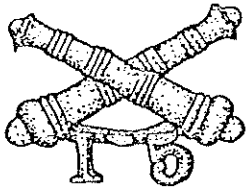


THE ADMINISTRATIVE HISTORY OF FORT ROSECRANS FROM 1872-1902

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The fortified seacoast defense of America's harbors spans an era from 1812 to 1959 and comprises the integration of engineering, artillery, and naval evolutionary processes within the very political framework of the nation itself. This process is demarked by a series of engineering boards created by presidential direction and implemented by legislative intent. The defense was characterized by a shift from Jeffersonian gunboat policy to Theodore Roosevelt's "Command of the Seas" policy.(1)

It is within this dynamic process that the Endicott Period seacoast defense of San Diego emerged from 1895 to fruition in 1905.(2) The strategic harbor of San Diego Bay was among thirty-one sites targeted for massive infusions of fortification construction and development money. The resulting structures on Point Loma were so massive that most remain today as outstanding examples of post-Civil War military construction in the United States. The concrete gun and communication emplacements, as well as post buildings, are likely candidates for inclusion on the National Register of the United States.(3)

Evolution of the Boards

Coastal defense of America's civilian and military interests in the continental United States during the 18th Century was fragmented by local circumstances of political expediency and lacked a centralized policy for effective strategy against foreign invasion. Defenses were based upon local initiative and

limited military and engineering principles. This evoked primarily a message of discontent rather than defense.

As early as the 16th Century, Dutch, Swedish, English, Spanish, and French colonists constructed defensive forts to protect local colonists from Indian hostilities. The earliest American seacoast fort was built on Society Hill in Philadelphia in 1750. During the American Revolution a second was built in 1775. All of these early structures were modeled after architecture familiar to the ethnic groups that produced them. These colonial forts were structures built from earth, rock, and brick, and thus subject to rapid deterioration under the onslaught of wind, rain, flood, and sea.(4)

The availability of inferior local building materials, and shortage of funds to import superior brick and stone, resulted in weak defenses in the New World. A few exceptions include one in New England, the British-made "Castle William," walled with fired-brick mortared with burned oyster shell.

In 1672, the Spanish built the Castillo de San Marcos, a limestone and coral block bastioned fortress in Saint Augustine, Florida. This fort stands today in striking contrast to the fallen and melted adobe, earth, and cobble forts of the greater Spanish Empire in 18th Century California.

In the late 18th Century, the Spanish government fortified the California coast in response to their fears of invasion by British or Russian expeditionary forces. Between 1794 and 1796 they designed and built three seacoast defenses at California harbors. The first defended the capital city of

Monterey, the second defended San Francisco, and the third was dedicated in San Diego on 16 November 1796.(5)

The fort at San Diego on Cobblestone Point in San Diego Bay, better known in the 18th Century as Punta de los Guijarros, was actually an outer cannon battery in Spanish defense schemes. The strategy was to create concentric circles of defense fortifications emanating away from a centralized town. The inner fort was the Presidio, a fortified town five miles northeast on a hill overlooking the bay to the south and Mission Valley to the north and east. In other locations, outer defenses of Spanish cities often included more elaborate structures such as trenches, walls, moats, and batteries of riflemen and cannons at key passes and waterways.(6)

As explained in the 1772 book Principios de Fortificacion, the cannon battery known today as Fort Guijarros served as an outpost and first point of contact to an invading force.(7) Actual construction of presidios and batteries may have been based upon the 25 B.C. writings of Roman architect Marcus Vitruvius Pollio.(8) A 1952 California Division of Mines and Geology publication, Fabricas, attributed the making of adobe bricks, fired tiles, and design of buildings and walls to an 1787 translation of Pollio's Book, De Architectura Libri Decem.(9)

Professor Brad Bartel, Associate Dean of Graduate Studies and Professor of Anthropology at San Diego State University supports the Roman connection.(10) He has compared Roman architecture with both the San Diego Presidio and Fort Guijarros.

Professor Steve Colston, Department of History at San Diego State University, has reported that Engineering Lieutenant Alberto de Cordoba designed Fort Guijarros after correcting defects pointed out by General of Artillery Pablo Sanchez.(11) No known reference to

the actual sources Cordoba used in the design can be made to connect Principios de Fortificacion or De Architectura Libri Decem with Fort Guijarros. The original plans have yet to be uncovered despite several searches in the Archives of the Indies and other sources in Spain.

Following the War of 1812, the United States agreed upon a policy of mutual defense of civilian and military sites around the continental territories.(12) From the American Revolution up to that time, American defense depended upon naval shipping. This was the Jeffersonian gunboat policy.

On 16 November 1816, President James Madison directed Secretary of War George Graham to convene a board of professional engineers to establish a defense policy.(13) On that day President Madison also commissioned the brevet rank of brigadier general upon Simon Bernard of France to serve on that board. Bernard had been assigned by Napoleon Bonaparte as a diplomatic gesture to aid in the development of modern defenses. The board was to include two U.S. Army engineers and one engineer from the U.S. Navy. Brevet Lieutenant Colonel Joseph G. Totten was among those men to serve on that first board and later replaced Bernard in 1838.(14)

Bernard Board (1817-1838)

In 1817, the first Board of Engineers was created to study the continental United States and designate locations in a ranking of relative importance for the selection of seacoast fortifications.(15) The Board of Engineers developed the administrative infrastructure necessary to conduct coastal surveys, study geography, implement policies on defense strategies, design fortifications, critique designs in war boards, and submit requests for funding for contractors to develop the system. The Board of Engineers and subsequent agencies designed the

defense of America through the first half of the 20th Century.

In the early years, defense work concentrated on the Atlantic Coast. In the years preceding the Mexican War of 1846 the Pacific Coast did not belong to the United States. The Bernard Board developed war gaming with models and maps of coastlines to predict weaknesses and develop coordinated construction and troop training programs.

Artillery of the pre-Civil War era was smooth-bore cannon of short-range and variable accuracy. Defense depended upon strategic development of infantry and naval forces. Roped booms, nets, small warships, and coastal batteries were placed to defend the river and harbor entrances.

