

U.S. NAVAL BASE, PEARL HARBOR, BATTERY ADAIR
(Fallout Shelter)
(U.S. Naval Base, Pearl Harbor, Naval Station Ford Island, Facility
No. 446)
Princeton Place
Pearl Harbor
Honolulu County
Hawaii

HABS HI-432
HI-432

HABS
HI-432

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN BUILDINGS SURVEY
PACIFIC GREAT BASIN SUPPORT OFFICE
National Park Service
U.S. Department of the Interior
1111 Jackson Street
Oakland, CA 94607

HISTORIC AMERICAN BUILDINGS SURVEY

U.S. NAVAL BASE, PEARL HARBOR, BATTERY ADAIR
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Location: Princeton Place
Ford Island
Pearl Harbor Naval Base
City and County of Honolulu, Hawaii

U.S.G.S. Pearl Harbor Quadrangle, Hawaii 1999
7.5 Minute Series (Topographic) (Scale-1 – 24,000)
Universal Transverse Mercator Coordinates 4.608740.2363220

Significance: Facility No. 446, Battery Adair, is significant as one of the earliest defensive facilities in Pearl Harbor. It was completed and armed in 1917 by the Army to protect both the Naval installation at Pearl Harbor and the Army's harbor defense batteries at Fort Kamehameha from a rear, land-based attack. It is also significant as a distinctive type of construction, a casemated gun position, comparable only to Battery Boyd, which is also on Ford Island. The design of Battery Adair is related to a specific period of land defense battery construction in the first decades of the twentieth century. This battery is also associated with the events of December 7, 1941, when it was used as a shelter during the Japanese attack. It is a contributing element to the Pearl Harbor National Historic Landmark.

Description: Facility No. 446 is located on the northeastern tip of Ford Island. It is almost hidden by the house (Facility No. 330, Quarters K) built above it and the vegetation growing around it. Built as a gun battery in 1917, it now serves as the basement for the house, but retains a separate facility number. The southwest side of the concrete structure is below grade, and the northwest end was originally also. The northeast side of the battery is somewhat visible as the rounded, vine-covered protrusions (which were the gun chambers) under the terrace of Facility No. 330. The added terrace walls, which echo the footprint of the battery below, are also vine-covered. The original exterior materials are only clearly seen in the concrete walls at the original entry on the southeast end. It is not known how or if this entry was originally closed. Now wooden flush double doors and a wall of tongue-and-groove boards close off the southeast end of the main corridor. This wooden portion is under the concrete beam that spans the corridor width. Above the beam, a lava rock wall has been added at this end of the corridor as foundation for the southeast end of the house. The corridor entrance walls, with distinctive heavy copings, extend beyond the wooden end wall. These slope down, functioning as retaining walls for the earth covering on the battery's rooms at this end. The corridors were originally open to the sky. A concrete

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stair has been built into the northeast retaining wall to allow easier access to the front lawn area.

The floor plan of the battery consists of a long main corridor, with two shorter ones at right angles which originally led to the gun chambers. Overall, it is a somewhat F-shaped plan, but with rounded shapes of the gun chambers at the ends of the shorter corridors. Five rooms are located along the main corridor, between the two shorter ones. Originally two rooms were on the outer side of each short corridor. As discussed in greater detail below, the two rooms on the northwest end have been converted into a garage (Facility No. 348) for the residents of Facility No. 330.

The main corridor is oriented from southeast to northwest, and has the following approximate measurements: length - 135', width - 10', and height - 14'. This corridor has concrete beams (approximately 1' x 1'-6" in cross section), spaced about 14' apart, extending across it at approximately 9' above the floor. Along the southwest wall of the corridor (the rear wall of the battery) are two concrete stairways, one near each end. The stair at the southeast end reaches about 6' up the walls and terminates at a small landing. The northwest stairway has a second flight above its landing going to the residence above.

At right angles to the main corridor are the corridors to the gun chambers, which are approximately 30' long and 10' wide. The northwest end corridor has a wood-joint ceiling at a height of about 9' which was erected above the 2'-thick beam that encircles all the corridors. The door to the gun chamber is placed at the end of the corridor. The wall adjacent to the door is built of vertical tongue-and-groove boards and has two signs on it: the top one says "1 Dept." and the other labels the room as "Gun Turret No. One." The corridor near the southeast end has a height of about 14', and a wall of vertical tongue-and-groove boards has been erected about 10' from the main corridor. In this wall there is a ten-light wood-frame door, plus screen door. There are also two screened openings, one to the northwest side of the door, and one centrally positioned at a height of about 10'. The sign adjacent to the door notes it leads to "Gun Turret No. Two."

