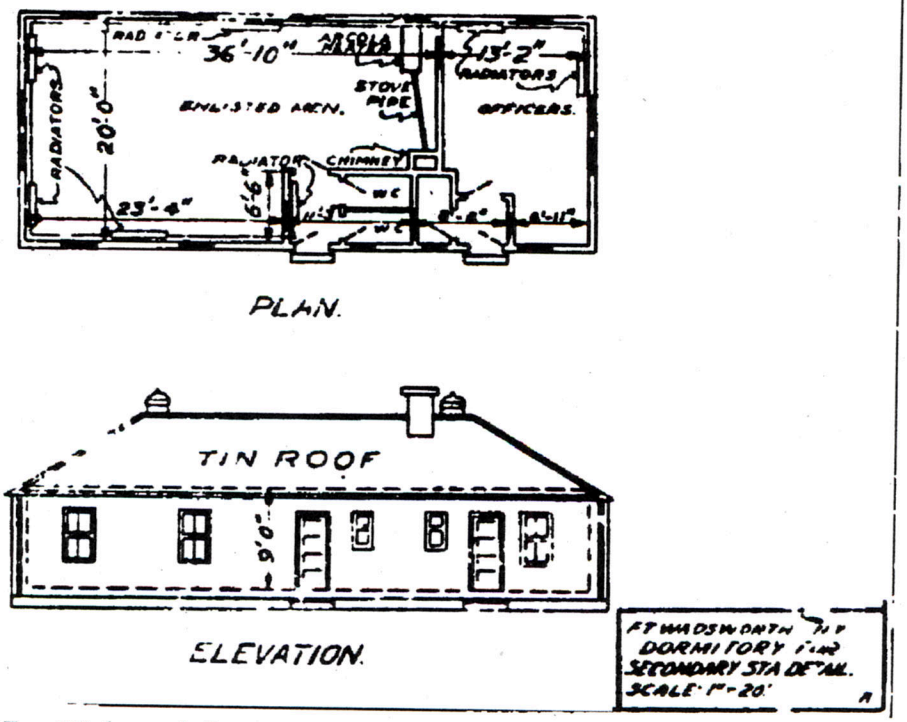
stations for the First and Second Fire Commands were behind Battery Gillmore, just east of the masonry fort. The lower levels of these stations were concealed behind the substantial embankments of the old 1870s mortar battery. The primary station for the Third Fire Command was east of the other primary stations, some 260 feet behind Battery Spear. These two-room, twin-story timber primary stations, each containing observation and plotting room, were transferred to the Fort Hamilton garrison on July 24, 1906.

The secondary stations for the Fort Wadsworth batteries were built some 700 feet north of Batteries Mendenhall and Livingston at Fort Hamilton. A nine-room complex was constructed in two timber buildings. The first building housed the observation rooms of the secondary stations for the Fourth Fire Command and Batteries Ayres, Richmond, and Duane; the second building housed a tertiary station for the Third Fire Command, the secondary station for the Fifth Fire Command, and secondary stations for Batteries Dix, Upton, and Hudson. These stations were transferred to the garrison on October 17, 1905. (47)

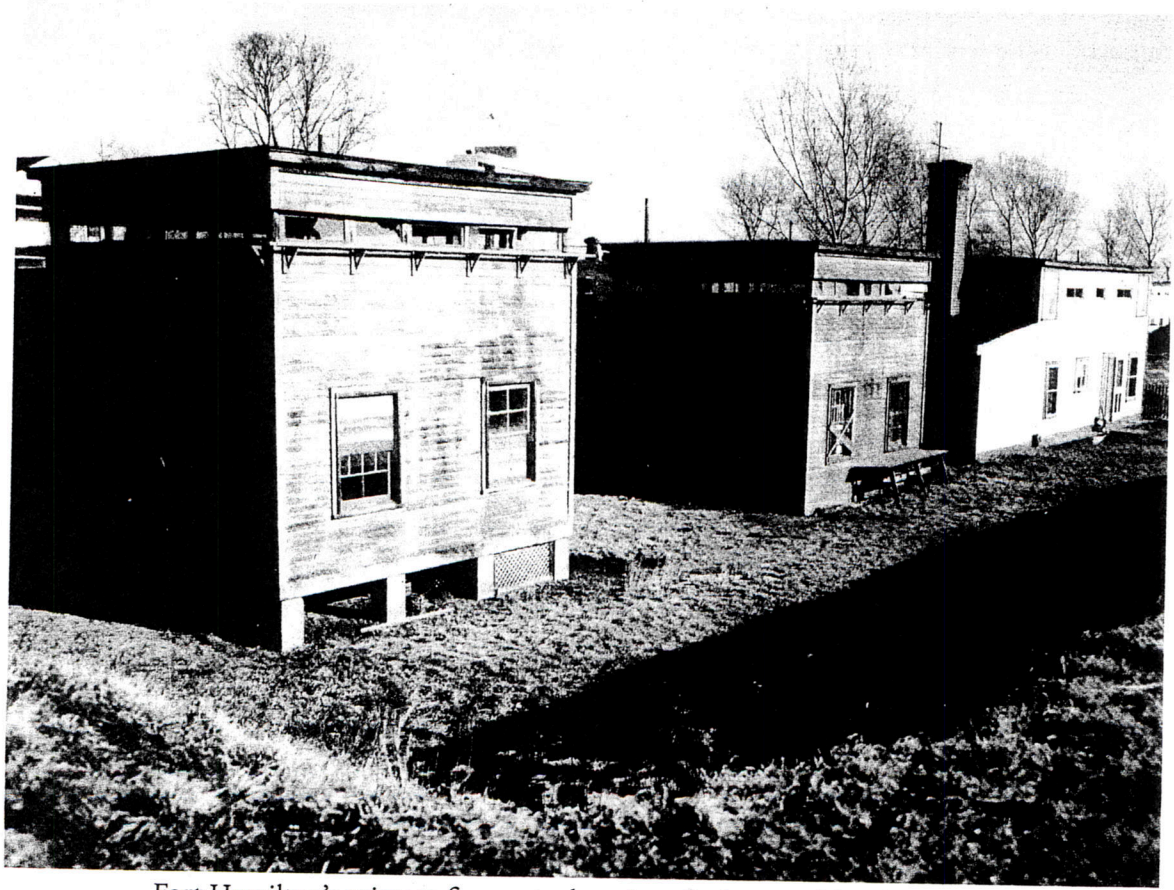
In 1906, primary stations for the First Fire Command and Batteries Spear, Gillmore, and Brown were built in a three-building complex just east of Fort Hamilton's glacis and some 300 feet north of Battery Gillmore. Fort Hamilton's switchboard rooms, one type-A and one type-C, were built just behind the primary stations in single-story timber structures with galvanized iron siding. The primary stations and switchboard rooms were transferred July 24, 1906.(48)



Secondary stations at Fort Wadsworth for Fort Hamilton batteries. *NARA*



Dormitory at Fort Wadsworth for Fort Hamilton's secondary stations. *NARA*



Fort Hamilton's primary fire control stations for large-caliber batteries.

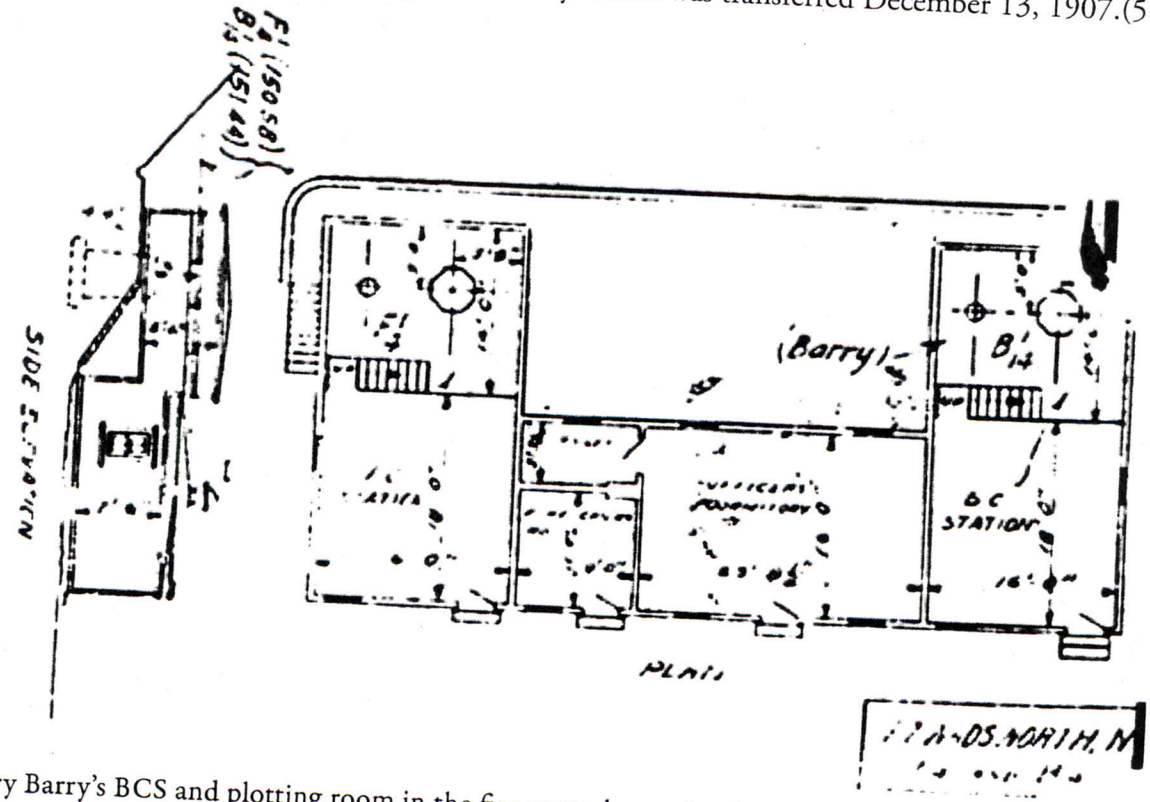
North of Battery Spear, a second group of four buildings was constructed as primary stations for the Second and Third Fire Commands and Batteries Neary, Doubleday, Livingston, and Mendenhall. Each was a double station, serving two batteries with a slight change in design. These buildings, still two stories, were timber with sidings and roofs of galvanized iron.(49)

Secondary stations for the Second and Third Fire Commands were built at Fort Wadsworth as part of a six-station complex behind Battery Richmond. It also housed secondary stations for Batteries Livingston, Doubleday, and Neary, and a supplementary station for Battery Ayres. A second complex of four stations housed the secondary stations for the First Fire Command and Batteries Burke-Johnston, Brown, and Gillmore. These stations were transferred on August 9, 1906.(50)

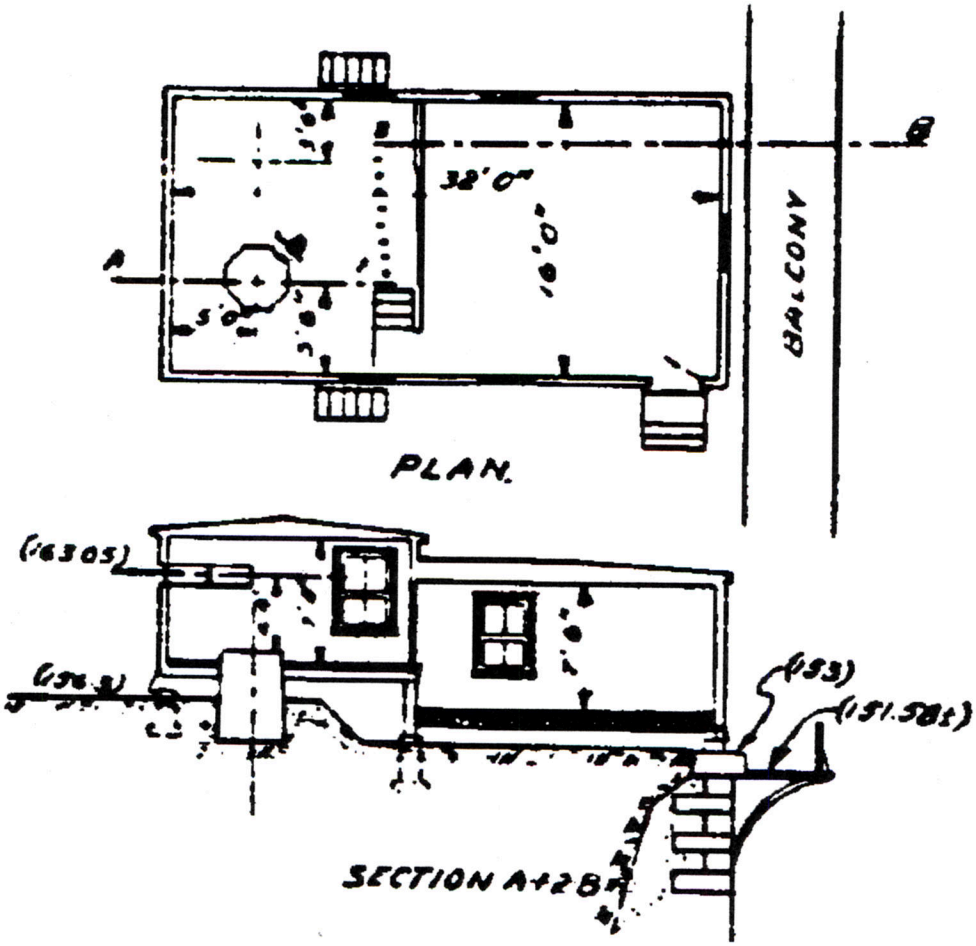
Battery Gillmore's BCS was built directly behind the battery. This 8 by 12-foot room of "reinforced" concrete (Reinforced concrete at this time did not contain the rebar incorporated later.) was dug into the top of the embankment of the old 1870s mortar battery. It was transferred on December 13, 1906.

In 1907, a CP for the First Battle Command was completed at Fort Hamilton, a three-room concrete-and-timber structure behind Battery Brown's left flank. The station was transferred on January 31, 1907, along with a tide station on the quartermaster wharf equipped with two tide gauges, one vertical staff and float in a copper tube, and one horizontal gauge with a float in a wood tube. Officers and enlisted dormitories were also built in 1907 to complete the fire control elements on the Long Island side of the Narrows. Both were transferred March 14, 1907.

Across the Narrows at Fort Wadsworth, two more fire control structures were built in 1907. Battery Barry's splinterproof concrete BCS was completed in the late summer of 1907 and transferred October 13, replacing a 1904 double station in a structure that had also served as primary station for the Fourth Fire Command. A two-room frame supplementary station for Fort Hamilton's Third Fire Command in the rear and to the right of Battery Catlin was transferred December 13, 1907.(51)



Battery Barry's BCS and plotting room in the fire control complex that housed the primary station for the Fourth Fire Command and an officers' dormitory. NARA



Supplementary station for Fort Hamilton's Third Fire Command on the right flank of Battery Catlin, at Fort Wadsworth. NARA

Manning the Defenses 1900-1924

The Artillery Corps Is Constituted and Organized

By 1900, the increasingly divergent missions and materiel of seacoast, also termed foot or heavy, batteries and the mounted light or field batteries urged the separation of the two types of artillery. Congress enacted an Act to Reorganize the Artillery February 2, 1901, abolishing the regimental system in force since 1821 and reorganizing the batteries into an Artillery Corps of 126 companies of coast artillery and 30 batteries of field artillery. The lettered firing batteries A, B, C, E, G, H, I, L, M, N, and O of the 5th Artillery regiment were redesignated the 49th through 59th Coast Artillery Companies, while Batteries D, F, and K were redesignated the 9th, 10th, and 11th Field Batteries. As only 82 companies of coast artillery could be formed from the former regiments, the remaining 44 companies were organized from the existing companies. The personnel for the 83rd, 84th, 85th, 86th, 98th, 122nd, 123rd, and 124th Companies of Coast Artillery were obtained respectively by dividing the 49th, 54th, 53rd, 57th, 51st, 52nd, 55th, and 50th Companies in half and filling out the ranks with recruits.

Following the reorganization, the following coast artillery companies were posted in the forts in the Artillery District of Southern New York:(52)

48th Co. Formerly O/4 Artillery, Ft. Hancock
49th Co. Formerly A/5 Artillery, Ft. Columbus
50th Co. Formerly B/5 Artillery, Ft. Wadsworth
51st Co. Formerly C/5 Artillery, Ft. Hamilton
52nd Co. Formerly E/5 Artillery, Ft. Hancock
53rd Co. Formerly G/5 Artillery, Ft. Wadsworth
54th Co. Formerly H/5 Artillery, Ft. Hamilton
55th Co. Formerly I/5 Artillery, Ft. Hancock
57th Co. Formerly M/5 Artillery, Ft. Wadsworth
83rd Co. Organized 4/6/01 at Ft. Hamilton
84th Co. Organized 1901 at Ft. Hamilton
85th Co. Organized 4/15/01 at Ft. Wadsworth
86th Co. Organized 1901 at Ft. Wadsworth
95th Co. Organized 1901 at Ft. Hancock
98th Co. Organized 8/2/01 at Ft. Hamilton
122nd Co. Organized 10//01 at Ft. Columbus
123rd Co. Organized 10//01 at Ft. Hamilton
Battery L, 5th Artillery, became the 56th Co. at San Juan, PR

The middle of 1903 found the garrisons at the Narrows organized as follows:(53)

Fort Hamilton: 51st, 84th, 98th, and 123rd Cos., CA.
Fort Wadsworth: 50th, 53rd, 57th, 85th, and 86th Cos., CA.
(The 85th Co. was later transferred to the Philippines)
Fort Hancock: 48th, 55th, 95th, and 113th Cos., CA.

In June 1905, the only change was the replacement of the 85th Co. at Fort Wadsworth with the 56th Co. In June 1906, the only change was the shift of the 86th Co. from Fort Wadsworth to Fort Hamilton.

The New York National Guard in Defense of New York City

From the earliest days of the republic, the Regular Army had relied upon the militia of the various states to reinforce it in the defense of the country. New York's State Militia, renamed the National Guard, contributed to the defense of New York Harbor. The 13th New York Heavy Artillery was one of the regiments that would play an integral part in the manning of the harbor forts. The relationship between the Regulars and the Guardsmen was, however, not always a happy one. The 13th had a historic lineage traced back to the Revolution and held its traditions sacred. The relationship was also clouded by politics. Periodically during the early years of the 20th century, the War Department would invite the 7th Infantry and 13th Artillery Regiments and other units of the New York National Guard to participate in the annual coast defense exercises. In 1907, the invitation was initially rejected by the state adjutant general, Maj. Gen. Charles F. Roe, after consultation with the regimental officers, because the guardsmen would not be under their own officers but would be parceled out among the harbor forts

as reserves. The National Guard officers were also invited to participate, although not in immediate command of their own troops. However, Roe was overruled by the governor and the National Guard units were ordered to participate.(54)

The National Guard elements distributed among the forts at the Narrows for the 1907 exercises included one battalion of the 7th Infantry Regiment, NYNG, and five companies of the 13th Regiment at Fort Wadsworth. The remainder of the 7th and four companies of the 13th were assigned to Fort Hamilton, while the remainder of the 13th and the 8th Infantry Regiments serving as coast artillery reserves and infantry supports were assigned to the defenses of Eastern New York. Over the next seven days, National Guard personnel participated in the maneuvers, which Col. Medorem Crawford, commanding Fort Wadsworth, described as "for the purpose of thoroughly interesting the National Guard in the coast defenses and fitting them to render valuable and efficient service in time of war. . . This kind of work has never before been undertaken seriously and the result is that much of the work this year will be of an elementary nature consisting to a large extent of object lessons with a "regular" beside every militiaman to coach him in the work that he would be called upon to do should his services be necessary in time of war."(55)

The training period culminated in an exercise in which a hostile fleet of "battleships, cruisers, and torpedo boats" (an army mine planter, tug, and launch) attempted to enter the harbor and lay waste to the city. On the final day of the sham battle, the hostile force was represented by the battleships USS *Alabama* and *Connecticut* that entered the harbor in a thick fog and were not discovered until they were only some 2,000 yards from the forts. As they emerged from the fog, the battlewagons were "sunk" by mines before entering the Narrows. The guns and mortars of the forts continued to belch flame and thunder as the two vessels proceeded on into the inner harbor followed by the destroyers and other vessels of the fleet, followed in turn by the army "fleet" of mine planter, tug, and launch. That night another run-by was attempted, but the "battleships" and "cruisers" were picked up at 5,000 yards by the searchlights of the forts. According to the umpires, the "enemy" fleet was destroyed four times.(56)

In June 1908, additional exercises were conducted at Fort Hancock using two battalions of New Jersey National Guard. In this event, the "hostile fleet" was army mine planters *Armistead* and *Knox* and two harbor boats that operated in the waters of the lower bay. "Enemy" forces managed to land on Sandy Hook and capture the fort, which placed Forts Hamilton and Wadsworth on the front line of the defenses. Tragically, a burning powder bag fragment in the bore of a 12-inch gun at Battery Dix was drawn back to the powder chamber when the breech was opened for reloading. When the new powder bag was pushed in, an explosion ensued, killing two men of the 9th Coast Artillery District, NYNG, and wounding several more. Col. Henry L. Harris, commanding the Artillery District of Southern New York, believed that the explosion was caused by the men being so intent on making a record in reloading and firing the gun.

In conjunction with the exercises, Fort Wadsworth's 10-inch and 12-inch guns were test fired to determine the differences between guns. On the first day, Batteries Ayres, Richmond, and Dix fired. The results of the firing of Battery Dix were so disparate that a second day of firing was required to establish the mathematical model for its two 12-inch guns. That second day, Battery Barry also fired 10 rounds from its 10-inch guns in the test firings. The exercises also presented an opportunity for Companies A and E of the 13th Artillery District, NYNG, to calibrate Battery Piper's 12-inch mortars. Men of the 13th also manned Battery Harvey Brown during its first full service charge calibration shoot. (57)

While the War Department had no authority to hold up shipping during gun practices, simple prudence on the part of ship captains would have indicated that passage at such times was ill advised.

Sometimes, however, stubbornness or arrogance held sway. The captain of the White Star Line's *Adriatic* may have possessed one or more those characteristics. *Adriatic* was seaward bound during the June 1908 target practices, and keeping to her course and speed gave the long streaming red flag flying high above Fort Hamilton a saluting toot on her whistle and made for the open sea, causing a temporary halt in the firing. Observers noted that the first full service round fired from Battery Brown at the large red target off Sandy Hook seemed not all that far removed from the *Adriatic's* churning propellers.

While windows and crockery had been broken in previous firings of the guns, using reduced charges, this first firing with full service charges created real havoc. Battery Brown's manning detachment of the 13th Artillery District were thrown down on the loading platforms as the column of crimson flame shot from the muzzle followed by a brown cloud of smoke. The effects were not confined to the battery. The post canteen suffered a pandemonium of exploding sarsaparilla, ginger, and soda bottles as they popped their corks, while the tobacco shelves came down from the walls with a clatter. Although the post inhabitants had opened the windows of their quarters in accordance with instructions, windowpanes were smashed anyway. Outside the fort, civilians also felt the effects of the firing. The beer pipes at Meyers' Tavern were twisted and sent flying into the air. An ancient denizen of the tavern who had not head a sound in a decade when asked if he heard the shot retorted: "Hear it, I thought I was hit!" A few doors away from the tavern, the plaster fell from the ceiling, one large piece falling on a woman who was laying down to rest. She had to be treated at the hospital.

Firing continued at targets off Coney Island and Sandy Hook, creating a cross fire from Forts Wadsworth and Hamilton. The Cunard liner RMS *Lusitania*, bound for Liverpool, exercised more caution than the *Adriatic*, halting in the Narrows for nearly a half hour as the firing was carried out.(58)

Firing practice would not continue at Forts Hamilton and Wadsworth beyond 1909 because of the destruction and complaints from the civilian population. The damage, coupled with the growth of the areas near the forts and increasing political pressure, forced the army to suspend firing practices from the Narrows forts. Future target practices would be carried out at Fort Hancock and the more isolated forts in the Coast Defenses of Long Island Sound.

Several New York National Guard heavy artillery regiments became coast artillery after the turn of the century. They were designated artillery districts in 1908 and coast defense commands in 1914, while retaining their traditional numbers.(59)

The Artillery Corps Is Divided into Field Artillery and Coast Artillery Corps

In the Artillery Corps, officers were subject to assignment with either field or coast units. The technological differences noted at the turn of the century had steadily increased with the modern advances of the early 20th century. Electrically operated artillery and searchlights, telephonic communications, and highly technical optical instruments used in long-range observation and fire control, as well as major increases in the power and range of seacoast guns and mortars argued for more specialization among the coast artillery officers whose talents were largely wasted when assigned to field batteries. The need for organizational changes was fully recognized by 1906.

Additionally, there was a need for additional coast artillery companies to man the projected seacoast fortifications under construction in the newly acquired overseas possessions in Hawaii and the Philippines. Because of their distance from the continental United States, and the lack of a local population of unquestioned loyalty, the War Department planned to place a full peacetime coast artillery garrison capable of fully manning the gun, mortar, and submarine mine defenses in Hawaii and the Philippines. In the Continental US, manning detachments equal to half that required for the gun and mortar batteries and full manning detachments for the submarine mine defenses were to be provided.

To achieve this goal, a substantial number of additional coast artillery companies were required. To provide a full manning detachment for the submarine mine defenses for the coast defenses at home and overseas, 41 companies would be needed, nearly the entire projected augmentation of 44 companies.

