

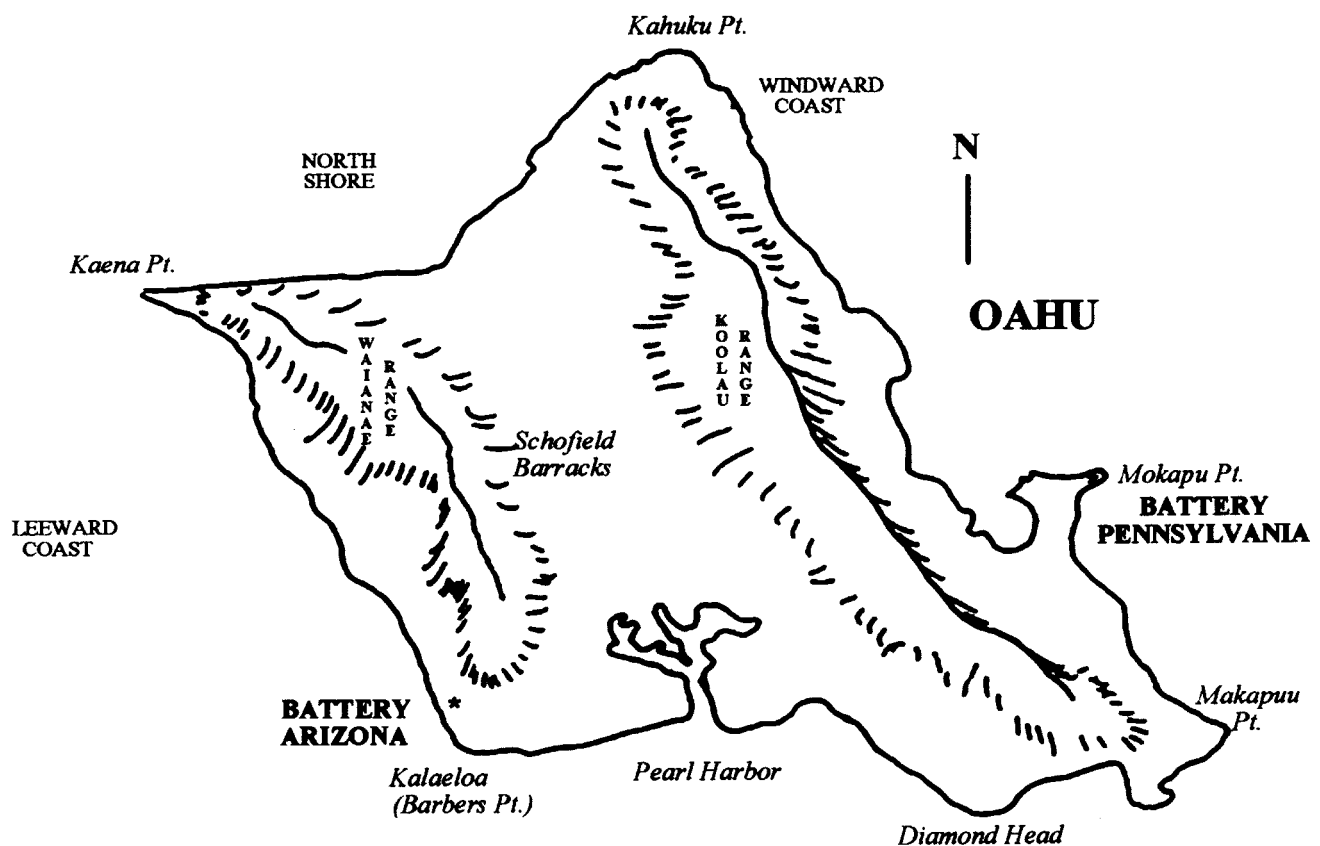
Battery Arizona and the Kahe Point Military Reservation

John D. Bennett

The battleship U.S.S. *Arizona* (BB-39), sunk at Pearl Harbor during the December 7, 1941, attack, was found to have suffered extensive damage to the forward portions of her superstructure and hull beyond the capability of the Pearl Harbor Navy Yard to repair, although the Navy Bureau of Ships believed, well into the early months of 1942, that she could be salvaged. Cost estimates in May 1943 amounted to \$1,777,000; along with other factors, this prompted the vice CNO to halt any further attempts to raise the hulk, except for ongoing removal of equipment.(1)

Sometime before January 14, 1942, the G-3 (Operations and Training) section of the Hawaiian Dept. informed Maj. Gen. H.T. Burgin, commander of the Hawaiian Coast Artillery Command (HCAC), that the army could likely obtain several 14-inch guns from damaged battleships at Pearl Harbor. *Arizona's* aft turrets (Nos. 3 and 4), each equipped with three 14-inch 45-caliber rifles, were subsequently offered to the Hawaiian Department for use as seacoast artillery.

On January 14, 1942, the Hawaiian Dept. ordnance officer told General Burgin that after discussions with navy authorities he was assured that two 14-inch gun turrets with three guns each, including all accessories, could be acquired by the Hawaiian Dept., with an additional turret possibly becoming available.

