NAVAL AIR STATION KANEOHE, ADMINISTRATION AND OPERATIONS BUILDING
(U.S. Marine Corps Base Hawaii, Kaneohe Bay, Facility 215)
E Street between 3rd and 4th streets
Kaneohe
Honolulu County
Hawaii

HABS HI-311-P
HABS HI-311-P

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

FIELD RECORDS

HISTORIC AMERICAN BUILDINGS SURVEY
National Park Service
U.S. Department of the Interior
1849 C Street NW
Washington, DC 20240-0001

HISTORIC AMERICAN BUILDINGS SURVEY

U.S. NAVAL AIR STATION KANEOHE, OAHU, ADMINISTRATION AND OPERATIONS BUILDING (U.S. Marine Corps Base Hawaii, Kaneohe Bay, Facility 215)

HABS No. HI-311-P

Location: E Street between 3rd and 4th Streets
Marine Corps Base (MCB) Hawaii, Kaneohe Bay
Honolulu County, Hawaii

U.S.G.S. Mokapu Point quadrangle, 1998
7.5 Minute Series (Topographic) (Scale – 1:24,000) NAD83 datum.
Universal Transverse Mercator Coordinates: 04.628510.2371690.
Lat. / Long. Coordinates: 21°26'35.05" N 157°45'35.45" W

Date of Construction: 1941

Designer: Albert Kahn, Inc., Detroit, Michigan

Builder: Contractors, Pacific Naval Air Bases

Owner: U.S. Marine Corps

Present Use: Offices

Significance: Facility 215, Administration and Operations Building, is significant for its association with U.S. Naval Air Station (NAS) Kaneohe and its role before the onset of World War II (WWII) in the Pacific. It was one of the primary buildings during the establishment of the U.S. Naval Air Station Kaneohe and headquarters for the station commander. The building contained the offices for numerous important administrative and communication functions of the station. The ca. 1939 building is also significant as a part of the original design of the station. In addition, Facility 215 at Kaneohe, along with forty-three other facilities there, is significant because it embodies distinctive characteristics of building types in this period that were designed by the notable architectural firm of Albert Kahn, Inc. of Detroit, Michigan. The founder of the firm, Albert Kahn, is renowned as the foremost industrial architect of the twentieth century.

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Date of Report: 2015

HISTORICAL CONTEXT

Background of Military Development on the Mokapu Peninsula

Mokapu Peninsula is the most prominent peninsula on the Windward side of Oahu, dividing the waters of Kailua and Kaneohe Bays. It is geologically distinctive, with fishponds at its inland boundary, where the peninsula joins the main body of Oahu. Towards the peninsula's northern or seaward end, there are three promontories or hills, named Pyramid Rock, Puu Hawaiiloa, and Ulupau. The special features of the peninsula, including its outstanding beaches and marvelous views towards the Koolau Pali (cliffs), have been recognized since its earliest settlement. In the late 1930s, prior to the establishment of NAS Kaneohe, the peninsula contained uses such as aquaculture, summer cottages, pastures, papaya cultivation, and other farming pursuits, including a "bird farm" owned by the Territory engaged in "the propagation of pheasants."[1] The U.S. Army controlled the land on the eastern side of the peninsula.

U.S. Army on Mokapu Peninsula

The first name for the Army installation on the east side of the peninsula was Kuwaaohe Military Reservation; the name became Camp Ulupau in 1940, and then Fort Hase in 1942. President Woodrow Wilson's signing of Executive Order No. 2900 established the reservation on July 2, 1918 and set aside 322 acres of public land on the Mokapu Peninsula for military use. In 1927, the Oahu contingent of the Army's Coast Artillery Corps, based at Fort Kamehameha since 1908, established a coast defense position at Ulupau on Kuwaaohe Military Reservation. This consisted of two 240mm howitzers in modified M1918 mounts.[2]

The original two howitzers here had a circuitous route to their installation at Ulupau. It began after WWI, when the Army expanded its ideas of how the Coast Artillery units of Fort Kamehameha should be protecting Pearl Harbor. Army planners realized that in addition to providing protection against a naval bombardment of Pearl Harbor, it was also necessary to prevent enemy forces from landing anywhere on Oahu. This was to thwart a possible land attack on the naval base.[3] In 1922, upon the signing of the Washington Naval Treaty, the U.S. diverted twelve 240mm howitzers to Hawaii from shipments originally bound for the Philippines. Article XIX of the treaty prohibited new fortifications or upgrading of coastal defenses of U.S., British, and Japanese bases in their small island territories in the Pacific. The treaty allowed expansion at the U.S. bases in Hawaii, Alaska, Panama Canal Zone, and the mainland.