The two gun chambers or turrets are roughly wedge-shaped in plan, each being about a third of a circle with a radius of approximately 16'. Because the corridors join the turrets on one side, the chambers are not symmetrically shaped, and are 24' wide at the widest point. They both have low ceilings of concrete. A drawing sheet dated June 1919 for Battery Adair, included with this report, shows that the concrete casemates above and fronting the gun chambers and other rooms to be about 8' thick (U.S. Army Museum Hawaii 1919). Earth cover over the concrete was approximately 5' thick. Two aerial photos dated September 1922 show that the casemates over the gun chambers did not have earth

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cover, and have rounded corners where the walls and roof meet (U.S. Army Museum Hawaii 1922). Each gun chamber was constructed with a narrow opening allowing a 120-degree firing arc. In "Gun Turret No. One" this opening is now filled with concrete masonry units. In "Gun Turret No. Two" only a narrow portion at the top of the original gun slit remains open, screened with metal mesh.

There are two types of niches in the walls of the gun chambers, about 4' above the floor. The smaller niches measure about 1'-6" wide by 2' high, and the second type of niche is about 5' wide by 2'-6" high. The side walls of both types of niches splay outward and both are about 1' deep. The functions of these niches are not known. Also recessed into the walls of the gun rooms are large steel rings of 1¼" round stock. The rings are 6" in diameter and are secured to the wall with U-shaped steel pieces of the same stock, which are imbedded in the concrete. These rings could have been used as anchor points for block and tackle.

On the floor of each gun chamber, centered in front of the gun slits, are circular concrete pads where the pedestal mounts for the battery's 6" Armstrong guns were secured. These pads are 6" high and have a top diameter of about 3' with sides sloping to a base diameter of about 4'. In the northwest gun chamber (Gun Turret No. One) the original 24 mounting bolts for the pedestal mount are still on the pad, consisting of 1½"-wide bolts set in a circle with diameter of 2'-10" (Berhow 2004: 92).

In addition to the gun chambers, nine ancillary rooms were originally built in Battery Adair. The 1919 drawing indicates that the fan room and engine room were originally located on the northwest end. The dividing wall and the exterior wall of these two rooms have been removed to create a garage for the house above. The original concrete roof over these rooms has been replaced by a wood-framed hipped roof. Although part of the battery, this garage has been given its own facility designation (Facility No. 348). The thick wall between the northwest end corridor and the garage remains, with its original metal doors and barred openings. The original windows in the openings have been removed. The doors consist of plate metal riveted to frames that include diagonal bracing. They have strap hinges and simple handle pulls and hasps. A two-panel wood door has also been installed on the garage side of the engine room door. The metal grids over the splayed openings each consist of eight vertical metal rods running through two horizontal angle-bars.

Seven of the original ancillary rooms are still extant and generally unaltered. Along the main corridor are five rooms consisting of a shell room and powder room for each of the gun chambers, and the center plotting room. The end rooms (for shells) measure approximately 12' x 19', while the adjacent powder rooms are slightly smaller, measuring about 11' x 19'. Each of those four rooms has a large metal door like those described in the paragraph above; these are about 4' wide and

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almost 7' tall. The plotting room measures approximately 14' by 16'. It is the only room with double metal doors and two barred windows opening onto the corridor. The nine-light, metal-framed, vertically pivoting windows are mounted flush with the inner wall plane of the plotting room, with the bars on the corridor side of the openings. The walls between the five rooms are concrete, about 2' thick. All have niches similar to the smaller type seen in the gun chambers.

The two rooms opening onto the corridor to the southeast gun chamber are listed on the original plans as officers' and men's latrine. The larger room (men's latrine) has a five-panel wood door, while the smaller room (officer's latrine) has the original riveted steel door; both rooms have a window and steel bars, like those in the plotting room. The officers' latrine has a sign labeling it as a "Brig," although it is not clear that it ever served that function.

The battery retains much of its integrity, but there have been several notable changes. These include: removal of the guns; construction of the house and guest house over it with a stair down from each (although the upper stair section to the guest house was subsequently removed); remodeling of two rooms to create the garage; erection of partition walls in the shorter corridors; removal of fixtures in the latrine rooms; and installation of electrical lighting fixtures.

Historical Context: Refer to HABS No. HI-382 for an overview of Ford Island's history. See also HABS No. HI-362 (Battery Boyd, Facility No. S145) for information on the other gun battery that was on Ford Island and was part of the land defenses for Oahu. Since these batteries share a common history, some of the information below is derived from the Battery Boyd report.

The Army's Hawaiian defense mission was to provide protection to the Navy (Clark 1973: 15). Three small parcels of land for the Army were acquired on Ford Island in September 1915 (District Public Works Office 1962). Two of the parcels were used for fixed battery land defenses. Battery Boyd was built on the west coast of Ford Island. Battery Adair, on the northeast tip of the island, was completed in December 1917, about ten months after Battery Boyd (U.S. Army Museum 1919). The wharf (Facility No. S380) adjacent to Battery Adair was built under the same funding as the batteries, because it was needed to bring in materials for their construction and supply.