Consequently, in 1907 the Artillery Corps was dissolved and two separate branches were created. The field artillery was organized into regiments and a separate Coast Artillery Corps (CAC) was to be composed of 170 companies. The new companies would be organized by splitting existing companies and filling out the ranks with recruits.

The Artillery District of Southern New York, 15 companies in 1907, gained little from the reorganization. The 157th Co., CAC, was organized at Fort Wadsworth in 1907, bringing the number of mine companies in the district to six. Almost immediately, the 57th Co. departed Fort Wadsworth for the Philippines on July 24, 1907. This transfer reduced the number of mine companies in the district to five. Upon arrival in Manila on September 4, the 57th Company was assigned to Fort Wint on Grand Isle in Subic Bay.

The Artillery District of Southern New York contributed three more companies to the Philippine defenses early in 1908. On February 17, the 50th Co. (Fort Wadsworth), 51st Co. (Ft. Hamilton), and 55th Co. (Ft. Hancock) left New York aboard the USAT *Kilpatrick* for the Philippines. The 50th Company was posted at Fort Wint in Subic Bay, the 51st and 55th Cos. at Fort Mills on Corregidor Is.

Soon after the departure of the companies for the Philippines, the 3rd Co., CAC, was ordered to Fort Moultrie, SC, but returned to Fort Hamilton by the years end. Efforts were made to keep about 15 companies of coast artillery in the district. To maintain that strength level, it was necessary to transfer companies to New York from elsewhere. In 1909, the 76th Co. arrived from Fort Barrancas, FL.

The 86th and 95th Cos. departed for Manila January 29, 1911, reducing the coast artillery in the Southern New York artillery district to 13 companies. This strength level was maintained into 1914. (60)

Armament Changes

By 1913, the army attempted to concentrate non-standard artillery to facilitate supply of parts and ammunition. The pair of 4.72-inch Armstrong QF guns in Battery Griffin at Fort Hamilton was transferred to Honolulu. In addition to shipping away obsolescent guns, improvements were also undertaken to increase the efficiency of the ammunition service of the 12-inch guns in the No. 2 emplacements of Batteries Brown, Neary, and Doubleday. On October 4, 1916, Taylor-Raymond back-delivery projectile hoists were ordered to replace the less efficient Hodges hoists.

At Fort Wadsworth in April 1914, the 3-inch guns of Battery Turnbull were exchanged with the guns of Battery Catlin, giving Battery Turnbull the six M1903 guns, while the six M1902 guns were in Battery Catlin. In 1908, three of Battery Duane's five 8-inch M1888 disappearing guns were dismounted and transferred down the bay to Sandy Hook, to be emplaced in Battery Arrowsmith. The remaining pair of 8-inch disappearing guns had become increasingly obsolescent by the middle of the second decade of the 20th century and the battery was considered of insufficient military value to justify either men or ammunition. Shortly before World War I, the remaining two guns of the battery were briefly moved to Battery Barton, Fort Rodman, RI, in July of 1917, before being shipped to Sandy Hook Proving Ground at the end of the year.(61)

In 1913, the Artillery District of Southern New York was renamed the Coast Defenses (CD) of Southern New York, part of the North Atlantic Coast Artillery District, headquartered at Fort Totten, in the CD of Eastern New York. The headquarters of the CD of Southern New York was moved from

Fort Hancock to Fort Hamilton. Late in the summer of 1914, in response to the war in Europe, the 114th Co. was transferred from Fort Totten to Fort Wadsworth, raising the number of companies in the CD to 14.

By July 1915, the garrison of the CD of Southern New York, commanded by Col. Samuel E. Allen, was distributed between three forts:

Fort Hamilton: 3rd, 84th, 98th, 122nd, and 123rd Cos.
Fort Wadsworth: 53rd, 54th (mine), 114th, Cos.
Fort Hancock: 76th, 113th, 136th (mine), 137th (mine) Cos.(62)

Soon afterward, Fort Hancock was separated as the CD of Sandy Hook, and nearly half the companies of the CD of Southern New York were assigned to the CD of Sandy Hook.

When war erupted in Europe in 1914, the U.S. Army was ill prepared to participate. By the latter part of 1914, super-dreadnoughts were raising increased concern in the United States War Department. These new battleships boasted guns considerably more powerful than those in the nation's coastal defenses. Even more important, these new naval guns had greater ranges than before, with higher trajectories which threatened to negate the advantage offered by the disappearing gun batteries that made up the backbone of the nation's harbor defenses. Although not yet involved in the European conflict, the United States Army reviewed the continental seacoast defenses as well as those of the overseas territories and possessions, and prepared for possibly being drawn into the conflict.(63)

The War Department lost little time forming a War Department Board of Review to consider the defense needs of the nation. The CAC was greatly under strength, with only 701 officers and 19,321 enlisted men in 170 separate companies, distributed among 25 domestic and five overseas harbors. The troop strength approved in 1907 was insufficient to man half of the gun and mortar batteries and all of the mine defenses in the continental defenses, along with all the overseas defenses, even on a peacetime basis. For this, 1,312 officers and 30,309 enlisted personnel were required. The CAC was short 10,000 men in November 1914 and stretched thin, as it was deploying 49 of its 170 companies to the newly completed coastal fortifications in the Panama Canal Zone, Hawaii, and the Philippines.

Among the board's recommendations was some 11,000 additional enlisted men for the CAC over the next four years. Congress approved, and the first increment, about 2,000 men, was ordered in 1916. This enabled creation of 29 new companies in 1916 and early 1917. Concurrent with the augmentation of the CAC, the designations of the separate companies manning the coast defenses were changed in the summer of 1916. The serially numbered designations held since 1901 were changed, and companies were numbered at the coast artillery post to which they were assigned.

As a part of this restructuring, the 98th Co. was demobilized in 1916 and its personnel were used to organize two new companies, the 1st and 4th Companies, Fort Hamilton, in the CD of Southern New York. The following redesignations were made in the CD of Southern New York:

Fort Hamilton Companies
1st Co. organized in 1916 Ft. Hamilton
3rd Co. redesignated 2nd Co., Ft. Hamilton
84th Co. redesignated 3rd Co., Ft. Hamilton
4th Co., (I) Ft. Hamilton, organized 1916; demobilized 1917 Rockaway Beach
123rd Co. redesignated 5th Co,. Ft. Hamilton
122nd Co. redesignated 6th Co., Ft. Hamilton

Fort Wadsworth Companies
53rd Co. redesignated 1st Co., Ft. Wadsworth
54th Co. redesignated 2nd Co., Ft. Wadsworth
114th Co. redesignated 3rd Co., Ft. Wadsworth

The Coast Defenses of Southern New York in World War I

The early months of 1917 were increasingly tense between Germany and the United States. Finally, in response to Germany's unrestricted submarine warfare, the US severed relations with Germany on February 3, 1917. War fever in the US was increased by disclosure of the contents of the "Zimmerman Note" in March, and on April 6, 1917, Congress declared war on the Central Powers. Since the outbreak of war in 1914, the War Department had been gradually moving toward a war footing. With the declaration of war, the augmentation authorized in 1916 to increase the army, including the CAC, over a four-year period was accelerated and the entire augmentation was authorized. A Selective Service Act was passed and plans were developed to forward American troops to Europe to reinforce British and French forces on the Western Front.

The expansion of the CAC to 30,000 men soon had an impact on the CD of Southern New York. In June, six more companies were organized in the Coast Defenses. Two companies, the 4th and 5th Cos., Fort Wadsworth, were organized on Staten Island, while Fort Hamilton's 7th Co. was organized.

On February 6, 1917, orders were given to remove two 6-inch guns from Battery Burke at Fort Hamilton. Two 6-inch M1900 guns Nos. 24 and 25 and their M1900 pedestal mounts Nos. 20 and 21 were removed from Battery Burke on July 1 and transported to Rockaway Beach for emplacement in the East Battery.(64)

By the time the United States entered World War I, the 4th Co., Fort Hamilton, had been shifted to Rockaway Point. In June, the 4th Company, Fort Hamilton, was disbanded, its personnel providing cadres for the 1st and 3rd Cos., Rockaway Beach. A new 4th Co. (II), Fort Hamilton, was organized later in June at Fort Hamilton.(65)

On May 1, 1917, the CDs of Long Island Sound, Eastern New York, Southern New York, and Sandy Hook were placed under the new Middle Atlantic Coast Artillery District, commanded by Brig. Gen. Harry F. Hodges.

Thus by the end of June 1917, the CD of Southern New York, commanded by Col. William C. Rafferty, consisted of:

Fort Hamilton, Colonel Rafferty, 1st-7th Cos.
Fort Wadsworth, Maj. Hudson T. Patten, 1st-5th Cos.
Rockaway Beach Military Reservation, Maj. Henry J. Hatch, 1st-3rd Cos.

The World War on the Western Front degenerated from a war of maneuver to a war of position, resulting in the stalemate of trench warfare by 1915. The contending armies wore themselves out in massive and largely futile attempts to smash their way through extensive systems of entrenchments. As a consequence, both sides relied more and more on massive artillery to pave the way for infantry across the shell-pitted "no man's land" between the two armies. This was the situation in April 1917 when the United States entered the war.

July 1917 saw more changes in the coast defense garrisons. The War Department authorized organization of a large brigade to man heavy artillery in France. During the first several weeks of the war,

the War Department developed plans to organize and field the heavy artillery brigade as part of the American Expeditionary Force (AEF) being prepared for deployment to France. As the CAC was best experienced in handling the large-caliber artillery needed, it fell to that corps to organize the brigade. In a memorandum dated June 27, 1917, Maj. Gen. Erasmus M. Weaver, chief of coast artillery, recommended the expeditionary brigade consist of three regiments. This proposal was approved by the chief of staff on July 6. This brigade was projected to man a portion of the available armament, much of which was to come from the nation's coast defenses. General Weaver then instructed his district commanders along the Atlantic seaboard to designate sufficient separate companies of coast artillery from the coast defenses to form a brigade of 36 companies organized into a brigade of the 6th, 7th, and 8th Provisional Regiments for overseas.

The CD SNY was called upon to provide five companies for the brigade. The 4th and 6th Cos., Fort Hamilton, were ordered to Fort Adams in July 1917, where they became Battery L, 7th Provisional Regiment. The 3rd Co., Fort Hamilton, was also ordered to Fort Adams and redesignated Battery F, 8th Provisional Regiment. Across the Narrows at Fort Wadsworth, the 3rd Co., Fort Wadsworth, was sent to Fort Adams to become Battery E, 8th Provisional Regiment. The recently organized 3rd Co., Rockaway Beach, was also transferred to the 8th Provisional Regiment as Battery G. The transfer of nearly half of the companies in the CD SNY again left the command short of troops through the remainder of the 1917.

In August 1917, the coast artillery troops underwent another reorganization. The companies were renumbered within their assigned coast defense commands. The 1st, 2nd, and 5th Cos., Fort Hamilton, were redesignated the 1st, 2nd, and 3rd Cos., CD of Southern New York. The 1st, 2nd, 4th, and 5th Cos., Fort Wadsworth, were redesignated the 5th, 6th, 7th, and 8th Cos., CD SNY. The 1st and 2nd Cos., Fort Tilden, were redesignated the 9th and 10th Cos., CD SNY.(66)

Armament Changes

Meanwhile, there were considerable changes in the armament of Forts Wadsworth and Hamilton. While the Narrows forts retained considerable heavy artillery, Fort Hancock's batteries on Sandy Hook and newly established batteries on Rockaway Beach constituted the primary defense of New York Harbor.

In conjunction with the brigade of heavy artillery for service in France, the War Department authorized dismounting heavy and medium-caliber seacoast guns and mortars from the coast defenses for modification and remounting on railway and tractor-drawn carriages for use in France, or for use on transport ships. Forts Hamilton and Wadsworth, as a secondary line of defense, would see much of their 6, 10, and 12-inch armament removed and sent off to be modified.

On August 24, 1917, General Weaver reported that one of Battery Spear's 10-inch M1888 guns, two of Battery Livingston's 6-inch M1900 guns, and four of Battery Mendenhall's M1903 6-inch guns at Fort Hamilton had been ordered dismounted for modification. Dismounting the guns and preparing them for shipment continued through fall and by December 31, 1917, the remaining pair of Battery Livingston's 6-inch guns and all four of Battery Mendenhall's 6-inch guns had been shipped to the Morgan Engineering for remounting on wheeled carriages. In the ensuing months, still more orders for the removal of coast artillery ordnance came to CD SNY and by July 3, 1918, the two 12-inch M1895 guns of Battery Doubleday had been tabbed for shipment to Watervliet Arsenal for conversion to railway artillery. In most cases, the gun carriages were left in place at the batteries. The next orders for the removal of Fort Hamilton's armament came July 24, 1918, when the remaining 10-inch gun of Battery Spear was ordered sent to Sandy Hook Proving Ground. The gun was transferred September

25, 1918. Both of Battery Gillmore's 10-inch M1888MII guns were ordered to Watervliet Arsenal on August 31, 1918.

In April 1918, the temporary mortar battery at the Rockaway Naval Air Station adjacent to Fort Tilden was completed and four of Battery Piper's 12-inch M1890M1 mortars, Nos. 46, 93, 102, and 103, were temporarily emplaced in a straight line behind a sand berm. In May 1918, orders to dismount the M1888 10-inch guns of Battery Gillmore at Fort Hamilton and Battery Barry at Fort Wadsworth were received, while Battery Piper's four remaining mortars were tabbed for removal and conversion to railway artillery. This was apparently not done because of the conclusion of hostilities later that year.

Across the Narrows, Battery Barry's pair of 10-inch guns were dismounted and shipped to Watervliet September 11, 1918. One of Battery Upton's 10-inch guns, No. 19, was shipped to the proving ground September 28, 1918, while gun No. 11 was scheduled to be sent to Watervliet for conversion to railway artillery, although it remained temporarily in place. One of Battery Mill's 6-inch guns was dismounted and transferred to SHPG. The battery's other 6-inch gun remained.

Battery Ayres' two 12-inch guns, and one of Battery Hudson's 12-inch guns, were also ordered dismounted and shipped to Watervliet Arsenal for conversion to railway artillery.

While removal of the 12-inch guns at Fort Hamilton and Wadsworth would constitute a considerable loss to the CD SNY, efforts were made to replace them from less vulnerable locations, such as Baltimore and Delaware Bay. Battery Stricker at Fort Howard, Battery Towson at Fort Carroll, and one of Battery Winchester's guns at Fort Armistead in Baltimore Harbor, along with Battery Read's two 12-inch guns at Fort DuPont in the CD of the Delaware, were slated for transfer to Southern New York.

As it turned out, the war ended in November 1918 before many of Fort Hamilton's guns could be shipped off and the War Department canceled their conversion. Initially, the replacement armament, upon arriving at Forts Hamilton and Wadsworth, was to be held in reserve until final decisions could be made regarding the railway artillery conversion project. Following the Armistice, the seven replacement guns for those sent to Watervliet Arsenal for conversion were emplaced in Batteries Ayres and Hudson at Fort Wadsworth and Batteries Doubleday and Brown at Fort Hamilton.

The improvements to the ammunition hoists in the 12-inch gun batteries at Fort Hamilton ordered in October 1916 were finally realized in March 1918, when the Taylor-Raymond hoists were installed. Between ordering and installing, the decision was made to purchase Taylor-Raymond hoists for both No. 1 and No. 2 emplacements of Batteries Brown, Neary, and Doubleday.(67)

Augmenting the Garrisons at the Narrows

Not until mid-December 1917, when the War Department began creating additional regiments for overseas service, were the forts at the Narrows authorized reinforcements. The regimental-sized 8th, 9th, and 13th Coast Defense Commands of NYNG, with some three dozen companies, had been formed prior to the war, but only a few of their companies had been federalized when many coast artillery National Guard units had been mustered into federal service in the summer of 1917. They, however, formed an immediate reserve of manpower that could be activated quickly and placed in the defenses.

That need arose at the end of 1917, when the War Department constituted 12 regiments of heavy artillery for service in France. Three of the 12 regiments were organized in the New York Coast Defenses. One of these, the 59th Artillery, CAC, was organized at Fort Hamilton in January 1918. Concurrent with the orders to organize the 59th Artillery, orders were received federalizing the 8th and 13th Coast Defense Commands for service in the CD SNY. Four companies of the 8th CDC and the 8th

CDC Band (redesignated the 24th CA Band) were assigned to CD ENY, while five other companies went to Fort Wadsworth and elsewhere on Staten Island. The 33rd Co., 8th CDC, NYNG, was assigned to Constable Hook at the outlet of Kill Van Kull into Newark Bay, Bayonne, NJ. The remaining personnel of the 8th CDC were assigned to non-coast artillery organizations.

The 13th CDC was stationed at Fort Hamilton, where most of its personnel were used to organize the 59th Artillery, CAC. Five companies were assigned to the batteries at Fort Hamilton and one company went to Fort Tilden. In addition to the National Guard companies, 14 additional Regular Army companies were organized as the 32nd through the 45th Companies, CD SNY, and assigned to the batteries at Forts Hamilton, Wadsworth, and Tilden. As of January 1918, the organization of the CD SNY was:

Fort Hamilton, 1st, 2nd, 3rd, 4th, 36th, 37th, 40th, 42nd, and 43rd Cos., CD SNY.
Fort Wadsworth, 5th, 6th, 7th, 8th, 26th, 29th, 31st, 32nd, 33rd, 34th, & 35th Cos., CD SNY.
Fort Tilden, 9th, 10th, 44th, and 45th Cos., CD SNY.

The 38th Co., CD SNY, was posted at Constable Hook, Bayonne, NJ, the 39th at the Iona Island Naval Ammunition Depot, and the 41st Co., CD SNY, was at Tompkinsville, Staten Island.

The 59th Artillery, CAC, was organized at Fort Hamilton in January 1918 by redesignating three Regular Army companies and five companies from the 13th CDC, NYNG. Hq Co. was formed by redesignating the 9th Co., CD SNY. Supply Company was formed from the 4th Co., 13th CDC; Battery A from the 4th Co., CD SNY; Battery B from the 1st Co., 13th CDC; Battery C from the 2nd Co., CD SNY; Battery D from the 6th Co., 13th CDC; Battery E from the 3rd Co., 13th CDC; Battery F from the 12th Co., 13th CDC. The regiment trained and prepared for overseas deployment into early spring of 1918. The various companies continued to occupy their quarters on each side of the Narrows during organization and training, as the 59th's companies were filled out with recently drafted National Army men. After weeks of organization and training, the regiment was moved to the Hoboken Port of Embarkation on March 27, 1918, sailing for France March 28.(68)

In February 1918, the detached companies at Iona Island, Constable Hook, and Tompkinsville were ordered back to Fort Hamilton. A major reorganization of the garrison, which also involved redesignating the 33rd through the 45th Cos., was completed in March. After reorganization, the garrison was composed as follows:(69)

<u>Fort Wadsworth</u>
1st Co. (II) CD SNY*
2nd Co. (II) CD SNY*
4th Co. (II) CD SNY*
5th Co. CD SNY
6th Co. CD SNY
7th Co. CD SNY
8th Co. CD SNY
17th Co. CD SNY (2nd Co. 13th CDC)
28th Co. CD SNY (26th Co., 8th CDC)
29th Co. CD SNY (30th Co., 13th CDC)
30th Co. CD SNY (33rd Co., 8th CDC)
31st Co. CD SNY (35th Co., 8th CDC)
32nd Co. CD SNY*

Fort Hamilton
3rd Co. CD SNY
11th Co. CD SNY*
12th Co. CD SNY*
13th Co. CD SNY*
14th Co. CD SNY*
15th Co. CD SNY*
16th Co. CD SNY*
18th Co. CD SNY*
19th Co. CD SNY*
20th Co. CD SNY (5th Co., 13th CDC)
22nd Co. CD SNY (7th Co., 13th CDC)
23rd Co. CD SNY (8th Co., 13th CDC)
24th Co. CD SNY (9th Co., 13th CDC)
25th Co. CD SNY (10th Co., 13th CDC)
26th Co. CD SNY (11th Co., 13th CDC)

Fort Tilden
9th Co. CD SNY
10th Co. CD SNY
21st Co. CD SNY*
27th Co. CD SNY*

*Regular Army/National Army companies organized January 1918

By the summer of 1918, as companies organized the previous January were generally trained, orders were received to organize a second regiment for service in France, the 70th Artillery, CAC, from the personnel in the coast defenses. Rather than redesignating whole companies as batteries of the new regiment, the transfers were done on an individual basis, although several coast defense companies were reduced to only a few men. The 70th Artillery moved across the Narrows to Fort Wadsworth, where it completed its training and preparations for shipment to France. In July, the 70th Artillery moved to Hoboken PoE and sailed later that month.

No sooner had the 70th Artillery departed when orders came to form still more units. The 38th Artillery, CAC, was organized at Fort Hamilton in September, along with Hq Co. of the 40th Artillery Brigade, CAC, and the 6th AA Bn, CAC. Later in September, 6th AA Bn moved to Camp Mills, NY, and Hq, 40th Brigade, shipped out for France through Hoboken PoE. The 38th Regiment moved to Camp Eustis, VA, in October and was awaiting transportation to France when the Armistice was signed. It then moved to Camp Stuart, near Fort Monroe, until the regiment returned to Fort Hamilton, where it was demobilized in December.

With the Armistice on November 11, 1918, the coast defense garrisons soon began to downsize. In December, all the companies composed of National Guardsmen were demobilized and any regular army personnel in those companies were reassigned to the companies that would remain active. The demobilization was so swift that it became necessary to reorganize several companies in January that had been demobilized in December. At the end of February 1919, the CD SNY was composed of the following companies:(70)

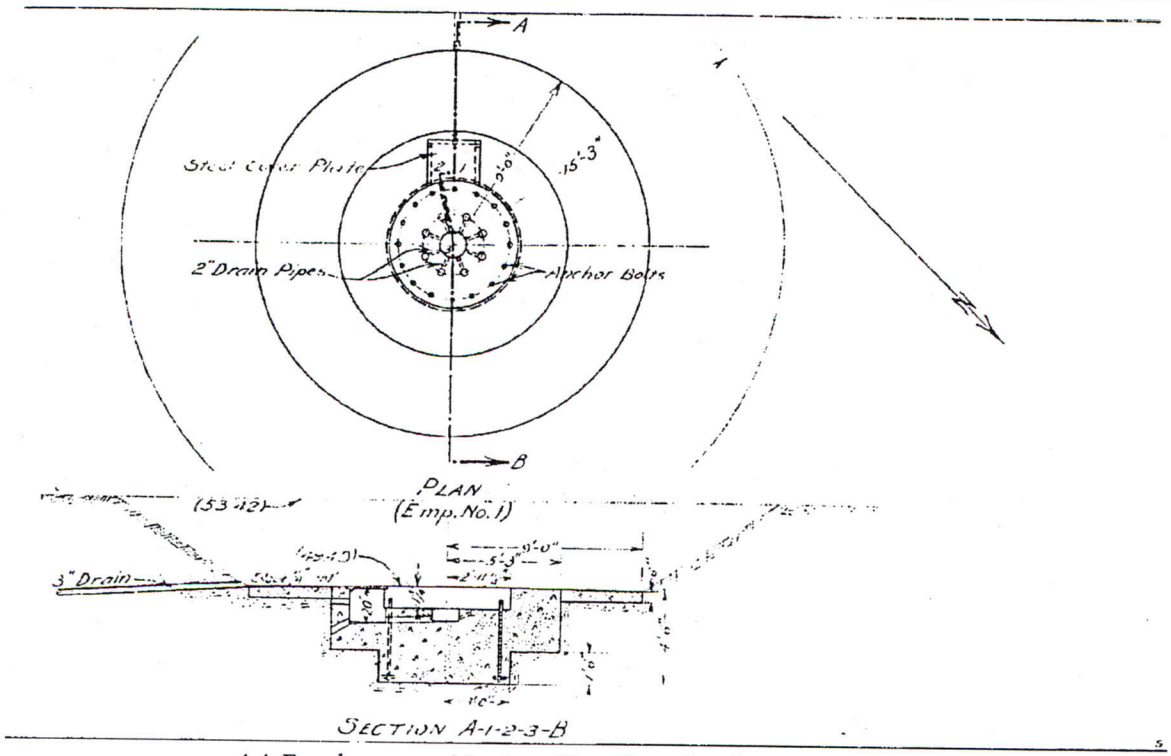
1st Co. (III), CD SNY, Fort Hamilton
2nd Co. (II), CD SNY, Fort Wadsworth*
3rd Co., CD SNY, Fort Hamilton
4th Co. (III), CD SNY, Fort Wadsworth
5th Co., CD SNY, Fort Wadsworth
6th Co., CD SNY, Fort Wadsworth
7th Co., CD SNY, Fort Wadsworth
8th Co., CD SNY, Fort Wadsworth
9th Co., CD SNY, Fort Tilden
10th Co., CD SNY, Fort Tilden*
11th Co., CD SNY, Fort Hamilton*
12th Co., CD SNY, Fort Hamilton*
13th Co., CD SNY, Fort Hamilton*
14th Co., CD SNY, Fort Hamilton*
15th Co. (II), CD SNY, Fort Tilden*
*Demobilized in September 1919

Forts Hamilton and Wadsworth between the World Wars

The downsizing of Fort Hamilton's coast artillery garrison continued into 1919, and by September only the 1st (III) and 3rd Cos., CD SNY, manned the post. The 4th Co. (III), 5th, 6th, 7th, and 8th Cos., CD SNY, manned Fort Wadsworth's batteries, while the 9th Co., CD SNY, was at Fort Tilden.