Implementation of the Bernard Board policies manifested in the early 1820s. While some of the earlier earth and cobble forts were incorporated in the Bernard Board sites, the majority were preserved for their historical values.

The primary consideration in defense strategy was to discourage foreign invasion. The Bernard Board viewed as failures those defenses where hostilities had already occurred. The Bernard Board always considered (1) opposition of foreign naval forces, (2) retention of fortified positions, (3) denial of the enemy's goals, and (4) forcing the enemy to attack pre-selected locations that were the most advantageous to ground forces.

Totten Board (1838-1864)

In 1838, Brigadier General James G. Totten succeeded General Bernard and a new era of defense began. Totten emphasized the development of seacoast fortifications such that seacoast assaults would be only at great cost to foreign invaders.

The Totten Board carried out strategies initiated by the Bernard Board but expanded them to minute detail. The 1840s was a time for

nationwide expansion and all branches of government pressed for the invasion of Mexican territories in the west. No doubt the Mexican War of 1846 was an end result of changes in the War Department at that time.

Following the capture of California, the Totten Board swiftly implemented its policies with the establishment of the Office of the Division Engineer in San Francisco and District Engineer offices in Los Angeles and San Diego. The first priority was given to San Francisco and in 1853 Fort Point was built on top of the north wall of the Castillo de San Joaquin, the Spanish fort. Outpost batteries were built on islands in San Francisco Bay and on the north shore of the harbor.(16)

By the time Fort Point was completed, the Totten Board had designed a complete defense for the continental United States. This included harbors and rivers from San Diego to Puget Sound. Tall brick and mortar forts like Fort Point were called "Third System" or "Totten System" forts. They are characterized by several tiers of rows of gunports that were often armored. Inside and on top of the fort were large smooth-bore cannons that were maneuvered on iron barbette batteries.

General Totten himself designed a sheet iron embrasure that sealed the gunport as the cannon rolled back upon firing. These embrasures protected the gunners from incoming fire. The cannons fired 24, 32, and 42 pound projectiles. As ordinance and artillery developed through the Totten Board era the large masonry fortifications became obsolete.

When the Columbian Foundry at Georgetown, D.C. developed their Columbiad cannons, it then became possible to maneuver the cannon at any angle from 0 to 40 degrees. In addition, 64 pound projectiles could also be fired as far as ten miles.

Between 1845 and 1860, the use of high strength metal alloys enabled manufacturers to produce artillery

with calibers up to 10, 15, and 20 inches. On 4 February 1861, the Rodman gun replaced the Columbiads and Third System forts posed no match for projectiles fired from those guns.(17) Both the Rodman guns and a later rifled-bore cannon shattered masonry forts during the American Civil War. Within months of the first battles, fortification shifted to earthen embankments backed by timbers and concrete.

Post Civil War (1865-1895)

Following the death of General Totten, the Board of Engineers became a functioning part of the U.S. Army Corps of Engineers. Chief engineers served as presidents of those boards. Two boards were created, one each for the Pacific and Atlantic. As specific fortifications were developed, the officer selected as "secretary" became the district engineer assigned to implement the Congressionally-funded projects. Until the work was completed, the district engineer served as commanding officer.

The post Civil War period was marked by accelerated construction at sites selected by the Totten Board. Many of those sites had not been developed because of funding short-comings and the Civil War. Lessons from that war caused many of the designs to be scrapped. The earthen embankments merged with masonry bunkers to defend systems of mortars, underwater mines, channel obstructions, and outpost shore batteries.

When the Board of Engineers of the Pacific Division convened on 10 December 1872, Secretary and First Lieutenant John Hall Weeden submitted an architectural rendering of a proposed fifteen-gun barbette battery for Ballast Point, San Diego Harbor, California.(18) The Board of Engineers for Fortifications received and endorsed the design on 25 March 1873 and recorded the document with the chief engineer in Washington,

D.C. on 2 April 1873.(19)

Weeden arrived in San Diego in 1873. He had orders from Lt. Colonel R.S. Alexander, President of the Board of Engineers, Pacific Division. Weeden hired a civilian construction crew and the necessary equipment to begin cutting an earthen embankment just north of the ruins of Fort Guijarros at a place where the sandstone ridges of Point Loma touched the shale cobblestones of Ballast Point.

Weeden had funds to construct a mess hall, barracks, and other buildings. The fort was to have occupied a spot that measured 750 feet wide by 450 feet deep.(20) That excavation impacted the archaeological remains of prior Spanish and Mexican settlements, as well as a Yankee whaling station. A map dated 29 October 1896 (U.S. National Archives, Record Group 77, Drawer 102, Sheet 20-1), reveals that Weeden had completed one ammunition magazine for a gun emplacement. That magazine measured 23.2 feet long on an east-west axis and 8.1 feet wide. Under the earthen pad were two concrete box culverts designed to drain the site to the sea. An access ramp had also been cut from the beach north of Fort Guijarros up to the top of the pad.

During the period Weeden and his crew were constructing the fort on Ballast Point, the chief engineer and secretary of war learned that, in experiments with Rodman guns against armor-plated earth and masonry forts, the structures were pierced. They concluded that forts such as the one at San Diego were obsolete. Congress cut the funding of such forts in 1874 and Weeden was recalled to San Francisco.(21) Caretakers guarded Ballast Point, driving off whalers and fishermen. There is, however, no clear record of events at Ballast Point after 1874 until whaler Enos A. Wall returned to render whale oil on the point until he died in December of 1884.

Endicott Period (1895 to 1905)

Throughout the 1880s, Congress and the Executive Branch became aware of seacoast weakness. Congressional representatives testified and lobbied for completion of the nation's defenses. In 1885, President Grover Cleveland directed Secretary of War William C. Endicott to assemble a special board of engineers to accomplish that task. The Endicott Board emerged in 1886.(22)

Ordinance research through the 1880s led to a series of dramatic breakthroughs that resulted in the development of rifled cannons which could be loaded through the breech. The barrels were made with successive concentric tubes of high strength forged metal. By 1890, rifled guns could fire ten-inch caliber 123 pound projectiles up to 12,300 yards. New propellants with timed-burning rates enabled longer barrels to be developed.