The howitzers were on board the USS *Wheaton* in February 1922. Shortly after the ship passed through the Panama Canal, in route to the Philippines from Aberdeen Proving Ground, MD, President Harding ordered the shipment stopped. The *Wheaton* sailed to Honolulu Harbor and on February 16, 1922 landed the howitzers, which went into Army storage near Aliamanu Crater. This windfall of large guns prompted Fort Kamehameha's 55th Artillery, Coast Artillery Corps, to adapt them for use in Oahu's defense. They emplaced the diverted howitzers at various elevated positions around Oahu, including the two at Kuwaaohe (Ulupau) to cover the approaches to likely landing beaches.[4]

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[1] "History of the Naval Air Station Kaneohe Bay, Territory of Hawaii August 1, 1939 to August 1, 1945" (Typescript at National Archives, San Bruno, CA in RG 181/NAS Kaneohe, accession # 181-58-3158, box 1 of 1) [1945]: p 16.

[2] Mark Berhow, ed., *American Seacoast Defenses, A Reference Guide* (Bel Air, MD: Coast Defense Study Group Press) 1999: pp. 327 & 280.

[3] William H. Dorrance, *Fort Kamehameha, The Story of the Harbor Defenses of Pearl Harbor* (Shippensburg, PA: White Mane Publishing) 1993: p. 108.

[4] William C. Gaines, "240mm Howitzers on Oahu, 1922-1944," *Coast Defense Journal*, November 2002: pp. 5-6.

In 1927, batteries with mounts for these howitzers were set up, the first at Kaaawa in April, and the other at Ulupau on the Kuwaaohe Military Reservation in May. The two howitzer mounts at Kuwaaohe were located at the foot of the outer west rim of Ulupau Crater, less than ¼ mile from the shore. The remaining batteries of howitzers were established in 1929 and early 1930s at Oahu locations ranging from Waimanalo to Makua.[5] The actual howitzers were in storage, with the mounts in place at the batteries. When needed, the Army would tow them the batteries and set up to fire in less than two hours. The 2nd Battalion, 55th Coast Artillery was responsible for the howitzers on windward Oahu. This would have been the Army unit stationed at Kuwaaohe Military Reservation during the 1920s and 1930s.

The modified M1918 mounts constructed for these howitzers were adapted from mobile mounts. The emplaced construction consisted of a sunken slab of concrete with an approximate 4' thick ring of concrete (about 23'-4" in diameter) at grade. At the center of the ring was a circular, grade-level concrete pedestal with a centered pintle for rotation of the gun platform. The trailing edge of the gun platform rode in circular steel tracks that were set in the concrete ring.

By the mid-1930s, the installation of the 16-inch Coast Artillery guns at Battery Hatch (in Fort Barrette, at Puu Kapolei) and the use of 8-inch railway guns on Oahu made the 240mm howitzers redundant for coastal defense. The Army issued orders to dismantle the existing 240mm batteries on May 5, 1939. They stripped metal parts, such as steel tracks, for re-use. The remaining concrete portions of the circular mounts of the 240mm howitzer battery at Kuwaaohe were "broken up and bulldozed away in early 1992 to provide space for family housing."[6]

Between WWI and WWII, ranchers leased some portions of the Kuwaaohe Military Reservation.[7] About 1939 Army usage at Kuwaaohe began to increase in anticipation of war. Although the Army did not man the former 240mm howitzer battery, they formed various coast artillery batteries and activity increased at the installation. From 1940 to 1941, the military reservation had a different Hawaiian name -- Camp Ulupau. The change in 1942 to Fort Hase honored Major General William F. Hase (b. August 31, 1874, d. January 20, 1935). He was the Chief of the Army Coast Artillery Corps from 1934 until his death. He received the Army Distinguished Service Medal for his service in France during WWI.