The armament continued to evolve. Scrapping the obsolete 4.7 and 6-inch Armstrong QF guns in Battery Barbour at Fort Wadsworth was authorized July 22, 1919. Before the war, firing the less than satisfactory 3-inch M1898 Driggs-Seabury guns on masking-parapet carriages had been prohibited except in case of actual attack. In 1920, the War Department declared the carriages obsolete and the guns were placed in storage.(71)

The secretary of war approved the recommendations of the Board of Review for antiaircraft batteries at the forts in the CD SNY, and they were included in the 1917 Ordnance Department estimates. Plans were prepared for two emplacements for 3-inch AA guns at each fort in February 1916. Two emplacements for M1917 3-inch AA guns on fixed mounts were called for on the southwest parapet of the Fort Hamilton Redoubt. Although construction of the AA emplacements at the redoubt was begun in 1918, they were not completed and armed with M1917 3-inch AA guns until June 1921. At Fort Wadsworth, two more emplacements for the same armament were projected, on the northern and southern parapets of Fort Tompkins. One more was to be placed on each flank of Battery Barry. Construction of the Fort Tompkins emplacements commenced January 1919 and was completed in May. Those at Battery Barry were begun in May 1919 and finished June 30. The Forts Hamilton and Wadsworth emplacements were transferred to the garrisons September 15, 1921.(72)



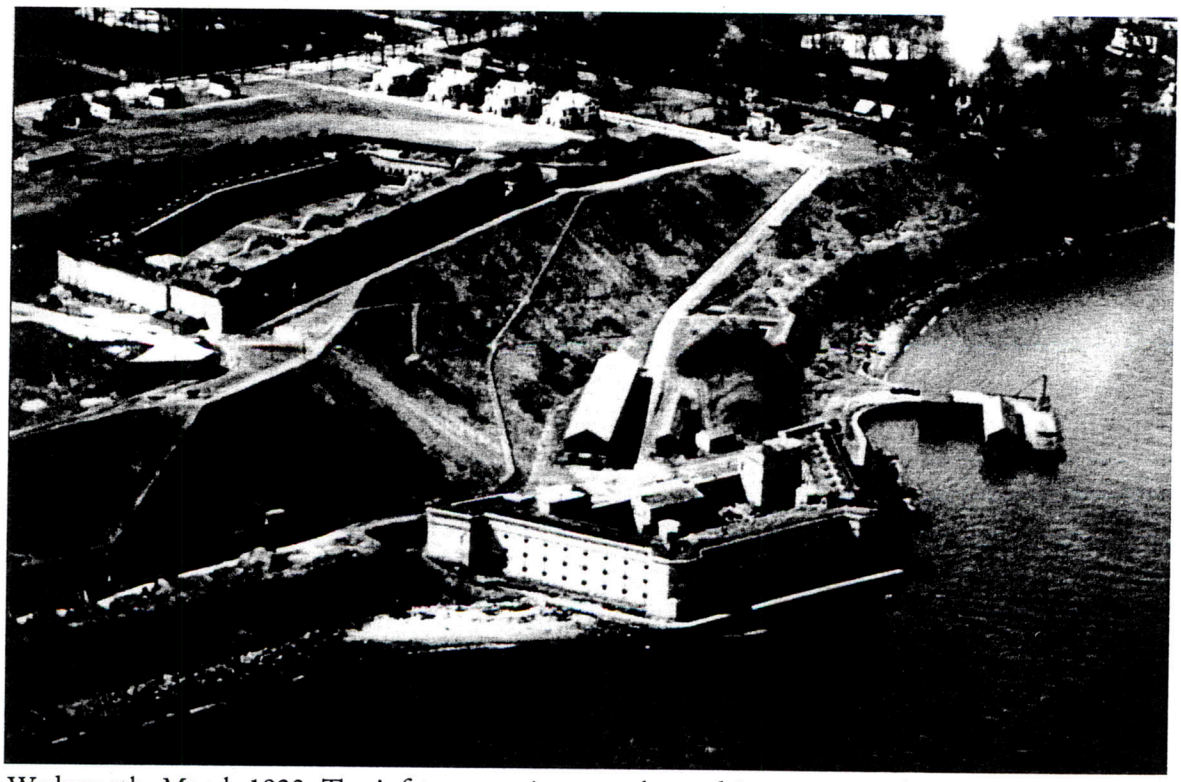
AA Emplacement No. 1 on Fort Tompkins' parapet. *NARA*



Southern portion of Fort Wadsworth in 1923. From left to right: an angle of Fort Tompkins II visible at the far left, Battery Duane's five unarmed emplacements, and the old Glacis Mortar Battery in advance of Battery Duane. The L-shaped groups of buildings are NCO quarters, while a larger group of buildings to the rear of Batteries Hudson and Mills are WWI temporary barracks, mess halls, and storehouses. *NARA*

The National Defense Act of 1920, approved by Congress on June 4, 1920, became the basis on which the US Army operated for the next two decades. The stated objective of the bill was to avoid the nation's characteristic unpreparedness at the beginning of a war and to set up an organized peacetime establishment consisting of the Regular Army, National Guard, and Organized Reserves. The act provided for all of the divisions and military elements necessary for a complete and immediate mobilization in the event of a national emergency. The act also sought to avoid the burden of "national militarism" and the expense of a large peacetime standing army. The authorized strength of the Regular

Army was set at 280,000 men, a number not achieved over the next 20 years. By 1925, the army's enlisted strength had dropped to 122,000, and by the next year, there were only 50,000 combat troops in the entire army. The Coast Artillery Corps was reduced to a mere 12,000 men, fully half of which were posted overseas. This concentration of CAC manpower overseas meant most of the nation's continental harbor defenses were in caretaking status.(73)



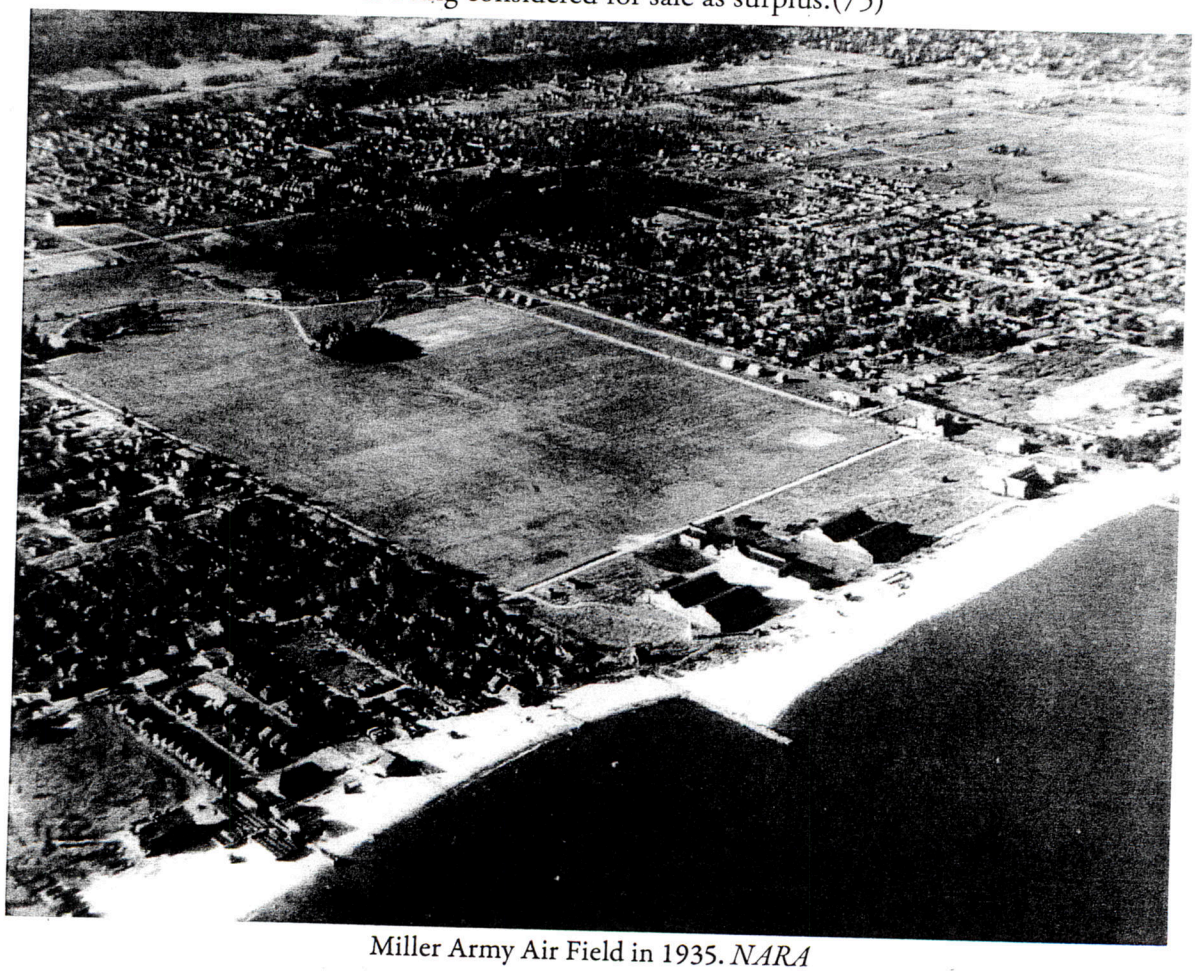
Fort Wadsworth, March 1923. The infantry garrison was housed in temporary barracks along New York Avenue and in the rear of Batteries Hudson and Mills. The South Cliff batteries Bacon and Weed and the submarine mine facilities occupy the foreground, with Fort Tompkins II on the heights. *NARA*

The organizational structure of CD SNY remained generally unchanged through the first half of 1921, but in June 1921, the 8th and 9th Cos., CD SNY, were demobilized, reducing the garrison to seven companies. On October 11, 1921, the remaining seven companies assigned to the CD of Southern New York were inactivated and the coast artillery materiél was placed in caretaking status, maintained by a company from the CD of Sandy Hook. On November 22, 1922, Fort Tilden became a sub-post of Fort Hancock in CD of Sandy Hook. The posts at the Narrows were not abandoned, as they were occupied October 9, 1921, by elements of the 22nd and 34th US Infantry Regiments and the 1st Engineer Regiment of the First Division, as well as the usual detachments from the Finance, Medical, Ordnance, and Quartermaster Departments. The 1st Bn, 34th Infantry (less Co. A) and the 85th Motor Transport Co. were posted at Fort Hamilton, while Co. A was stationed at Fort Wadsworth. Howitzer Co. of the 22nd Infantry was posted at Miller Field, as was Co. B, 1st Engineers. (74)

Coast Defense Airfield Built on Staten Island

A farm near New Dorp, Staten Island, belonging to William H. Vanderbilt was selected for an Army Air Service airfield; its principle mission being to assist the Coast Artillery in the defense of New York Harbor. (Crissy Field in San Francisco performed the same function.) In November 1919, construction of the field's two sod runways, seaplane ramps, and four hangars was begun. The longest runway was 2,100 feet, on an E/W bearing. The other on an NW/SE bearing was 1,729 feet long. The airport, which took 20 months to complete and cost $1,350,000, was named Miller Field in honor of Capt. James Ely Miller, commander of the 95th Aero Squadron, who was shot down and killed by a German aircraft on March 10, 1918, over German-held territory in the Rheims sector. When completed in July 1921, Miller Field was the Air Service's only coast defense station on the East Coast.

Although the field was completed in July 1921, it was little used, and by October 1922, no Army Air Service personnel remained at the field. In 1923, the 102nd Observation Squadron, NYNG, moved to Miller Field from Mitchel Field on Long Island. This unit, part of the 27th Division's Aviation section, remained through the 1930s. Miller Field was the site of military air shows in the 1920s. The National Defense Day Celebration, September 12, 1924, included a mock air attack on nearby Fort Wadsworth using sacks of flour as simulated bombs. On July 25, 1925, the Tank Company of the 1st Division arrived at Miller Field, after two and a half months of intensive training at Camp Dix, NJ. During the summer of 1928, Adm. Richard Byrd, the polar explorer, tested his Ford Trimotor named "Floyd Bennett" at Miller Field. On November 28-29, 1929, he flew this aircraft to Antarctica. By 1931, the little-used airfield was being considered for sale as surplus.(75)



Miller Army Air Field in 1935. *NARA*

In the May 1931 economies, Miller Field was included in the 53 military posts slated for abandonment and sale. However, the field, one of four in the New York area, was retained as Hq of the aviation section of the 27th Division. On Oct 15, 1940, the 102nd Observation Squadron was activated for federal service and moved to Fort McClellan, AL. Miller Field's broad open area served as storage for trucks and other material awaiting shipment overseas during World War II. The airfield was also the site for one of the anti-motor torpedo boat batteries covering the Narrows during the war, as well as one of the many facilities holding Axis PoWs.

CAC Reorganized

On June 1, 1922, the Coast Artillery Corps was again reorganized in an attempt to restore the CAC's prewar *esprit de corps* and historic lineage. The 170 companies organized before the 1916 reorganization were to be restored to their pre-1916 designations and those active companies organized following the 1916 reorganization became the 171st-198th Cos., CAC. Twenty-five of the pre-1916 companies had been redesignated batteries in regiments formed during the World War and were demobilized at the end of the war. These units were reconstituted and consolidated with active companies organized after 1916 that were serving in the coast defenses; the consolidated company was assigned the pre-1916 designation. In addition, the regimental Hq and firing batteries organized during the war retained on the army's rolls after the war as either active or inactive were assigned serially numbered additional designations as CAC companies. For batteries organized after 1916, these were the 199th-274th Cos. The seven CD SNY companies inactivated October 1922 received the following designations:

1st Co., CD SNY, redesignated 98th Co. CAC
2nd Co., CD SNY, redesignated 3rd Co. CAC
3rd Co., CD SNY, redesignated 123rd Co. CAC



One of the First Division M1917 tanks "attacks" a detachment of the 22nd Infantry defending Battery Hudson in the 1920s. *Author's Collection*

ARE YOU INTERESTED IN ANY OF THESE SUBJECTS?
Keith Malloru & Arvid Ottar

4th Co., CD SNY, redesignated 176th Co. CAC
5th Co., CD SNY, redesignated 53rd Co. CAC
6th Co., CD SNY, redesignated 54th Co. CAC
7th Co., CD SNY, redesignated 177th Co. CAC

All seven remained inactive. The posts at the Narrows would remain without a coast artillery garrison until mid-1924. Caretaking for the batteries and ordnance continued to be provided by a detachment from Fort Hancock.

CAC Reorganized as Regiments

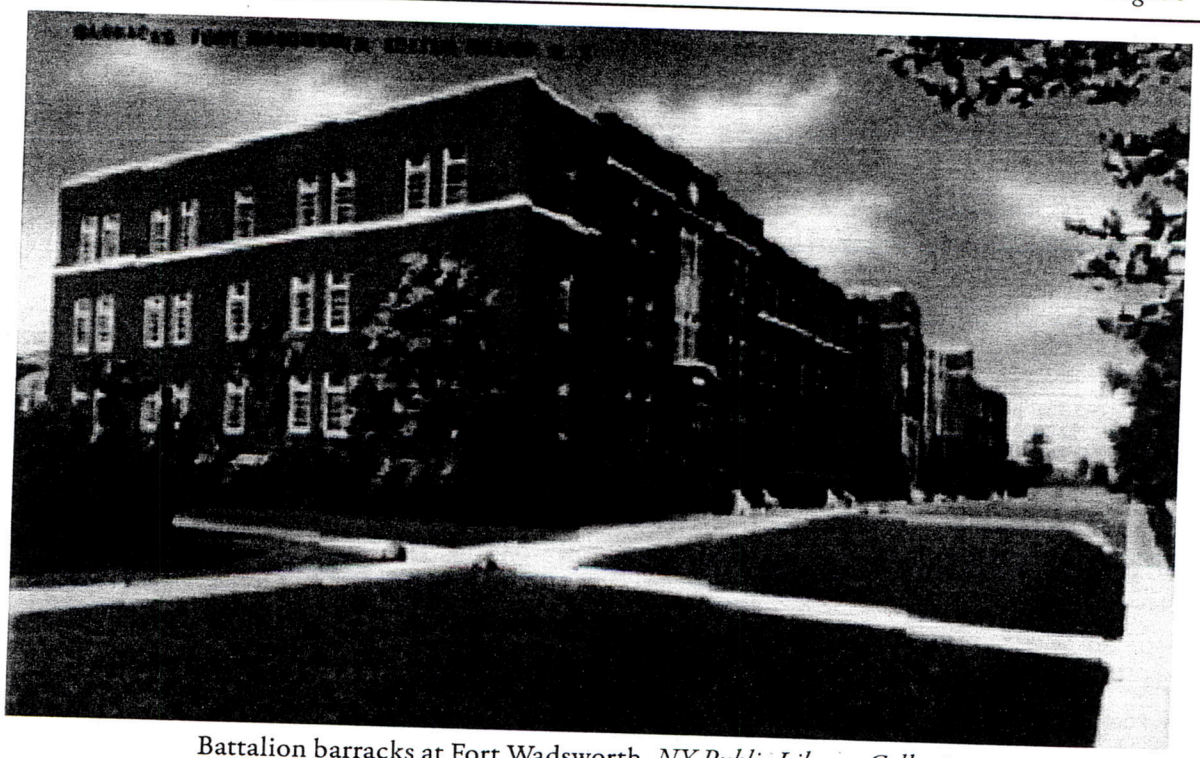
To better enable the CAC to serve with the mobile army and to further improve *esprit de corps*, another reorganization was ordered in February 1924. On July 1, 1924, the serially numbered separate companies were redesignated either Hq batteries or lettered firing batteries of 16 newly constituted coast artillery harbor defense regiments. The 1st through the 7th Coast Artillery (Harbor Defense) Regiments were to assume the historic lineage of the 1st through 7th Regiments of US Artillery that had been broken up in 1901 to form the Artillery Corps. The CD SNY would be manned by the 5th CA (HD) Regiment.(76)

Hq Battery was formed by redesignating the 57th Co., CAC, transferred from Fort Winfield Scott in the CD of San Francisco to Fort Hamilton. The battery was activated with personnel of the caretaking detachment assigned to the forts at the Narrows and would be the only active element of the regiment until shortly before World War II.

Battery A (inactive) was formed by redesignating the 49th Co., CAC, transferred to Fort Hamilton from Fort Worden. Battery B (inactive) was formed by redesignating the 50th Co., CAC, transferred to Fort Hamilton from Fort Levett. Battery C (inactive) was formed by redesignating the 51st Co., CAC, transferred to Fort Hamilton from Fort McKinley. Battery D (inactive) was formed by redesignating the 56th Co., CAC, transferred to Fort Hamilton from Fort Hancock. Battery E (inactive) was formed by redesignating the 54th Co., CAC, transferred to Fort Hamilton from Fort Wadsworth. Battery F (inactive) was formed by redesignating the 55th Co., CAC, transferred to Fort Hamilton from Fort DeRussy. Battery G (inactive) was formed by redesignating the 53rd Co., CAC, transferred to Fort Hamilton from Fort Wadsworth.(77)

New Barracks Construction Program

The War Department undertook to dispose of many military reservations that were considered no longer necessary, and with the funds obtained, planned to improve garrison housing at the retained posts. An initial sum of $285,000 was earmarked for new barracks at Fort Wadsworth. Bids were finally advertised in August 1927 for a large three-story barracks at the fort to accommodate a full battalion of infantry. Construction began on the first of three projected barracks in 1928 and was completed in 1929 at a cost of $350,000. Although three large barracks had been projected, only two 650-man barracks were actually built; the economic woes of the "Great Depression" halted efforts to build the third barracks. By the time the project was suspended, some $675,727.49 had been expended to improve the garrison accommodations at Fort Wadsworth.(78)



Battalion barracks at Fort Wadsworth. *NY Public Library Collection*

A new post theater was built in 1932 by federal prisoners under the oversight of the Corps of Engineers. While at Fort Wadsworth, the prisoners were housed in Fort Tompkins. They also built a large brick stable for 51 army mules and horses. As the depression recovery programs progressed, laborers from the Works Progress Administration (WPA) and the 390th Veterans Company of the Civilian Conservation Corps (CCC) arrived in the mid-1930 to make various improvements at the post. The WPA workers were housed in temporary World War I wooden barracks west of New York Avenue, near the rear of Batteries Richmond and Ayres. The WPA workers helped build the front and rear gates to the fort, along with garages, guardhouses, several roads, a post exchange, and an officers club. The CCC built a portion the seawall and did some forestry work on the post. In October 1940, the War Department approved construction of six temporary structures: a medical staff building, a recreation building, a mess hall, company officers quarters, and two barracks.(79)

In the early 1930s, the 2nd and 3rd Bns of the 18th Infantry occupied the two new barracks at Fort Wadsworth, replacing elements of the 34th Infantry. Fort Wadsworth saw very little infantry training while 1st Division elements were posted there. The infantry regiments usually went to Fort Dix, NJ, each summer for summer maneuvers.

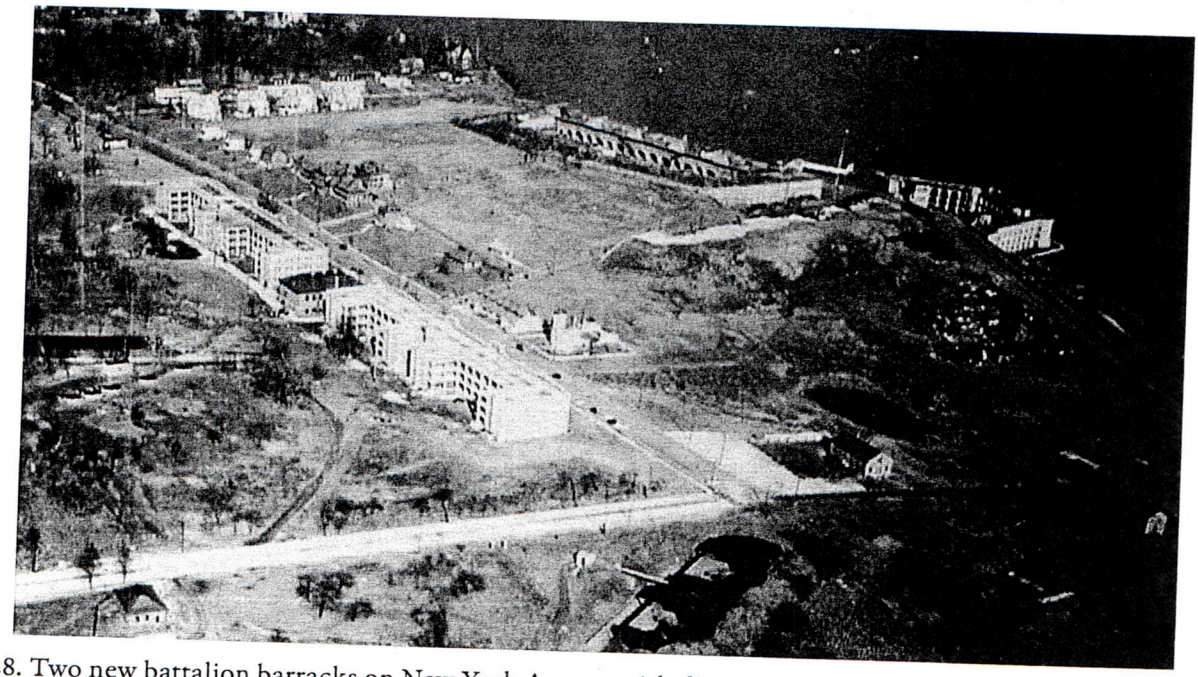
In 1930, the CAC was reorganized to meet a new training mission that emphasized antiaircraft defense. This reorganization had little impact on the 5th CA, as the three officers and 56 enlisted men of Hq and Hq Battery had been on caretaking status for nearly a decade. A detachment of one officer and 20 men was responsible for the seacoast artillery and materiél in the HD ENY, leaving the main body of Hq Battery to care for the guns and materiél at the Narrows.

The army was granted a new strength level of 165,000 in 1936, including a 5,000-man augmentation for the CAC. Most of the augmentation went to overseas harbor defenses and to the antiaircraft regiments.(80)

Complaints by residents on Staten Island and in Brooklyn on Long Island had silenced the guns at the Narrows after 1909, but 23 years later, on July 4, 1932, the 12-inch guns at Forts Hamilton and Wadsworth fired a national salute. By now, however, these weapons were obsolete, without the range to counter a bombardment by enemy vessels that could stand offshore and bombard New York and its harbor with impunity. New York's harbor defense relied almost entirely on the 16-inch guns of Battery Harris at Fort Tilden and the four 12-inch long-range guns of Batteries Kingman and Mills at Fort Hancock.(81)

The number of officers assigned to the 5th CA during the early 1930s rarely exceeded three. Maj. Gilbert Marshal commanded the regiment at Fort Wadsworth from 1930 until promoted to lieutenant colonel in June 1934, when he was transferred to Fourth Corps Area. 1st Lt. Robert J. Moulton commanded Hq Battery, 5th CA, from August 1930 to June 1933. Lt. Col. Lloyd P. Hortsfall succeeded Marshall in command of the harbor defenses in June 1934 and commanded the 5th CA until August 1936. Capt. Walter J. Gilbert arrived at Fort Hamilton in January 1934. He and Capt. Carroll G. Riggs, who arrived at Fort Wadsworth in December 1934, composed the officer contingent in 1937. Maj. James R. Lowder arrived from Hawaii in June 1938 to command the caretaking detachment at Fort Wadsworth. By October 1938, Maj. Ernest R. Barrows was in command at Fort Hamilton. In December 1939, Maj. Edward W. King arrived to command the Panama Detachment being formed at Fort Hamilton.