This battery was named in honor of First Lieutenant Henry Rodney Adair of the 10th United States Cavalry. He was killed in action on June 21, 1916 during the Mexican Punitive Expedition at the battle of Carrizal, Mexico while leading a contingent of black "buffalo soldiers" in an attack on Mexican forces (Finley 1993). This expedition had taken place in response to an invasion of American territory by Francisco (Pancho) Villa,

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and probably would have led to war with Mexico, except for the U.S. attention to the battles in Europe and its eventual entrance into the first World War.

Construction of Batteries Boyd and Adair is somewhat related to World War I, in terms of increased military budgets. Although World War I was mainly in Europe, the Japanese seizure of the German colonies in the Pacific fueled fears of expansion of combat to this ocean. Tensions between the United States and Japan were high due to the passage of the Alien Land Law in California in 1913 (Thompson 1985: 40) which denied land ownership rights to aliens who were ineligible for citizenship. At that time Asians were ineligible for naturalization under U.S. immigration laws. These two Ford Island batteries should also be considered in the context of the history of fortification modernization that started with the Endicott Board proposals of 1886 and, more specifically for Hawaii, with the Taft Board recommendations of 1906 (Lewis 1970: 100).

The Endicott-era forts were an improvement over the earlier brick fortifications with smooth-bore cannons. Over seventy harbor defenses at mainland United States locations were upgraded in the last decade of the nineteenth century. The United States acquired island territories at the end of that century, including Hawaii. When Theodore Roosevelt became president in 1905, he convened a National Coast Defense Board under Secretary of War William Taft, because "he saw that scientific advances made possible improvements in Endicott Board-inspired harbor defenses, and that suitable defenses were required for harbors located within the 'insular possessions'" (Dorrance 1995: 148). The Taft Board recommendations were submitted to Congress in March 1906, and included defenses for Honolulu Harbor and Pearl Harbor. "The recommendations were refined by a joint Army and Navy board in 1908, and the harbor defense buildup of Oahu followed the refinements until the onset of World War I" (Dorrance 1995: 148).

Until the early 20th century, the military had believed that troops could not be successfully landed except at a harbor. Therefore, harbor defenses had been designed only with ships' attacks in mind. The guns in the harbor defense batteries on Oahu were typically placed on disappearing carriages behind parapets, but were unprotected above and to the rear. It was not until a War College study of 1905-06 that the possibility of enemy troop attacks from the rear, and capture of harbor fortifications, were pointed out. Plans for adequate land defenses for Oahu's harbors and forts were debated from 1908 through 1912. It was finally decided that if enemy landings were made on the west or east shores of Oahu, they could be stopped at narrow places, or "pinch points," between the ends of the Koolau and Waianae mountain ranges and the southern coastal plains. The land defense batteries were oriented inland, not out to sea. They also differed from the harbor fortifications in being casemated

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(enclosed in bombproof concrete). Oahu's land defense batteries were among "the first casemated batteries constructed by engineers in the post-Civil War era" (Dorrance 1995: 155). Casemating was necessary "to furnish protection from overhead and flank fire [that was] not contemplated in coast defense design" (Dorrance 1995: 156).

The Ford Island batteries were in the second phase of fortification construction on Oahu, part of the land defense emplacements. The first period of construction, for harbor defenses, was done between 1906 and 1913. This work included building eight coastal gun and mortar batteries at Forts Ruger, DeRussy, Armstrong, and Kamehameha. In the second phase six additional batteries (besides the ones on Ford Island) were built at Forts Ruger and Kamehameha (Thompson 1985: 410). Each battery on Oahu appears to have a unique design, although there are common elements. The design varied according to site-specific topography, and also according to the type of gun installed in it (Dorrance 1993: 8). Because of a shortage of field artillery pieces (mobile guns and howitzers), Oahu's land defenses were "built around the use of stationary gun emplacements because it was the only option available at the time" (Dorrance 1995: 154).

Battery Adair originally had two six-inch (diameter) guns installed in it. These guns were 1898 Armstrong rifles, purchased along with six others from a company in England. Dorrance (1995: 154) notes that these guns were originally ordered during the Spanish-American War and were previously in a seacoast defense emplacement before being shipped to Oahu. This design was described:

The built-up barrel was 249 inches long, with a 40-caliber length of bore. The rifling was 24-groove, with a twist increasing from 0 to 1 in 30. The gun was designed for a concentric mount, and therefore did not have trunnions (the cylindrical projections usually seen on a cannon). It weighed 14,784 pounds.

The breech mechanism was interrupted screw, like the 4.72-inch gun. The breechblock was supported by a carrier, and operated by a lever pivoted at the carrier hinge on the right of the breech. The normal method of firing was electric, but percussion primers could be used. The powder chamber was conical, and ammunition was semi-fixed (Smith 1998: 88).