Fort Hase was the headquarters for the Army's Harbor Defenses of Kaneohe Bay (HDKB), created ca. 1940 to defend NAS Kaneohe. In 1941, East Beach Battery (four mobile guns – probably 155mm) was set up in Camp Ulupau/ Fort Hase in the Ulupau Crater. In 1942 a new set of emplacements, called Battery East (four Panama-mount 155-mm guns), replaced the mobile guns. The Army also established two other batteries at Fort Hase in 1942: Battery Puka (three 3-inch guns), on the south side of Ulupau Head, and Battery Kii (two 3-inch guns), on the north side of Ulupau Head.[8]

In addition to the above batteries that were located within Fort Hase, HDKB included several casemated batteries of medium and large guns:
Battery 301 (Battery French), two 6-inch guns located at NAS Kaneohe (1944).
Battery 302 (Battery Cooper), two 6-inch guns located at Kualoa (1944).
Battery 405 (Battery Demeritt), two 8-inch guns sited at the base of the Mokapu Peninsula (1944).
Battery Pennsylvania, three 14-inch naval guns located at Ulupau Head (1945).

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[5] Gaines, "240 mm Howitzers": pp. 9 & 12.

[6] Ibid.: p. 25.

[7] United States Marine Corps, "Marine Corps Base Hawaii," on website www.mcbhawaii.marines.mil/Units/SubordinateCommands, accessed May 22, 2014.

[8] "Fort Hase," Harbor Defenses of Kaneohe Bay, on website www.northamericanforts.com, accessed on May 22, 2014.

The 41st Regiment of the Coast Artillery Corps, stationed at Fort Hase, administered all of these batteries. This regiment was organized at Fort Kamehameha in December 1922 as a railway unit of the Coast Artillery Corps. In July 1924, the railway designation was removed, and the unit was inactivated in June 1931. On April 21, 1942 the Army reactivated this regiment and transferred it to Fort Hase to serve as Headquarters Regiment for the HDKB.[9] The 41st Regiment remained at Fort Hase until May 25, 1944 when it was mostly disbanded, except for three personnel units, also called batteries (A, D, and G). On August 13, 1944 Battery A was redesignated as the 831st Coast Artillery Battery.

In 1943, Fort Hase was in its heyday. Its boundaries ran approximately along the current alignments of Mokapu and Lawrence Roads, from their intersection and extending to the coastlines near the south end of Fort Hase Beach and the east end of Heleloa Beach. That year, the majority of the Fort's buildings were located on a series of grid-pattern streets that occupied an area, measuring about ½ mile (east-west) by ¼ mile (north-south), just north of Mokapu Road. Four east-west oriented streets, intersected by six north-south streets, divided this area into blocks containing a total of approximately160 buildings. The center appeared to be a billeting area of Quonset huts or other temporary structures or tents, with warehouses, offices, shops or other ancillary buildings at the north and west sides. On August 10, 1945, the guns of Battery Pennsylvania were test fired. This battery was a barbette carriage containing three guns in a naval turret salvaged from the USS *Arizona*, sunk at Pearl Harbor on December 7, 1941. At an unknown date after WWII, the Army scrapped the guns and turret.[10]

After WWII ended, Fort Hase "became a skeleton outpost" for the Army. It remained under Army jurisdiction until 1952 when the land became part of Marine Corps Air Station Kaneohe.[11] By 1956, virtually none of the ca. 1943 buildings of former Fort Hase within the grid-pattern streets remained. At that time, the streets still existed (named Irwin, Middaugh, MacLachlan, Lambrecht, Harris, Platt, Cushman, and Pennsylvania) and a few new buildings were located there.[12] By 1958, the Marine Corps approved removal of the north portion of the street grid, to allow a new street configuration for a housing area.