With the expansion of the army in 1940, the 5th CA began receiving additional officers to fill out various headquarters staff positions and supply line officers for newly activated batteries. Maj. Walter J. Wolfe was assigned to the 5th CA, as was 1st Lt. William H. Jordan, who commanded Hq Battery, and 1st Lt. Alan B. White, assigned to Fort Wadsworth. Maj. Edmond E. Russell, a CA Reserve officer, 1st Lt. Seth F. Hudgins, and 2nd Lts. Edwin F. Black and Mark C.B. Klunk were assigned to Fort Hamilton in October 1940. In February 1941, Maj. Willard L. Wright reported for duty at Fort Hamilton. By August 1941, 2nd Lt. James E. McElroy was also on duty at Fort Hamilton.(82)



128. Two new battalion barracks on New York Avenue with disarmed Battery Barry in the lower left corner and Battery Upton at the end of New York Avenue, 1932. *NARA*

War in Europe Fosters Modernization of the Coast Defenses

The Veterans Administration's need for additional facilities caused that agency to approach the War Department in March 1940 to ascertain whether any military posts could be transferred to that agency. In evaluating this request, the War Department ordered a new survey of the nation's seacoast defenses by the Harbor Defense Board. At that time, France was falling to the German blitzkrieg and Great Britain was threatened by German invasion. The survey was still in progress in June when France fell and the German threat to Great Britain intensified. The probability of the French fleet falling into German hands, along with possibly the greater part of the Royal Navy being combined with the German *Kriegsmarine,* raised the specter of a weakly defended American eastern seaboard being attacked by a massive enemy fleet. The Harbor Defense Board, presided over by Maj. Gen. Walter C. Baker, chief of the Chemical Warfare Service, was directed to a completely reassess harbor defense requirements.(83)

On July 27, 1940, the board submitted its recommendations for what would become the last system of seacoast gun defenses in the United States. The 16-inch gun would be retained as the primary seacoast weapon and 6-inch guns as the standard secondary seacoast armament. The proposed 16-inch batteries were to be emplaced within protective casemates of concrete, covered with earth to conceal and protect them from aerial and shipboard bombardment. New batteries of two 6-inch guns each, mounted *en barbette,* were also proposed, to supplement the older 6-inch and 3-inch RF batteries. When completed, this program would permit the deletion of outmoded Endicott-era batteries. In addition to the new construction, 16-inch barbette batteries and 12-inch barbette batteries built after World War I were also to be casemated and included in the new harbor defense system. By September 11, 1940, the initial priorities were set.(84)

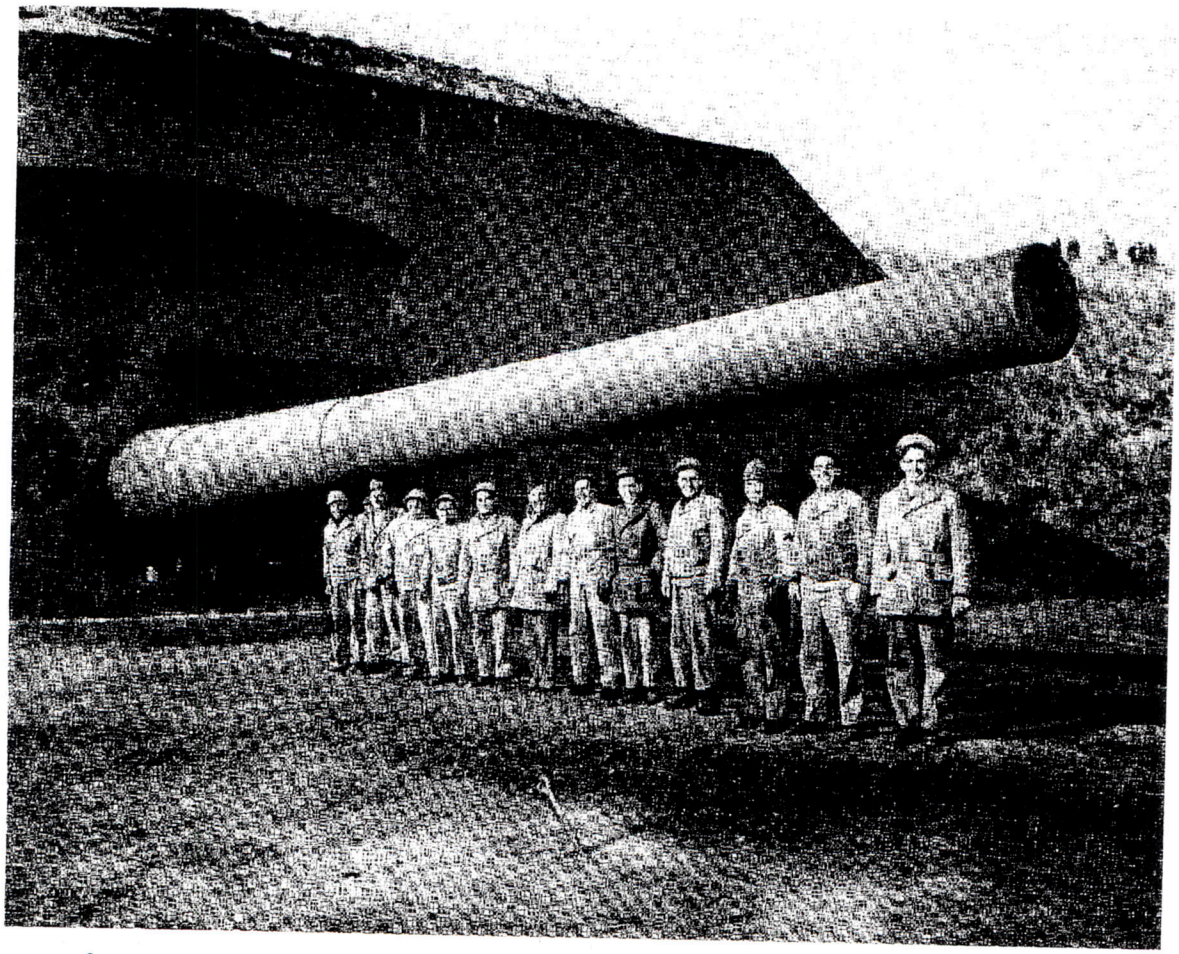
At New York, three new 16-inch batteries were projected as part of the 1940 Modernization Program. One was to be built on the southern flank of the harbor in the New Jersey Highlands, a second at Fort Wadsworth. The third was to be located at Nigger Point near the Jamaica Sea Airport. Battery Harris's 16-inch guns at Fort Tilden were to be casemated, as were the four 12-inch guns of Batteries Kingman and Mills at Fort Hancock. Of the modern 6-inch gun batteries, three were to protect the southern approaches to New York Harbor. One would be built near the 16-inch battery in the New Jersey Highlands, the second would replace West Battery at Fort Tilden, while the third would be located at Fort Wadsworth near the proposed 16-inch battery. East Battery's pair of 6-inch guns at Fort Tilden, renamed Battery Kessler, was to be given shields and bombproof magazines. Formal approval of the 1940 Modernization Program came in early September 1940, accompanied by a recommendation that $62,000,000 be allotted to begin the program.(85)

The various projects in the 16-inch battery program were assigned battery construction numbers (BCN) beginning with 101. BCN 101 and 102 were at Portland Harbor, 103 at Portsmouth, and so on down the Atlantic seaboard, and then north along the Pacific coast from San Diego to Puget Sound. Fort Wadsworth's 16-inch battery was BCN 115. The 6-inch gun batteries of the program were similarly numbered in the 200s. The third to be built at Fort Wadsworth was designated BCN 218.(86)

The 1940 Program progressed slowly. Planning, constructing, and arming massive gun batteries was a lengthy process and the program lagged as the program vied with other construction projects associated with the military buildup of the early 1940s. In July 1941, a year after the board decided to develop the new harbor defense program, only four casemated 16-inch batteries had been completed and these had been authorized under an earlier program in 1934 and begun between 1939 and 1940. Only five of the batteries authorized in 1940 had even been begun. The realization that the construction of the batteries as originally planned could not be attained for several more years, coupled with the

belief that by then our air and naval forces would be so strong as to make the modern harbor defense batteries much less necessary, caused the army to reevaluate the entire seacoast defense program. By August 1941, the War Department had decided to continue construction of only those 16-inch batteries that could be brought to completion by the end of June 1944. Construction of the others would be deferred pending further evaluation.(87)

The 16-inch battery for Fort Wadsworth initially had been given a priority of 34, out of 36 batteries initially proposed in September 1940, but by 1941 the project had been canceled and deleted from the program altogether, before any funding was allotted for planning or construction. Although Battery Construction Project 117 near Jamaica Sea Airport had an initially priority of 21, and in August 1941 its priority was increased to 19, it too never received any funding. By November 13, 1942, that project too was deleted from the program. Only the 16-inch battery in the Navesink Highlands of New Jersey, eventually named Battery Lewis, would actually be completed in May 1943. In the meantime, the nation had become embroiled in World War II.(88)



A battery of 16-inch casemated guns like this one at the Navesink Highlands, NJ, were projected for, but not built at Fort Wadsworth. *Author's Collection*

World War II

Between the two world wars, considerable planning was undertaken with regard to the organization of the nation's defenses. This planning was codified in what became known as the Joint Action Army and Navy (JAAN) plan. As revised periodically in the interwar period, it called for wartime

"coastal frontiers," defined as "geographical divisions of our coastal area established for organization and command purposes in order to insure the effective coordination of Army and Navy forces employed in coastal frontier defense." On the east coast of the United States, the North Atlantic Coastal Frontier and the Southern Coastal Frontier were established. The army's tactical subdivisions of the coastal frontiers consisted of sectors and subsectors that corresponded generally to the various coast artillery districts and harbor defenses, respectively. The First Army was responsible for the North Atlantic Coastal Frontier and from about the middle of 1941, First Army, headquartered at Fort Jay on Governor's Island in New York Harbor, had placed itself on a war footing and established a Northeastern Theater of Operations. When war was declared in December 1941, the theater plan was implemented. This organizational structure continued until March 1942, when four continental defense commands were established and the Northeastern Theater was redesignated the Eastern Defense Command (EDC).(89)



Fort Tompkins quadrangle from the HECP during WW II. *Author's Collection*

When the United States entered World War I, there was no effective mobilization plan and in the years following, the War Department sought to remedy that shortcoming by instituting Protective Mobilization Plans each year to speed mobilization of the National Guard and the Organized Reserves in the event of war or national emergency. By 1938, the mobilization plan for HD SNY was well developed. The 5th CA would be fully activated with 78 officers and 1,617 enlisted personnel within 30 days after mobilization was ordered and by M+120, the regiment would be fully operational.(90)

By 1941, however, considerable alterations were made in the mobilization requirements for HD SNY, largely as a result of the 1940 Modernization Plan and the projected elimination of most of the seacoast armament from Forts Hamilton and Wadsworth. These changes would reduce the manning detachments that had been considered necessary only a few years before.

On August 1, 1940, the 5th CA first stirred beyond daily caretaking activities by the regimental headquarters battery. Battery A was activated at Fort Wadsworth with cadre from the caretaking detachment. By mid-January 1941, the War Department moved to reactivate some of Fort Wadsworth's seacoast gun batteries. On January 15, 1941, Battery B was activated at Fort Wadsworth and Battery D at Fort Hamilton. One hundred draftees from the Panama Coast Artillery Detachment at Camp Upton, Yaphank, Long Island, NY, were sent for the two new batteries. James R. Lowder, newly promoted to lieutenant colonel of the 5th CA (HD) Regiment, was sent from Fort Hamilton to command the Staten Island post when the 18th Infantry departed. As war clouds continued to darken in early 1941, the men of the 1st Division began departing the New York harbor forts that had been their home for a decade. By February 27, 1941, the last infantrymen had departed and the forts again became coast artillery posts.(91)

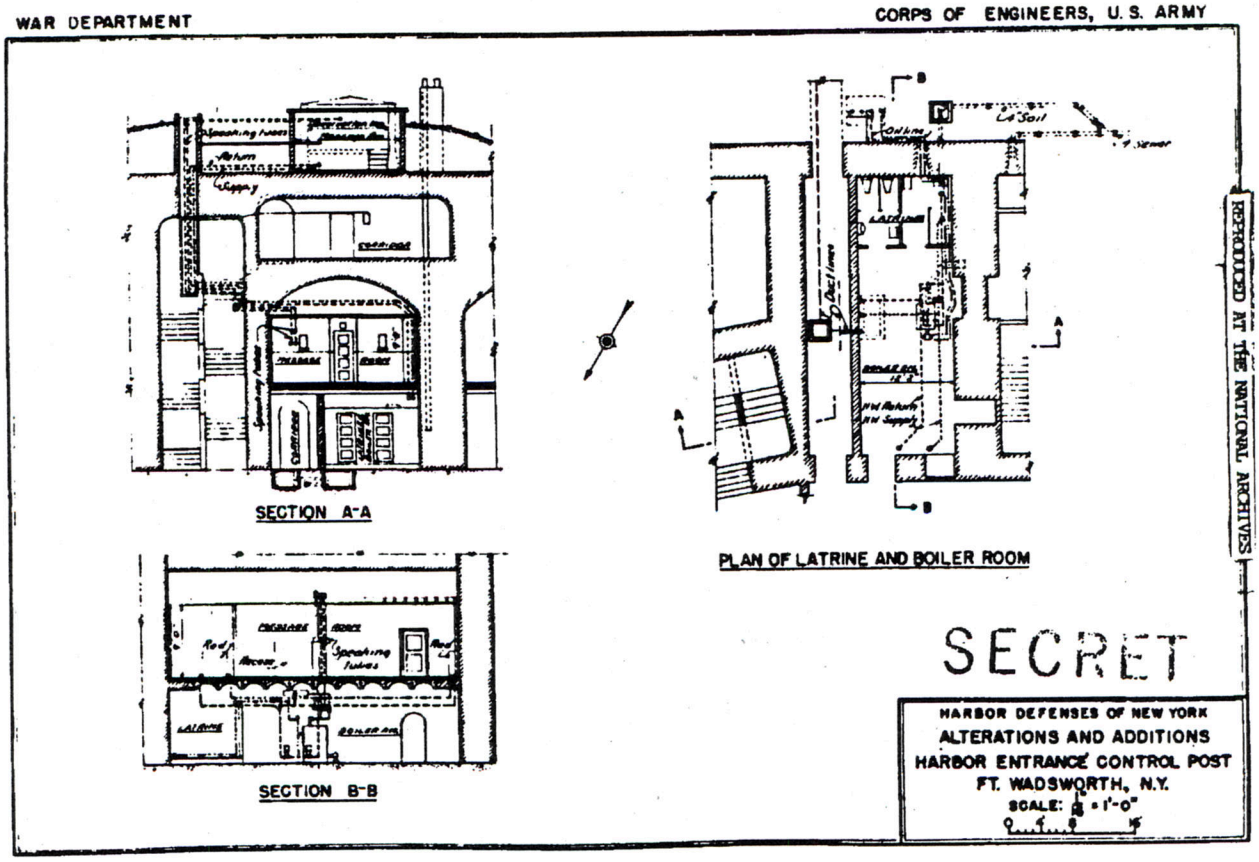
As planned prewar, the 2nd Coast Artillery District commanded by Gen. Arthur G. Campbell at Fort Hamilton became a sector of the North Atlantic Coastal Frontier. Brig. Gen. Ralph E. Haines and Campbell exchanged commands, with General Haines taking command of 2nd CA District at Fort Hamilton and General Campbell going to Fort Adams, RI, to command the HD of Narragansett Bay. On March 20, 1941, the Local Joint Planning Committee for what would eventually became the New York-Philadelphia Sector of the North Atlantic Coastal Frontier met at Fort Hamilton for the first time to discuss plans for the projected sector. Although operating under the JAAN Plan, the 2nd CA District officially remained as such until March 1, 1942, when the War Department created the New York-Philadelphia Sector as a part of the EDC.

A local board of officers met in October 1940 to determine the harbor defense needs, both current and upon completion of the modernization program authorized in September. After considerable study, the board recommended shields for Batteries Livingston and Griffin at Fort Hamilton and Catlin and Turnbull at Fort Wadsworth. Once the modernization program was complete, the 12-inch guns of Batteries Doubleday and Harvey Brown at Hamilton and Dix at Wadsworth, along with the remaining 6-inch disappearing gun of Battery Mills, were to be salvaged.(92)

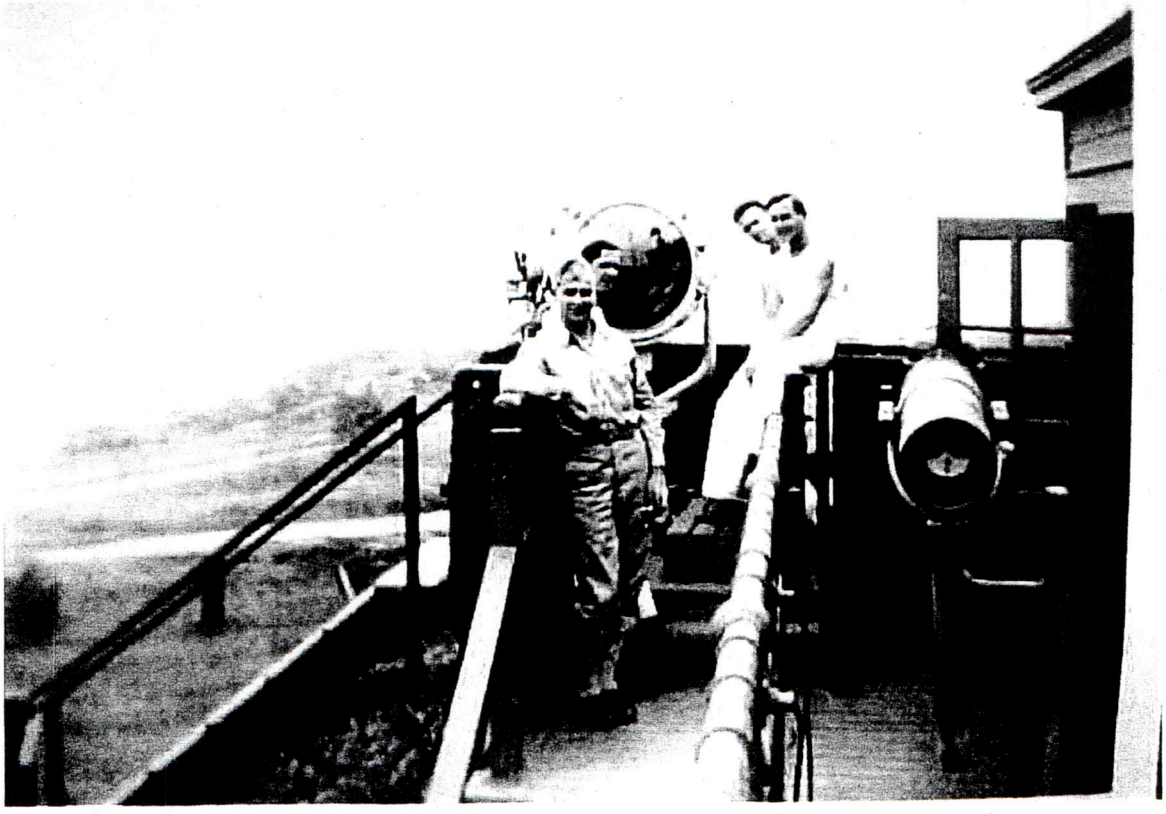
Fort Wadsworth Selected for Harbor Entrance Control Post

In March 1941, the local joint planning committee selected Fort Wadsworth for the joint-service harbor entrance control post (HECP) in the New York Sub-Sector of the New York-Philadelphia Sector. At that time, the army's harbor defense command post (HDCP) was at Fort Wadsworth. However, it was immediately obvious that Fort Wadsworth alone could not gave complete observation of the entire defensive coastal area. The solution was to provide additional observation posts at Forts Hancock and Tilden. These were subsequently designated advanced HECPs, while tests and exercises in conjunction with the navy ended with the selection of the southeast corner of Fort Tompkins for the central HECP at Fort Wadsworth.(93)

The HECP message center, equipped with radio, telephone, and teletype, was in an upper-tier casemate in the south front; the boiler room with an oil-fired burner and a latrine were on the casemate's ground level. The observation room of the HECP was directly above the message center, in a small frame house on the barbette tier of the fort. Voice communication with the message center was by speaking tubes. The observation room was protected from hostile gunfire with splinterproof steel plates and by the fort's brick breastheight wall. The observation room was equipped with telescopes and radiotelephones. The portion of the observation room visible from seaward was given camouflage paint. Outside the observation room was a signal station with a signal mast and halyards for signal flags, blinker signal lights, and telescopes for visual communications.(94)

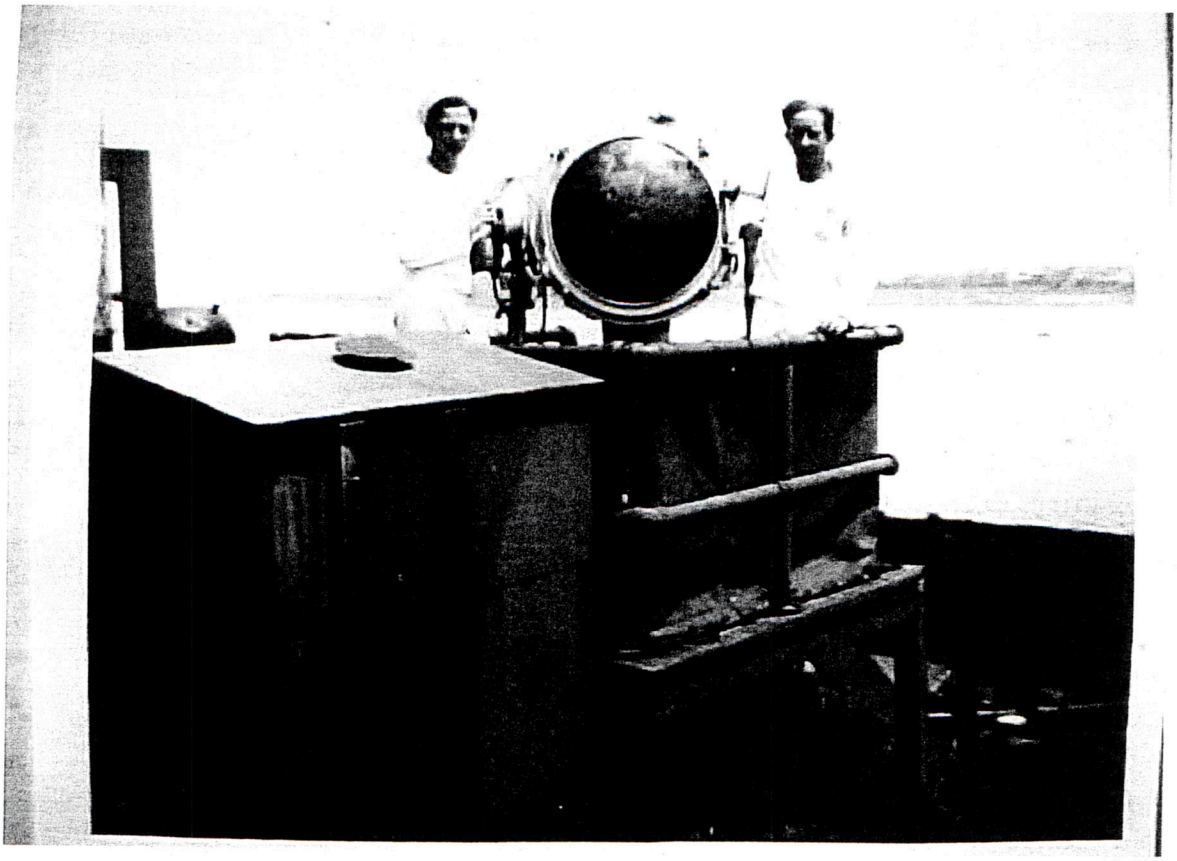


HECP at Fort Tompkins II in 1942. *NARA*



Part of the HECP detachment at Fort Tompkins II. *NARA*

On June 7, 1941, President Roosevelt directed the army and navy to take certain measures for the defense of the Western Hemisphere. The chief of naval operations and the army chief of staff issued a joint directive to man HECPs on a training basis. In HD SNY and HD Sandy Hook, the harbor defenses were placed in readiness condition three (except for the major-caliber batteries) and the HECP at Fort Wadsworth was placed in operation for training basis, preparing for continuous operation. Additionally, a third 3-inch AA gun position was to be added to the AA batteries at Fort Hamilton and Wadsworth. The HECP was opened on a training basis by the 2nd CA District, with two officers from the HD of Sandy Hook and two from the HD SNY, who prepared the Fort Wadsworth HECP for continuous operations and conducted frequent tests of its operation. Although the HECP had been in "existence" since May 1941, it still had several deficiencies, including the lack of independent electrical power to make it ready for "war operation." Fort Hancock's signal station atop decommissioned Battery Potter was pressed into service as an *ad hoc* advanced HECP and the HECP became active October 20, 1941. Considerable difficulty was experienced in getting the two advanced HECP authorized by the War Department, as they required additional personnel and three HECPs for one harbor entrance was judged excessive. As a consequence, the proposed advanced HECP for Fort Tilden could not be activated until August 6, 1943, since the War Department directed that personnel for the two advanced HECPs were to come from the garrisons at Forts Hancock and Tilden.