As shown in a figure included in this report, such guns normally had a heavy steel shield to protect the gun crew: "3¼ inches thick in front, with sides about 1¼ inches thick, and a top made up of a flat piece ½ inches thick and an inclined piece 1½ inches thick" (Smith 1998: 91). It is not clear if the guns installed inside the gun chambers retained this metal

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armoring, which was not needed because of the 8'-thick concrete casemating.

By the end of 1919 all Armstrong guns had been declared obsolete (Gon 1919). Battery Adair, along with "most of the batteries that had been constructed following the 1913 Japan crisis, [were] disarmed in 1925" (Thompson 1985: 73). Developments in artillery guns had occurred during World War I and included designs that allowed higher elevations and larger diameters. In 1920 12-inch guns were installed in Fort Kamehameha's Battery Closson. These guns, which were not casemated, had 360-degree coverage and a longer range, which allowed them "to discharge both harbor-defense and land-defense missions" (Dorrance 1995: 158). Battery Adair's and the other Oahu land-defense batteries' designs and guns had been "outreached and rendered obsolete" (Dorrance 1995: 158) within a few years by rapidly developing technology.

In April 1935 the Navy was planning to construct 16 houses in the vicinity of Battery Adair for officers' quarters. In a memo to the Chief of the Bureau of Yards and Docks, the Commandant of the Fourteenth Naval District noted that Battery Adair, elevated above the water's edge, was "the preferred location for the Commanding Officer's Quarters" (Yarnell 1935). However, there was a slight complication, since the Battery Adair parcel was still under the control of the Army. The Commandant made the following points in his memo (*numbering dropped*):

Battery Adair is the site of an abandoned gun emplacement. It is now used by the Army (Luke Field) only for dead storage of bomb containers. In appearance, the site is a mound of earth overgrown with weeds, covering the concrete gun foundations beneath. There is a sheer drop of about 20 ft. from the bottom of the mound to the water. . . .

On the occasion of a recent inspection by a representative of the Inspector General's office of the War Department, the Commanding Officer of Luke Field stated that it was entirely agreeable to him to relinquish Battery Adair as a part of the Army establishment on Ford Island.

It is obviously greatly to the Navy's advantage to have Battery Adair relinquished by the Army; it is not only the best location for the Commanding Officer's Quarters of the Fleet Air Base, but its continued presence will preserve the existence of an "alien" area within the region occupied by the Officer's Quarters, Fleet Air Base, which region, when developed and landscaped, etc., should present a very agreeable appearance.

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It is therefore urged that the Navy Department make all possible effort to have Battery Adair discontinued as such and to have its area transferred to the Navy as part of the Fleet Air Base, Pearl Harbor, T. H. (Yarnell 1935: 2).

By an Executive Order dated October 26, 1935 all the Army's land on Ford Island (about 336 acres) was transferred to the Navy (District Public Works Office 1962). Although it took several more years before the Army's airfield activities finished moving from the island, the Army did quickly relinquish this battery. In 1936 Quarters K (Facility No. 330) and its terrace were built on top of Battery Adair, using its concrete structure as a foundation for the new building.

In 1937 or 1938 a separate guest house was added to the southeast of Quarters K, also above Battery Adair (Mariani & Associates Architects 1987: 708). A stair was built from both of them down to the battery's main corridor. Thus it served as a joint basement and a connecting passage between these originally separate housing units. However, by 1939 there were plans (nos. V-N4-219 to -227) to join Quarters K and the guest house by building an addition, so there was no need for the underground connection. The date of removal for the upper part of the stair to the original guest house is not known. The date that electrical lighting was installed is also unknown.

Also about 1937 the fan and engine rooms of the battery were altered to become the garage for Quarters K. This garage is listed in the Navy database as Facility No. 348 with a 1939 date. A drawing dated 1937 (no. V-N4-193) shows that the thick outer wall, the wall between the two rooms, and the thick concrete roof over them had already been removed. It shows that a curved concrete roof for the garage was planned, and that ragged concrete faces from the demolition work were to be retained. At some date the concrete edges were further cut back and smoothed. The existing roof is a wood-framed hipped shape that abuts the edge of the 8'-thick casemating that was over the original battery rooms.

Battery Adair had been designated as an air raid shelter by the Navy, and served in this capacity during the Japanese attack of December 7, 1941.

As Japanese planes attacked and the battleship Arizona blew-up nearby, some 200 women and children crowded into the battery's long passageways which were protected by a thick layer of concrete and several feet of earth. They came from the enlisted men's houses on the northwest side of the island and from the officers' quarters nearby. At that time the admiral's house was occupied by Rear Admiral Patrick N. L. Bellinger, U.S. Navy, Commander Patrol Wing Two (Grobmeier 1990).