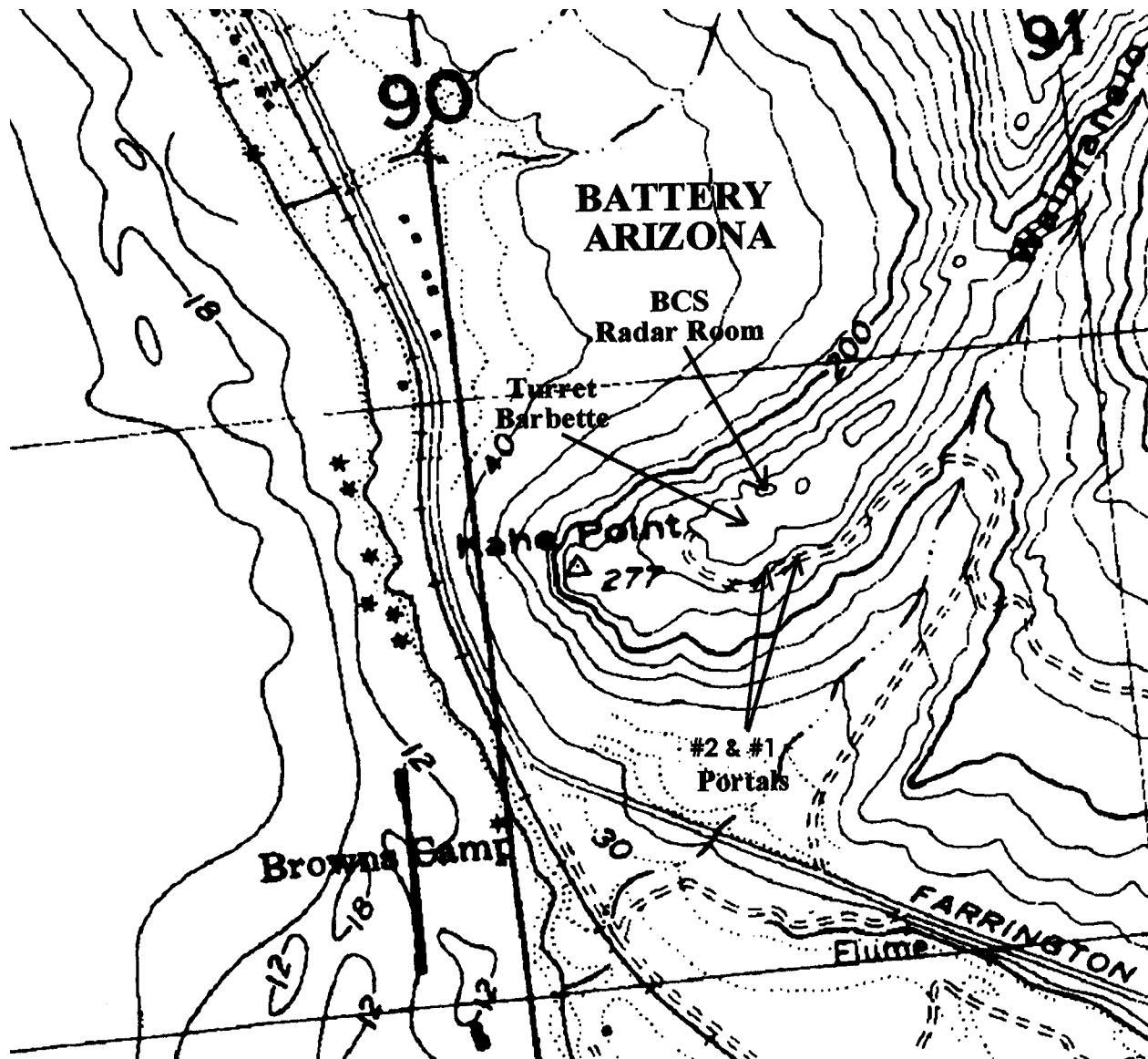


Map of Oahu

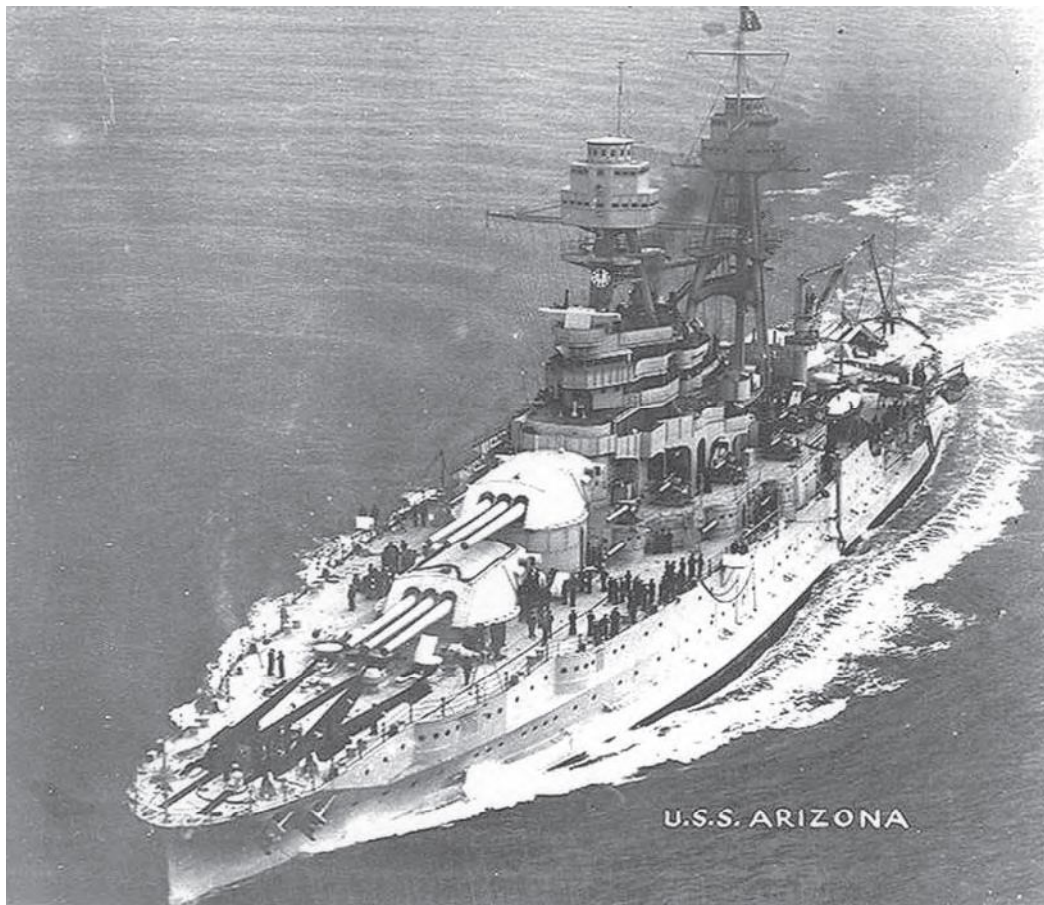
Based on the assumption that these turrets and guns would become available in the foreseeable future, General Burgin wrote the new commander of the Hawaiian Dept., Lt. Gen. Delos C. Emmons, on January 16, 1942, informing him that a study by HCAC concluded that the best sites to emplace the 14-inch guns, in order of priority, were:

1. Salt Lake
2. Kahe Point
3. Wilhelmina Rise

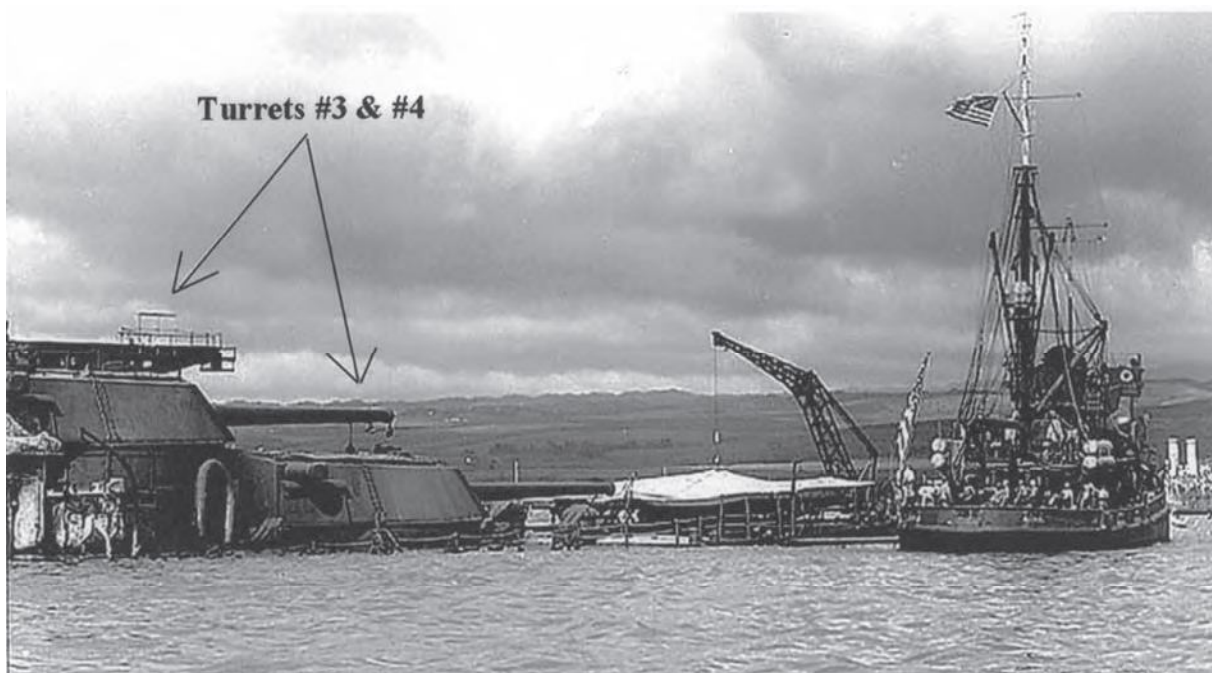
General Burgin acknowledged to General Emmons that the installations at Pearl Harbor, Hickam Field, and the Honolulu dock area presented the greatest potential targets for enemy attack. Naval Air Station (NAS) Kaneohe on the east coast presented a second-rate target for naval bombardment, but the existing armament in the area of the naval air station was sufficient to defend the base.



Kahe Point showing approximate location of Battery Arizona. Adapted from 1943 Corps of Engineers



USS Arizona (BB-39). USN Photo



Turrets 3 and 4 of USS Arizona with USS Widgeon alongside in Dec. 1941. USN Photo

General Burgin felt it imperative that any new installations be placed well back from the shoreline; if possible, on elevations where the batteries could not be easily overrun by small raiding parties. Additionally, with the 14-inch navy guns on Oahu's south shore, a large number of 155 mm GPF guns would be available to bolster the defenses of the north, east, and west shores of the island. General Burgin urged the department commander to take definite action to secure two, and if possible three, 14-inch navy gun turrets, and that they be mounted in the order of priority he mentioned.(2)

Turrets 3 and 4 of the *Arizona* were considered salvageable in early 1942 after Lt. Col. Lawrence M. Guyer, assigned to HQ, Hawaiian Seacoast Artillery Command (HSCAC), donned a diving helmet and inspected them; he concluded that from an artillery viewpoint they were serviceable and capable of being emplaced on land. Standard coast artillery then in production would have taken two to three years to procure, and *Arizona's*

than the 6-inch M1905 and 8-inch MkVIM3A2 guns being emplaced on Oahu at the time.

Guyer was credited with establishing numerous seacoast gun batteries on Oahu, including four batteries, each armed with two twin-gun 8-inch 55-caliber naval mounts removed from the aircraft carriers *Lexington* (CV-2) and *Saratoga* (CV-3) in early 1942. Guyer, who also initiated both 14-inch naval turret batteries (*Arizona* and *Pennsylvania*), was awarded the bronze star for "meritorious service in connection with military efforts against the enemy." (3)

Arizona's

Because the removal of the turrets began before any consideration was given to their reuse, when their roofs were removed no consideration was given to their reassembly, and no attempt was made to safeguard the integrity of the turret shells, which had been separated into two major components at an extremely fragile location.

The navy's 150-ton heavy-lift floating crane (YD-25) transported Turret 4's faceplate and slide assembly and the aft catapult to Waipio Point for safekeeping in early March 1942. The smaller turret components were removed from the *Arizona*, transported to the Pearl City Peninsula, and taken to a nearby yard and warehouse, where they were set aside for the salvage operation in May 1943. Once ashore the equipment was disassembled completely; then the time-consuming task began - cleaning the small parts of corrosion caused by immersion in seawater for over a year. This included reworking and rewinding electrical motors and completely overhauling the hydraulic systems. The inventory and cataloging of the numerous components essential to the rehabilitation of the turrets was also performed at the salvage yard.(4)

Batteries Authorized by the War Department

In June 1942 the Hawaiian Dept. Engineer (HDE) and representatives of the HSCAC examined potential sites on Oahu after the War Department gave preliminary endorsement to emplacing both 14-inch naval turret (NT) batteries.

Two sites on opposite sides of the island that met criteria imposed by the HSCAC and HDE were eventually selected after extensive surveys. Consideration was first given to emplacing a 14-inch NT battery near the mid-point of the West Coast at Puu Mailiili, south of the sugar-plantation town of Waianae. However, a location further south was ultimately selected, to cover the entire west coast including the Lualualei Naval Ammunition Depot and the south coast from Kaena Point to Diamond Head. The site selected for Battery Arizona was in the Harbor Defenses of Pearl Harbor, at the Waianae Pocket on Kahe Ridge. The 14-inch NT battery at Kahe Point would augment the existing 16-inch gun batteries (Hatch and Williston) at Forts Barrette and Weaver. The battery was finally built between the 268 and 357-foot elevations on the southwest coast of the island, some 492 feet east of the Kahe Point Triangulation Station.

The second site chosen was in the Harbor Defenses of Kaneohe Bay at Moku Peninsula, the joint home of NAS Kaneohe and Fort Hase. Moku Point, between the 250 and 300-foot elevations on the east coast, was to become the location of Battery Pennsylvania.(5)

Batteries Arizona and Pennsylvania were named on October 21, 1942, by a directive from Brig. Gen. Robert C. Garrett, commanding HSCAC. Garrett approved the construction plans for both batteries on May 7, 1943. The adjutant general of the army gave final approval to both projects on August 13, 1943, based on a Hawaiian Dept. letter of May 11, 1943, "Plan for Batteries Arizona and Pennsylvania." Preliminary estimates were that Batteries Arizona and Pennsylvania would probably be finished in nine months; however, the timetable was later revised to 24 to 30 months.(6) Both batteries were of similar design, with slight variations due to the topography at each site.

Kahe Ridge

Battery Arizona was a tunneled complex with only the gun turret and battery commander's station above ground. It was in the District of Ewa and Sub-District of Honouliuli on several plateaus of the southwestern terminus of the Waianae Mountain Range, one of two extinct volcanoes that make up the island of Oahu.

The site was approximately 17 miles west by north of Honolulu and some 3 miles southeast of the village of Nanakuli. The Kahe Military Reservation eventually comprised 955 acres. The lands were commandeered by the theater commander and occupied as of October 26, 1942.