A special concern in the United States at that time was the development of similar weapons in Europe and the Orient. Mobile battle fleets with rifled guns posed a serious threat to national security.

The Endicott Board presented the secretary of war with a list of twenty-six coastal sites to be fortified. The Endicott System involved floating batteries, torpedo boats, and submarine mines to support the coastal guns. Electrical power enabled system-wide communication and controlled detonation of in-place torpedoes (later known as mines). Optical sighting bases enabled triangulation and calculations for speed and trajectory to be communicated to gun emplacements for plotting of moving targets. Five more ports were added to the list before Congress approved \$126,377,800 to implement the plan.(23)

The massive concrete batteries and command posts installed in the natural topography and encased in reinforced concrete were characteristic of the Endicott Period.

Plumbed with huge volcanic or granitic boulders, these defenses were designed to withstand 1000 pound projectiles fired from naval battleships. The fortifications typically have twenty to thirty foot thick walls behind another thirty feet of earth. The earthen banks were then planted with native vegetation to camouflage the profiles from offshore. Deep below the gunpits were projectile and gunpowder magazines. Mechanical elevators and chain-hoists brought the munitions up to the gun crews.

The Endicott System guns that fired from these batteries were like none the world had seen before. Projectiles measuring 8, 10, 12, and 14 inches in diameter were fired from "disappearing guns." Gun carriages were counter-weighted to swing up above the top of the emplacements upon command. Upon firing, the guns would swing back in an arc from a fulcrum in the carriage and disappear behind the emplacement. About 300 of these heavy guns were installed in the Endicott Period.

The main batteries were backed up by smaller batteries with light caliber guns placed further away. These smaller guns fired more rapidly and increased the fields of fire. Mine fields offshore were electrically detonated from mining casemates. Behind the rifled guns were mortar batteries. Large caliber mortars fired clusters of projectiles in groups of four. A total of 376 mortar sites were developed during the Endicott Period.

The lighter caliber guns were three or five inch caliber and could fire from five to fifteen rounds per minute. Known as rapid-fire batteries, they were installed in large numbers after 1895. Over 500 of these emplacements were built.

Following the Civil War, fixed mines were hauled out to defend harbors and rivers. In peacetime, these weapons and their cables were stored on land. The term "torpedo" and "mine" were interchangeable

during the Endicott Period. During combat, the mines were hauled in light rail cars down wharfs to be swung out to minelaying boats. Cables attached to the mines were connected to cables emanating from mining casemates onshore.

The "Specifications for Submarine Cable of American Manufacture," 27 May 1897, described the cables as having seven-strands of copper cable insulated with rubber wrapped with jute, dipped in insulation rubber, and stored in two-mile lengths in cable drums. Torpedo warehouses were concrete structures under thirty-five feet high and roofed with non-flammable slate.

During the Spanish-American War of 1898, San Diego Bay was mined. Civilian crews worked with the U.S. Army Corps of Engineers to install the cables and mines.(24) None of the troops assigned to the mines were trained in this form of warfare, as construction on the Endicott System had not been completed.

The San Diego Defense

By 1890, the Endicott System had been implemented at eighteen harbors around the continental United States. San Diego was among those ports approved for the system. On 18 February 1893, Congress appropriated \$45,000 to preserve and study the unmanned defense structures abandoned by the U.S. Army in 1874.(25) This examination was reported in the Annual Report of the Chief of Engineers and the District Engineer to the Secretary of War, 1893-1903. Colonel Henry L. Abbot was President of the Board of Engineers. He was joined by Colonel C.B. Comstock, Lieutenant Colonel Henry M. Robert, Lieutenant Colonel G.L. Gillespie, Lieutenant Colonel G.H. Mendell (Pacific Division Engineer), and Lieutenant Colonel W.P. Craighill (Southeast Division Engineer). That board inspected Ballast Point on 8 March 1894 and proposed two designs.

When Colonel Craighill was

promoted to Brigadier General and Chief of Engineers, Colonel Charles R. Suter became Pacific Division Engineer on 8 August 1896.(26) In turn, Suter appointed Major Charles E.L.B. Davis secretary on 29 October 1896. Davis became district engineer and commanded the construction of fortifications on Ballast Point.

Fort Rosecrans

The defense of San Diego Bay initially called for the development of a series of gun and mortar batteries along the southern shore of North Island and the Silver Strand, opposite the shore of Point Loma, as well as at Ballast Point. Several architectural designs for a mortar battery on North Island were proposed in 1895 and then abandoned when civilian real estate negotiations stalled.(27) The Coronado Land Company would have forced condemnation, a course rejected by the secretary of war. Instead, the Zuniga Shoal Tract opposite Ballast Point enabled the U.S. Army to develop gun batteries and search light facilities on the south shore of San Diego Bay after the turn of the 20th Century.

Battery Wilkenson

The focus of the new San Diego defense was the neck of Ballast Point where Spanish architects had designed and emplaced Fort Guijarros in 1796. The 1872 Weeden map of Ballast Point revealed that the Spanish fort was located just in front of the earthen embankment of the unfinished construction. Major Davis ordered Lieutenant Charles L. Potter and Lieutenant Herbert Deakyne to produce a new map. Davis recommended that Weeden's earthen pad of 1874 be used for a four-gunpit disappearing rifle battery design, thus differing from a plan 15 January 1895. Prior to Davis' arrival, the Board of Engineers had considered demolishing the site of Fort Guijarros with the

construction of the new battery.

Davis explained his rationale to the Board as a method for:

1. Reduction of the cost of the battery, due chiefly to great reduction in amount of fill required.
2. Greater field of fire, due to change in direction of front the battery.
3. Less exposure to reverse fire from ships inside Ballast Point, because of the change of direction of the front (Document 16484/3, War Department, National Archives, Record Group 77, 29 October 1896).