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An eyewitness to the attack, Captain Shoemaker, Commander of the Naval Air Station, Ford Island, reported that after the first wave of the attack he personally went to "the air-raid shelter under Quarters K" [Battery Adair] to check on his family and the other refugees utilizing the shelter. He noted: "Everything seemed as well in hand as possible, considering the number of refugees from *Arizona, West Virginia, Tennessee, California, Utah*. Just after I left Quarters K the Japanese delivered another dive-bombing attack" (Shoemaker 1941).

Recently Facility No. 446 has been listed as a "Fallout Shelter" in the Navy database. Battery Adair currently serves as the basement for the house above (Facility No. 330, Quarters K), mainly used for storage space. Minor changes to the facility, such as the installation of partition walls in the corridors to the gun chambers, or the removal of the fixtures in the latrine rooms have not been documented in drawings. In recent years the battery has been decorated as a haunted house during Halloween.

Sources:

The original drawings for this building are not in the Plan Files of the Naval Facilities Engineering Command, Pacific, probably because it was built and originally owned by the Army. In the U.S. Army Museum, Hawaii, there is a 1919 drawing, on 8 1/2" x 11" paper, showing a plan, sections and a rear elevation of the battery. This drawing is reproduced in this report. Some of the drawings for Facility No. 330, Quarters K, which was built on top of this battery, were used to help determine the alteration history of Facility No. 446. These drawings are on microfiche cards in the Plan Files of the Naval Facilities Engineering Command, Pacific.

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Project Information: Commander Navy Region (COMNAVREG) Hawaii has embarked on a program of documentation of historic properties within its area of responsibility, with the goal of recording historic information about each property and establishing its context of significance. This information will assist COMNAVREG Hawaii in the appropriate management of these properties, be it routine repair and maintenance for continuing use, rehabilitation for continuing use / adaptive reuse, or demolition. At this time, specific action that may affect this facility has not been determined. This report was prepared under a Historic Preservation Services contract (N62742-97-D-3502) awarded to AMEC Earth and Environmental, the

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prime contractor, by the U.S. Navy, Naval Facilities Engineering Command. The contract was funded through the Cultural Resources Program of COMNAVREG Hawaii. The photographic documentation was undertaken by David Franzen, of Franzen Photography. Location maps were made by Nestor Beltran of NAB Graphics. Between 1999 and 2001, the field work was done and the draft of this report was written by Dot Dye, AMEC Earth & Environmental, Inc. The report was rewritten in 2005 by Mason Architects, Inc.