After about 787 acres of leased land were returned to the owner after the war ended, the United States Government made formal application to acquire some 168 acres from the James B. Campbell Estate by condemnation proceedings "for seacoast artillery and other military purposes." (7)

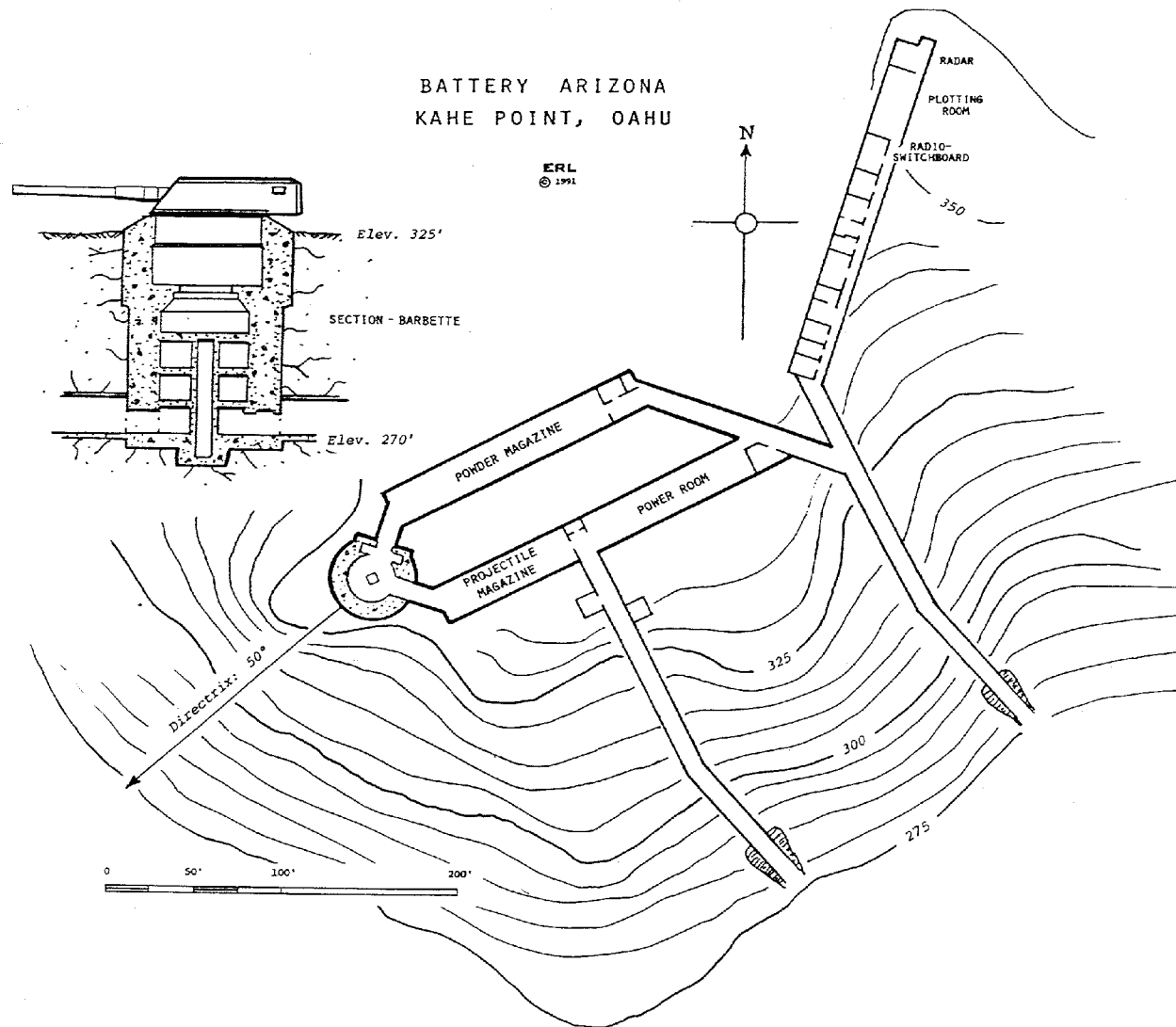
The battery was constructed at the lower elevations of the ridge, in a semi-arid region whose annual rainfall varied from 15-20 inches. The surface was rock land (basalt and red earth) with hardpan subsurface stratum. Vegetation consisted of non-native species of low thorny and other shrubs, mainly Kiawe and Koa Haole with growths of exotic grasses. The ridge eventually linked with Puu Manawahua (elev. 2330 ft), the site of several army installations.(8)

The Hawaiian Dept. had selected the Kahe Point area in February 1941 as a "strong point" to defend against an enemy landing on the West Shore and attacking toward Pearl Harbor and Honolulu from the Waianae Pocket. The coastal plain narrowed at the point, forming a choke point; to thwart any enemy advances down the Nanakuli coast, pre-war plans were drawn up for the 2nd Bn, 35th Inf. Regt., to man rifle trenches, machine gun emplacements, and other defensive works at the point.(9) The Kahe Strong Point was situated in the South Sector of Oahu's two World War Two defense sectors and assigned to the 25th Infantry Division from its organization in October 1941 until it was relieved by the 27th Infantry Division in November 1942.

Design and Construction of Battery

The Hawaiian Dept. was responsible for the design of Batteries Arizona and Pennsylvania, with the design and construction delegated to the district engineer under Work Order No. 600.118-A-89.1.

A number of problems during the salvage operation of Arizona's turrets prompted the Hawaiian Dept. to form a central office under the district engineer, known as the "Project Installation Committee," in March 1943. It included officers from the Corps of Engineer, Signal Corps, Ordnance Department, and HSCAC, plus the US Navy Bureau of Ordnance and the Ordnance and Salvage Sections of the 14th Naval District, Pearl Harbor.(10) Work started on building new parts and repairing major elements of the turrets' components, including rewinding electric motors and converting all AC, pending authorization from the chief of ordnance.(11)



Battery Arizona. Courtesy of E.R. Lewis, from "The Oahu Turrets," *Warship International*, Vol. XXIX, No. 3 (1992).

Work proceeded at a slow pace due to heavy workloads at the Pearl Harbor Navy Yard (PHNY) and other mainland shipyards. It took over a year to produce the turning gear worm and pinion for a single turret. The 14-inch turret projects were further delayed by lack of ordnance technicians thoroughly familiar with reconstruction and reassembly of turrets and 14-inch gun components.

Detailed design and assembly plans for the turrets were not available in Hawaii; the navy eventually furnished a complete set of plans in late 1943. Requests were made to the Navy Bureaus of Ordnance, Ships, and Engineering, as well as the Naval Gun Factory and navy yards on the East and West Coasts for assistance in furnishing parts, additional data, or drawings related to the turrets.(12)

The NAVBUORD sent the commandant of the PHNY ordnance publications, 29 drawings, and two sketches, while the New York Navy Yard furnished 18 drawings pertaining to the turret training gear for the 14-inch turrets.(13) Reviewing the plans, it was discovered that they did not correspond with the actual turrets due to numerous modifications incorporated during or subsequent to the original installations on the *Arizona*.