Davis went on to explain in detail how the old earthworks would serve well for the placement of 10 inch guns. The driveway to the beach would serve the wharf. The cost estimate for the first two emplacements was placed at \$128,610.25.

Under the Congressional Act of 6 June 1896, a request for proposals was advertised only days after the board approved Davis's design change. The actual schedule of details was mailed on 7 July 1896 and the bids were opened on 30 November 1896. The California Construction Company of San Francisco received the contract with a low bid of \$109,417.39.

Work began on 1 February 1897 with re-shaping of the 1874 earthwork and demolition of the old concrete magazines. Problems relating to the procurement of cement in the United States were exacerbated through U.S. Customs regulations. The project deadline was extended and work placed on hold temporarily.

Brigadier General John M. Wilson ordered Major Davis to submit plans for the third gun emplacement. The schedule estimated the cost at \$64,000, and noted that additional earth would have to be removed because of defense construction

during the Spanish-American War alert. He later lowered that estimate by reducing the concrete and ventilation system.

Major Davis assumed the role of district engineer and commanded all work by the California Construction Company and the defense of San Diego from Point Loma during the alert.

Brigadier General Wilson and Major Davis arranged through the secretary of war to purchase 4000 barrels of German-made cement and then route the cargo through hostile waters.

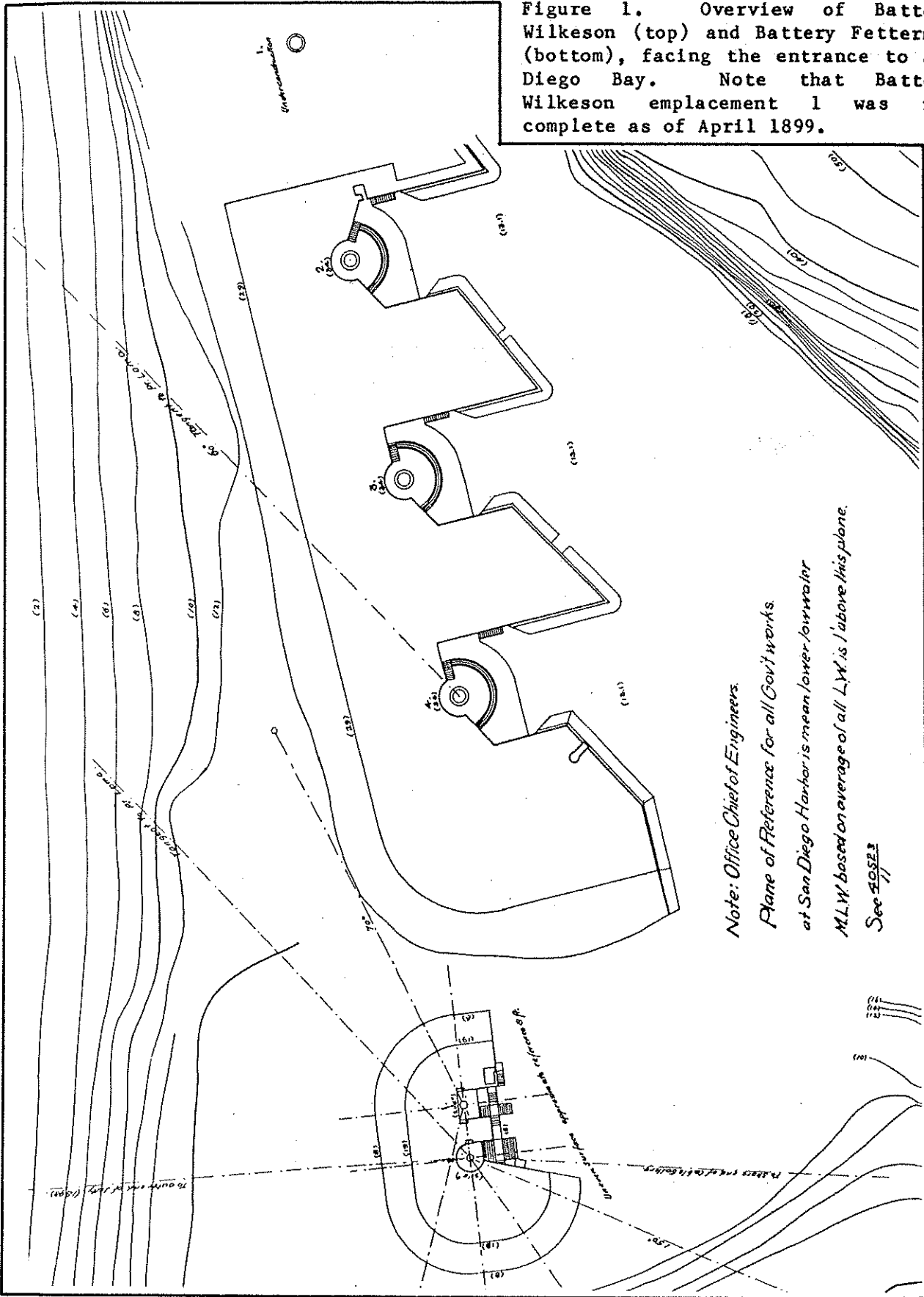
On 1 October 1898, Major Davis wrote to General Wilson to implore the secretary of treasury to allow passage of 3500 barrels of cement to San Diego duty-free on the British ship Gunford. Failure of the Gunford to arrive by 3 December 1898 stimulated another series of letters clearing the ship Thalassa to bring 1500 barrels of cement, which arrived on 9 January 1899.

Meanwhile, Major Davis described the excavations of Ballast Point by the California Construction Company as

clay mixed with sand, mostly made ground, and becomes very soft when wet. The excavated earth has been placed in front of (the) embankment in front of (the) emplacement and in traverse. On site of (the) gun platform, the ground was wet and soft. It was excavated down to a firm stratum, then moist sand was placed in six-inch layers and tamped; upon this the concrete was laid. (Annual Report, 1893-1906, page 746, U.S. National Archives).