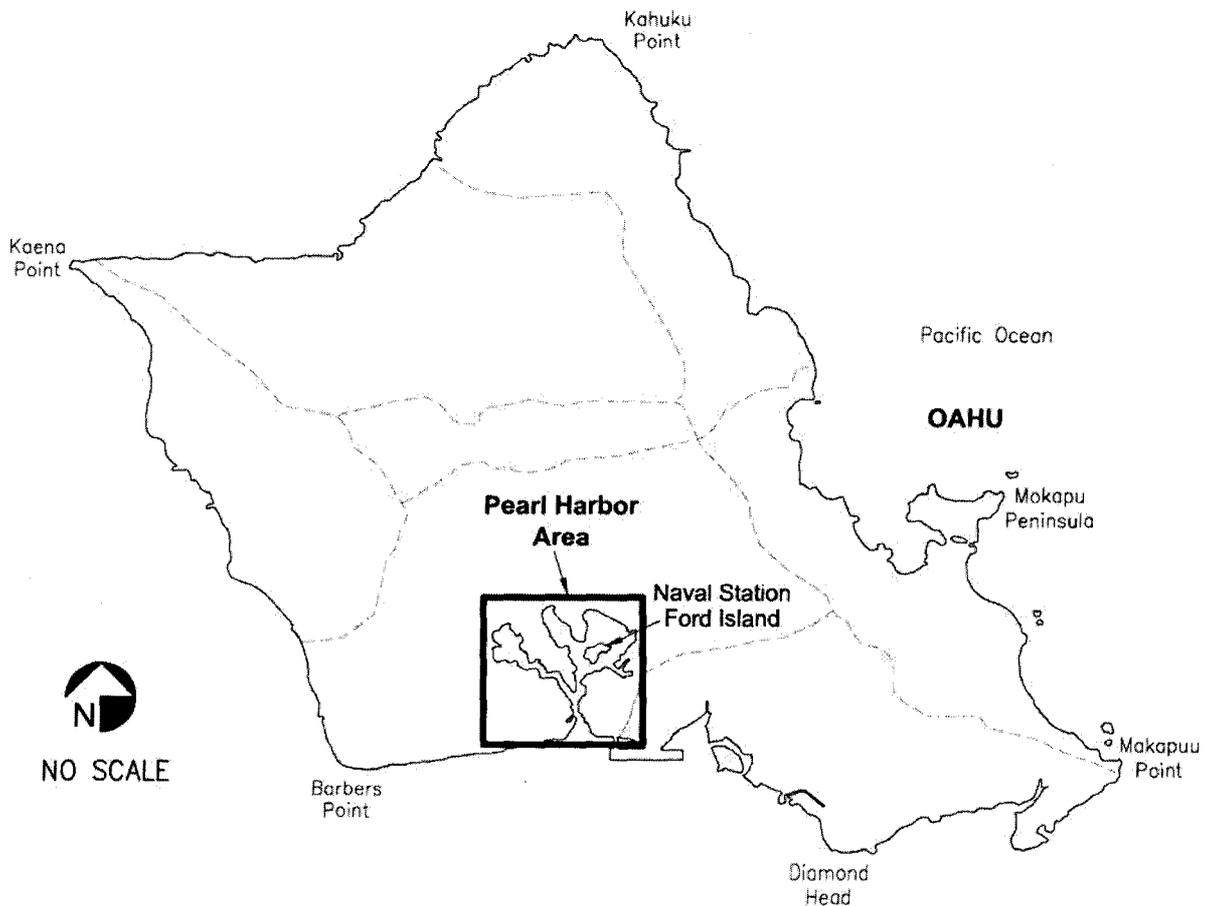
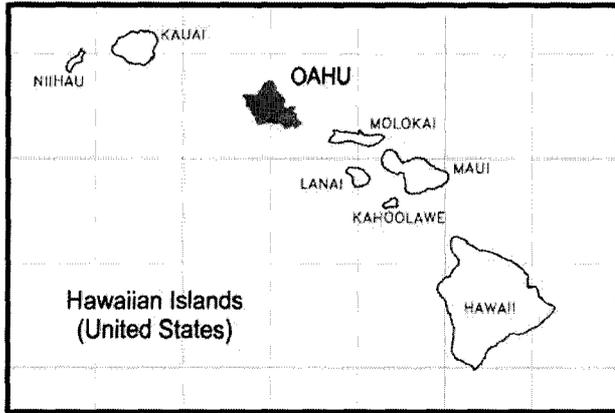
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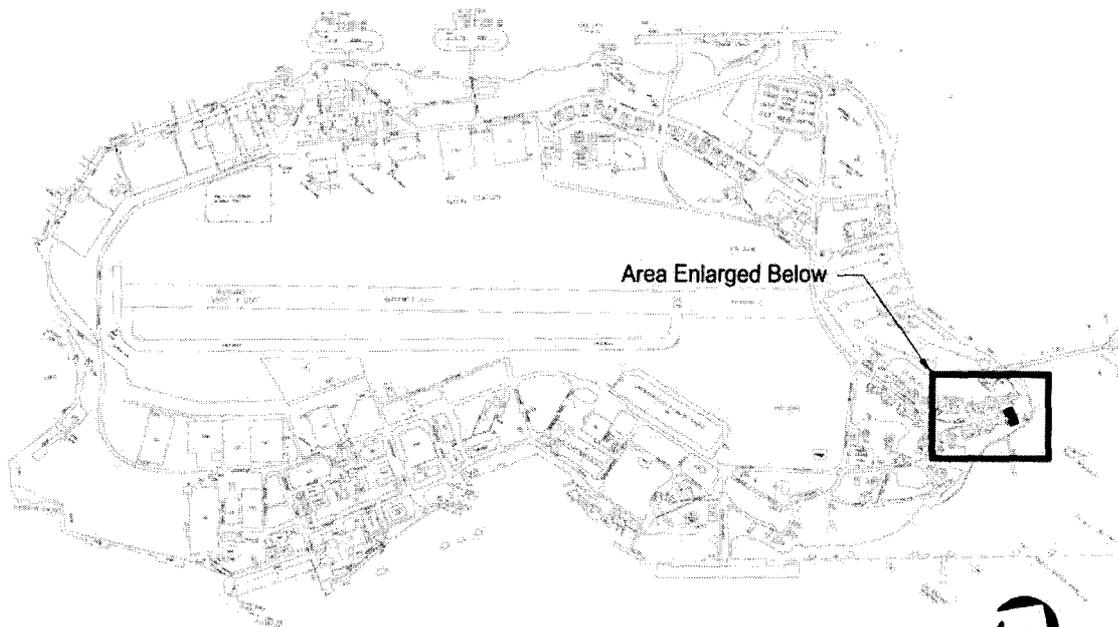
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Date of Final Report: July 2005

