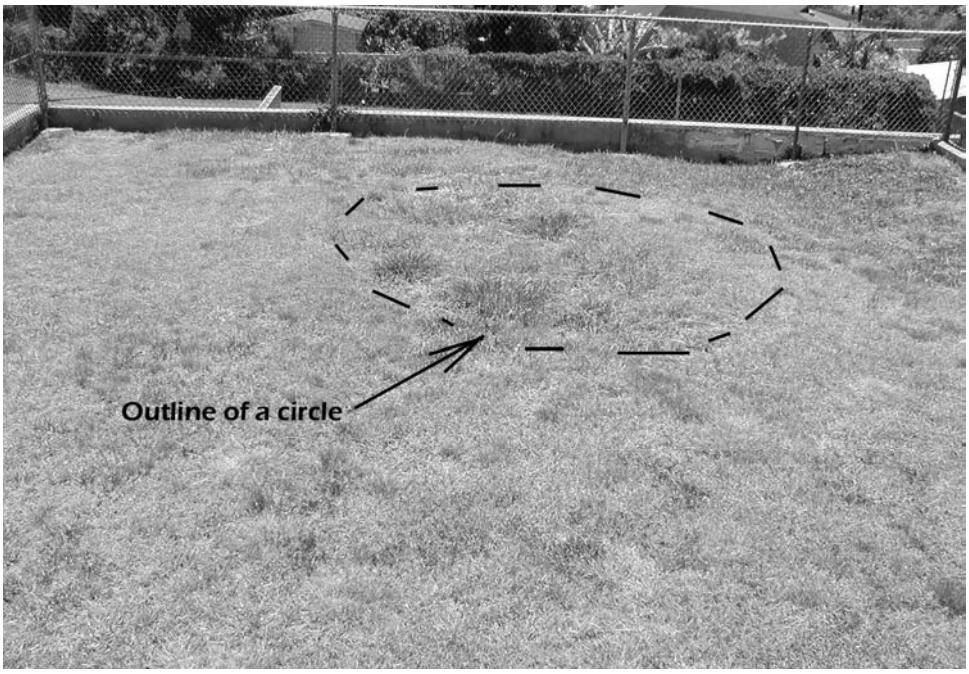
Looking towards Pearl Harbor from Napuanani Park, Aiea Heights. *Author, 2006*



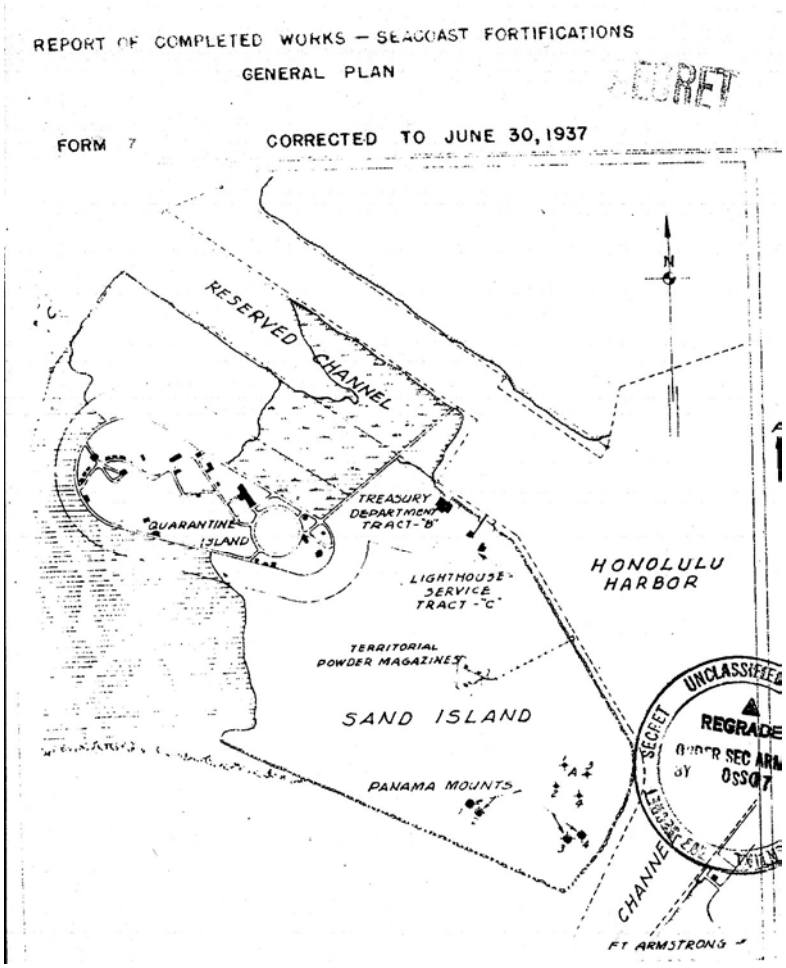
Possible AA gun emplacement at Napuanani Park. *Author, 2001*