The design layouts of Batteries Arizona and Pennsylvania were completed by May 1943 after extensive in-depth studies of the functioning of the 14-inch naval turrets by the engineers. Of chief importance were the following criteria:(14)

1. Topography and geologic makeup of the sites.
2. Limitations of the heavy tunneling equipment.
3. Minimum of 40-feet of overhead cover.
4. Design and dimensions of corridors, magazines, power rooms, and operations rooms to insure they would house the shells, powder charges, and equipment.
5. Protection of the radar equipment from the concussion of the guns firing.

Project engineers had to design a central concrete barbette well that extended 70 feet down in rock; this necessitated a redesign of the projectile and powder lifts to accommodate the extra depth. The army engineers' only experience mounting turreted guns was the construction of Fort Drum in Manila Bay, so they called upon the navy for assistance.

By August 30, 1943, the navy's floating hammerhead crane was in position to lift the final section from the *Arizona*, then all the heavy components were ready to be barged to Kahe Point.(15) The barge had to arrive before the northeast trade winds shifted to the south, to avoid high surf that could damage the barge and cargo. The bulky components of the turret, including the turret shells, gun tubes, and slides, were barged some 18.5 miles from Pearl Harbor to a landing prepared by the engineers of the 1st Field Area at the beach near Kahe Point.

A large-scale continuous operation followed the arrival of the turret, gun tubes, and associated components at the beach landing, to avoid high surf. The components were removed from the barge onto the shore, where they were cleaned and given a coat of protective paint.(16)

The turret shell and associated components were subsequently hauled on rollers from the barge landing below the Waianae Coast Road to the battery site some 1.5 miles uphill. A compacted-gravel road ran up from the coast road, and the 71-ton gun tubes were parbuckled uphill.(17) The battery-access road was paved with asphalt-concrete for the last 350 yds. A large stationary steel-girder crane



No. 2 Portal showing ventilator stack and gunite applied to both sides. *Bolling Smith, 2000*

with a heavy-lift boom was erected near the barbette to lift the turret housing, slides, gun tubes, and other assemblies onto the completed barbette.(18)

The Tunnels

Two parallel access tunnels - 176 feet apart on center - were driven northwest into the southeast slope of Kahe Ridge. Drilling tunnels in igneous (volcanic) rocks required:(19)

- Setting up and drilling
- Loading holes and shooting explosives
- Ventilation and removal of dust following an explosion
- Loading and hauling muck
- Removing ground water
- Supporting the roof and sides as necessary
- Reinforcing steel
- Concrete lining

Both portals included thick rectangular reinforced-concrete facades that incorporated vertical ventilator stacks in the top-center of the structure, with inlets facing the ridge. Forced air was to be drawn into the interior through ducts attached to the tunnel ceilings.

The vent stack of Portal No. 1 was shorter than that of Portal No. 2. (Portal No. 1 was the first one on the right of the battery-access road.)

Gunite, a mixture of cement, sand, slag, and mortar, was pressure sprayed on the approaches of both portals to prevent rocks from being dislodged and to preserve the integrity of the slope.

All tunnels in the complex were arched, with floors 270 feet above sea level and vertical sides. The height of the crowns in the tunnels varied from 12 to 18 feet. Tunnels were pressure grouted when pockets of cinders or water seepage was encountered, and lined with thick reinforced concrete. The volcanic rock at Kahe Ridge was chiefly basalt, a dark rock commonly occurring in sheet-like lava flows, and Lualualei soil, an extremely stony clay.

The corridor from Portal No. 1 ran some 60 feet, made a 15° bend to the right, then continued another 102 feet or so to a branch corridor running off to the left at 45°. The original corridor continued for another 60 feet to an air lock fronting the operations tunnel that ran off at 45° to the right, N by E.

The branch corridor connected first with the power room entrance then continued for another 60 feet to the powder room entrance, both rooms at 45° angles to the left of the access corridor.

The power room, about 108 by 20 by 15 feet, was equipped with three 125 KW diesel-driven generators on raised rectangular concrete bases. The exhaust from the diesel engines was routed through three pipes that extended through a vertical shaft in the ceiling, exiting some 60 feet above. Diesel fuel for the engines was in one or possibly two 10,000-gallon storage tanks beneath the floor. Other equipment in the power room included air compressors, evaporative water coolers, pumps, transformers, surge tanks, ventilating equipment, and a large electrical switch panel.(20)

The projectile magazine, about 84 by 20 by 15 feet, was in the western portion of the southern lateral tunnel also occupied by the power room. A small area in the middle of the tunnel, walled off on each end, contained a latrine. The corridor from Portal 2 connected to the southern tunnel at the walled center portion, between the power room on the right and the projectile magazine on the left.