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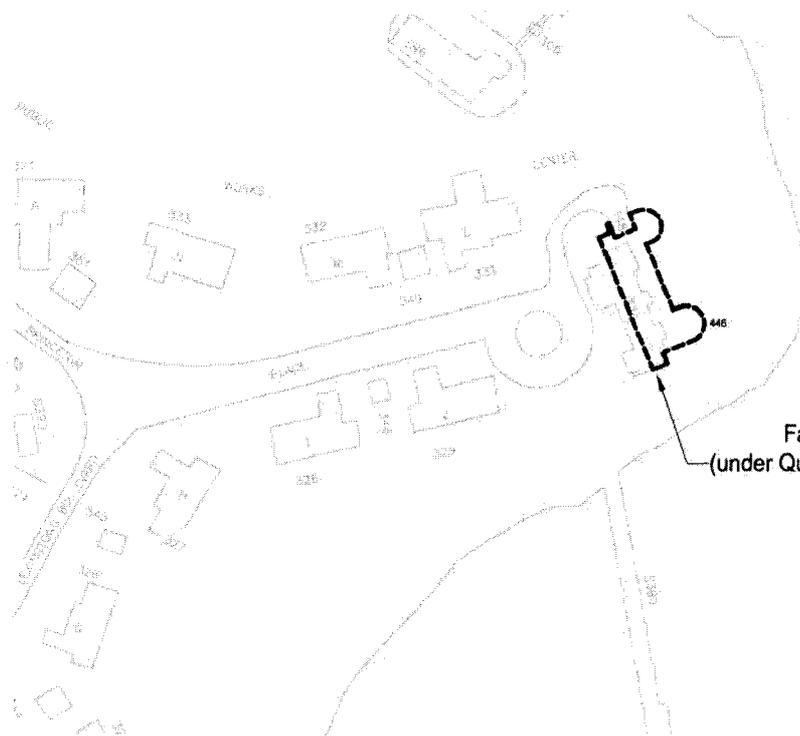
U.S. NAVAL BASE, PEARL HARBOR, BATTERY ADAIR
(U.S. Naval Base, Pearl Harbor, Naval Station Ford Island)
(U.S. Naval Base, Pearl Harbor, Fallout Shelter)
(Facility No. 446)
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Vicinity Map



NO SCALE



Site Map

U.S. NAVAL BASE, PEARL HARBOR, BATTERY ADAIR
 (U.S. Naval Base, Pearl Harbor, Naval Station Ford Island)
 (U.S. Naval Base, Pearl Harbor, Fallout Shelter)
 (Facility No. 446)
 HABS No. HI-432 (Page 15)

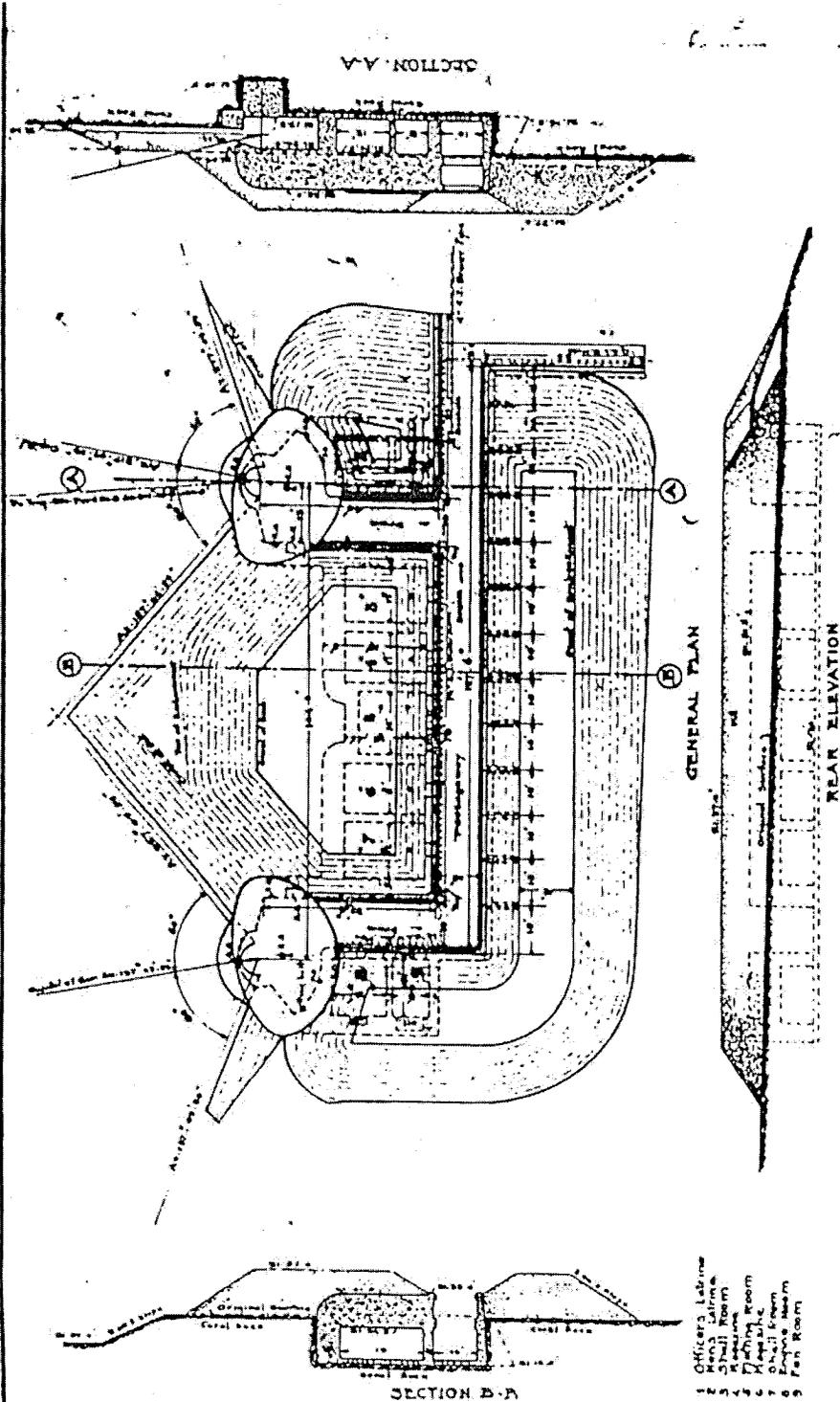
Report of Completed Works Drawing, dated 1919 (from U.S. Army Museum Hawaii)