Development of NAS Kaneohe and Activities During WWII

Construction of NAS Kaneohe started in September 1939 under Navy contract NOy-3550 awarded to Contractors Pacific Naval Air Bases (CPNAB), a consortium of firms that joined to build naval bases under the recommendation of the Hepburn Board. The initial design for NAS Kaneohe was to support five seaplane patrol squadrons. The first work was dredging seaplane lanes and using the spoils to fill shallow bay areas (about 280 acres total of filled land)[13] for building sites. Extensive dredging of Kaneohe Bay and its entrance channel enabled ships and seaplanes to utilize the bay, and, of equal importance, provided the large amount of fill needed to enlarge the buildable area of Mokapu Peninsula. Dredging accounted for most of the work accomplished during the first year of base construction.

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[9] Dorrance, *Fort Kamehameha*: p. 123; and "41st Field Artillery Brigade," on website www.military.com, accessed on May 23, 2014.

[10] E. R. Lewis and D. P. Kirchner, "The Oahu Turrets," *Warship International*, Vol. XXIX, No. 3(Toledo, OH: International Naval Research Organization, Inc.) 1992: p. 299.

[11] "Map of U.S. Naval Air Station Kaneohe Bay, Oahu Showing Conditions on 30 June1951," #OA-N1-2198, 1951. And "U.S. Marine Corps Air Station Kaneohe, General Development Map, Existing and Planned Pre-M Day, Station Map," #311734, August 6, 1951.

[12] "U.S. Marine Corps Air Station Kaneohe Bay, Demolition & Removal of Surplus Buildings, Location Plan," #731562, May 8, 1956.

[13] "History of the Naval Air Station Kaneohe Bay": p. 15.

(Dredged materials here totaled over 11 million cubic yards during WWII.) The Navy acquired the approximately 2,108 acres of land, tidal areas, and fishponds that became NAS Kaneohe by various means. An Executive Order by Hawaii's governor transferred the Territory's 346-acre, game-bird farm to the U.S. Two small parcels owned by H. K. L. Castle, called the Mokapu Rifle Range and Mokapu Recreation Beach, were leased. The military obtained most of the area through a "declaration of taking in accordance with the First War Powers Act," from Mr. Castle and other private owners.[14]

The construction of shore facilities progressed as fast as the filling of the land. The first structures authorized were a hangar and four seaplane ramps, underground fuel storage, magazines, six shop buildings, radio station, power plant, barracks, officers' quarters, two recreational buildings, bakery, mess hall, laundry, dispensary, and administrative facility (Facility 215). About September 1940, the Navy awarded another contract (NOy-4173) to CPNAB for additional work, a great expansion of previously authorized construction. The added scope of authorized construction at NAS Kaneohe included five hangars (the floor area of the original hangar tripled), one new seaplane ramp, additional fuel storage, increased dredging, more magazines and storage facilities, a rifle range, a gunnery school, further training and shop buildings, plus a landplane runway.[15] Many buildings required the use of pile foundations driven into the filled ground. Construction of roadways involved clearing the underlying muck and adding a base course of coral fill.[16]

In December 1940, the only buildings completed were two barracks.[17] Despite its unfinished state, the commissioning of NAS Kaneohe took place on February 15, 1941. Before completion of the landplane runway, on July 8, 1941, the station could only accommodate amphibious aircraft. Dredging of the ship channel into Kaneohe Bay was finished in the summer of 1943, which meant that ships no longer had to traverse the narrow pass south of Coconut Island to reach the station wharf. The initial construction at NAS Kaneohe was largely accomplished under the two contracts (NOy-3550 and NOy-4173) awarded to CPNAB. Work under these contracts extended from 1939 through the end of March 1943. Navy Construction Battalions took over construction at the station on April 1, 1943.

"Practically all [major] structures for this station, under contract NOy-3550, were designed by Albert Kahn Associates, Inc."[18] Kahn maintained his office in Detroit and was one of the most important industrial architects in America during the early 20th century. His firm's industrial designs are noted for the pioneering use of reinforced concrete and for maximizing natural lighting and ventilation, by utilizing continuous bands of windows and roof monitors. His firm was among the first to design with long-spans steel trusses that yielded expansive floor areas free of columns and posts. Kahn's firm was also an early advocate of the use of steel-sash windows in concrete-framed buildings. See sections following for additional context about the architectural practice of Albert Kahn and his firm's work in the Hawaiian island chain.