There are no traces of antiaircraft gun emplacements at the park. The sole remnant is a reinforced-concrete World War II-vintage bunker, which may have been the bombproof CP for the HAAC or munitions storage. The padlocked steel-plate doors prohibited inspection of the interior. A faint circular outline in the grass several yards above and to the right of the bunker could have been a gun emplacement, but this has not been confirmed.

Battery No. 9 (Sand Island)

The Sand Island 5-inch AA battery was built on the military reservation of the same name on the west side of Honolulu Harbor, on land composed of limestone coral and sand. The battery, four 5-inch/25 naval AA guns in reinforced-concrete emplacements, was scheduled to be completed on October 15, 1942.

The battery was built in addition to "Fixed Antiaircraft Battery No. 7," a pre-existing antiaircraft gun battery armed with four 3-inch M1917 guns. The 3-inch battery was manned after December 7, 1941, by members of Battery F, 55th CA, who also manned four 155 mm GPF guns on Panama mounts (Battery Sand Island) until December 14, 1942, when the 155 mm battery was relocated to the Punchbowl Crater overlooking Honolulu and the harbor.(47)



155 mm GPF battery as of June 30, 1937. *NARA*

Battery No. 9 was sited to protect Honolulu Harbor on its immediate left flank, and Pearl Harbor, approximately 6 1/2 miles to the west.

On September 18, 1942, it was reported that all four guns had been mounted and could be fired manually. Additional work to be done included hooking up the gun director within 10 to 15 days, and in puzzling statment, the report stated that "work on case mates (*sic*) is continuing. Two case mates (*sic*) being completed, the third case mate (*sic*) probably procured today or tomorrow, and the fourth case mate (*sic*) to be started as soon as possible." The report went on to state that the battery would be able to be fired "with power hook ups in approximately ten days pending the necessary approval from Punahou."(48)

The reference to "Punahou" was in regards to the headquarters of the Honolulu District engineer,

Young Hotel in downtown Honolulu before moving to Punahou, "New Spring" in Hawaiian. On December 8, 1941, the district engineer commandeered the prestigious private preparatory school located at the mouth of Manoa Valley in Honolulu for his headquarters and moved in without advance warning. Two days after the occupation of the school property, the trustees received a letter informing them that, "The forces of the United States District Engineers have occupied the grounds (for an indefinite period)." The campus was also the headquarters of "Hawaiian Constructors," a consortium of private contractors employed by the Honolulu District engineer on defense contracts.(49)

The precise location of Battery No. 9 is not known, as there are no identifiable remains of the battery. The fixed 3-inch AA battery was in the southeast portion of the island, the 155 mm GPF battery was somewhat west of the 3-inch AA battery, and Battery Harbor's 7-inch naval guns were northwest of the GPF battery.