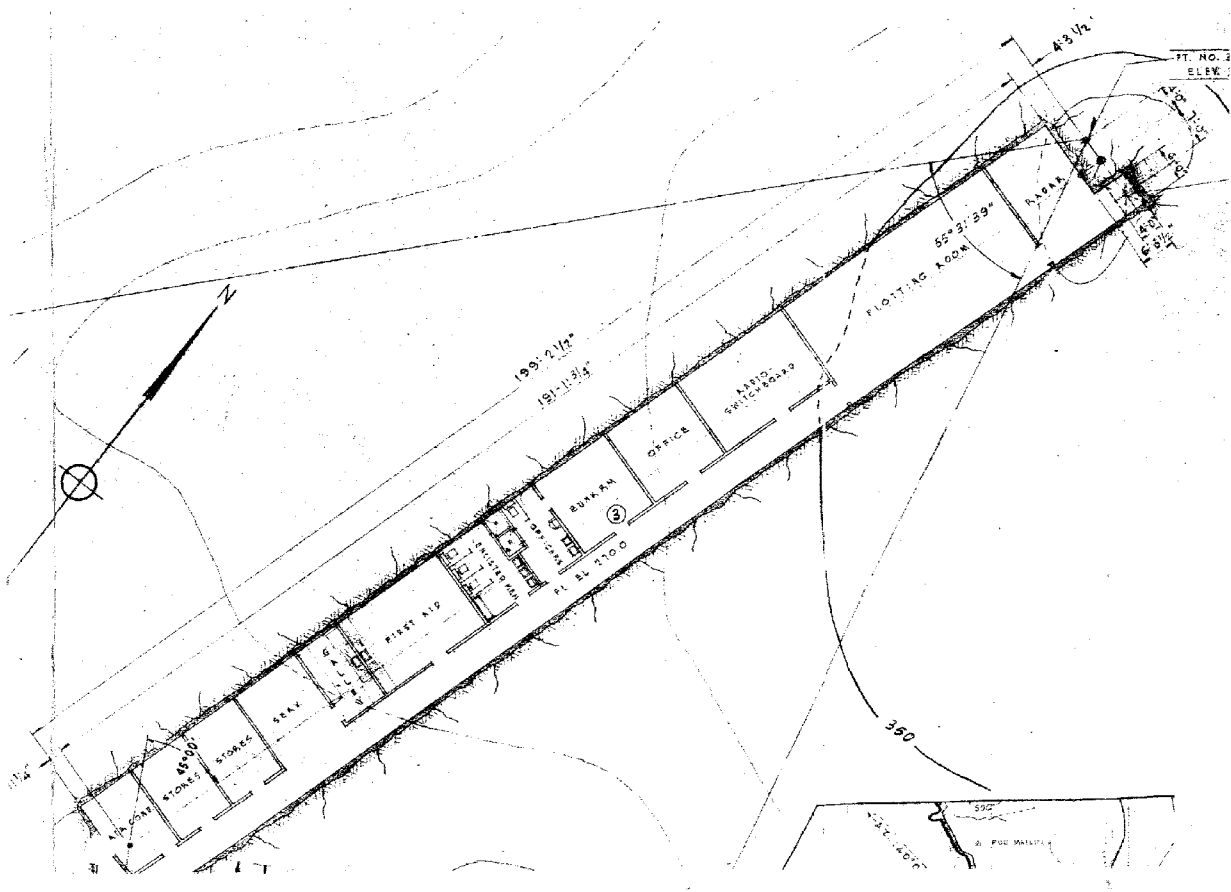
Powder magazine. *B.W. Smith*



Tunnel corridor. *B.W. Smith*



Stairway in barrette. *B.W. Smith*



Operations tunnel. *NARA*

Portal corridor No. 2, about 206 by 10 feet, made a 15° bend to the right after the first 58 feet. Two 12 by 5-foot storerooms were on the right and left, staggered across the tunnel from each other shortly before the junction with the lateral tunnel housing the power/projectile rooms.

The standard battle allowance for 14-inch guns aboard ship was 280 rounds per gun. Lt. Col. Guyer preferred, if feasible, this many rounds in the new shore emplacements, subject to the navy's ability to supply the 1,680 rounds needed for both batteries.(21)

The powder magazine, 147 by 20 by 15 ft, was in a parallel tunnel some 40 feet northwest of the power room/projectile magazine tunnel, accessed by the tunnel from Portal No. 1. A latrine and a store-room were also at the powder-magazine entrance. Powder charges were stored on steel shelves on raised concrete platforms lining the walls of the magazine. The powder charges, 40 inches long and 15 inches in diameter, were stored in cans 4 inches longer and 1 inch wider. The powder and projectile rooms were connected to the barbette by 24 by 10 by 12 ft corridors at 45° from the left ends of the rooms.

No emergency water tank shows on the plans, but a cylindrical 10,000-gallon emergency water tank 28 feet long with a diameter of 8 feet was housed in a separate tunnel at Battery Pennsylvania, and Battery Arizona may have has a similar arrangement.(22)

The operations tunnel, about 204 by 22 feet, included a 5-foot wide passageway running the length of the right side of the tunnel. Housed in this tunnel were rooms for air conditioning, storage (two), galley, first aid, enlisted and officers' latrines, bunks, an office, radio-switchboard, plotting, and radar. A 6 by 4 foot vertical shaft 90 feet high at the northern end of the tunnel connected to the above ground BCS.

Partition walls in the operations tunnel were hollow concrete block and the floors were covered with nine-inch squares of asphalt tile. The dropped ceiling for the passageway had wooden framing; the fiberboard ceiling panels are no longer there, if they ever were.

Barbette

The nucleus of the battery was the barbette: 42.5 feet in diameter and 70 feet deep. To sustain a vertical load of 780 tons and a firing thrust of 2,620 tons, a heavy circular steel foundation ring supported the roller path, with radial webs anchored to the reinforced concrete barbette that ranged from nine to 15 feet thick. The ring was supported and anchored by welding six hundred 1.25-inch-square reinforcing bars to the shell and webs and by a six-inch-wide steel shelf welded around the shell near the bottom.

The barbette contained three service levels; the first two levels were accessed from the powder and projectile magazines 70 feet below ground via a spiral concrete stairway. The top level was reached by a metal ladder through a manhole in the floor of the third level.

Ammunition service was by a pair of naval-style shell skips powered by motor-winches that raised the shells from the floor of the magazine to the shell-loading platform in the turret 45 feet above. The capacity of this room was 105 shells aboard ship; the number was increased to 150 at the batteries. A pair of powder hoists similar to those aboard ship raised the powder bags to the powder handling room, 25 feet above the magazine.(23)

In an April 4, 1943, letter, Maj. Gen. Leroy Lutes, War Department assistant chief of staff for operations, offered the Hawaiian Dept. commander, Lt. Gen. Robert C. Richardson, Jr., 1,000 empty 14-inch H.E. shells for use with the turret batteries. The offer was declined because the navy was unable to supply suitable propelling charges from local sources and there were no facilities in the Hawaiian Dept. for TNT shell loading.(24)

Acting vice CNO, Adm. J.H. Newton, informed the War Department chief of staff that the navy would supply eighty-five 1500 lb. AP shells per gun (a total of 510 shells), with powder and primers

for an initial velocity of 2500 fps, plus fifteen 1275 lb. high capacity (HE) shells per gun (a total of 90 shells) with powder and primers for an initial velocity of 2700 fps. "An additional supply similar to the above types" would be held under the control of the C-in-C, Pacific Fleet.(25)

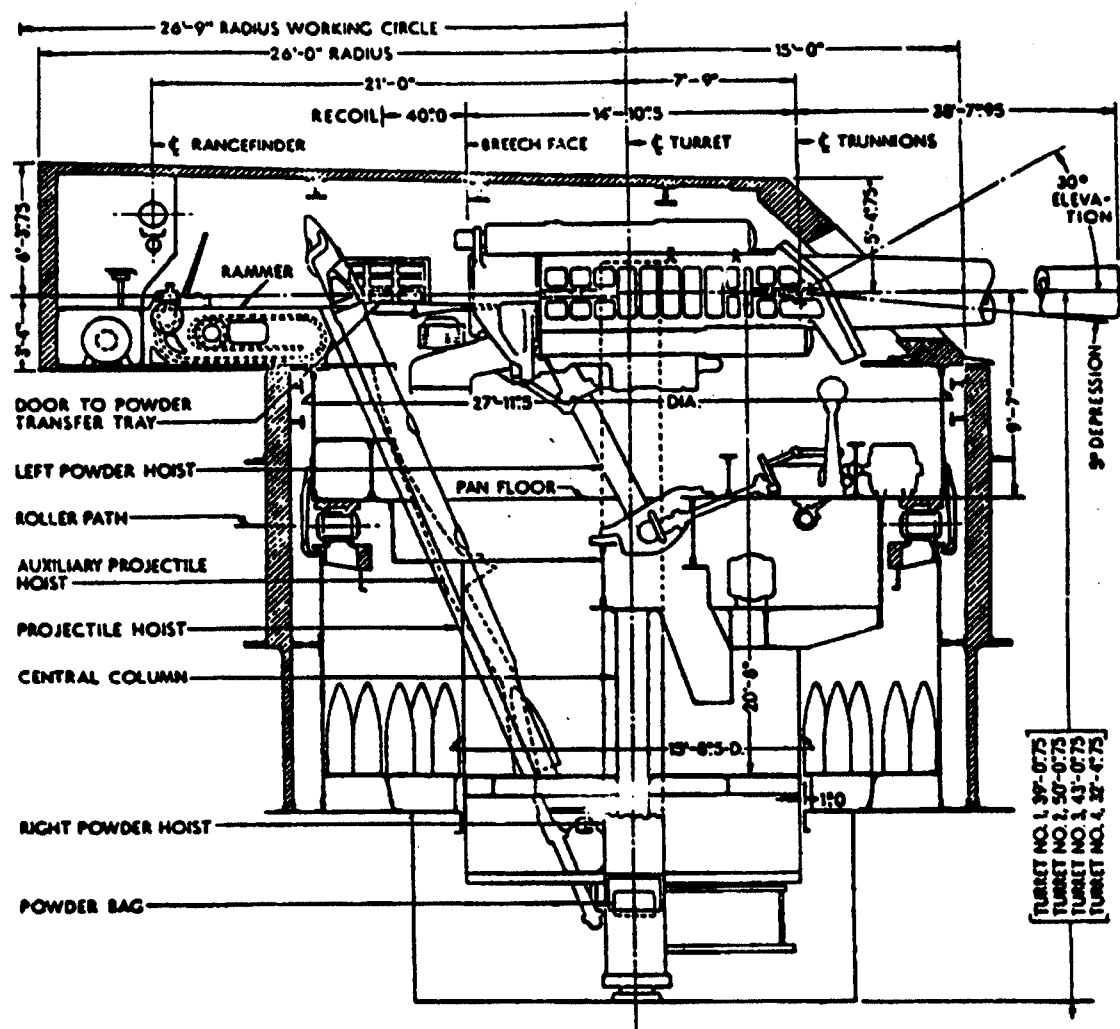
14-inch (356 mm) 45-caliber MkVIII Naval Gun