On Sunday December 7, 1941, NAS Kaneohe and Wheeler Army Air Field were the first military installations attacked by Japanese aviators. The enemy planes arrived at Kaneohe several minutes before the ones attacking Pearl Harbor. The attack did not damage the two hangars that were under construction

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[14] "History of the Naval Air Station Kaneohe Bay": pp. 16-17.

[15] CPNAB, "Technical Report and Project History, Contracts NOy-3550 and NOy-4173" (microfilmed typescript, Naval Facilities Engineering Command Library) [1946]: pp. A-529 & A-530.

[16] "History of the Naval Air Station Kaneohe Bay": p. 19.

[17] Ibid.: p. 24.

[18] CPNAB: p. A-542. [Note that firm name in 1940s was Albert Kahn Associated Architects and Engineers, Inc.]

on that date.[19] However, Japanese planes almost completely destroyed Hangar 1 (Facility 101). CPNAB later reported that:

> During the attack on Kaneohe, bombs burst on the roof and on the floor of hangar No. 1; 50-calibre ammunition and planes were set on fire. The wood used in construction of the two-story leantos [sic], and in the roof deck, added fuel to fires which caused more damage to steel framework than did the bomb bursts. The steel was warped by the fire, pierced by bomb fragments and exploding ammunition.[20]

The attack concentrated on the hangar and landing ramp area. The Japanese planes strafed other areas and moving automobiles, but they did little damage to the station's supply facilities. The strafing and bombing damaged nearly all of the aircraft on the ground or in the water at the station – reports noted 33 destroyed. Only three aircraft, which had been in the air at the time of the attack, remained serviceable.[21] As early as three days after the attack the officers and station administrators began discussing plans to increase the capacity of NAS Kaneohe in anticipation of the "large numbers of flight personnel expected to arrive in the near future."[22]

The burial of seventeen persons killed at NAS Kaneohe during the attack was on Monday, December 8. The bodies of two more seamen who died in the attack washed ashore on December 12. The attack had taxed the medical facilities available at the station. The dispensary "proved inadequate to care for the 75 wounded who required hospitalization" so 40 of the patients were transferred to the "Territorial Hospital for the Insane" in Kaneohe, the nearest medical facility to the station.[23]

Immediately following the attack, CPNAB interrupted their ongoing construction projects to address repairs to damaged buildings and to assist the Fourteenth Naval District with a defensive construction program. They built new splinterproof and bombproof buildings across all Navy installations, including NAS Kaneohe, in preparation for a possible follow-up attack. CPNAB also had to adjust their projects at Kaneohe in response to available materials. "In order to conserve critical materials, the later buildings – i.e., specifically the personnel facilities [at NAS Kaneohe], were constructed of wood instead of the originally-planned concrete."[24]

Fears of an imminent follow-up attack subsided after several days had passed, but mistrust of Japanese civilians in the Kaneohe area prompted searches of their property. Because the station obtained much of its fresh produce locally, Intelligence staff suggested that the food supply of the station could be in jeopardy from poisoning by local Japanese saboteurs.[25] Searches of homes and interrogation of occupants continued in the area as late as February 1943.

Although NAS Kaneohe did not see any combat action after December 7, 1941, its role in supporting naval aviation in the Pacific during the war resulted in numerous aircraft accidents and fatalities for the fliers using the station. During the war, over 100 aircraft accidents in the station vicinity claimed 163 lives. About 40 percent of the downed aircraft were salvaged from under water and 165 men rescued

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[19] "History of the Naval Air Station Kaneohe Bay": p. 42.

[20] CPNAB: p. A-546.

[21] "History of the Naval Air Station Kaneohe Bay": pp. 76 & 40.

[22] Ibid.: p. 51.

[23] Ibid.: pp. 53 & 123-124.

[24] CPNAB: pp. A-544 & A-545.