The cement used in the construction of the 10-inch gun emplacement was made from a combination of Hilton, Germania Porta, White Brothers, and Jasson cement mixed with clean white sand that had been recovered from Ballast

Figure 1. Overview of Battery Wilkeson (top) and Battery Fetterman (bottom), facing the entrance to San Diego Bay. Note that Battery Wilkeson emplacement 1 was not complete as of April 1899.



*Note: Office Chief of Engineers.
 Plane of Reference for all Gov't works
 at San Diego Harbor is mean lower low water
 M.L.W. based on average of all L.W. is 1' above this plane.
 See 40523*

Point. Major Davis tested the foundation strength with a load of 7,600 pounds of cement poured in a two-foot square wooden form where the

foundation consisted of five feet of sand, underlaid by a firm stratum of clay, sand, and shells.

The load bore 1900 pounds per square foot and settled one half inch immediately and one third inch ten hours later. Davis found this settlement acceptable and ordered forms constructed for the emplacement.

Cobbles from the beach were dumped in a Gates Crusher to make concrete out of the cement. It was mixed in a Ransom Mixer. After ten turns, it was poured into a bucket and swung on a derrick to the part of the work under construction. Spread in six-inch layers, the concrete was tamped with iron rods. Massive rock boulders weighing up to five tons had been quarried near the Sweetwater Dam and hauled by boat to the site. The boulders were swung into place in the concrete about six inches apart. Men tamped the concrete into the voids as it poured around the mass.

The effect of the concrete and boulder mass was to deflect incoming naval artillery on a flat trajectory. This architecture was then covered with an earthen embankment about sixteen feet thick.

The impregnability of the battery can be underscored by a project in 1902 to cut tunnels between gun pits to enhance communication. Thirty-three foot long galleries, seven feet high, and another gallery forty-seven feet long required removal of sixty-one and a half cubic yards of material. Over one hundred boulders were encountered and forty cut-off. Removal of the entire boulders left holes in the walls, ceilings, and floors, increasing the actual removal to sixty-nine yards. One hundred and ten pounds of Giant Number 2 powder was used in 700 small blasts. Cement

without rock filled the holes (Annual Report, 1893-1903, pages 2471-2472, U.S. National Archives).

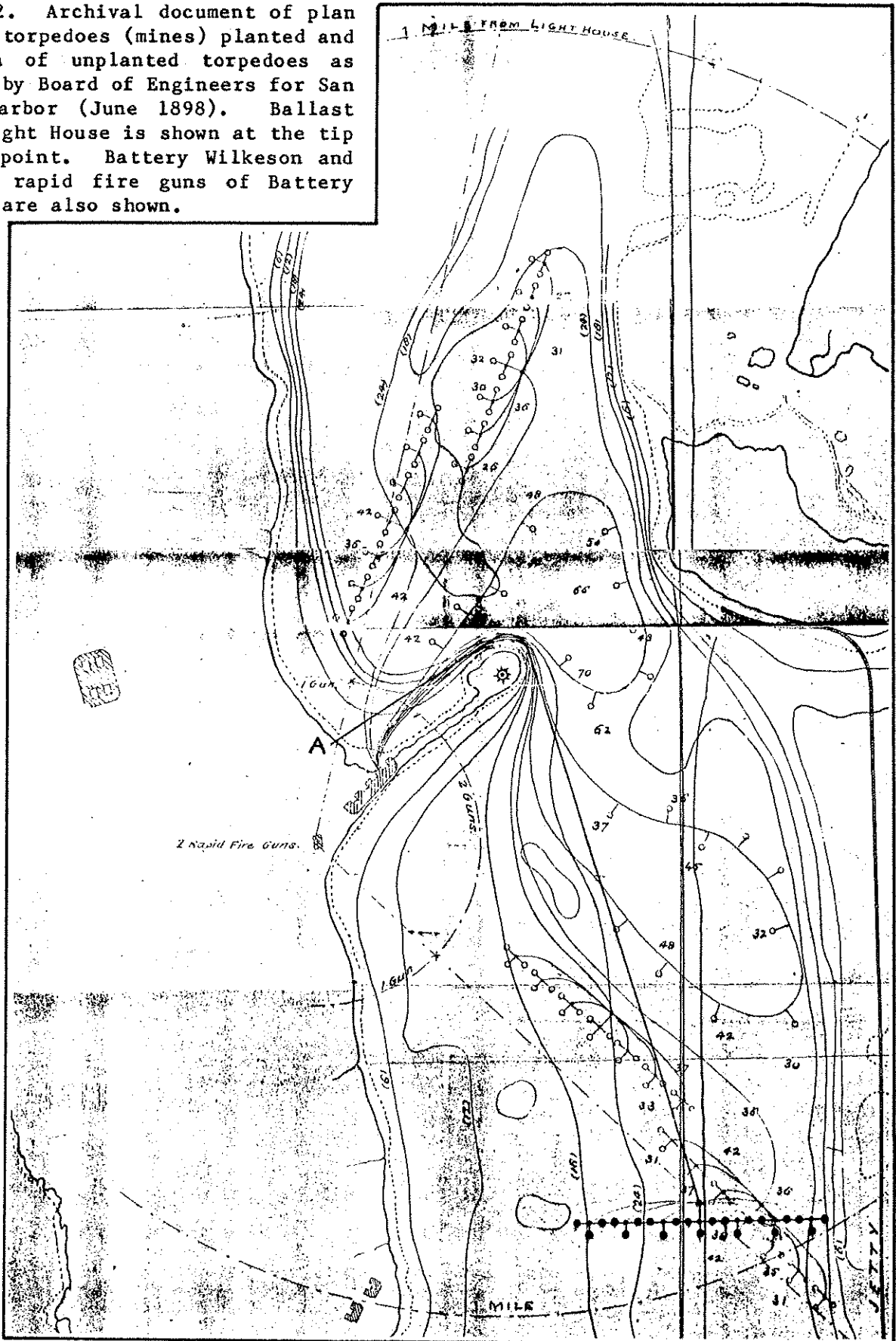
General Wilson authorized construction on the third emplacement on 17 June 1898 and work commenced on 7 February 1898. Two months later, Major Davis was able to report that the first two emplacements were complete and ready to receive the 10-inch rifles. Davis then recommended that an officer from the San Diego Barracks be designated to receive command of regular troops to install the carriages and guns. General Wilson then transmitted the message to Brigadier General Shafter, Commanding Officer, San Diego Barracks that quarters were ready in the 1874 barracks near Ballast Point.