Signal searchlight and flag bag on signal deck of the Fort Wadsworth HECP 1942. *NARA*

Defending the Narrows in World War II

Fort Hamilton briefly served as Hq of the 2nd Coast Artillery District, and Batteries Livingston and Griffin were still armed. Meanwhile, the post on Long Island had also become Hq of the army's

New York PoE. In addition to Hq and Hq Battery, Battery D of the 5th CA had begun manning the 6-inch guns of Battery Livingston 24 hour a day in June 1941 and after the commencements of hostilities, manning the 3-inch guns of Battery Griffin. The remaining coast artillery units at the Narrows, Batteries A and B, 5th CA, moved to Staten Island in 1941.

During 1941 the garrison of Fort Wadsworth was increased by the activation of the 1205th Coast Artillery Station Complement (CASC), which assumed most of the routine garrison duties to allow the battery personnel of the 5th CA to concentrate on their primary assignment of training and manning the seacoast armament. The 1216th CASC, slated for Miller Field, was formed at Fort Wadsworth from a cadre from the 1205th CASC. Also posted at Fort Wadsworth were the 716th MP Bn and 175th Signal Repair Co. of the Signal Corps. By January 1942, components of both the 61st and 213th CA (AA) Regiments were also stationed at Fort Wadsworth.

The plan for the operation of the New York-Philadelphia Sector was placed in effect December 10, 1941, by Hq, 2nd CA District, which began functioning as sector headquarters although the sector was not formally established until March 1942. Upon the outbreak of war in December 1941, the 5th CA, now commanded by Lt. Col. Ernest R. Barrows, was positioned as follows: Hq Battery operated the HECP at Fort Wadsworth while detachments from Batteries A and B manned searchlights at Forts Hamilton and Wadsworth. Battery A operated as a mine battery.

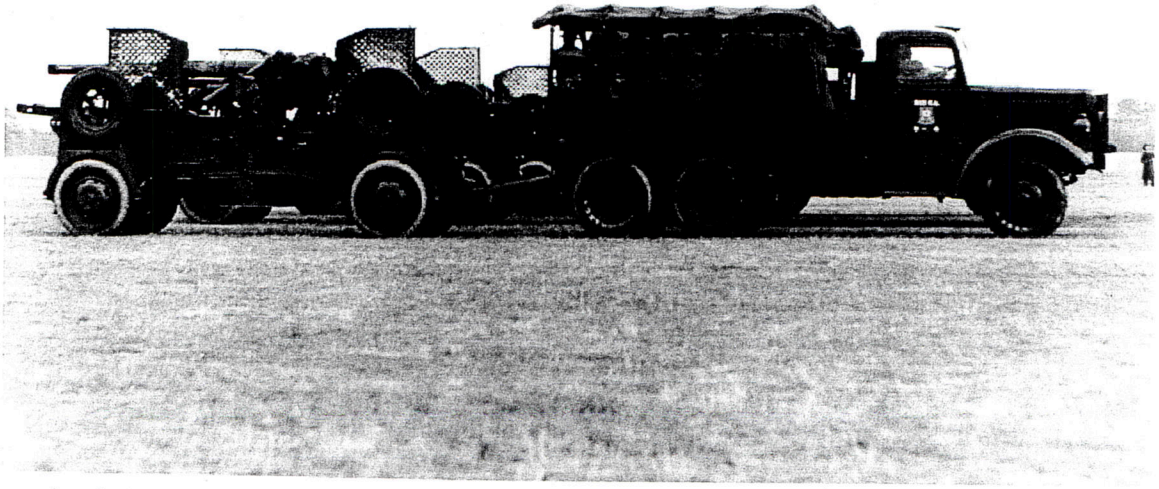
Battery B manned Battery Dix's 12-inch guns at Fort Wadsworth, the 3-inch guns of Batteries Turnbull and Catlin (on an emergency basis only), the 6-inch guns of Battery Livingston at Fort Hamilton and the 3-inch AA batteries at Forts Hamilton and Wadsworth. Battery D manned the 3-inch guns of Battery Griffin at Fort Hamilton on an emergency basis only.

The HD SNY had nine batteries ready for service with ammunition when the war began. Inadequate funding during the interwar years, coupled with the small caretaking detachment had taken its toll in the defenses, leaving the supporting elements in the harbor defense far from adequate.

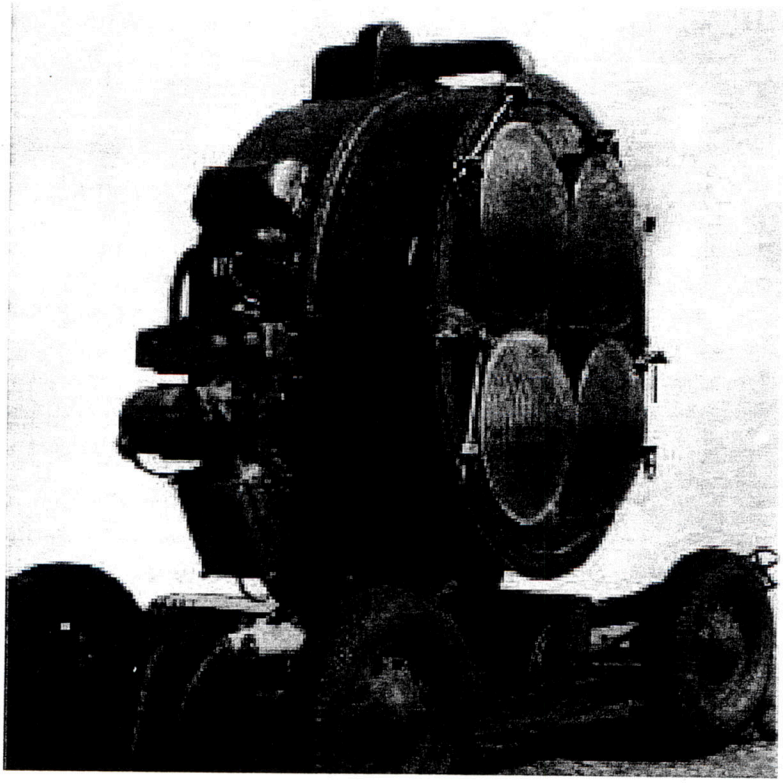
At Fort Hamilton, the following batteries were available:
- Battery Doubleday, two 12-inch disappearing guns - 240 rounds
- Battery Brown, two 12-inch disappearing guns - 240 rounds
- Battery Livingston, two 6-inch barbette guns - 339 rounds
- Battery Johnston, two 6-inch barbette guns - 491 rounds
- Battery Griffin, two 3-inch barbette RF guns - 336 rounds

At Fort Wadsworth, the following batteries were available:
- Battery Dix, two 12-inch disappearing guns - 480 rounds
- Battery Mills, one 6-inch disappearing gun - 300 rounds
- Battery Catlin, six 3-inch barbette RF guns - 1201 rounds
- Battery Turnbull, six 3-inch barbette RF guns - 701 rounds

The mobile 155 mm gun battery at Fort Wadsworth was not ready for service, with no ammunition, field wire, or telephones. There were two AA gun batteries in HD SNY, each with three 3-inch M1917 AA guns on fixed carriages. Neither was serviceable. They had no ammunition; their fire control system was not complete as they lacked their two directors; one battery had no height-finder, field wire, or telephones, as well as being short eight 60-inch portable AA searchlights.(95)



A 3-inch M3 AA gun towed by a prime mover of the 213th CA (AA), ca 1941. *Author's Collection*

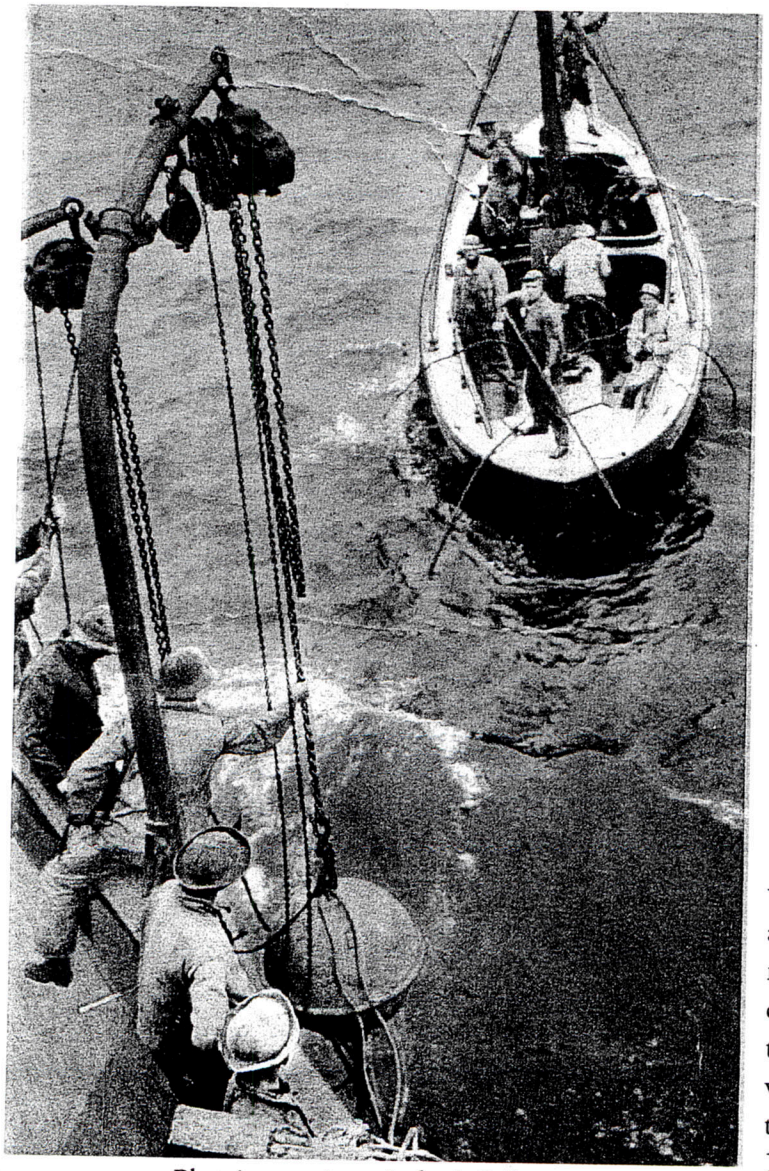


M1941 60-in portable searchlight with spread beam attachment. *Author's Collection*

The antiaircraft defenses for the New York area initially fell to the 62nd CA (AA) Regiment from Fort Totten and later to elements of the 38th CA (AA) Brigade, ordered from Camp Stewart, GA, December 12, 1941. The brigade headquarters was established at Fort Totten and the 213th CA (AA) Regiment arrived at Fort Hamilton December 22. On January 1, 1942, elements of the 213th CA

moved across to Fort Wadsworth, where they manned the AA defenses of the Narrows until June 7, 1942. The 62nd CA (AA) Regiment's primary mission was the AA defense of the Brooklyn Naval Yard, consequently it was not available to man AA defenses of the harbor defense. There were two fixed and two portable 60-inch seacoast searchlights on hand and serviceable.

The mine command at the Narrows, just Battery A, 5th CA, was also inadequately supported. It was short its mine planter and a distribution box (DB) boat. The USAMP *General E.O.C. Ord*, and the US Army Cable Ship *Joseph Henry,* a former mine planter, were assigned to the Sandy Hook defenses, where both vessels were fully occupied planting the outer minefields. The Coast Guard buoy tender USCGC *Spruce* (WAGL-246) was made available "on two days notice," August 1, 1941, as an emergency mine planter and it was believed that the Narrows, or inner, minefield could be planted in about one week. This inner minefield consisted of a single line of five groups of submarine mines between Staten and Coney Islands. Ironically, in 1919 *Spruce* had been built as US Army mine planter *Colonel Garland N. Whistler.* In the budget cutbacks of the early 1920s, the 704-ton 172-foot *Whistler* was transferred to the US Lighthouse Service as a tender on December 24, 1923, and renamed USLHS Tender *Spruce.* When the Lighthouse Service was amalgamated with the Coast Guard July 1, 1939, *Spruce* became a Coast Guard buoy tender in New York Harbor.



Planting a mine. *Author's Collection*

The army mine planters assigned to the seaward Sandy Hook minefields operated out of the Brooklyn Army Base and later from Fort Hancock. The *Spruce*, which maintained the Narrows mine groups, was based at Tompkinsville, Staten Island, where the navy's coastal frontier base operated the naval net depot, the base anti-submarine warfare training center, a section base for the inshore patrol, the naval frontier base's ship repair training unit, the anti-submarine training unit, and the degaussing range (Ambrose Channel). They picked up submarine mine materiél at the extensive Fort Wadsworth mine depot's wharf next to Battery Weed. Two new army mine planters were expected to arrive in early 1943. One would relieve the cable ship *Joseph Henry* and work with the mine planter *Ord*, while the second was projected to relieve *Spruce.* When the USAMP *Story* arrived on January 1, 1943, it was assigned to Fort Hancock. The USAMP *Maybach,* manned by the



USAMP *Maybach* underway in New York Harbor. *Author's Collection*

20th Coast Artillery Mine Planting (CAMP) Battery, arrived at New York May 13, 1943, and was assigned to Fort Wadsworth, mooring at Tompkinsville.(96)

Combat Teams and Reconnaissance Patrols Assigned as Sector Mobile Reserve

On December 12, 1941, First Army ordered II Corps to make up a battalion combat team from elements of the 113th Infantry Regiment of the 44th Division, at Fort Dix, NJ. The team was to be based at Mitchel Field on Long Island, NY, as the mobile reserve for the New York-Philadelphia Sector. The next day a second battalion combat team was ordered to the vicinity of Georgetown, DE, and a third battalion to the vicinity of Freehold NJ. Hq and Hq Co., 113th Inf., established its headquarters at Fort Hancock December 23, 1941. The combat teams were formed early in 1942, when the 199th FA Bn, with 75 mm truck-drawn guns, was reassigned as part of the sector mobile reserve, along with elements of the 177th Engineer Bn, 119th QM Regiment, and the 119th Medical Regiment. The 1st and 3rd Bns, 113th Inf., were assigned to the New York Sub-Sector.(97)

New York's Separate Harbor Defenses Merged into a Single Command

While the beginning of the war appeared to find New York Harbor's defenses with a somewhat archaic organizational structure consisting of three separate harbor defense commands, this "disunity" of command was more appearance than reality, as the Harbor Defenses of Sandy Hook operated as the superior command of the harbor defenses, under Brig. Gen. Phillip S. Gage.(98)

The army also occupied Hoffman and Swinburne Islands, small, man-made isles at the south end of the Narrows off South Beach, Staten Island. Hoffman Island, the larger of the two, had been taken over from the US Public Health Service as a training station for the US Maritime Service. Here, a small detachment from Battery A, 5th CA, operated the primary station for Minefield No. 5 in the upper reaches of Lower New York Bay. Later in the war, Swinburne Island was the site for an AMTB battery. (99)

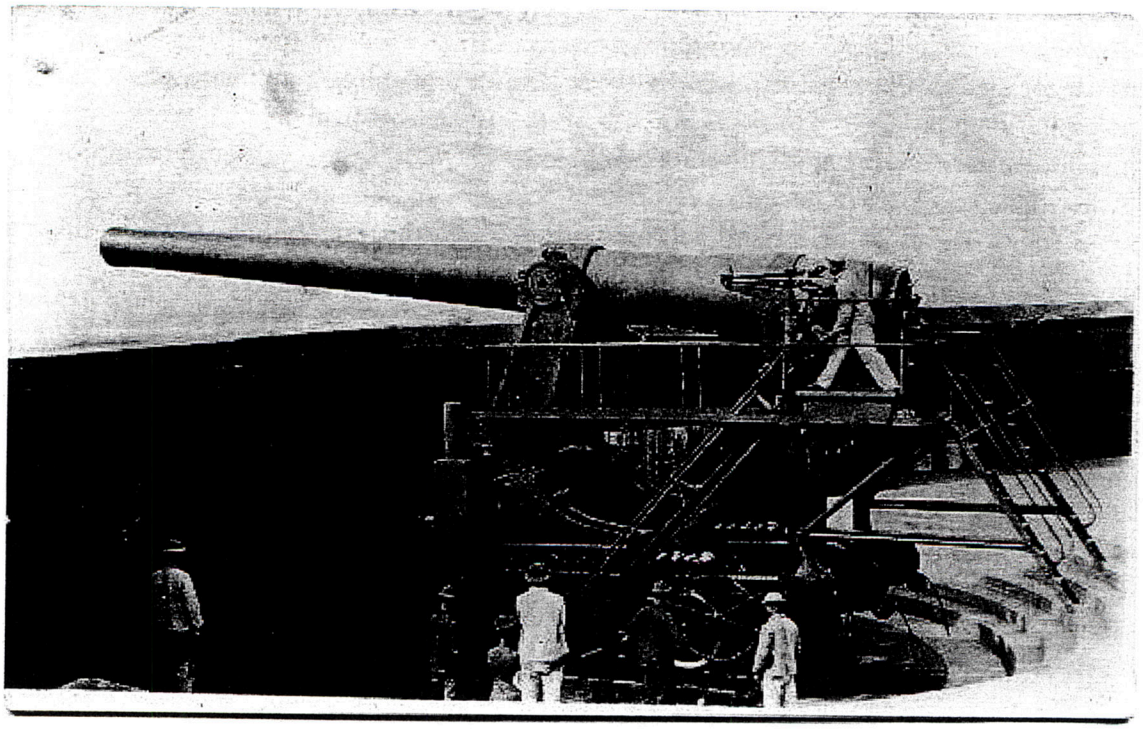
On May 5, 1942, the separate harbor defenses for New York were inactivated and the Harbor Defenses of New York constituted and activated with Hq and Hq Battery of the HD of New York (HD NY) at Fort Hancock, by order of Brig. Gen. Ralph E. Haines, commanding the New York–Philadelphia Sector, Eastern Defense Command (EDC). This action made the defense of New York City and its harbor more efficient. Brig, Gen. Phillip S. Gage, commanding HD of Sandy Hook, was placed in command of HD NY. General Gage had essentially been commanding the three harbor defense commands as a single organization since December 1941, and the action by the sector simply formalized the merger.

In order to release as many able bodied men for service overseas as possible, most of the harbor defense regiments in the EDC, including the 5th CA, were designated "limited service units" on November 11, 1942. Limited service units were to have their general service personnel gradually reduced as limited service personnel to replace them became fully trained. Meantime, all elements of the 5th CA were moved to Fort Wadsworth with the exception of Battery D and a detachment from regimental Hq Battery, which remained at Fort Hamilton. By January 1, 1943, the 5th CA had 37 officers, two warrant officers, and 785 enlisted men.(100)

Housing to accommodate the 5th CA, the newly organized station complements, and other supporting elements at Forts Hamilton and Wadsworth was generally sufficient. Fort Hamilton's permanent and mobilization-type housing for 2,137 men was more than sufficient for the small coast artillery contingent assigned to that post. At Fort Wadsworth, mobilization barracks for only 386 men were required in addition to the permanent barracks that housed 1,219 men. That post also had 31 sets of married officers' quarters, although 20 officers were accommodated in mobilization-type structures. The post also boasted a 119-bed permanent hospital. When Battery Turnbull was relocated to the southeast corner of the post, theater-of-operations-type housing was provided for 88 men. Miller Field also had permanent housing for some 200 men, as well as 14 sets of permanent married officers' quarters. Another 102 men were housed in theater-of-operations barracks.(101)

By autumn of 1942, it was becoming increasing clear that major enemy naval units did not pose a threat to the Atlantic seaboard of the United States. Consequently, the EDC directed that the "C" category of defense be reduced to "B" for all seacoast batteries in excess of 6-inch calibers, with the exception of mobile 155 mm GPF guns. The "C" category continued to be maintained at all other installations such as fire control stations, searchlights, etc. In HD SNY, the 12-inch disappearing guns of Batteries Harvey Brown and Dix were to be kept in class "B" maintenance status, pending completion of the modern batteries.

The shortage of antiaircraft troops in the New York area, coupled with the impending departure of the 62nd CA for England in July 1942, resulted in the organization of the 701st Provisional Antiaircraft Regiment at Fort Totten, May 20, 1942; the provisional designation was dropped October 1. When the regiment was activated, one battery manned the fixed AA battery at Fort Totten, while other batteries manned the fixed AA batteries at Forts Hamilton, Wadsworth, Tilden, and Hancock. By March 1943, the 701st CA (AA) Regiment had been ordered to Camp Miles Standish, MA, and the AA defenses at Forts Hamilton and Wadsworth was reassigned to the harbor defense troops. The 701st CA (AA) Regiment was broken up September 1, 1943, and its elements redesignated.(102)



One of Battery Dix's 12-inch guns. *Author's Collection*

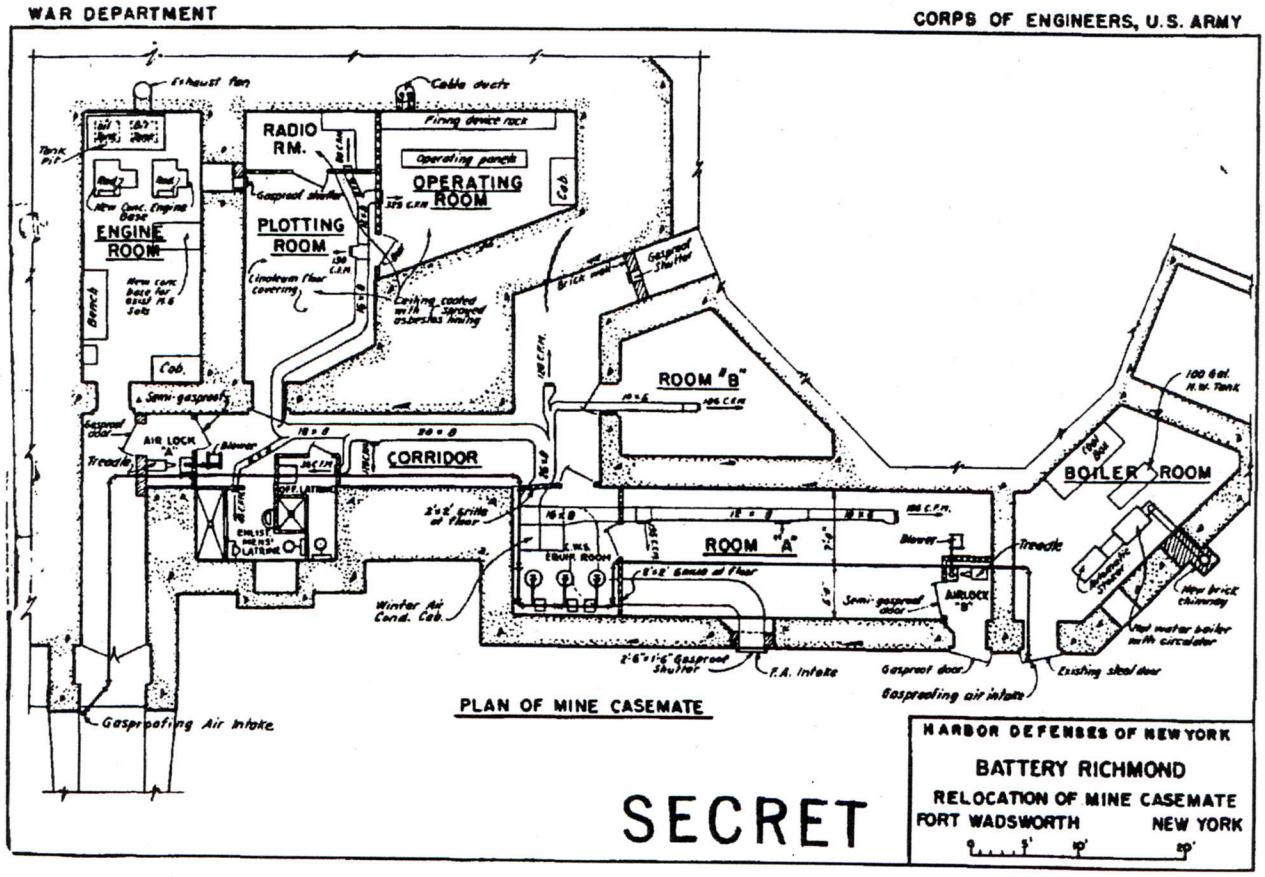
Salvaging the Armament at the Narrows

By 1941, Fort Hamilton's seacoast gun and mortar batteries had for the most part been abandoned and most were at least partially disarmed. The abandonment of the batteries was partially because they were obsolescent and superseded by more powerful and longer-range batteries at Forts Hancock and Tilden, and partially because of the absence of personnel to man them. The War Department eventually ruled on October 19, 1942: "Due to the shortage of enlisted personnel, no activation of units to be employed within the continental United States can be favorable considered at this time." Army manpower shortages continued to be a problem in HD SNY, eventually resulting in the abandonment of all batteries greater than 6-inch. On November 3, 1942, sector headquarters determined that Batteries Johnston at Fort Hamilton and Mills at Fort Wadsworth should be placed in class "C" caretaking status. The "active season," when the guns would be used for training, for Batteries Doubleday and Brown at Fort Hamilton and Battery Dix at Fort Wadsworth would be limited to April 1 to September 30 each year. On November 12, 1942, orders for the disposition of much of the remaining armament at Forts Wadsworth and Hamilton were issued. The gun tubes of Batteries Upton, Richmond, Ayres, and Hudson at Fort Wadsworth and Battery Gillmore at Fort Hamilton were to be turned over to the Ordnance Officer, Second Service Command, and their disappearing carriages were to be scrapped. (103)

Although the massive concrete monoliths of the Endicott Era were being phased out of service, use of the structures did not end. The battery magazines and storerooms would be adapted for general storage and some batteries would continue to have a tactical mission. In 1942, Battery Neary's magazines between Emplacement 1 and 2 were converted into a fire control switchboard and radio room, heated by a coal-fired boiler with automatic stoker. Flush-type latrines were provided and an emergency electric generator installed.