[25] "History of the Naval Air Station Kaneohe Bay": p. 56.

alive after the crashes. During the first few months of the war, the rescue crash boats had no radios, which complicated rescue efforts.

From the June 1942 Battle of Midway through the remaining years of the war, the front lines of fighting in the Pacific remained far west of Kaneohe. During these years, NAS Kaneohe performed vital duties in "supply, assembly and repair of aircraft, training, and the provision of accommodations for Fleet Activities quartered here."[26] By the spring of 1943, the Navy projected that another attack on NAS Kaneohe was highly unlikely; at this time security staff at the station discontinued camouflage preparation and bomb shelter upkeep. However, staff maintained decontamination stations because they were useful for training personnel headed to the front.[27]

Departments supplying aviation materials tried to make available stocks go as far as possible during the war. For instance, NAS Kaneohe Supply Department had to request parts for the carrier-based F4F Wildcat fighter from the aviation supply depot at Pearl Harbor, as needed. This tight availability of spare parts led pilots of grounded planes to begin removing needed parts off any Wildcats damaged while practicing carrier landings on the mat at Kaneohe. The pilots "swarmed over the wreck like vultures stripping off…whatever they needed to put their own planes back in the air."[28] When the supply department received the aircraft to begin salvaging parts for disposition, there was often little remaining. This situation did not continue long before directives prohibited that practice of pilots stripping the planes. Then the supply department was able to take custody of the aircraft, salvage and recondition its parts, and redistribute them.

The Assembly and Repair (A&R) Department for aircraft was another important function of NAS Kaneohe during the war, functioning to overhaul and repair aircraft engines and accessories. Serving to relieve the swamped A&R department at Pearl Harbor, it started operation in July 1942 with equipment diverted from proposed A&R facilities at Wake Island and Cavite, Philippines, since the Japanese had captured those U.S. naval installations. Through September 1943, the department operated primarily in temporary buildings, probably Quonset huts. On the 28th of that month, the engine overhaul building (Facility 373) was completed and the department began to overhaul Pratt & Whitney R-1830 engines. This engine was a very important part of combat aviation during WWII. It was the power plant for several widely used aircraft: the B-24 Liberator bomber (the principal bomber in the Pacific theater during most of the war), the C-47 Skytrain transport (used as a troop carrier in the Pacific), the F4F wildcat fighter (a primary carrier-based Navy and Marine fighter used during the war), and the PBY Catalina flying boat (a patrol aircraft based at Kaneohe and in use throughout the Pacific). In March 1944 the station was designated the Hawaiian area overhaul center for the R-1830 engine by the Bureau of Aeronautics.[29] In July of that year, the A&R department was designated Hawaiian area overhaul center for Curtis electric propeller synchronizers, used on the F4F wildcat and some PBY Catalina aircraft.

The training component of NAS Kaneohe was an important function of the station during WWII. The Navy established a gunnery school only days after the Japanese attack, using simulators constructed from salvaged equipment.[30] Known as the Aerial Free Gunnery Unit, it taught gunners the principles of

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[26] Al Steele, "Myths, Martyrs and Marines of Mokapu: A History of the Marine Corps Air Station, Kaneohe Bay, Hawaii" (typescript on Internet Archive website, https://archive.org/details/mythsmartyrsmari00stee, accessed December 2014) 1965: p. 50.

[27] "History of the Naval Air Station Kaneohe Bay": pp. 66-67.

[28] Ibid.: p. 77.

[29] Ibid.: pp. 85 & 87.

[30] "History of the Naval Air Station Kaneohe Bay": p. 162.

machine gun operation as well as sighting and firing at moving targets, and it influenced gunnery schools on the mainland. It was primarily involved with instruction in operating variations of the Browning .50 caliber machine gun.[31] In February 1943, the Gunnery School building (Facility 455) was completed. The school expanded its curriculum during the war to include target recognition, turret performance, range estimation, and air-to-air firing. During the war, over 26,000 men went through the Gunnery School at Kaneohe.[32]