LAND DEFENSES OF OAHU
 FORT KAMEHAMEHA
 BATTERY HENRY ADAIR
 TWO GUNS. 6" CALIBER BARBETTE CARRIAGES
 (Graphic Scale)

REPORT OF COMPLETED WORKS, SEACOAST FORTIFICATIONS
 (Battery Plan)

Corrected to June 14, 1919

FORM 7



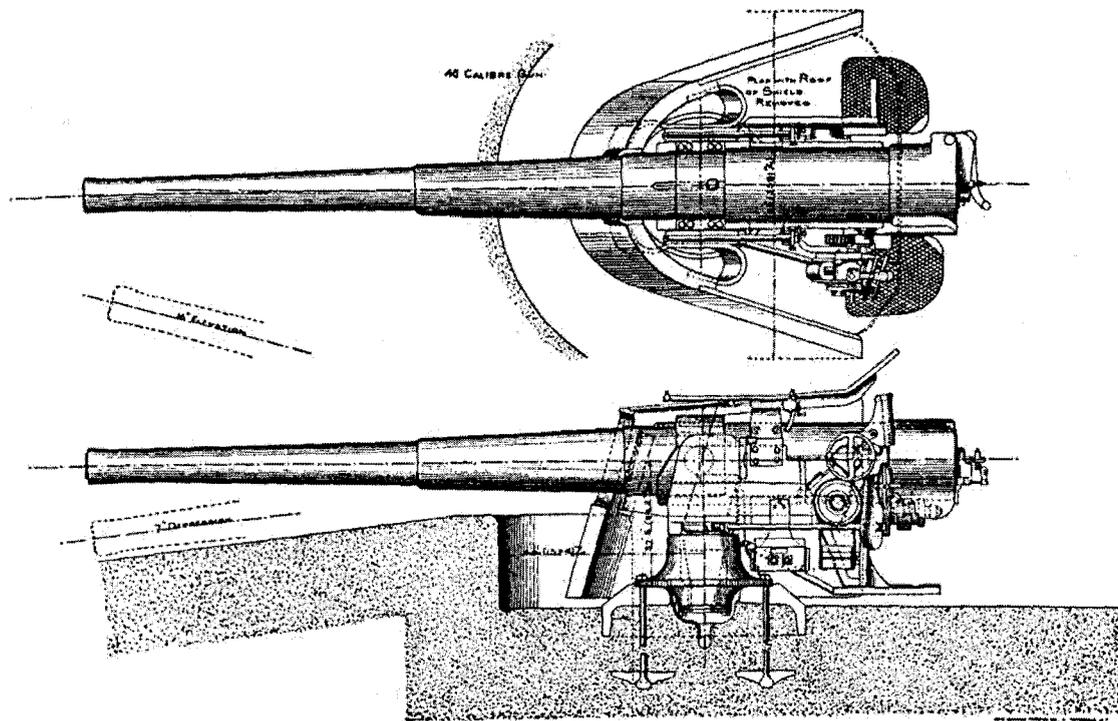
- 1 Officers' Latrine
- 2 Men's Latrine
- 3 Hall
- 4 Wash Room
- 5 Ammunition Room
- 6 Magazine
- 7 Gun Room

SECTION B-B

U.S. NAVAL BASE, PEARL HARBOR, BATTERY ADAIR
(U.S. Naval Base, Pearl Harbor, Naval Station Ford Island)
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Armstrong 6-inch gun with pedestal mount (in Berhow 2004: 93, from Smith 1998: 93)

ARMSTRONG PEDESTAL MOUNT FOR 6-INCH GUN



6-INCH ARMSTRONG CARRIAGE.

**U.S. NAVAL BASE, PEARL HARBOR, BATTERY ADAIR
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(Facility No. 446)
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Aerial photo of Battery Adair, September 1922 (National Archives 38-FCD-35)