On 21 May 1898, Davis telegraphed General Wilson that the guns were installed and teams of civilians had been recruited to install mines in San Diego Harbor for the Spanish-American War. Fifteen mines were installed two days later and two Civil War vintage Napoleon cannons were transferred from the San Diego Barracks to assist in the detonation of the mines in the event of battle. The U.S.S. Corwin had been diverted from revenue duties to patrol the harbor and mine field (Annual Report, 1893-1903, page 30, U.S. National Archives).

The mines were laid with a volunteer crew of eighty citizens, including carpenters, electricians, civil engineers, surveyors, telegraphers, boiler-makers, steam engineers, boatmen, and mechanics. General Shafter received material from Major W.H. Heuer, U.S. Army Corps of Engineers, San Francisco. One Non-commissioned officer and four enlisted men were assigned from the Engineer Battalion. Mariners received a notice on 20 May 1898 that the harbor was mined and orders published in the newspapers to enforce a blackout after 25 May 1898.

Major Davis devoted his efforts to designing the fourth emplacement, following orders to that effect from

Figure 2. Archival document of plan showing torpedoes (mines) planted and position of unplanted torpedoes as devised by Board of Engineers for San Diego Harbor (June 1898). Ballast Point Light House is shown at the tip of the point. Battery Wilkeson and the two rapid fire guns of Battery McGrath are also shown.



General Wilson on 7 May 1898. Davis estimated an additional 8,000 cubic yards of excavation, "due to the fact that under the stress of the war excitement in the early Spring, an earth filling was put around the uncompleted and exposed flank of emplacement number 2." (Annual Report, 1893-1903, page 975, U.S. National Archives; Major Davis to Brigadier General Wilson, 5 July 1898).

Modifications of the design for emplacement 4 by Colonel Charles R. Suter, Division Engineer, Pacific Division, and Captain Joseph Kuhu of General Wilson's staff reduced the cost estimate to \$60,000. The Congressional Act of 7 July 1898 funded the work and the California Construction Company commenced work in September of 1898. The layout of this last gun emplacement was far more elaborate than the other three.

Unforeseen problems arose during the construction of emplacement 4. Excavation pierced the water table. The weight of the mass of emplacements 1 through 3 pushed the water table higher. Pile driving in the cobbles of Ballast Point would have cracked the other emplacements and excavation to basement rock would have required extensive shoring and pumping. The latter plan was selected by Major Davis, but at greater cost.

Foundation and water problems encountered by the U.S. Army Corps of Engineers and the California Construction Company later led to serious cracks in numerous areas of the 10-inch gun battery. One large crack near emplacement 4 currently measures three inches wide.

Cracks in the concrete became a serious problem during the history of the battery. Regular artillery commands repeatedly requested the District Engineer to seal leaky cracks. Gallons of linseed oil were poured down the cracks, only to leak again the following season. Eventually, a veneer of cement troweled into small squares "in

imitation of sidewalk to mask flaws and other narrow cracks" camouflaged the problem (Annual Report, 1893-1903, page 978, U.S. National Archives).

After the guns were installed, soldiers then assisted the contractors in placement of the aerial trolley, ammunition lifts, cranes, speaking tubes, staircases, railings, and doors. In small pits on top of the battery, Type A Lewis Range finders were installed.

Modification of the emplacements was a daily activity in the final days of the dual operations of the soldiers and engineers. Orders from various U.S. Army research and development branches required improvements in the electrical, sighting, and loading systems. In 1901, for example, the ammunition lifts were replaced by chain-hoists and balanced platform lifts. The Taylor-Raymond Chain Hoist, made by the Ellicott Machine Company of Baltimore, had been ordered by Colonel Suter out of the Division Engineer's office for this replacement.

At that time, Captain James J. Meyler, U.S. Army Corps of Engineers, and civilian engineer, David Hughes transferred to San Diego to join Artillery Inspectors Captain George L. Anderson and Captain Sedgewick Pratt in the formation of the Artillery District of San Diego.(28) They were joined by Major A.W. Vogdes, who assumed command of the San Diego Barracks on 18 June 1901. Major Vogdes relieved Captain E.T. Cole, Infantry, who had been on temporary assignment to supervise the installation of the guns. Captain Cole remained under the command of Major Vogdes.

On 22 July 1899, General Order Number 134, War Department, named the Military Reservation on Point Loma "Fort Rosecrans" in honor of General William S. Rosecrans, a Civil War veteran who later advocated the development of rail and military facilities in San Diego. Major

Vogdes moved from the San Diego Barracks on Market Street after assuming command of the San Diego Artillery District. General Order 63 authorized the transfer of Captain Meyler to the Artillery District as district engineer.

Major Vogdes assumed command of one of the first U.S. Army Artillery Corps units in the United States. This administrative unit had been created on 2 February 1901 with 126 companies assigned to thirty-one coastal and river forts. Each company had been organized to service a major caliber gun, mortar battery, two or more rapid-fire gun batteries, or a mine battery. From regular troops at the San Diego Barracks and veterans of the Spanish-American War, Major Vogdes first formed the 30th Company of Coast Artillery and assigned Lieutenant G. A. Youngberg as the first company commander. Upon completion of training of the 30th Company, Major Vogdes then divided a portion of the troops and formed the 115th Company of Coast Artillery under Captain E. T. Cole.