Besides gunnery, NAS Kaneohe offered training for bomber crews. The Air Bombers Training Unit, established there in January 1943, provided training in the combat operation of the Norden Bombsight. The school had ground training simulators as well as aircraft for air checkouts of the students.[33] Pilots also received instruction on the automatic flight controls and autopilots that operated in conjunction with the bombsight. The Norden Bombsight, an analog computer that aimed and released a falling bomb by calculating the aircraft's speed, altitude, and any crosswinds, was a classified piece of equipment during the war. Because of its security classification, bombardiers using the sight were required to take an oath that they would protect its secrecy, with their lives if necessary. A thermite apparatus was set up in the aircraft that would destroy the sight if the plane ended up abandoned. In addition, armed guards would oversee the removal of the sights from the aircraft after each sortie and their transport, under cover, to and from a secure storage vault.[34]

Additional training activities at NAS Kaneohe during the war were in navigation and instrument flying. Both of these training courses used Link trainers, a flight simulator widely used during the war. The Air Navigation Training Unit refreshed airmen in subjects such as plotting, dead reckoning, long-range radio navigation (LORAN), sextants, celestial observation and navigation, magnetic compass, and Mark III plotting board. The Air Navigation Training Unit, started in early 1943, used six Link Celestial Trainers[35] that were set up in Facility 248, the Celestial Navigation Building (no longer extant). The students had flight checks after classroom and Link Trainer sessions. From January to July 1945, the unit trained over 500 aviators per month. The Instrument Flying Center, Hawaiian Area, established at NAS Kaneohe in February 1943, coordinated Link Trainer activities in the Hawaiian area. The goal was to maximize their utilization and to make them available to the greatest number of aviators in the Fourteenth Naval District. Subjects covered included: instrument take-offs, climbing and descending, recovery from unusual positions, crash descent procedures, and evasive tactics against fighters and anti-aircraft fire. By January 1945, NAS Kaneohe was coordinating the use of 45 Link Trainers and 57 operators available in the Fourteenth Naval District. About 200 hours per week of Link training activity occurred at Kaneohe, a significant portion of the approximately 450 total hours per week for the entire district.[36]

NAS Kaneohe also provided survival training. A faux jungle village, created in a "corner of the Officers Housing Area" (likely present-day Heleloa housing), looked like a Hollywood stage set but was a military classroom. (The Marine Corps also developed this type of village at the installation during the Vietnam War.) An officer of Carrier Aircraft Service (CASU) 38, Lieutenant John J. Morgan started the program, and attendance at first was voluntary. Morgan worked with Kenneth Emory, an ethnologist at the Bernice

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[31] "History of the Naval Air Station Kaneohe Bay": p. 164.

[32] Ibid.: p. 164.

[33] Ibid.: p. 170.

[34] "Norden Bombsight," on website of Armed Forces History Museum, http://armedforcesmuseum.com/norden-bombsight/, accessed September 29, 2014.

[35] "History of the Naval Air Station Kaneohe Bay": p. 165.

[36] Ibid.: pp. 175-177.

Pauahi Bishop Museum in Honolulu, who "was an authority on survival in the Pacific."[37] The Commander, Naval Air Forces Pacific instituted mandatory sea and land survival training in June 1945.

In the months after the war ended, NAS Kaneohe hosted transient military units en route between the Western Pacific and the continental United States. Two Naval units remained at NAS Kaneohe as the station transitioned from war to peacetime: Fleet Air Wing Two and Carrier Aircraft Service (CASU) Unit 38.

One of the facilities still under construction at NAS Kaneohe at the end of WWII was its second landplane runway. There is a direct connection between the seaplane lanes and landplane runways at this station. The typical depth for seaplane landing and take-off lanes was 8', but CPNAB had dredged these features in Kaneohe Bay several feet deeper (between 12' and 14'). They used the surplus "finger coral" as compacted fill, much of it for the first landplane runway at NAS Kaneohe. The 1939 plan for the station had a "future landplane runway" located east of Puu Hawaiiloa, but, a few years later, its construction occurred on the west side of that hill. Originally planned with a length of about 3,000' and a width of 50', the primary east-northeast/west-southwest landplane runway's WWII length was 5,250', and its width a notable 1,000'. About two-thirds of its area was on land created by dredging seaplane lanes.[38] In late 1945, NAS Kaneohe's secondary north-northwest/south-southeast runway, 5,000' long and 800' wide, was in progress.