Weight of gun (incl. breech):	141,000 lbs.
Elevation:	+5° to +30°
Maximum range at 30° elev.:	34,300 yds.(w/ 1500 lb. AP)
15° elev.:	23,000 yds.
Projectile weight:	1,500 lbs. (AP) 1275 lbs. (HE)
Propellant charge:	420 lbs. (4-sections)
Muzzle velocity:	2600 fps (AP), 2735 fps (HE)
Roller path diameter:	27 ft. 1.25 in.

Sources: John Campbell *Naval Weapons of World War Two* "14 in. 45 cal Triple Gun Turret RR 38" The Floating

Dry I

14-IN. 45-CAL., TRIPLE GUN TURRET, 1



14-inch 45-caliber triple-gun turret. *Al Grobmeier collection*



Assembly of turret at Battery Pennsylvania showing heavy-lift derrick. *USAMH*



Completed turret, Battery Arizona. *USAMH*



Concrete footing and heavy-duty mounting bolts. *Author, 2000.*



Barbette ring in October 2000, *Author*

Turret Components

Major components of the turret consisted of the gun tubes, including breech mechanism and yoke; slide and training gear; rollers and roller paths; shell and powder hoists; rammer and spanning trays; and sights. Each gun was fitted with a gas-expelling device. Blowers were installed in the turret for ventilation; sprinklers for fire protection were installed in both the turret and the powder handling room.

Elevation was by hand-wheel, powered by electric and hydraulic motors through the Mk. 2 Mod. 4 Waterbury (Tool Co.) elevating gear. An electric motor and universal speed gear powered the Waterbury

training gear to train the turret in azimuth. The shipboard auxiliary training gear, a low-voltage electric motor powered by storage batteries in the revolving structure of the turret in case of power failure, was probably retained in the shore mounting.(26)

Command and Fire Control

Shortly before December 22, 1942, Lt. Col. Guyer and Lt. Cdr. Langley discussed the Arizona's antiquated optical fire control equipment and decided the equipment was outdated and not feasible for use ashore. The standard coast artillery fire control system was to be installed in conjunction with the 14-inch turret batteries, including base end stations equipped with azimuth instruments and/or depression position finders (DPFs). Both Mk XXXIII Mod 1 26.5 ft rangefinders (Ser. Nos. 38 and 39) of Turrets 3 and 4 were removed in May 1942 and placed in storage at the PHNY.(27)

Battery Arizona's splinterproof battery commander's station (BCS) included an adjacent radar room. It was built some 415 feet to the rear and above the gun turret at the 357-foot elevation, to avoid damage to the SCR-296A gun-laying radar from the blast of the guns.

The rectangular reinforced-concrete structure consisted of two single fire control stations, one above the other, with the radar operations room at the rear of the upper-level battery commander's station. Both stations included roof overhangs that extended out the front and both sides, with rounded corners at the front; each roof was covered with earth.

The lower observation station protruded forward of the upper-level station and was excavated below grade. The lower observation room was entered by a short flight of concrete steps that descended below grade to a steel-plate door at the northeast corner of the structure.

In the observation room a DPF pedestal was bolted to an octagonal concrete pier on the center-front of the concrete floor. The room, painted dark maroon, was equipped with an 18-inch-high horizontal slit that ran the lengths of the front (south) wall and both shorter sidewalls (east and west). Steel shutters hinged to the outside wall of the slit opened downward. At the right rear (NE) corner of the observation room was a three-foot-square opening in the floor for the vertical 90-foot shaft to the operations tunnel, with six 15-foot steel ladders that arrived at landings, each alternating from the ladder above.(28)

Five concrete steps led from the northeast corner of the lower observation room up to a concrete landing. A few concrete steps on the left of the landing accessed the battery commander's level; a pipe railing on the east side prevented accidental falls. The single room, also painted dark maroon, was equipped with an octagonal concrete instrument pier on the center-front of the floor. The horizontal slits, similar to the lower level, had similar shutters.

Adjoining the rear (north) wall of the battery commander's room was the room housing the SCR-296A radar transmitter, receiver, and associated equipment. The roof of the radar room was covered by earth to conform to the terrain. On the roof of the upper-level rooms, four large concrete piers supported the SCR-296A radar antenna platform and the separate IFF (Identification Friend or Foe) RC 136 antenna.(29)

The SCR-296A radar set was previously mounted on a 100-foot steel tower in support of Battery Haleiwa (four 8-inch M1888 Ry guns) on Oahu's north shore prior to being relocated to Battery Arizona. Rough target ranges and azimuths were to be provided by an SCR-582 radar atop Puu Manawahua and from other SCR-296A radars along the south and west coasts of Oahu at Batteries Hulu, Hatch, Williston, and Salt Lake.(30)

SCR-296A radar antenna arrays were usually mounted atop 100-foot steel towers, encased by cylindrical wooden housings designed to resemble water tanks, although at several elevated locations in Hawaii the antennas were mounted on 25-foot steel towers or directly atop battery commander's stations.(31)



Battery Arizona's BCS showing closed shutters and mounting piers for SCR-296A radar. *Author, 2000*