The sector Hq established its command post at Fort Hamilton at the beginning of the war and later in 1942 work was commenced on a bombproof sector command post. Long abandoned Battery Piper was chosen for the command post and $3,751.57 was made available to modify the old battery's magazines. Upon completion, the Chemical Warfare Section (CWS) provided the battery with air locks, collective protectors, and other gasproofing equipment. The modified magazines provided offices and quarters for the commanding general, a cryptographic room, a radio room and message center, and an operations room, as well as officer and enlisted latrines. Acoustical tile ceiling and wood flooring was installed, along with fluorescent lighting, air conditioning, and an oil-fired furnace.(104)

At Fort Wadsworth, abandoned Battery Richmond gained new life when it was selected for the new bombproof and gasproof mine casemate and fire control switchboard and post telephone switchboard rooms. The former magazines and storage rooms of Emplacement 2 were converted into a gasproof mine casemate. The casemate contained an operating room equipped with the firing panels for the groups of mines used in the M3 submarine mine system. Next door was a plotting room equipped with an M1906_submarine mine plotting board and a room equipped with telephone and radio communications. An engine room contained two generators to power the casemate and minefield. A coal-fired boiler provided hot water and heat in winter. Two rooms provided sleeping accommodations for officers and enlisted personnel. Two latrines were adjacent to the CWS air locks. There were two entries to the casemate, each with an airlock. At the opposite end of the battery, in the magazines and storage rooms of Emplacement 1, air locks afforded entry to the fire control switchboard room, the post telephone switchboard room, and a restroom.(105)

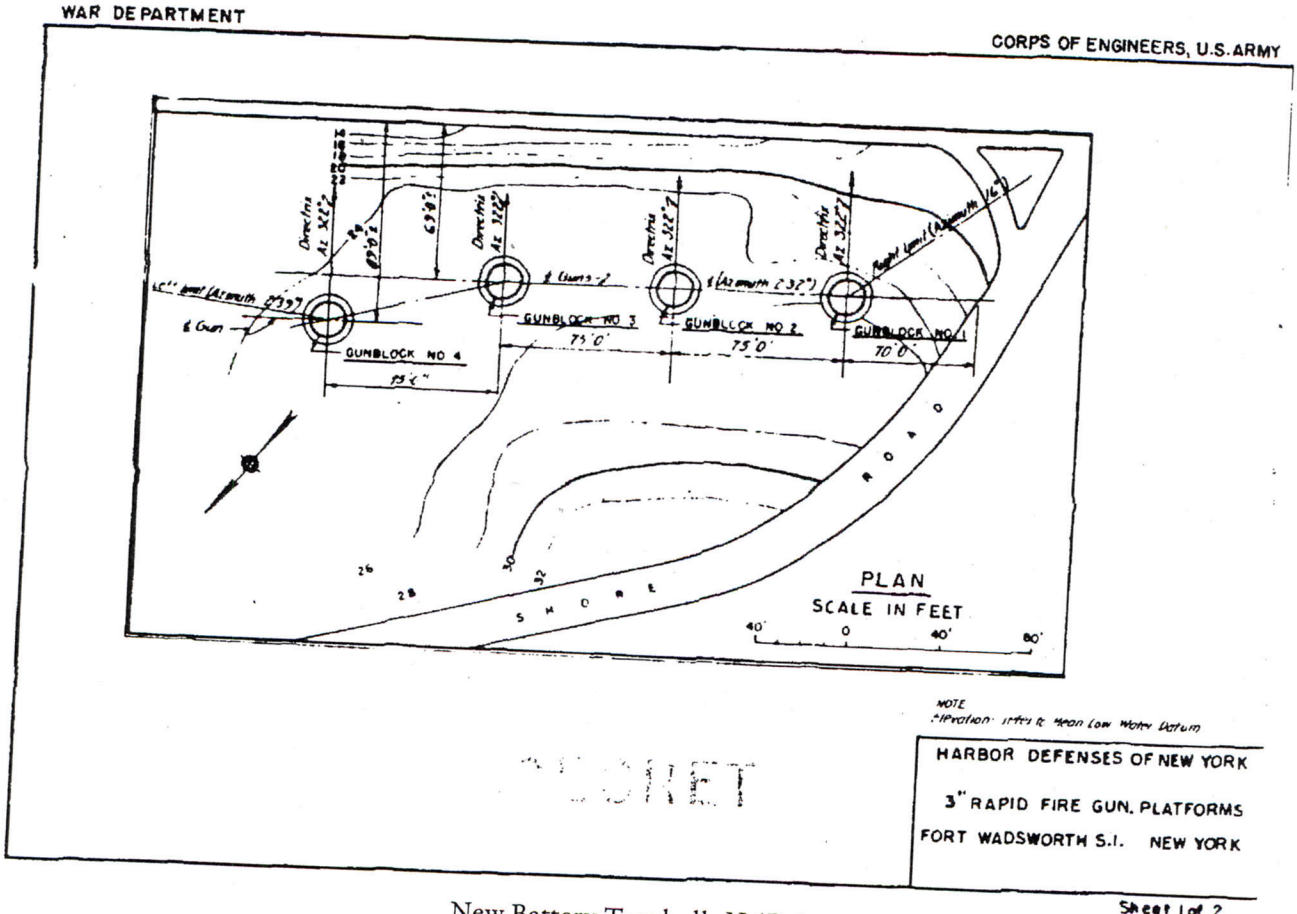


New mine casemate relocated to Battery Richmond. *NARA*

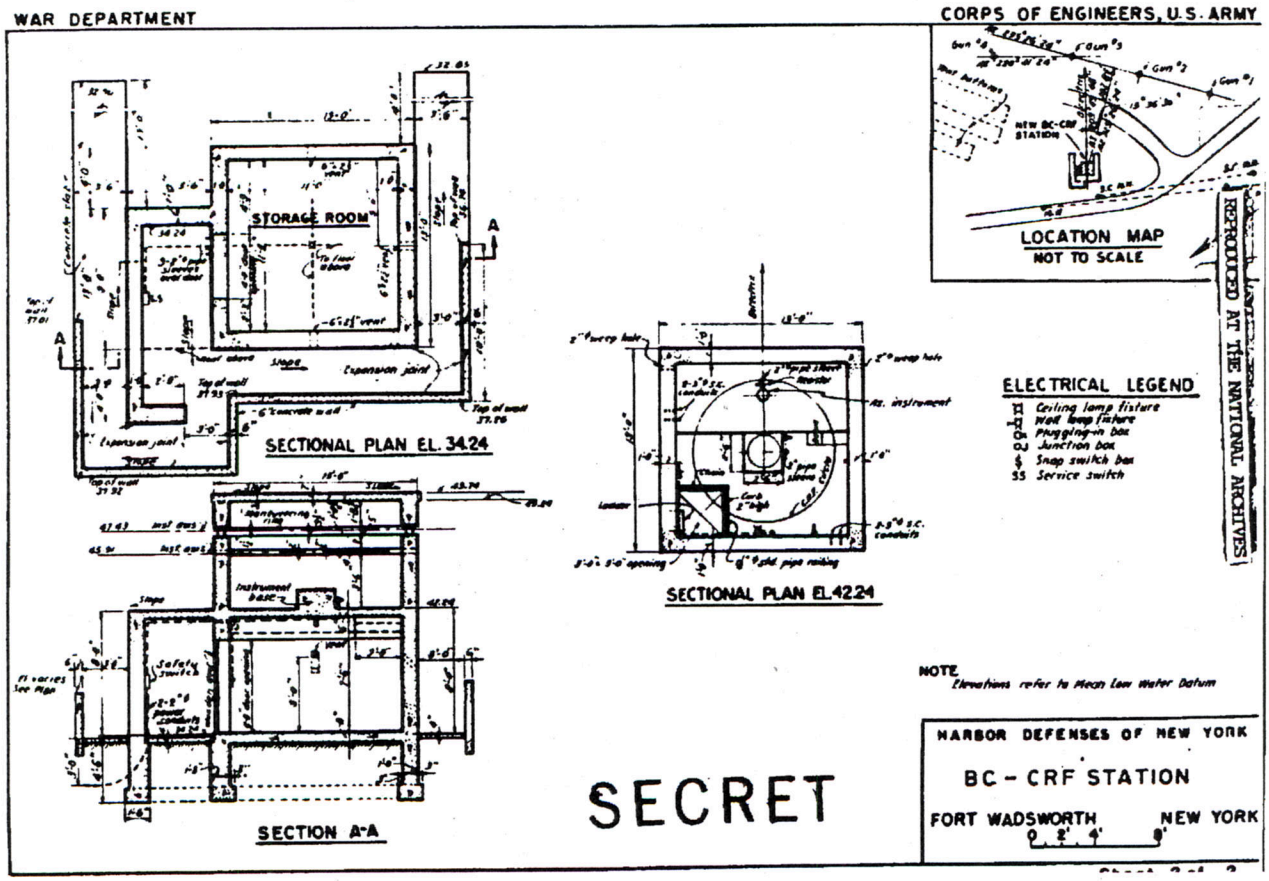
Anti-Motor Torpedo Boat (AMTB) Batteries Established

One of the first problems to be confronted in the harbor defenses early in 1942 was that of attack by motor torpedo boats. These fast and highly maneuverable small boats posed a threat that the existing seacoast armament had not been designed to counter. The War Department was working rapidly to adapt the newly developed 90 mm AA gun, but until that was perfected, the harbor defenses were to utilize 37 mm automatic weapons and 3-inch seacoast guns, as well as fixed and portable 3-inch and 90 mm AA guns as extemporized AMTB weapons. The 5th CA was authorized to re-site these weapons as necessary to prevent penetration of the harbor by torpedo boats.

By April 1942, a plan had been developed to relocate four of Battery Trumbull's guns and six of Battery Catlin's guns to new locations to provide a better defense against enemy motor torpedo boats. Four of Battery Trumbull's 3-inch M1903 RF guns (Nos. 60, 66, 67, and 68) and barbette carriages (Nos. 37, 38, 39, and 40) were shifted to the southeast corner of the Fort Wadsworth Reservation in June 1942, where they were designated New Battery Turnbull. New Battery Trumbull was provided with four open concrete gunblocks in a line, affording all around fire. To the rear of the gun line, a two-story splinterproof station was commenced late in 1942 and completed by early 1943. The structure's lower level was used as storage while the upper level served as the BCS and coincidence range finder (CRF) station. The remaining two guns of Battery Turnbull were transferred to Fort Miles at Cape Henlopen, in the HD of the Delaware, where they were also part of a temporary AMTB battery. (106)



New Battery Turnbull. *NARA*



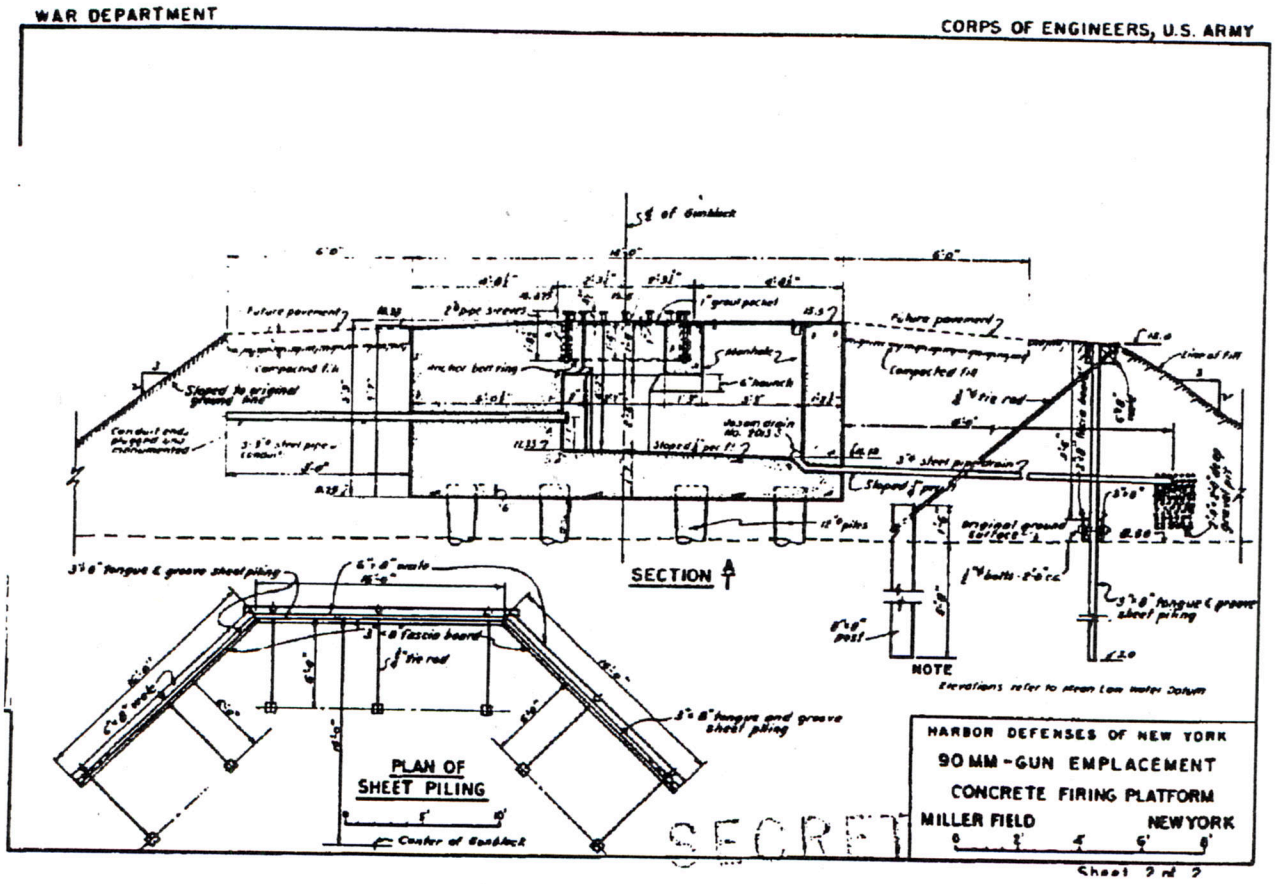
BCS, New Battery Turnbull. *NARA*



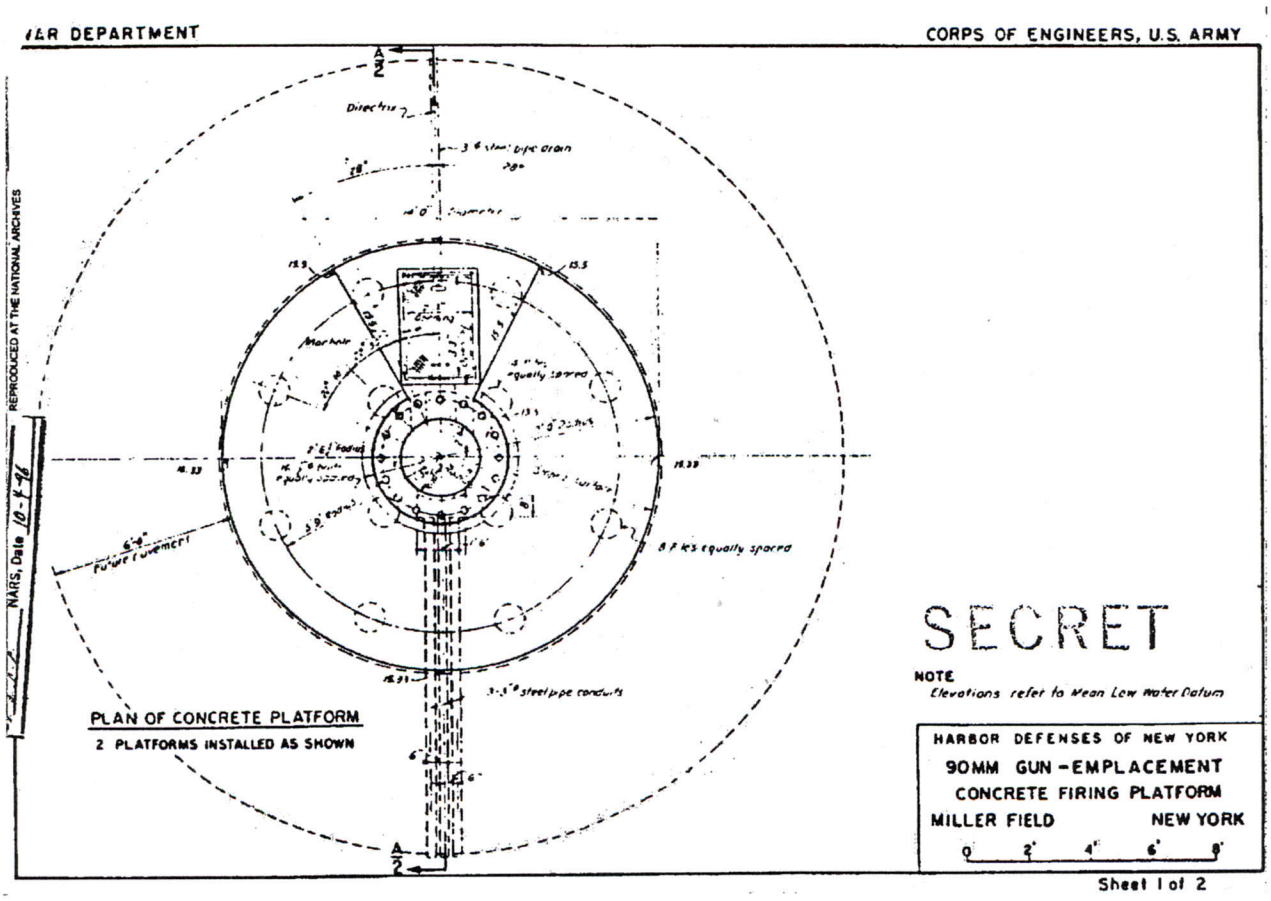
BCS, New Battery Trumbull. *Author*

In the late summer of 1942, four of Battery Catlin's six 3-inch M1902 RF guns and carriages (Nos 32, 33, 34, 35) were moved from Fort Wadsworth to Norton's Point on the Long Island side of the lower bay, near Seagate, NY. Designated New Battery Catlin, the battery was completed November 6, 1942, although it was not formally transferred to the CA until July 9, 1943. The four guns were mounted on open concrete gun blocks in a single line. The battery's combination BCS/CRF station was behind the gun line, between Guns 3 and 4. The two-story splinterproof-concrete structure sported a pitched roof to camouflage it as a seaside cottage. This structure was probably completed by late 1942, although not transferred to the coast artillery until January 3, 1944. The battery was designated Tactical Battery No. 18. The remaining two guns and carriages of Battery Catlin (Nos. 30 and 31) were shipped to Rockaway Point and designated Tactical Battery 20.(107)

A trio of 90 mm AMTB batteries would be emplaced to cover the waters of the Lower Bay and Narrows. By January 1943, the first 90 mm AMTB battery was installed at Forts Hancock, followed by a battery at Fort Tilden. These covered the channel into the Lower Bay. Typically, the AMTB batteries were equipped with four M1 90 mm guns, two on fixed M3 carriages on gun blocks 14 feet in diameter and two on mobile M1A1 carriages. The guns could rotate through 360 degrees, elevate from -8 to 80 degrees, and had a range of 8,000 yards. A crew of 15 men (9 men in the gun squad and 6 men in the ammunition squad) manned each gun. These guns were initially supplemented by a pair of 37 mm automatic weapons; by the last year of the war these had been replaced by a pair of 40 mm weapons. The first AMTB battery, AMTB Battery 19, was adjacent to New Battery Catlin at Norton's Point. Construction began on February 1, 1943, and was completed March 30, 1943. The battery was



90 mm AMTB battery at Miller Field. *NARA*



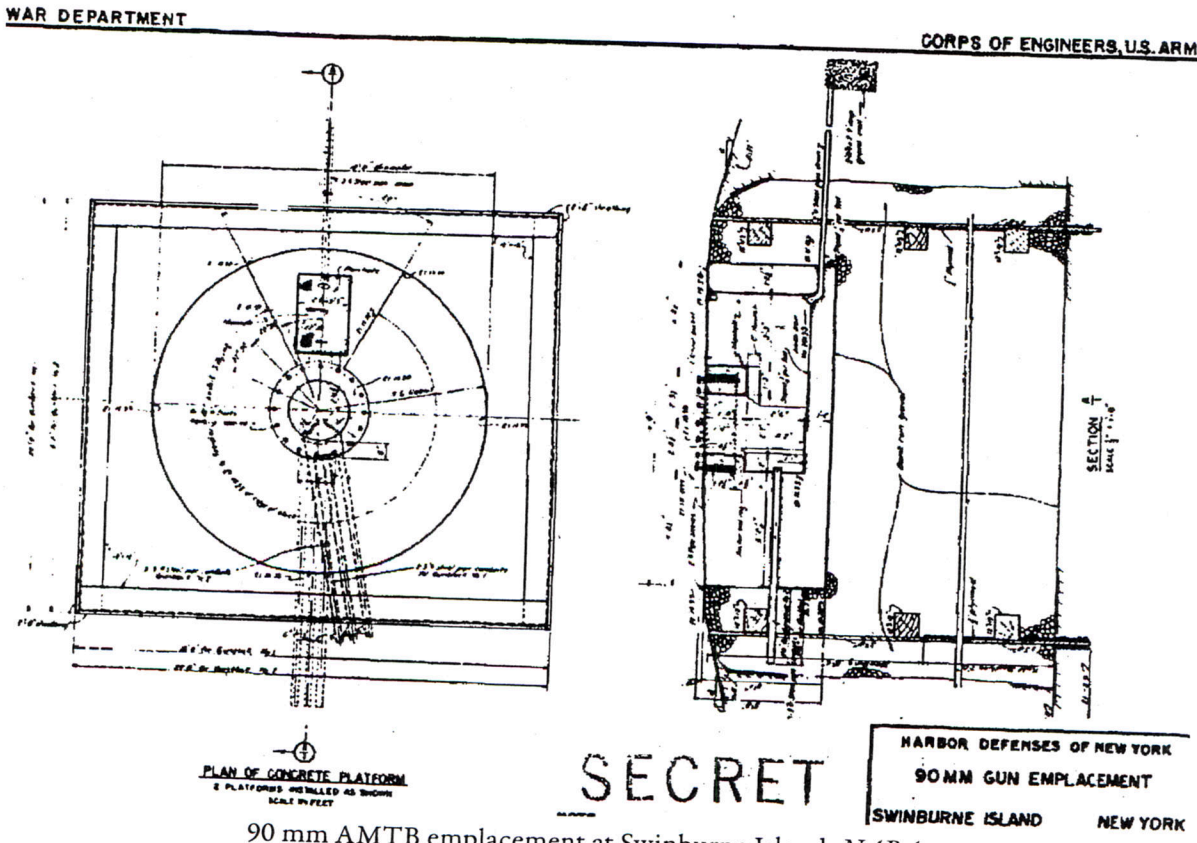
Firing platform for 90 mm AMTB at Miller Field. *NARA*

transferred April 14, 1943, but its four 90 mm M1 guns were not emplaced until September 1943. These guns were supplemented by the four 3-inch RF seacoast guns emplaced there in the late summer of 1942.