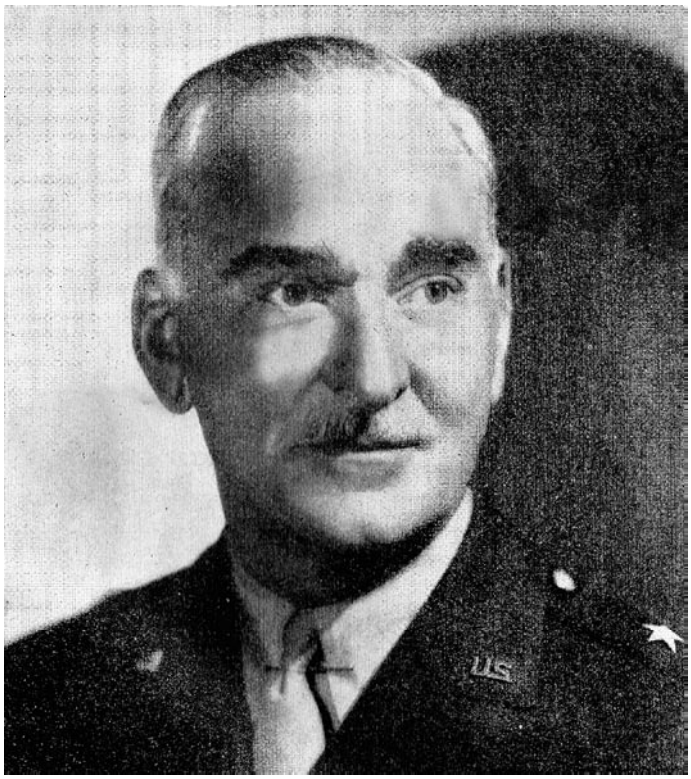
The portion of the island used by the coast artillery has been extensively grubbed and planted with trees by the State of Hawaii after the army departed. The Department of Land and Natural Resources,

include Battery Harbor's four concrete gun emplacements, eight magazines, plotting room, power room, and several unidentified structures. The double-tier battery command post/harbor entrance control post (HECP) atop a 50-foot steel tower exists, as do a 1934 prototype concrete machine gun pillbox, and several World War II concrete bunkers and machine gun pillboxes. Coordinates of the main gate to the state park are: 21º 18' 11" N, 157º 52' 17" W.

5-inch Naval AA Batteries Scheduled for Replacement

A June 18, 1943, army engineer inter-office memorandum addressed stronger replacement bunkers for the 5-inch AA batteries on Oahu. Replacing the 5-inch navy guns with 90 mm guns would take some time; in the meantime, it was decided that no new permanent bunkers should be built for the 5-inch batteries.

inside the present gunited surfaces of the emplacements to protect artillerymen from injury when slabs of gunite fell. Under Troop Work Order No. 34.132, troop labor was to be furnished by the AA Command, and the 34th Engineer Regiment was to provide supervision and construction materials as requested.(50)

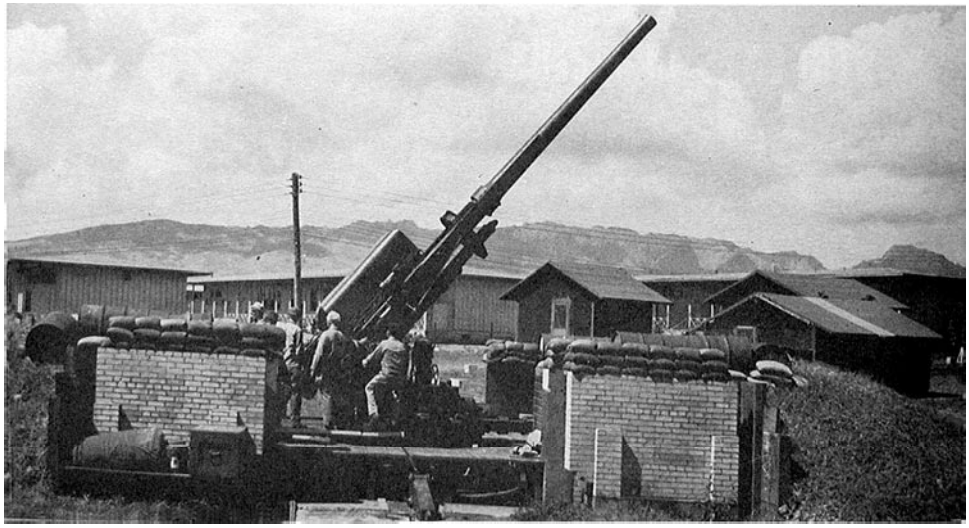


Brigadier General R.M. Perkins. *From HAAC Scrapbook*

On November 19, 1943, Brigadier General R.M. Perkins, CG, 53rd CA Brigade (AA), recommended the present gun bunkers manned by CA batteries C-97, G-97, H-95, 711, 714, 712, and F-95 be remodeled to accommodate either 90 mm or 4.7-inch (120 mm) guns. Remodeling was to be accomplished as each battery received new guns and the 5-inch/25 guns were removed. General Perkins further recommended outrigger slots be cut into the sides of the revetments to accommodate either 90 mm or 4.7-inch gun carriages.(51)