Administratively, Captain Meyler remained under the command of Lt. Colonel D. P. Heap, Division Engineer, San Francisco, in addition to direct command of Major Vogdes. Vogdes answered to Major William E. Birkhimer, Artillery Inspector, and Major General S. B. Young, Artillery Division, San Francisco.

The San Diego Artillery District also included two batteries of rapid-fire guns on the flanks of the 10-inch battery, known then as Battery Wilkeson. Uphill was Battery McGrath and down on the east was Battery Fetterman. In later years, searchlight batteries were placed further east on Ballast Point and above Battery McGrath. The 115th Company serviced Battery Wilkeson and the 30th Company divided their troops among the rapid-fire batteries and the mine cables.

By 1902, Major Vogdes ordered the oil lamps in the batteries to be replaced by incandescent lights

powered by a dynamo borrowed from the Torpedo Station and placed in the Relocating Room. Clocks, megaphones, and telephones followed.

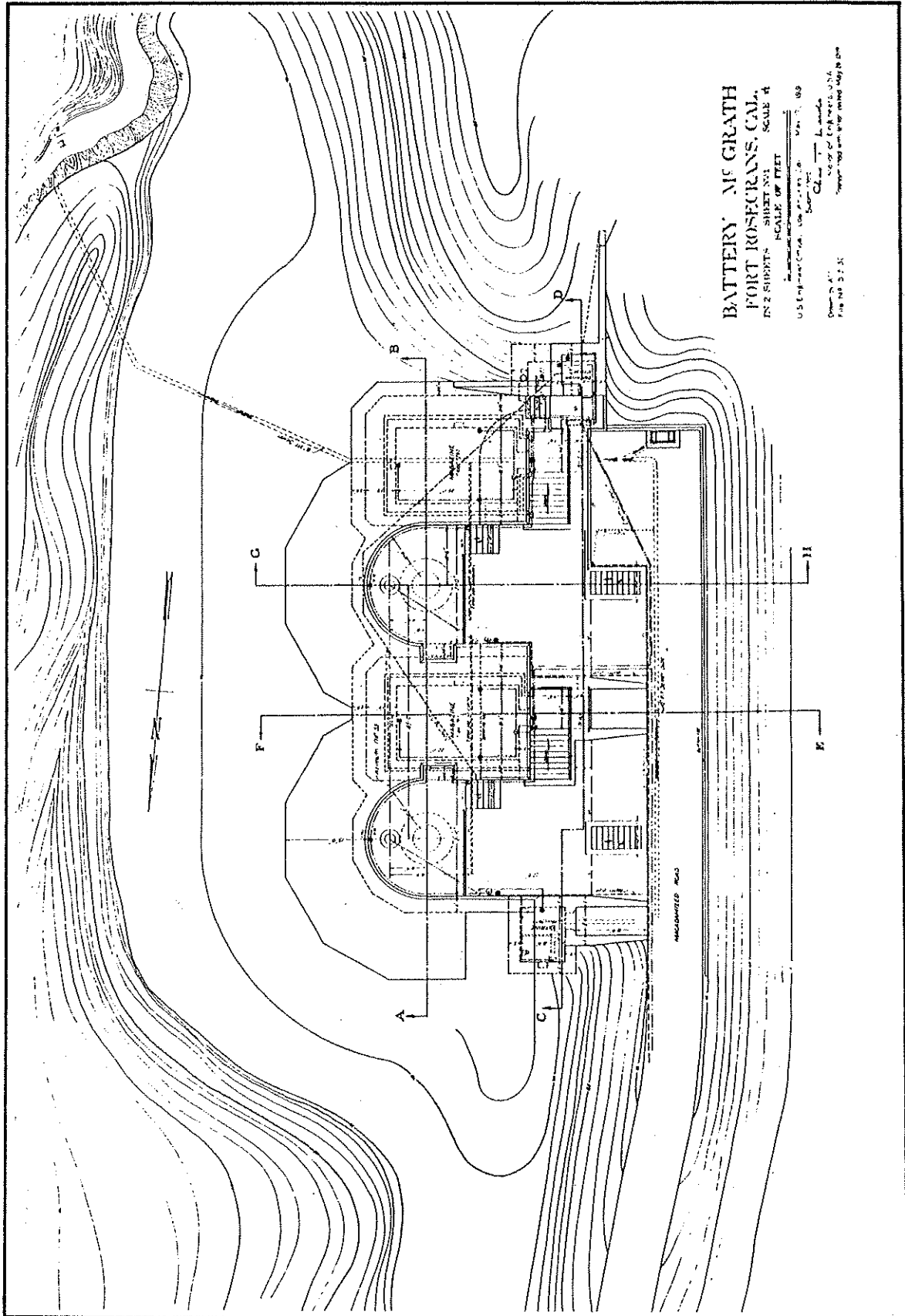
On March 28, at 9:23 PM, the call to arms was sounded without previous warning, the U.S.S. Farragut, having been sighted off Coronado, Cal., in an attempt to torpedo the U.S.S. Wisconsin; within a trifle less than (sic) five minutes the men were all at their assigned stations except that "A" and "B" stations were not manned, these details being held on the flank of the battery. Within fourteen minutes No. 3 gun was loaded with dummy shot and cartridge, laid in case III and fired; Twenty minutes later the Farragut was communicated with, by signal lantern as she entered the harbor.(29) (Major Vogdes to Adjutant General, Artillery Corps, Department of California)"

Battery Fetterman

Battery Fetterman protected the eastern flank of Battery Wilkeson with two three-inch caliber, 15-pounder, rapid-fire guns. Design changes placed the location of this battery essentially parallel with the front slope of Battery Wilkeson. The final plan was submitted by Captain Meyler to General Wilson on 2 February 1899. Meyler estimated that it would cost \$8865.24 to remove 2750 cubic yards of earth from behind Battery Wilkeson to cover the concrete of Battery Fetterman.(30) Labor and equipment were taken from the latter project and the tramway extended 300 feet from the cement plant behind Battery Wilkeson. Cement from the Thalassa was used in this construction.