Interior of the BCS showing concrete pier for DPF pedestal. *Bolling Smith*

Under a "Modernization Program," an endeavor was made in June 1944 to acquire 20 AN/MPG-1 fire control radar sets to equip 18 seacoast batteries on Oahu, with two sets held in reserve. Batteries Arizona and Pennsylvania were slated for the upgraded fire control system under Project No. CP-21, but there is no evidence these set were ever installed.(32)

In a study dated May 31, 1945, the 2274th Hawaiian Seacoast Artillery Command, successor to the HSCAC, decided that the seacoast batteries to be retained to defend Hawaii should be equipped with AN/FPG fire control radars. AN/FPG-1 radar was to equip the 6-inch SBC and 8-inch NT batteries, all others were to receive AN/FPG-2s. Batteries Arizona and Pennsylvania were slated for the AN/FPG-2 radar to replace their SCR-296A sets.(33)

A network of base end stations on the west and south shores of Oahu was scheduled to provide target data to the battery:

- B1-S1 - Station "S" at Kaena Point
- B2-S2 - Station "S" at Kepuhi Point
- B3-S3 - Station "U" at Puu-o-Hulu
- B4-S4 - BCS
- B5-S5 - Puu Makakilo
- B6-S6 - Station "C" on the north rim of Aliamanu Crater(34)

Progress Report on the 14-inch Turret Batteries

In a December 6, 1944, memorandum to the engineer, U.S. Army Forces Pacific Ocean Area, Captain H. Perlis, chief, Special Installations Division, reported Batteries Arizona and Pennsylvania "practically completed." The remaining work consisted of Signal Corps wiring and completion of the ceilings, which were delayed pending arrival of the plotting boards. Perlis soon announced the plotting boards had arrived and after installation all final details of the project would be complete except for the installation of the turrets. Battery Pennsylvania's turret installation was 50% completed and Battery Arizona's foundation ring was in concrete in the barbette.(35)

The rollers and roller paths of Turret No. 3 slated for Battery Arizona were severely pitted and no replacements were available. BUORD considered it highly desirable that the PHNY attempt to refurbish the rollers and roller paths following guidelines forwarded by BUORD.(36) The PHNY completed milling the lower roller path and the upper roller path of the upper turret section. The gun slide, recoil, and counter-recoil cylinders, top and side armor plate, ventilating ducts, and 11 exposed portions of the upper and lower turret had been completely overhauled and were ready for installation in the barbette as soon as the PHNY completed the rollers.

The upper section of Battery Arizona's turret would be installed as soon as the rollers were in place, then the upper and lower turret sections would be welded together. Captain Perlis estimated Battery Pennsylvania would be completed by September 1, 1945, and Battery Arizona by January 1, 1946.(37)

Construction Halted

Battery Arizona's construction was halted on August 1, 1945. Although the turret and guns had been mounted, the battery still lacked some components of its SCR-296A radar. It was not probable that it was turned over to the coast artillery and manned.(38) In 1944, Army Ground Forces had scheduled Batteries Arizona and Pennsylvania to be manned by four officers and 157 enlisted men each when completed. However, work on the batteries slowed considerably.(39)

Battery Arizona was subsequently placed in caretaker status and by 1948 the battery had been abandoned. The heavy guns at Kahe Point were never proof-fired, unlike those of its sister Battery Pennsylvania, and were eventually cut up for scrap.

155 mm GPF Battery

Kahe Point was also an alternate position for four 155 mm M1918 GPF guns on Panama mounts, established in the late spring of 1942. Named Battery Kahe by the HSCAC on June 12, 1942, it was assigned to the Hulu Group (Puu-o-Hulu Military Reservation). Battery B, 55th CA Regiment, manned the battery until they were withdrawn to participate in the Saipan Operation in the latter part of 1943.

The battery site was unoccupied until Battery B, 48th CA Regiment, arrived on May 6, 1944, and manned it sporadically until they too were withdrawn for service in the Western Pacific. It is believed that the battery remained unmanned after the departure of Battery B and the site was no longer maintained.⁽⁴⁰⁾ The only coordinates given for the location of the battery were 86.8 - 77.5.⁽⁴¹⁾

Postwar Use of the Battery

After the war, Battery Arizona was used for a time by civil defense authorities as a command post and evacuation shelter; the complex has not been used since then. Vandals entered the subterranean tunnels and started a fire in the power room prior to a 1991 inspection by a Corps of Engineers DERP/FUDS inspection team.

Concluding Remarks

Access to the site is restricted by a gated entrance to the municipal landfill at Waimanalo Gulch, which occupies parcels northeast, south, and east of the existing battery complex. The Hawaiian Electric Company owns the land on which the BCS and turret barbette are situated, known informally as "Electric Hill."

The extant structures, with the exception of the fire damage to the power room, remain in a state of disrepair ranging from fair to good condition. The exact location of Battery Kahe is not known, therefore, it is not known whether any remains are extant.

Acknowledgements

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Endnotes

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3. "Biography of Brigadier General Lawrence M. Guyer, USAF," < http://www.af.mil/bios/bio_5310.shtml>, Feb. 20, 2001.
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8. Puu Manawahua was the site of the Barrette Group CP, which controlled Batteries Williston and Hatch's 16-inch guns plus Battery Closson's two 12-inch guns; Fire Control Station "A" with four stations that supported the Brown's Camp RY battery, Battery Salt Lake, BCN-303, and BCN-304; a dummy AWS radar station; an SCR-582 radar station; and AAIS O.P. No. 12.
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13. Chief BUORD to commandant, Navy Yard, Pearl Harbor, T.H., "Ex-Arizona - Turrets 3 and 4 - Gun Fire Control and Optical Cards," June 2, 1943, U.S. Army Museum of Hawaii (USAMH). Commandant, Navy Yard, N.Y., to commandant, Navy Yard, P.H., "BB39 (Ex Arizona) Turret Training Gear - Forwarding Plans of," October 8, 1943, USAMH.
14. HRCOE, p. 328.
15. Ibid, p. 329.
16. U.S. Engineer Office, Honolulu, T.H., Inter-Office Memo Slip, Area Engineer to OPA, 1st. Ind., August 25, 1943, HDE.
17. Lewis and Kirchner, p. 288.
18. Historical photographs taken during construction of Battery Pennsylvania depict a heavy-lift guyed derrick built at the site to lift the heavy components, along with a dismounted mobile crane. It is assumed that such an apparatus was built atop a series of concrete slab footings and large mounting bolts some 2-1/2 to 3 feet high found several yards northeast and southeast of the barbette at Battery Arizona during a site examination in October 2000.
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20. Ann Yoklavich, U.S. Dept. of Interior, National Register of Historic Places - Registration Form, "Battery Pennsylvania," July 1992, Sec. No. 7, p. 6. (Hereafter: NRHP-RF, Battery Pennsylvania.) - "The drawings show that there were two large fuel tanks of a large diameter under this room."
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22. NRHP-RF, Battery Pennsylvania. Measurements are for the water tank at Battery Pennsylvania; Battery Arizona's tank was probably similar.
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