On December 6, 1943, Brigadier General H.F. Nichols, CG, Hawaiian AA Command, wrote the Engineer's Office, Central Pacific Area, approving remodeling the existing gun bunkers of Battery F, 95th CA (AA), to accommodate the 90 mm guns, without specifying the location. General Nichols also suggested that new bunkers for 4.7-inch guns be made similar to the 90 mm gun bunkers depicted on Engineer Drawing No. F-145/1121. Nichols went on to say that all battery positions on government land should be constructed with bunker retaining walls more permanent than timber. The general felt the new bunkers should be built of concrete with minimum reinforcement, or of masonry, with the exception of the movable wall at the entrance that permitted the guns to be moved in and out of the emplacements.(52)

On December 2, 1943, Work Order No. XB-343.0 authorized the area engineer, 2nd Field Area, to return one 5-inch/25 battery to storage, in accordance with prior indorsements, but did not name the battery site. Also included in the authorization was the removal of a 3-inch M1917 (fixed) antiaircraft battery, again with no location given. The work was to be coordinated with the AA Command and Lt.



4.7-inch AA gun at Waipahu High School during World War II. Note the use of bricks, timber, and sandbags to reinforce the emplacement built on territorial government land.
U.S. Army Photo from Waipahu At War

4.7-inch AA gun in sugarcane field near the town of Waipahu during World War II.

Concluding Remarks

It is not known if any remnants of Battery No. 1 (Hickam Field) exist today, although it is highly unlikely, as the area is the location of Air Force housing. Battery No. 2's (West Loch) location has not been pinpointed; portions of the former sugarcane lands bordering the loch at Waipahu have been extensively developed in the past 40 years for housing and light industrial use. The area also includes the West Loch Branch of Naval Magazine, Pearl Harbor, off-limits for any site inspection.

Battery No. 3 (Puuloa) was on navy land occupied by Fort Weaver, which was developed for housing following the end of World War II. Battery No. 4 (Ewa Mooring Mast) was on land occupied by the Ewa MCAS, which was decommissioned in 1952. Portions of the former Ewa MCAS have been turned into stables; the navy uses a large portion of the former MCAS for a golf course.

Battery No. 5 (Fort Kamehameha-Ahua Point) was on land that has been incorporated into the taxiway leading to the reef runway of Honolulu International Airport.

A March 1995 reconnaissance of the Waipio Peninsula discovered remnants of Battery No. 6 on the eastern portion of the peninsula. The structures included one concrete 5-inch/25 gun emplacement, a smaller concrete gun emplacement, a splinterproof power generator housing, and another concrete structure that may have housed the fire control switchboard.(54) Access is restricted, as the peninsula is within a security zone and a 1 1/2 mile blast-zone around the West Loch Branch of Naval Magazine, Pearl Harbor.

Remains of the superstructure removed from the U.S.S. *Arizona*, including the deckhouse and fore and aft masts, have been lying in storage at Waipio Point since being removed from the ship. Access is restricted to the site.(55)

The location of Battery No. 7 on Ford Island is unknown. Jeffrey Dodge, architect-historian for Pearl Harbor Naval Station, has not located any remains of the 5-inch/25 AA battery.

As for Battery No. 8 (Aiea Heights), the one remaining World War II-era structure found there is a reinforced-concrete bunker situated on the left at the entrance to Napuanani Neighborhood Park. The outline of a circle beneath the surface on a grassy mound on the right just above the comfort station may have been a gun emplacement.

Nothing remains of Battery No. 9 (Sand Island), as the State of Hawaii has done extensive brush clearing, grading, and planting since acquiring the land. Other Coast Artillery remnants exist at the park as reported earlier in this paper.

Acknowledgements

CDSG member William Gaines graciously provided copies of his unpublished manuscripts, reviewed this paper, and sent additional material via e-mail. In addition, the author wishes to thank Bolling Smith for material from NARA, College Park, MD, Wray Taylor, and Ann Yoklavich. Jeffrey Dodge, Pearl Harbor Naval Station historian also assisted, as did Katharine Slocumb, architect-historian for Mason Architects, who provided photographs and drawings of the Waipio AA battery.