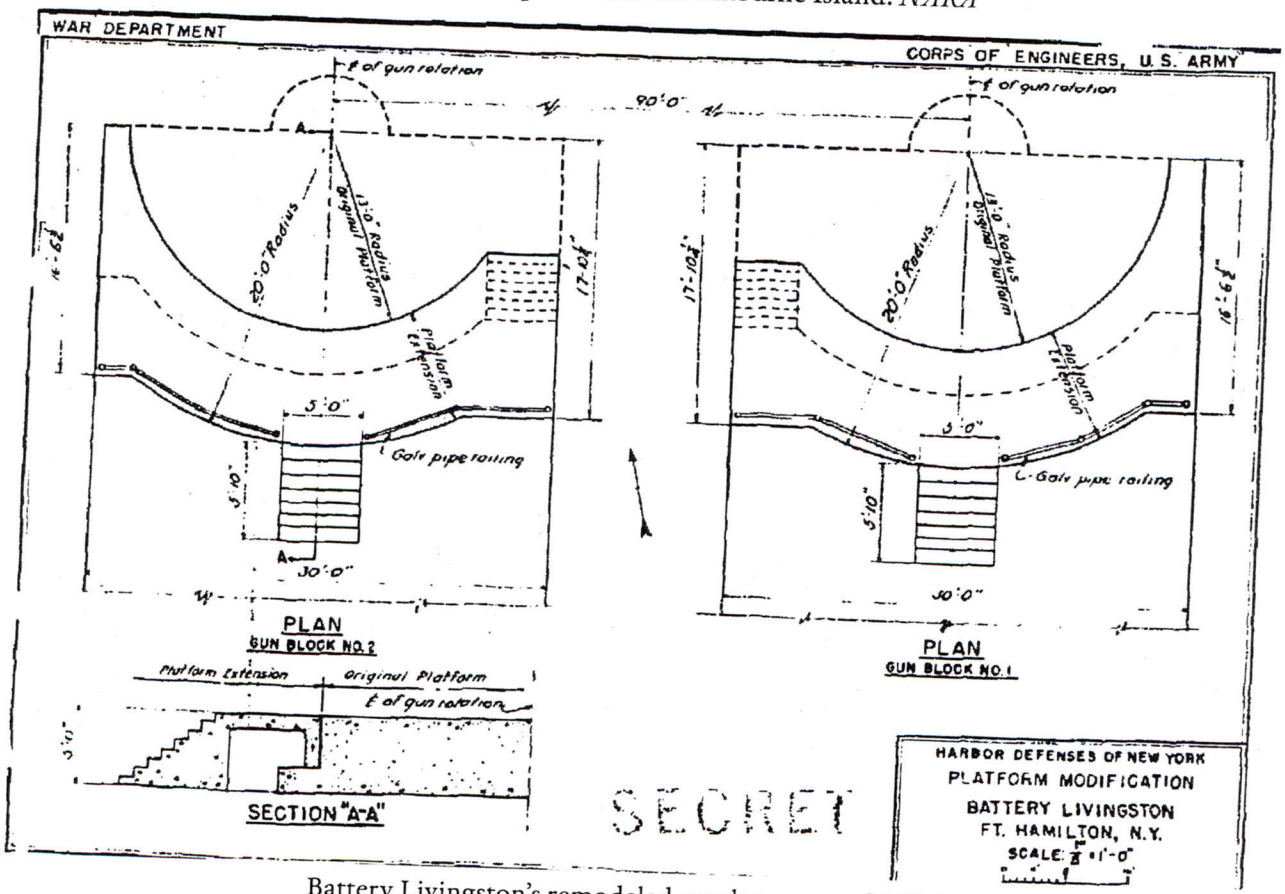
The second battery was commenced on Staten Island at Miller Field, April 13, 1943. Later that month, two 90 mm M1 guns on M1 mobile carriages were emplaced at the battery. Construction was completed June 11, 1943, and two more 90 mm guns on fixed T3 carriages were emplaced in July of that year. The Miller Field battery was designated AMTB Battery No. 11. Battery M, 245th CA, helped construct and then man the Miller Field battery from February 22 to May 20, 1943, and Battery G, 245th CA, was assigned from May 20 until December 2, 1943, when they were relieved by Battery K, 245th CA. Battery K manned the Miller Field battery until March 1, 1944, when they moved to Fort Wadsworth.

The third AMTB battery at the Narrows, a pair of M1 90 mm guns, was commenced April 20, 1943, and completed on July 3, 1943, on Swinburne Island, just off South Beach, Staten Island. Its two 90 mm M1 guns on T3 (M3) shielded fixed mounts were emplaced in August 1943. The Swinburne Island battery was designated AMTB Battery No. 12. Early in 1944, EDC placed 90 mm guns on M1A1 mobile carriages in storage.(108)

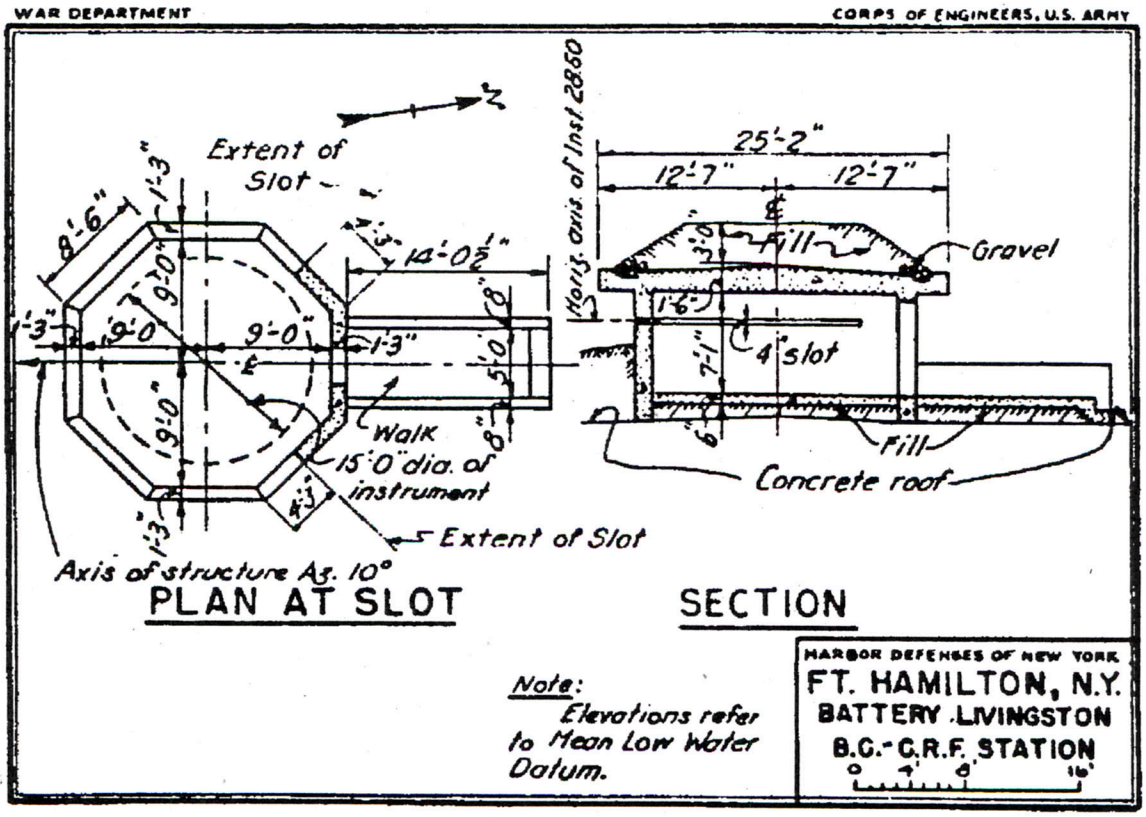
By 1943, the four 3-inch guns of the relocated New Battery Turnbull at Fort Wadsworth, the pair of barbette 6-inch gun at Battery Livingston, and Battery Griffin's pair of 3-inch RF guns were the only remaining Endicott-era batteries in service. Battery Livingston's Emplacements 1 and 2 had been remodeled in 1941, extending their loading platforms seven feet and building stairs up to the plat-



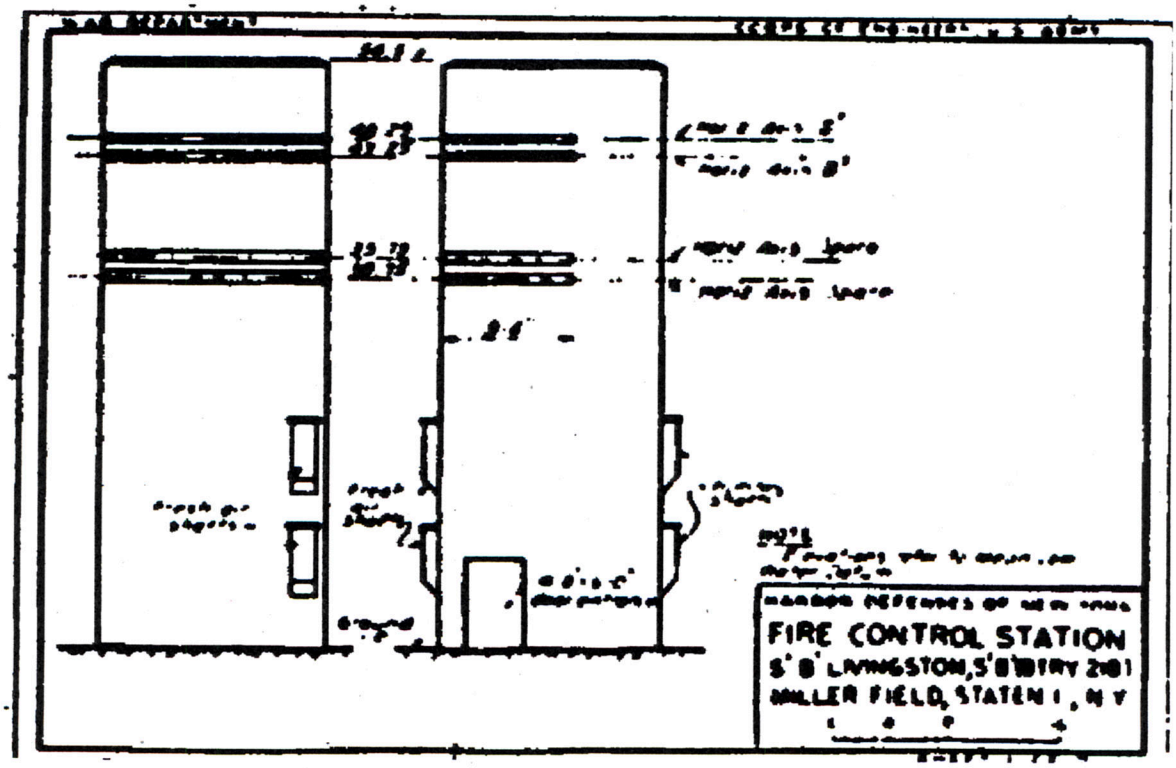
90 mm AMTB emplacement at Swinburne Island. *NARA*



Battery Livingston's remodeled emplacements. *NARA*



New splinterproof BCS and CRF station, Battery Livingston. *NARA*



Miller Field base-end station for Battery Livingston and BCN 218. *NARA*

forms. In September 1943, splinterproof-concrete BCS/CRF had been constructed at both Batteries Livingston and Battery Griffin.(109)

A 70-foot long, 24-foot 8-inch-wide sheet metal building on concrete footings was erected in 1943 at Fort Hamilton to store six portable 60-inch searchlights and their portable electrical generators, one of the very few harbor defense structures built at the Narrows during World War II. A similar but slightly smaller (60 feet long by 24 feet 8 inches wide) building for another four portable searchlights and generators was erected in the south-central section of Fort Wadsworth.(110)

At Miller Field, a 44-foot splinterproof-concrete fire control tower was also built in 1943 and transferred to the garrison in September. The uppermost station was a base end station for Battery Livingston, while the lower was for BCN 218, when that battery was completed. In 1944, a 100-foot structural-steel tower was erected for an SCR-296A fire control radar for BCN 218. The top of the tower mounted a prefabricated antenna housing. In addition to the tower, there were two generator buildings and equipment and transmitter buildings. A timber platform with ramp for a 60-inch portable searchlight was also built at Miller field in 1944 to provide illumination for Batteries Livingston, Griffin, and the Miller Field AMTB battery. The searchlight platform was transferred January 3, 1944. (111)

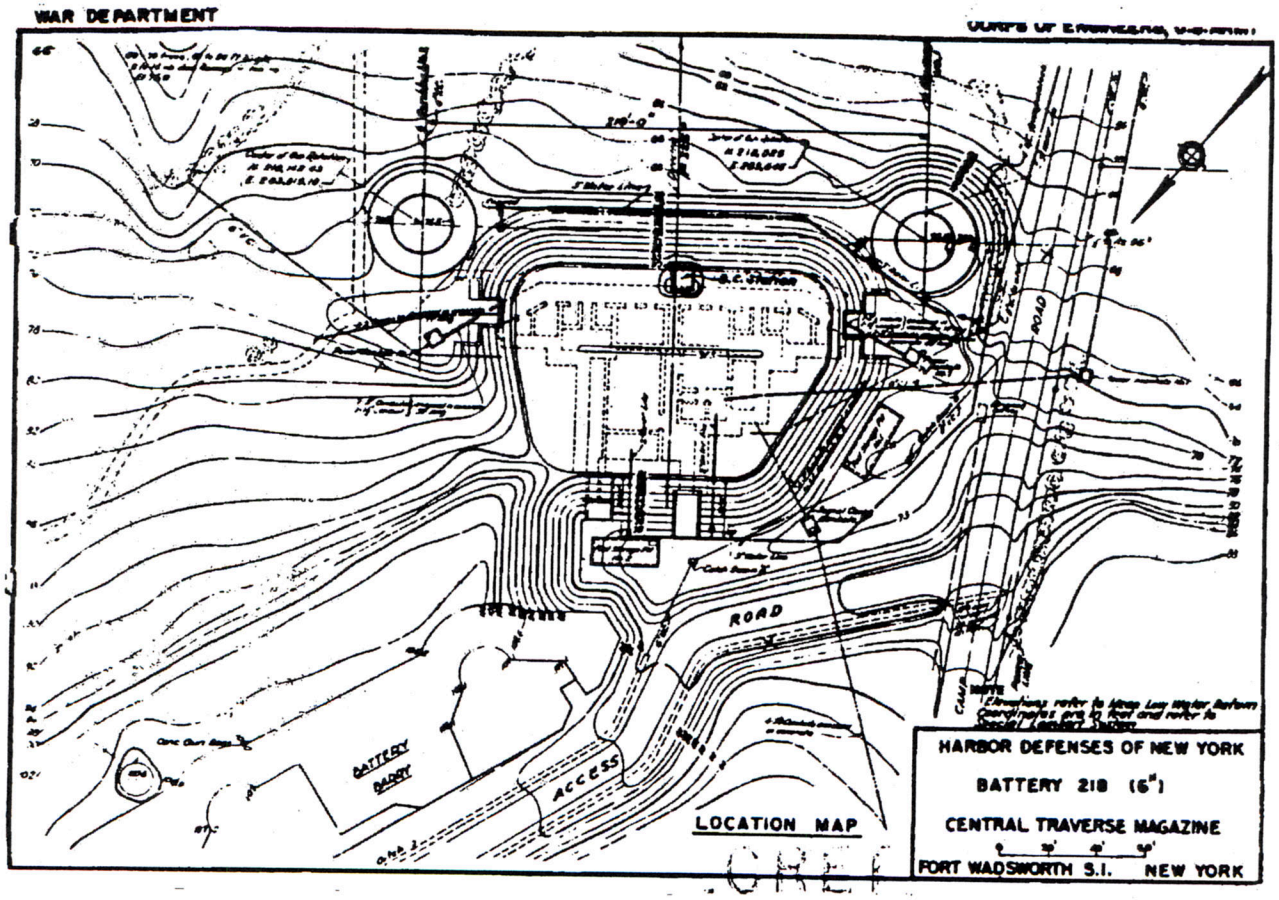


Base-end station at Miller Field. *Author's Collection*

Because the several harbor defense commands in New York had been merged into a single command, the various coast artillery regiments were shifted as the need arose. The 265th CA (HD) Regiment arrived at Fort Hancock February 16, 1943, from Key West, FL, by way of Fort Jackson, SC. Most of this former Florida National Guard regiment's batteries were assigned Forts Hancock and Tilden, but Battery C took over New Battery Catlin at Norton's Point, while Battery F took over New Battery Trumbull in July 1943. The 265th CA manned batteries in the HD New York until late December 1943, departing for Alaska on January 11, 1944.(112)

Hq and Hq Battery, 245th CA (HD) Regiment, along with Batteries D and N, also moved to Fort Wadsworth early in 1943. By late summer, Battery D had been shifted out to Swinburne Island to man the new 90 mm AMTB battery there, while Battery N manned the AA guns and radar on Staten Island. By this time, however, the various elements of the 5th CA were preparing to move to Forts Tilden. On May 20, 1943, Hq and Hq Battery and Battery D, 5th CA, moved to Fort Tilden, while Battery B, 5th CA moved to Fort Hancock. Battery A, 5th CA, continued to man Battery New Turnbull until relieved by Battery F, 265th CA, in July.(113) 113.

Hq and Hq Battery, 4th Bn, 245th CA, was posted at Fort Wadsworth from March 22 until May 20, 1943, when it moved to Norton Point. On May 20, 1943, Hq and Hq Battery, 3rd Bn, and Batteries H and I, 245th CA, were posted at Fort Wadsworth, and Hq and Hq Battery, 3rd Bn, moved to Norton Point November 23, 1943. Battery I was transferred to Fort Tilden October 1, 1943, and Battery H moved to Fort Tilden December 2, 1943. Battery L, 245th CA, manned the batteries at Norton Point from November 23, 1943, until February 22, 1944, when it too moved to Fort Wadsworth.



BCN 218 in front of the right flank of obsolete Battery Barry. *NARA*

By November 1, 1943, the modernization program for New York Harbor was sufficiently advanced to eliminate the last Endicott-era seacoast batteries. These batteries had been largely used for training during the past year and were no longer essential to the defense. On November 9, 1943, the War Department authorized disposal of Battery Dix at Fort Wadsworth, Batteries Brown and Doubleday at Fort Hamilton, the remaining 6-inch disappearing gun of Battery Mills at Fort Wadsworth, and Battery Johnston's pair of 6-inch disappearing guns at Fort Hamilton. Only the guns of Battery New Turnbull at Fort Wadsworth remained in service at the end of 1943, those of Battery Griffin at Fort Hamilton having been placed in maintenance status.(114)

On February 1, 1944, the HD of New York was composed of the following units:(115)

Hq, New York Subsector, Ft Hancock
Hq and Hq Battery, HD NY, Ft Hancock
HECP HD NY, Ft Wadsworth
Advanced HECP No. 1, Ft Hancock
Advanced HECP No. 2, Ft Tilden
Hq and Hq Battery, 7th CA (HD) Regiment, Ft Hancock
Hq and Hq Battery, 1st Bn, 7th CA (HD) Regiment, Ft Hancock
Hq and Hq Battery, 2nd Bn, 7th CA (HD) Regiment, Ft Hancock
Batteries A, B, C, D (-det), & E, 7th CA (HD) Regiment, Ft Hancock
Battery D (det) and F, 7th CA (HD) Regiment, Ft Totten
Hq and Hq Battery, 245th CA (HD) Regiment, Ft Wadsworth
Band, 145th CA (HD) Regiment, Ft Hancock
Hq and Hq Battery, 1st & 2nd Bns, 245th CA (HD) Regiment, Ft Hancock
Hq and Hq Battery, 3rd Bn, 245th CA (HD) Regiment, Ft Tilden
Hq and Hq Battery, 4th Bn, 245th CA (HD) Regiment, Norton's Point
Battery A, B, E, & F, 245th CA (HD) Regiment, Ft Hancock
Battery C & N (-AA Plt), 245th CA (HD) Regiment, Ft Wadsworth
Battery D, 245th CA (HD) Regiment, Swinburne Island, Ft Wadsworth
Battery G, H, I, & N (AA Plt), 245th CA (HD) Regiment, Ft Tilden
Battery K, 245th CA (HD) Regiment, Miller Field
Battery L, 245th CA (HD) Regiment, Norton's Point
Battery M, 245th CA (HD) Regiment, Rockaway, Ft Tilden
Hq & Hq Battery, 5th CA (HD) Regiment, Ft Tilden
Battery A, 5th CA (HD) Regiment, Ft Wadsworth
Battery B, 7th CA (HD) Regiment, Ft Hancock
Battery D, 7th CA (HD) Regiment, Ft Tilden
5th CA Mine Planter Battery, USAMP *General Ord,* Brooklyn Army Base
15th CA Mine Planter Battery, USAMP *Story,* Ft. Jay, Governors Is.
20th CA Mine Planter Battery, USAMP *Maybach,* Tompkinsville, S.I.

With the departure of the 5th CA from Fort Hamilton, Battery Griffin was placed in Class C maintenance and the fort left in the hands of Hq, 113th Infantry RCT; 199th FA Bn; 2nd Bn, 132nd Engineers; and 671st Collection Co. (Sep). Fort Wadsworth was similarly left almost devoid of a coast artillery presence, only Battery A of the 5th CA remaining.

By the end of 1943, the New York Subsector had been stripped of most of its non-harbor defense functions, especially with the removal of the infantry battalion combat teams. Effective March 1, 1944, the EDC was reorganized. The New York-Philadelphia Sector and its subsectors were closed, and the EDC was restructured with two new sectors, the Northeastern and the Southeastern. Initially HD NY came under the direct control of the Southeastern Sector. On July 29, 1944, the northern boundary of the Southeastern Sector was adjusted to conform to the northern boundaries of Merced and Monmouth Counties, NJ, and HD NY became a part of the Northeastern Sector effective August 1, 1944.(116)

Concurrent with the reorganization of the EDC in March 1944, the harbor defenses were further reduced. The 5th CA Regiment was transferred to Camp Rucker, AL, on March 11, 1944, where it was inactivated April 19, 1944, and disbanded June 26. The 7th CA that had garrisoned the Sandy Hook defenses since 1924 was transferred to Fort Leonard Wood, MO, and Camp Chaffee, AR, March 13, 1944. The 7th CA was inactivated April 7, 1944.(117)

The 245th CA Regiment continued to operate HD NY until October 1, 1944, when it was reorganized into two separate battalions: the 192nd CA (HD) Bn (Separate) and the 245th CA (HD) Bn (Separate). The elements of the 245th CA Regiment were redesignated as follows:

HHB, redesignated HHD, 245th CA (HD) Bn, Ft Hancock
Btry A, 245th CA (HD): Btry A, 245th CA (HD) Bn, Ft Hancock
Btry B, 245th CA (HD): Btry B, 245th CA (HD) Bn, Ft Hancock
Btry C, 245th CA (HD): Btry C, 245th CA (HD) Bn, Ft Wadsworth
Btry D, 245th CA (HD): Btry A, 192nd CA (HD) Bn, Swinburne Is.
Btry E, 245th CA (HD): Btry D, 245th CA (HD) Bn, Ft Hancock
Btry F, 245th CA (HD): Btry E, 245th CA (HD) Bn, Ft Tilden
Btry G, 245th CA (HD): Btry B, 192nd CA (HD) Bn, Norton Pt
Btry H, 245th CA (HD): Btry C, 192nd CA (HD) Bn, Ft Tilden
Btry I, 245th CA (HD): Btry D, 192nd CA (HD) Bn, Ft Tilden
Btry K, 245th CA (HD): Btry E, 192nd CA (HD) Bn, Miller Field
Btry L, 245th CA (HD): inactivated
Btry M, 245th CA (HD): inactivated
Btry N, 245th CA (HD): Btry F, 245th CA (HD) Bn, Ft Wadsworth
HHB 192nd CA (HD) Bn constituted and organized Ft Tilden

On March 18, 1945, the coast artillery forces remaining at Forts Hamilton and Wadsworth were minimal. Only the 90 mm AMTB batteries were still in service, and even they had been reduced to their fixed guns, the mobile 90 mm guns being in storage. The numerous radars and searchlights around the harbor also remained active, as did the 40 mm automatic weapons and machine guns. The HECP detachment of Hq and Hq Battery, HD NY, was posted in the HECP atop Fort Tompkins. Battery B, 192nd CA Bn, was posted at Norton Point manning a pair of 90 mm guns. The removal of the remaining 90 mm guns from the AMTB batteries at Miller Field, Swinburne Island, and Norton Point was authorized April 14, 1945, and on May 15, the navy ordered removal of the harbor's anti-submarine nets and booms.

The retrieval of the single line of five groups of submarine mines of the inner mine field between Staten and Coney Islands began March 21 and continued until mid-August 1945. On March 21, the Northeast Sector was abolished and HD NY reported directly to the EDC. The remaining armament

was now in Class C caretaking status. Battery E was assigned to Forts Hamilton and Wadsworth, providing caretaking detachments for the remaining armament, consisting of Battery Livingston's pair of 6-inch guns and Battery Griffin's two 3-inch RF guns at Fort Hamilton. At Fort Wadsworth, BCN 218, complete except for its gun tubes, as well as New Battery Turnbull's four 3-inch guns, a 3-in AA battery, and the two 90 mm guns AMTB guns at Miller Field were also in caretaking status. Even the light ships returned to their stations.

On June 8, the EDC directed all remaining harbor defense armaments be placed in Class C caretaking status and on June 18, the HECPs were closed and the US Coast Guard's ship reporting service took over the Fort Wadsworth HECP. The 192nd and 245th CA Battalions continued to operate HD NY until August 1, 1945, when they were inactivated and the batteries of the 245th CA (HD) Bn were redesignated batteries of HD NY. Batteries A, B, and D were assigned to Fort Hancock, Batteries C and F to Fort Wadsworth, and Battery E to Fort Tilden.(118)

Battery C, HD NY, manned Battery 218 at Fort Wadsworth, with four officers and 101 enlisted men. Battery F, HD NY, a single platoon of three officers and 48 men, was the caretaking detachment for Forts Hamilton and Wadsworth. Hq and Hq Battery, HD NY, continued to operate the harbor defenses from Fort Hancock until June 30, 1946, when it was inactivated by order of the First Army and replaced by a harbor defense caretaking detachment.(119)

In November 1946, the War Department Seacoast Defense Armament Board ("Tilton Board") chaired by Brig. Gen. Rollin L. Tilton presented its recommendations to the War Department. At New York, the Board recommended advancing the harbor defenses seaward, concentrating at Forts Tilden and Hancock. Forts Hamilton and Wadsworth were judged to have no further value as harbor defenses if the inner minefield was eliminated and the mine defenses were advanced seaward. The newly constructed BCN 218 at Fort Wadsworth (still without its guns) would no longer be necessary and could be dismantled and removed. At Fort Hamilton, Battery Livingston, the sole remaining seacoast battery, was no longer required and could be removed. Miller Field was also surplus to harbor defense needs, with the exception of the small area occupied by AMTB Battery 11, a 60-inch searchlight position, and fire control and radar sites that were to be retained. The Tilton Board also recommended retaining the AMTB battery sites at Norton Point and Swinburne Island and the searchlight position at Hoffman Island. The War Department, however, did not view the recommendations with favor to the extent they involved the expenditure of any funds.(120)

Although the two forts at the Narrows would no longer have a significant harbor defense role, their usefulness to the army had not ended, and Forts Hamilton and Wadsworth entered the postwar era with new missions that would continue for decades. Today although much diminished in area, Fort Hamilton continues to be an important army base, while Fort Wadsworth is now part of the National Park Service's Staten Island Unit of Gateway National Recreation Area.