The ground at the site of Battery Fetterman was described as a fine, wind-blown sand containing much mica,

Figure 4. Battery McGrath.



some black magnetized sand and appearing light gray in color (Annual Report., 1893-1903, page 2470, U.S. National Archives). Mortar was used to coat the interior and lampblack darkened the exposed walls. The outer earth was then coated with crude oil to retain the soil from erosion. Lt. Youngberg and the 30th Company of Coast Artillery installed the guns in 1902.

Battery McGrath

Uphill from Battery Wilkeson, Battery McGrath had been designed by Captain Meyler and plans submitted on 21 June 1899 with an estimated cost of \$10,270. The location and plan were adopted by General Wilson and work completed on 16 October 1900. The Artillery Corps assumed command on 7 November 1900, but the guns were not installed until late 1902.(31)

It is interesting to note that the construction crew complained about the basement in the excavation. They encountered a resilient adobe and concrete-bonded cobble construction that had to be blasted to penetrate.(32) This is likely to have been a Spanish or Mexican construction, perhaps the powderhouse. More on the feature remains a mystery.

Mining Complex

Fort Rosecrans also included a mining complex that protected the harbor from naval invasion. Initially, the Torpedo Station and Cable Tank lay one mile north at the Quarantine Station, but was later moved to the inside of Ballast Point in 1910.(33)

The Mining Complex was a well-protected encasement that had been buried and entered in underground tunnels. Cables led from the tunnel out into the water to the end of a wharf. In the event of war, more cable from the Cable Tanks would have been hauled on a tram to the end of the wharf, connected to the

permanent cable, and extended into the harbor. The Mining Casemate housed the electrical dynamo, power storage batteries, and cable gallery.

Changes in design and equipment created quite a stir during the Spanish-American War. In the excitement of the alert, it was discovered that the doorways were too small to allow the new dynamo to pass through. Thus it had to be hidden outside in the canyons above Sylvester Road.

Other Facilities

The power and light facilities, battery commander's station, and the post buildings supported the gun batteries and mine system. The strategy for Fort Rosecrans in 1902 was to hide the power stations and sighting places in the canyons and uphill from the main emplacements.

Conclusion

Fort Rosecrans in 1902 lacked the impressive officer and enlisted men's structures that remain today. Post buildings were limited to the barracks, mess hall, stable, and old whaler's shacks left behind by Lt. Weeden in 1874. Even Fort Pio Pico, designed for the Zuniga Tract, across the bay on North Island, would not be constructed until 1906.

When Major Vogdes ordered the practice firing on the U.S.S. Farragut, Fort Rosecrans must have been an awesome sight for the civilians of San Diego. Hidden under the Coastal Sage Scrub vegetation, back in the canyons and below the old 1874 post buildings, immense concrete bunkers greeted the 20th Century with the mightiest defense ever to have been mounted in San Diego history to that time.

References

1. Emmanuel Raymond Lewis, Seacoast Fortifications of the U.S.: An Introductory History, (Annapolis,

- MD: Leeward Publishing Co., 1979).
2. Ronald V. May, "The Guns of Point Loma: America's First Sea Coast Artillery Defenses in San Diego," in The Military on Point Loma, (San Diego: Cabrillo Historical Association, 1985), p. 22.
 3. National Register of Historic Places, Title 36, Code of Federal Regulations, Part 800.
 4. Lewis, Seacoast Fortifications.
 5. Stephen A. Colston, "San Joaquin: A Preliminary Historical Study of the Fortification at San Diego's Punta de Guijarros," in The Military on Point Loma, (San Diego: Cabrillo Historical Association, 1985), p. 61.
 6. Frank Quillan, "A Translation of Chapter VI of Don Pedro de Lucuze's 1772 Principios de Fortification as it Relates to the Design of the Fort at Punta de Guijarros, San Diego, California," in Fort Guijarros Quarterly, vol. 1, no. 1, (San Diego: Fort Guijarros Museum Foundation, 1988), pp. 308.
 7. Ibid.
 8. Ronald V. May, "The Fort That Never Was on Ballast Point," in The Journal of San Diego History, Spring, vol. 31, no. 2, (San Diego: San Diego Historical Society, 1985), p. 122.
 9. Elizabeth L. Englehoff, ed., Fabrics (California Department of Natural Resources, Division of Mines, April 1952), p. 10.
 10. Brad Bartel to Ronald V. May, personal communication.
 11. Colston, San Joaquin, p. 64.
 12. Jamie W. Moore, "Fortifications Board, 1816-1828, and the Definition of National Security," in The Citadel, Monograph Series, no. XVI, (South Carolina: The Military College of Charleston, 1981).
 13. Ibid.
 14. May, The Fort that Never Was, p. 122.
 15. Moore, Fortifications Board, p. 10.
 16. May, The Fort that Never Was, pp. 124-128.
 17. Ibid.
 18. Ibid.
 19. Letter from Brigadier General A. A. Numphreys, Chief of Engineers, United States Army Corps of Engineers, to Lieutenant Colonel R. S. Stewart, Engineer of the Pacific Division, United States Army Corps of Engineers, San Francisco, California, April 16, 1873.
 20. May, The Guns of Point Loma, p. 21.
 21. May, The Fort that Never Was, p. 135.
 22. Ibid., p. 22.
 23. Ibid.
 24. Ibid., p. 24
 25. "Annual Report of the Chief of Engineers and the District Engineer to the Secretary of War, 1893-1903, Regarding the Construction of the Endicott Coastal Defense Structures at Fort Rosecrans," pp. 12, 30, 746-747, 975, 978, 2471, 2742.
 26. May, The Guns of Point Loma, p. 23.
 27. Ibid.
 28. Ibid., p. 27.
 29. Letter from Major A. W. Vodges to Major General S.B. Young, April 2, 1902, Quarter Report, Record Group 76, National Archives, Washington, D.C.
 30. May, The Guns of Point Loma, pp. 28-29.
 31. Annual Report, 1893-1903, P. 2470
 32. Ibid.
 33. Ibid.