Endnotes

1. David Madsen, *Resurrection: Salvaging the Battle Fleet at Pearl Harbor* (Annapolis: Naval Institute, 2003), pp. 57-58. (Hereafter: Madsen.) James C. Fahey, *The Ships and Aircraft of the U.S. Fleet 1939* (NY: Nathan-Herald Press, 1939), p. 4.
2. Madsen, p. 81. The total number of 5-inch/25s in operable condition or able to be refurbished is not known.
3. *Robert C. Richardson, Jr., Historical Review, Corps of Engineers, United States Army, Vol. I, Covering Operations During World War II,*

4. Erwin N. Thompson, *Pacific Ocean Engineers: History of the U.S. Army Corps Of Engineers In The Pacific 1905-1980* (Honolulu: Ft. Shafter, n.d.), p. 123.
5. William R. Furlong, Commandant, Navy Yard, Pearl Harbor, T.H., to CG, 53rd C.A. Brigade, Fort Shafter, T.H., "Engineering Work in Connection with Mounting Naval A.A. Batteries," 8 Feb 1942, Hawaiian Department Engineer General Correspondence, 1920-1946, U.S. Army Forces Middle Pacific and Predecessor Commands, 1942-, RG 494, NARA, College Park, MD. (Hereafter: Furlong letter; all Hawaiian Dept. Engineer citations are from NARA, College Park, MD, hereafter: HDE.)
6. William C. Gaines, "Antiaircraft Defense of Oahu 1916-1945," *CDSGJ,* Vol. 15, No. 2 (May 2001), p. 49. (Hereafter: Gaines: Antiaircraft Defense of Oahu.)
7. William C. Gaines, "Notes on the Provisional 700 Series of Coast Artillery (AA) Batteries on Oahu 1942-1943." E-mail to author, Oct. 3, 2006. (Hereafter: Gaines, 700 Series Batteries.)
8. Ibid.
9. Ibid.
10. William C. Gaines and Peter D. Smith, "Installations and Organizations of the Coast Artillery Corps, U.S. Army, on the Island of Oahu, Territory Of Hawaii 1905 – 1946," pp. 63, 69, 93, unpublished MS in the author's collection. Hereafter: Gaines and Smith.)
11. R.M. Perkins, Commanding, 53rd C.A. Brigade (A.A.) to CG, Hawaiian A.A. Command, "Remodeling of 5"/25 cal. Gun Bunkers," 18 Nov. 1943, HDE. (Hereafter: Perkins, 18 Nov. 1943.)
12. Norman Friedman, *US Naval Weapons: Every Gun, Missile, Mine and Torpedo Used by the US Navy from 1883 to the Present Day* (London: Conway Maritime Press, 1983, Reprint 1985), pp. 63-64. (Hereafter: Friedman.)
13. James Campbell, *Naval Weapons of World War Two* (London: Conway Maritime Press, Ltd., 1985), p. 110. (Hereafter: Campbell.)
14. U.S. Navy, *Naval Ordnance and Gunnery* (Washington: Bureau of Naval Personnel, Training Division, May 1944), pp. 118-120. (Hereafter: *Naval Ordnance and Gunnery.)*
15. Friedman, p. 242.
16. John C. Reilly, Jr. ,*United States Navy Destroyers of World War Two* (Poole, Dorset, G.B.: Blandford Press, 1983, Reprint 1985), p. 16. Author's note: The Ford rangekeeper was invented by Hannibal Ford.
17. Furlong letter.
18. *Naval Ordnance and Gunnery,* pp. 366-67.
19. Coast Artillery Project List, Hawaiian Seacoast Artillery Command, n.d., HDE. (Hereafter: CA Project List.)
20. Cary Hall, "After the Seventh," Reprint from *Naval History,* winter 1991 issue, *CDSG News,* (Aug. 1992), pp. 57-58. (Hereafter: Hall.)
21. Ibid., p. 57.
22. Ibid., p. 58.
23. Ibid.
24. See: John D. Bennett, "Naval Air Station Johnston Island's World War Two Marine Garrison," *CDJ,* Vol. 18, No. 4 (Nov 2004), p. 58. The diamond formation may have been the typical formation of naval and marine AA shore batteries when space permitted.
25. Hall, p. 57.
26. Ibid, p. 58.
27. Jesse C. Conde and Gerald M. Best, *Sugar Trains: Narrow Gauge Rails of Hawaii* (Felton, CA: Glenwood Publishers, 1973), p.