Footnotes

1. William L. Haskin, "The First Regiment of Artillery," in Theodore F. Rodenbough and William L. Haskin, (eds.) *The Army of the United States: Historical Sketches of Staff and Line with Portraits of Generals-in-Chief* (Ann Arbor, MI: University Microfilms, 1966), p. 310. Hereafter: Haskin, "The First Regiment of Artillery."
2. *Official Army Register, 1901,* Adjutant General's Office, pp. 113-114.
3. *Annual Report of the Secretary of War*, Annual Report of the Chief of Engineers, 1898 (GPO, 1889), pp. 628-29. Hereafter: ARCE, year.
4. Willets Point was named Fort Totten in July 1898. ARCE, 1898, p. 12; 1899, pp. 176-77, 189. "Torpedo Journal," Fortification Notebook, Southern New York, Coast Defense Fortification File, 1898-1920, Entry 220, RG 77, Archives I, Washington, DC. Hereafter:" Torpedo Journal," Fortification Notebook.

5. ARCE, 1898, pp. 629-30; 1899, pp. 773-75; 1901, p. 766. Frederick R. Black, *Historic Resource Study: A History of Fort Wadsworth, New York Harbor* (Boston: NPS, 1983), pp. 112-13. Hereafter: Black, *History of Fort Wadsworth.*

6. ARCE, 1899, p. 766. "Torpedo Journal," Fortification Notebook.

7. Report of Completed Works, Mining Casemate Fort Wadsworth, Corrected to August 21, 1935, Harbor Defense Geographical File, Entry 1007, RG 77, Archives II, College Park, MD. Hereafter: RCW, battery/structure, date.

8. "Torpedo Journal," Fortification Notebook.

9. RCW, M' and M" Stations, Fort Wadsworth, corrected to July 1, 1920.

10. ARCE, 1895, pp. 7-8, 504-05; 1896, pp. 14-15, 478-79; 1897, pp. 614-18. Card File on Guns and Carriages, Entry 712, Records of the Chief of Ordnance, RG 156, Archives II. Hereafter: Gun and Carriage Card File.

11. ARCE, 1897, pp. 614-18. RCW, Battery Samuel Spear, corrected to February 2, 1922. Gun and Carriage Card File.

12. ARCE, 1897, pp. 614-18; 1898, pp. 627-28; 1899, pp. 768-69. RCW, Battery Gillmore, Corrected to July 1, 1920. Gun and Carriage Card File. "Battery Journal," Fortification Notebook.

13. ARCE, 1900, p. 833. Heitman, *Historical Register*, Vol. I, p. 457-58. Matthew Adams (comp.), *Designating US Seacoast Fortifications* (Peoria: self, 2000), p. 46.

14. Francis B. Heitman, *Historical Register and Dictionary of the United States Army from its Organization September 29, 1789, to March 2, 1903*, Vol. I (GPO: 1903), p. 909. Hereafter: Heitman, *Historical Register.* Adams, *Designating US Seacoast Fortifications*, p. 85.

15. ARCE, 1898, pp. 627-28; 1899, pp. 768-70; 1900, p. 833.

16. Heitman, *Historical Register*, Vol. I, p. 380. Adams, *Designating US Seacoast Fortifications,* p. 46.

17. Heitman, *Historical Register*, Vol. I, p. 741. Adams, *Designating US Seacoast Fortifications*, pp. 80, 85, 86.

18. ARCE, 1898, p. 627; 1899, p. 770; 1900, p. 833; 1901, p. 762. RCW, Battery Piper, corrected to July 1, 1920.

19. Gun and Carriage Card File. Heitman, *Historical Register*, Vol. I, p. 793. Adams, *Designating US Seacoast Fortifications*, p. 58

20. ARCE, 1898, pp. 627-28; 1899, p. 770; 1900, p. 833; 1901, pp. 685-86. RCW, Battery Harvey Brown, corrected to July 1, 1920.

21. Adams, *Designating US Seacoast Fortifications*, p. 58. Heitman, *Historical Register*, Vol. I, p. 251.

22. Battery Griffin's two 4.72-inch guns were removed July 28, 1913, shipped to Fort Kamehameha, and emplaced in Battery Barri. ARCE, 1898, pp. 627-28. Gun and Carriage Card File.

23. ARCE, 1899, p. 770; 1900, p. 833; 1901, pp. 685-86; 1901, p. 763; 1902, pp. 685-86. RCW, Battery Abraham Johnston, corrected to July 1, 1920. Adams, *Designating US Seacoast Fortifications*, p. 85. Heitman, *Historical Register*, Vol. I, p. 577.

24. ARCE, 1899, p. 770. The masking-parapet was Driggs-Seabury's balanced-pillar mount. Adams, *Designating US Seacoast Fortifications*, p. 61. Heitman, *Historical Register*, Vol. I, p. 478.

25. RCW, Battery Burke, corrected to July 1, 1920. ARCE, 1901, p. 763; 1902, p. 686. Heitman, *Historical Register*, Vol. I, p. 263. Adams, *Designating US Seacoast Fortifications*, p. 61.

26. ARCE, 1901, p. 763; 1902, p. 686. RCW, Battery Manning Livingston, corrected to February 2, 1922. Emplacements 3 and 4 were disarmed in 1907. Report of Completed Batteries, Southern New York, File Nos. 49105 and 79501, Entry 103, RG 77, Archives I. Hereafter, RCB. Adams, *Designating US Seacoast Fortifications*, p. 77. Heitman, *Historical Register*, Vol. I, p. 636.

27. RCB. Adams, *Designating US Seacoast Fortifications*, p. 77. Heitman, *Historical Register*, Vol. I, p. 708.

28. ARCE, 1899, p. 771; 1901, p. 686. RCW, Battery Commander's Station, Battery Piper, corrected to July 1, 1920. "Fire Control Ledger," Fortification Notebook.

29. Black, *History of Fort Wadsworth,* pp. 106-10. ARCE, 1895, pp. 7, 504-05; 1896, pp. 14, 478; 1897, p. 613. Heitman, *Historical Register*, Vol. I, p. 384. Adams, *Designating US Seacoast Fortifications*, p. 46

30. Heitman, *Historical Register*, Vol. I, p. 746. Adams, *Designating US Seacoast Fortifications*, p. 32. Black, *History of Fort Wadsworth*, p. 108.

31. Adams, *Designating US Seacoast Fortification*, pp. 32, 52.

32. ARCE 1896, p. 14; 1897, p. 613; 1898, p. 629. RCW, Battery Emory Upton, corrected to April 2, 1928. RCW, Battery Barry, corrected to February 2, 1922. "Work At Fort Wadsworth," *Brooklyn Eagle*, March 15, 1898, p. 1.

33. ARCE, 1899, p. 776. RCB. "Battery Journal," Fortification Notebook. RCW, Battery Emory Upton, corrected to April 2, 1928. RCW, Battery Barry, corrected to February 2, 1922. Gun and Carriage Card File. Heitman, *Historical Register*, Vol. I, pp. 978-79. Adams, *Designating US Seacoast Fortification*, p. 52.

34. Heitman, *Historical Register*, Vol. I, p. 195. Adams, *Designating US Seacoast Fortification*, p. 52.

35. ARCE, 1898, p. 629; 1899, p. 773; 1900, p. 838. Gun and Carriage Card File. RCB. Adams, *Designating US Seacoast Fortifications*, p. 46.

36. ARCE, 1898, p. 629; 1902, p. 688. Gun and Carriage Card File. RCB. "Battery Journal," Fortification Notebook. Adams, *Designating US Seacoast Fortifications*, p. 46.

37. Gun and Carriage Card File. RCW, Battery Ayres, corrected to July 1, 1920. Adams, *Designating US Seacoast Fortifications*, p. 52. Heitman, *Historical Register*, Vol. I, p. 177.

38. ARCE, 1902, p. 688. Gun and Carriage Card File. RCB. RCW, Battery Dix, corrected to July 1, 1920. Adams, *Designating US Seacoast Fortifications*, p. 66. Heitman, *Historical Register*, Vol. I, p. 375.

39. ARCE, 1898, p. 629; 1899, p. 773. Guns and Carriages Card File.

40. ARCE, 1899, p. 775. RCB. Guns and Carriages Card File. Adams, *Designating US Seacoast Fortifications*, p. 66. Heitman, *Historical Register*, Vol. I, p. 190.

41. RCB. "Battery Journal," Fortification Notebook. Adams, *Designating US Seacoast Fortifications*, p. 85. Heitman, *Historical Register*, Vol. I, p. 713.

42. ARCE, 1899, p. 775. Heitman, *Historical Register*, Vol. I, p. 713. Adams, *Designating US Seacoast Fortifications,* pp. 65, 179.

43. RCW, Battery Turnbull, corrected to July 1, 1920. Adams, *Designating US Seacoast Fortifications*, p. 77. Heitman, *Historical Register*, Vol. I, p. 974.

44. RCW, Battery Catlin, corrected to July 1, 1920. RCB. Guns and Carriages Card File. Heitman, *Historical Register*, Vol. I, p. 291. Adams, *Designating US Seacoast Fortifications*, p. 77

45. It is believed these early wooden range-finder stations were demolished and replaced early in the 20th century when a horizontal base line system was implemented. Battery Richmond's initial BCS was reassigned as the secondary (B") station for Fort Hamilton's Battery Spear. ARCE, 1899, p. 776. "Fire Control Ledger," Fortification Notebook.

46. "Fire Control Ledger," Fortification Notebook.

47. RCWs, Battle Commanders Station, corrected to July 1, 1920; Secondary Stations for Ft. Wadsworth, May 21, 1919. "Fire Control Ledger," Fortification Notebook.

48. "Fire Control Ledger," Fortification Notebook. RCW, Primary Stations for Battery Spear and Gillmore, corrected to July 1, 1920. RCW, Type A Switchboard Room, corrected to July 1, 1920. RCW, Type C Switchboard Room and Storage Battery Room, corrected to July 1, 1920.

49. "Fire Control Ledger," Fortification Notebook. RCW, Primary Stations for Batteries Doubleday and Neary, corrected to July 1, 1920. RCW, Primary Stations for Batteries Mendenhall and Livingston, corrected to July 1, 1920.

50. "Fire Control Ledger," Fortification Notebook. RCWs, 6 Secondary Stations, corrected to July 1, 1920; 4 Secondary Stations, corrected to July 1, 1920.

51. "Fire Control Ledger," Fortification Notebook. RCWs, Officers Dormitory, corrected to July 1, 1920, Mens Dormitory, corrected to July 1, 1920; Barry Primary Station, corrected to July 1, 1920.

52. *Army List and Directory,* Adjutant Generals Office, January 20, 1901; July 20, 1901; January 20, 1902.

53. *Army List and Directory,* June 20, 1903, pp. 13-16; June 20, 1904, pp. 15-16; June 20, 1905.

54. "Guardsmen Refuse Regular Army Offer," *New York Times,* April 20, 1907, p. 5. Gen. Roe Overruled," *New York Times,* April 24, 1907, p. 5. "Troops Will Not Revolt," and "Gen. Roe Changed His Mind," *New York Times,* April 25, 1907, p. 5.

55. "Troops Will Not Revolt," *New York Times,* April 25, 1907, p. 5. "Regulars To Teach Citizen Soldiery," *New York Times,* June 9, 1907, p. 5.

56. "Forts Defend City in Mimic Warfare," *New York Times,* June 14, 1907, Pt 2, p. 14. "Enemy Driven Off Mimic War Ends," *New York Times,* June 15, 1907, p. 5.

57. "Three Men Dying in Sham Bay Fight," and "With the Gun Spotters," *New York Times,* June 19, 1908, p. 16. "Bay War Ends in Gloom," *New York Times,* June 20, 1908, p. 16.

58. "Big Guns Cause Havoc near Forts," *New York Times,* June 18, 1908, pp. 1, 5.

59. "Big Guns Here End 23 Years of Silence," *New York Times,* July 6, 1932, p. 21.

60. *Army List and Directory,* January 1908, p. 24; June 1908, p. 23; December 1908, p. 24; January 1911, p. 25

61. "Battery Journal," Fortification Notebook.

62. *Army List and Directory,* July 1914, p. 26; October 1914, p. 26; July 1915.

63. "Coast Artillery Short 10,000 Men," *New York Times,* November 1, 1914, Section IV, p. 6.

64. On August 2, 1917, the military reservation at Rockaway Beach was designated Fort Tilden in honor of former Governor Samuel J. Tilden. Gun and Carriage Card File. "Battery Journal," Fortification Notebook, "Rockaway Guns Mounted," *New York Times,* March 4, 1917, Section I, p. 8.

65. U.S. Army War College, Historical Section, *Order of Battle of the United States Land Forces in the World War (1917-19): Zone of the Interior,* GPO, 1949, Vol. 3, Part 2, pp. 1201, 1217, 1225. Hereafter: *Order of Battle, World War.*

66. *Order of Battle, World War,* Vol. 3, Pt. 2, pp. 1201, 1217, 1226-27.

67. Gun and Carriage Card File. "Battery Journal," Fortification Notebook.

68. *Order of Battle, World War,* Vol. 3, p. 300; Part 1, Part 2, pp. 1140, 1186, 1187, 1201. Janice E. McKinney, *Air Defense Artillery* [Army Lineage Series] Washington, D.C., 1985. Hereafter: McKinney, *Air Defense Artillery.*

69. *Order of Battle, World War,* Vol. 3, p. 300; Part 2, pp. 1140, 1186, 1187, 1201.

70. Ibid.

71. "Battery Journal," Fortification Notebook. Gun and Carriage Card File.

72. "Battery Journal," Fortification Notebook. RCWs, AA Battery Fort Hamilton, corrected to December 1, 1921; AA Battery (Battery Barry), corrected to December 1, 1921; AA Battery, Fort Tompkins, corrected to December 1, 1921.

73. U.S. Army, Eastern Defense Command, *History of the Eastern Defense Command* (Raleigh NC, 1945), p. 1. Hereafter: *History of the Eastern Defense Command*

74. "Coast Artillery Corps Companies, July 1st, 1916, to December 31st, 1920," Records of the Chief of Coast Artillery, RG 177, Archives II. Historical Branch, War Plans Division, "Outlines of Histories of Regiments, United States Army", May 1, 1921. *Army List and Directory,* July 1, 1921; October 1, 1921; January 1, 1922; October 1, 1922. Black, *History of Fort Wadsworth,* pp. 8-9. Robert H. Thompson, Jr., "Fort Wadsworth, New York," *Coast Artillery Journal (CAJ),* Vol. 64, No. 1 (Jan 1926), pp. 66-69. Torres, *Fort Tilden,* pp. 18-21.

75. "Miller Field Air Post," *New York Times,* May 21, 1931, p. 12.

76. G.O. No. 8, War Department, February 27, 1924. H.C. Barnes, "A Regimental Organization for the Coast Artillery Corps," *CAJ,* Vol. 60, No. 4 (Apr 1924), pp. 293-99.

77. "The Fifth Coast Artillery," *CAJ,* Vol. 65, No. 10 (Oct 1926), pp. 390-92.

78. "Moves to Improve New York Army Posts," *New York Times,* March 13, 1926, p. 6. "Army To Soon Build New Barracks Here," *New York Times,* February 5, 1928, p. 6. "$40,000 for Fort Wadsworth Barracks," *New York Times,* April 18, 1928, p. 9. "Summerall Visits Fort," *New York Times,* January 20, 1929, p. 7. "Fort Wadsworth Bill Approved," *New York Times,* February 27, 1929, p. 25.

79. Black, *History of Fort Wadsworth,* p. 9. "Barracks for Fort Wadsworth," *New York Times,* October 16, 1940, p. 8.

80. "The Reorganization and New Training Objective of the Coast Artillery Corps," *CAJ,* Vol. 72, No. 1 (Jan 1930), pp. 1-11. *History of the Eastern Defense Command,* p. 2.

81. "Big Guns Here End 23 Years of Silence," *New York Times,* July 6, 1932, p. 21.

82. "The Coast Artillery Corps, Officers Station List, January 20, 1937," *CAJ,* Vol. 80, No. 1 (Jan-Feb 1937), pp. 97-102. "The Coast Artillery Corps, Officers Station List, October 1, 1938," *CAJ,* Vol. 81, No. 5 (Sep-Oct 1938), pp. 409-16. "The Coast Artillery Corps, Officers Station List, October 1, 1939," *CAJ,* Vol. 82, No. 5 (Sep-Oct 1939), pp. 491-96. "The Coast Artillery Corps, Officers Station List, August 1, 1940," *CAJ,* Vol. 83, No. 4 (July-Aug 1940), pp. 393-400. "Coast Artillery Orders," *CAJ,* Vol. 73, No. 2 (Aug 1930), pp. 189-92; Vol. 76, No. 6 (Nov-Dec 1932), pp. 477-78; Vol. 77, No. 3 (May-June 1934), pp. 224-25; Vol. 79, No. 4 (July-Aug 1936), pp. 312-13; Vol. 81, No. 2 (July-Aug 1938), pp. 325-26; Vol. 873, No. 1 (Jan–Feb 1940), p. 90; Vol. 83, No. 6 (Nov-Dec 1940), pp. 582-86; Vol. 84, No. 2 (Mar-Apr 1941), pp. 185-87; Vol. 84, No. 6 (Nov-Dec 1941), pp. 641-43.

83. George V. Strong to the adjutant general (TAG), April 3, 1940. Walter C. Baker, President of the Harbor Defense Board, to TAG, April 25, 1940. Records of the Adjutant General's Office, 1917-, RG 407, Archives II.

84. Report of the Harbor Defense Board to TAG, July 27, 1940, RG 407, Archives II. *History of the Eastern Defense Command,* pp. 21-22. Stetson Conn, Rose C. Engleman, and Byron Fairchild, *Guarding the United States and its Outposts* (Washington, 1964) pp. 47-48. Hereafter: Conn, et al, *Guarding the United States.*

85. Jamaica Sea Airport and the squatters' shacks of Cornell Basin were named Gen. Alexander E. Anderson Airport by the New York City Council for a resident of Forest Hills, World War II aviation hero, and former chairman of the Queens Democratic Committee. The name never caught on, however, and people just called it Idlewild Airport until the name was changed to John F. Kennedy Airport in 1963. Conn, et al, *Guarding the United States,* pp. 48-49.

86. Report of the Harbor Defense Board to TAG, July 27, 1940, RG 407, Archives II.

87. Conn, et al, *Guarding the United States,* p. 49.

88. Southeastern Sector, EDC, *History of the New York-Philadelphia Sector, Eastern Defense Command* (Raleigh, NC, 1945), p. 44. Hereafter: *History of the New York-Philadelphia Sector.*

89. *History of the Eastern Defense Command,* pp. 20-34.

90. David P. Kirchner, "The Harbor Defense in the 1938 Protective Mobilization Plan," *CDSG Journal,* Vol. 12, No. 2 (May 1998), pp. 4-41.

91. Station List and Historical Data Sheet, 5th CA (HD) Regiment, Organizational Records Section, Military Personnel Records Unit, National Personnel Records Center, St. Louis, MO. Hereafter NPRC. *History of the New York-Philadelphia Sector,* p. 9. "To Revert to War Status," *New York Times,* January 16, 1941, p. 16. Black, *History of Fort Wadsworth,* p. 9.

92. Station List and Historical Data Sheet, 5th CA (HD) Regiment, NPRC. *History of the New York-Philadelphia Sector,* p. 9. "To Revert To War Status," *New York Times,* January 16, 1941, p. 16. Black, *History of Fort Wadsworth,* pp. 9, 30.

93. *History of the New York-Philadelphia Sector,* pp. 9, 126-27.

94. RCW, HECP Fort Wadsworth, corrected to 15 September 1943.

95. *History of the New York-Philadelphia Sector,* pp. 1-13, 25-26, 99-100, 127-130.

96. *Spruce's* "rebirth" as a mine planter was short lived. When the USCGC *Acacia* (WAGL-200, former USAMP *General John P. Story*) was sunk by gunfire from the German submarine *U-161* south of Haiti, March 15, 1942, *Spruce* was transferred to Puerto Rico to replace her. Ibid., pp. 18-19, 26, 112-113, 125.

97. The 113th Infantry Regiment, commanded by Col. H. Norman Schwarzkopf, was a NJNG unit inducted into federal service September 16, 1940. *History of the Eastern Defense Command*, p. 51. *History of the New York-Philadelphia Sector,* pp. 93-96.

98. *History of the New York-Philadelphia Sector,* p. 97.

99. In 1863, the city of New York ordered construction of two artificial islands in Lower New York Bay for quarantine. Two hexagonal artificial sand islands were formed in 1870 and 1873, revetted with timbers and riprap. Swinburne Island, originally called Dix Island but renamed for Dr. John Swinburne, a Civil War surgeon and health officer for New York City, was used primarily as a quarantine hospital for infectious diseases. Hoffman Island, named for former Governor John T. Hoffman, was also used for isolation and quarantine. Between 1901 and the 1920s, almost 8,000 people were detained on Hoffman Island, in crowded and not overly sanitary conditions. In the 1920s, the islands were sold to the US Public Health Service and fell into disuse. From 1931 to 1937, imported parrots were quarantined on Hoffman Island.

100. *History of the New York-Philadelphia Sector,* pp. 42-44.

101. Report of the War Department Seacoast Defense Armament Board, Vol. II, Annex B, Inclosure 7, pp. 5-7.

102. *History of the New York-Philadelphia Sector*, pp. 41-42, 115-116. Edwin C. Bearss, *Fort Hancock, 1895-1948* (Denver Service Center, Historic Preservation Div., NPS, 1981), p. 584. James A. Sawicki, *Antiaircraft Artillery Battalions of the US Army* (Dumfries, VA: Wyvern Publications, 1991), Vol. II, p. 776. Shelby Stanton, *Order of Battle, U.S. Army, World War II* (Novato, CA: Presidio Press, 1984), p. 476.

103. *History of the New York-Philadelphia Sector,* pp. 110-11.

104. RCW, Sector CP, corrected to 1 February 1944.

105. RCW, Relocation of Mine Casemate, Battery Richmond, corrected to 21 June 1943.

106. *History of the New York-Philadelphia Sector,* pp. 38, 109. RCWs, New Battery Trumbull, corrected to 22 January 1944; BC CRF Station, corrected to 21 June 1943.

107. *History of the New York-Philadelphia Sector,* p. 109. RCW, New Battery Catlin, corrected to 27 March 1944; BCS/CRF Station 3-inch RF Battery No. 18, corrected to 4 April 1944.

108. *History of the New York-Philadelphia Sector,* pp. 133, 135, 137, 138. RCWs, Battery 11, Miller Field, corrected to December 8, 1943; 90 mm gun emplacements, corrected to December 8, 1943; 90 mm gun emplacements, Norton Point, corrected to June 21 1943.

109. Statement of Cost and Nature of Repairs of Fortifications, RCWs Battery Griffin and Livingston, September 1943.

110. RCWs, Storage Building for Portable Searchlights, corrected to November 15, 1943; Storage Building for Portable Searchlights, corrected to October 16, 1943.

111. RCW, Fire Control Station, Miller Field, corrected to 6 October 1943; SCR-296, Miller Field; Searchlight Platform, corrected to 26 January 1944.

112. "Reminiscence of Brigadier General Vernon F. Sikes," *265th Coast Artillery Selected Abstract Biographies World War II*, Florida Department of Military Affairs, Special Archives No. 119, State Arsenal St. Francis Barracks, St. Augustine, FL. *History of the New York-Philadelphia Sector*, p. 114.

113. Historical Data and Station List, 5th CA (HD) Regiment, NPRC.

114. *History of the Southeastern Sector of the Eastern Defense Command 1 March 1944 to 15 May 1945*, Appendix II, Elements of the Southeastern Sector: "The Harbor Defenses of New York," p. 7.

115. Ibid, p. 8.

116. Eastern Defense Command, *History of the Northeastern Sector, Eastern Defense Command, Historical Record, New England Sector – Northeastern Sector 11 December 1941—15 May 1945* (Raleigh, NC, 1945), p. 5. Hereafter: *History of the Northeastern Sector*

117. Historical Data and Station List, 5th CA (HD) Regiment Historical Data and Station List, 7th CA (HD) Regiment, NPRC. *History of the Southeastern Sector,* Appendix II, Elements of the Southeastern Sector: "The Harbor Defenses of New York," pp. 1-2.

118. *History of the Northeastern Sector,* pp. 5-6.

119. Historical Data Sheet and Station List, Headquarters and Headquarters Battery, Harbor Defenses of New York, NPRC.

120. "Report of the War Department Seacoast Defense Armament Board," Vol. I, pp. 1-24, Vol. II, Annex B, Inclosure 7, pp. 1-14.