28. Madsen, p. 58.
29. Gwenfread Allen, *Hawaii's War Years 1941 - 1945* (Honolulu: Univ. of HI Press, 1950), p. 109. (Hereafter: Allen.)
30. CA Project List.
31. Gaines and Smith, pp. 60, 62-63.
32. William C. Gaines, e-mail to author, Oct. 6, 2006.
33. Gaines and Smith, p. 63. Perkins, 18 Nov. 1943.
34. Ibid., pp. 57, 60, 62-63.
35. Madsen, p. 102.
36. "Gun Emplacements; Job Order 508-W," April 9, 1942, HDE. Lists seven job orders and one work order, and gave preliminary status of each project. Gaines and Smith, p. 93.
37. Ibid, pp. 90, 93.
38. Joseph Matson, Jr., COE, to CG, Hawaiian AAA Command, A.P.O. 958, "Transfer of Completed Work at Waipio and Aiea, Oahu, T.H.," 21 Oct 1942, HDE. (Hereafter: Matson, RCW, 21 Oct 1942.)
39. Ann Yoklavich, e-mail to author, Oct. 10, 2006. The site of the 5-inch AA battery was approximate. Conde and Best, p. 317.
40. Matson, RCW, 21 Oct. 1942. HQ, Hawaiian Department, "Report On Overseas Facilities, Oahu, T.H.: H. Miscellaneous Facilities," June 30, 1942, HDE.
41. "Realty Atlas State of Hawaii, First Tax Div., City and County of Honolulu," Map Vol. Zone 9, 28th Edition 1994. Prepared by TRW-REDI, Riverside, CA.
42. Melborne H. West, LTC, 97th CA (AA), "Report of Findings of Board of Officers," 12 May 1943, HDE.
43. Allen, p. 225. COMNAVAIRPAC - The Beginnings <http:www.airpac.navy.mil/corner/beginnings.asp>, Sep. 25, 2006.
44. "Gun Emplacements, Job Order 526-W," April 9, 1942, HDE. Matson, RCW, 21 Oct 1942. George Wills, Principal Superintendent, area engineers, First Field Area, to department engineer, Hawaiian Department, Honolulu, T.H., "Completion of Fortification Projects, First Field Area, Sep 18, 1942, HDE. (Hereafter: Wills, Fortification Projects.)
45. Ibid.
46. Gaines and Smith, p. 69.
47. John D. Bennett, "Sand Island's Military Past 1916-1945, *CDJ*, Vol. 16, No. 3 (August 2002), pp. 66, 68, 70.
48. Wills, Fortification Projects. AA guns could not be casemated, by their very nature. Although Battery Harbor was not casemated because there were enough AA guns in the immediate vicinity, Wills also refers to constructing casemates for that battery. It seems likely that Wills, a civilian, meant to refer to emplacements, rather than casemates.
49. Allen, p. 236.
50. U.S. Engineer Office, Inter-Office Memorandum, "Replacement of Gun Bunkers," 1st and 2nd Indorsements, 18 June 43, HDE.
51. Perkins, 18 Nov. 1943.
52. H.F. Nichols, CG, HAAC, to Office of the Engineer, C.P.A., "Remodeling of 5"/25 cal. Gun Bunkers," 6 Dec. 43, HDE.
53. "Return to Storage, 5"/25 caliber AA Battery, 3" M1917 (fixed) AA Battery," AA letter, 29 Sept 43, Indorsement 18, HDE.
54. Jeffrey Dodge, historian for the Pearl Harbor Naval Station, e-mail to author in 2005.
55. No. 127, 2005, pp. 30-31.

Additional Sources

The R.O.T.C. Manual, Coast Artillery Basic, 7th Ed. Washington, D.C.: Military Service Publishing Co., 1935.

R.H. Lodge (comp.), *Waipahu At War.* Honolulu: Hawaii Sugar Planters Assn., n.d.

Stearns, Harold T. *Geology of the State Of Hawaii.*

Topozone, <http://www.topozone.com>

"United States Naval Guns," <http://www.navweaps.com/Weapons/WNUS_Main.htm>, August 22, 2006.