The Navy Bureau of Yards and Docks (BY&D) had prepared the initial plans and station layout for NAS Kaneohe in 1939.[39] However, the immense scope of the architectural and engineering design drawings required for all new facilities, here and at other Navy installations, could not be done by the BY&D's Public Works Department. In anticipation of this situation, Congress had authorized the Secretary of the Navy:

> whenever decreed by him to be advantageous to the National defense, and providing that in his opinion the existing facilities of the Naval Establishments are inadequate, to employ, by contract or otherwise, outside architectural and engineering corporations, firms, or individuals for the production and delivery of the designs, plans, drawings, and specifications required for the accomplishment of any naval public works or utilities project.[40]

The Navy awarded Albert Kahn, Inc. the largest amount of work for building and utility designs, under several design contracts. The BY&D prepared the station and utility layouts for NAS (Kaneohe) as well as some preliminary building sketches and other information as the basis for the construction documents prepared by Albert Kahn, Inc. The following section provides the history of this firm and its founder.

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[37] Ibid.: pp. 178-179.

[38] "History of the Naval Air Station Kaneohe Bay": pp. 20-21.

[39] "U.S. Naval Air Station, Kaneohe Bay (Oahu), T.H., Roads and Services … Key Plan" [and Areas A-D]. Maps #133218 -- 133222. Revised - various dates in1939.

[40] CPNAB: p. 40 [Basic section].

Albert Kahn, His Background and Architectural Practice

Albert Kahn, the "foremost industrial architect of the twentieth century,"[41] when looking back on his 50-plus years of architectural practice, displayed his modesty and his practical approach to design work:

> When I began, the real architects would design only museums, cathedrals, capitols, monuments. The office boy was considered good enough to do factory buildings. I'm still that office boy designing factories. I have no dignity to be impaired.[42]

His experiences during his early decades clearly contributed to his realistic and pragmatic attitudes about industrial design.

Early Life and Career

Born in Rhaunen, Germany on March 21, 1869, Albert Kahn spent most of his first ten years in Luxembourg. Albert's father, Joseph, was an itinerant rabbi who immigrated to the United States in 1879. The following year Albert's mother, Rosalie, and her children joined Joseph in Baltimore for a short time before the family moved to Detroit. At an early age in Luxembourg, Albert showed great talent as a pianist and was considered a prodigy. His formal schooling in Europe, interrupted by his family's move to the United States, never resumed. In Detroit, Joseph Kahn had a difficult time providing for his large family. Albert, as the eldest of eight children, had to forgo school to take odd jobs to help support the family. Besides his abilities on the piano, Albert showed talent for drawing. His parents helped him obtain a job, without pay, at the architectural firm of John Stott and Company. His tasks at John Stott were menial and he stayed there less than a year.[43]

His father encouraged his drawing by providing supplies and his mother arranged for Albert's free drawing lessons under the German sculptor Julius Melchers. Mr. Melchers referred young Albert to the Detroit architectural firm of Mason and Rice, which hired him in March 1884. At that time, the firm was similar to many others, designing in the mold of H.H. Richardson and the Shingle Style. What set Mason and Rice apart from others in Detroit was not their distinctive designs, but the "great care and sensitivity with which they executed their commissions."[44] Making a great impression on Albert Kahn was the encouragement and interest he received from the firm's partner, George D. Mason. Soon Kahn advanced beyond running errands to drawing. The firm raised his salary to $3.50 per week and instructed him in perspective drawings, sketches, and drawing details. "In spite of the brevity of his formal education, he could draw on a vivid European childhood and a natural sensitivity to the arts, strengthened by his parents support and by his training with Julius Melchers."[45]

In 1888, Mason and Rice gave Kahn his first large project, responsibility for design and construction of a substantial residence. After that, he was in charge of most of the firm's residential projects. In 1890, Kahn received a $500 traveling scholarship from *American Architect and Building News*. He spent most of 1891 touring Europe. It was there he met Henry Bacon, also on a traveling scholarship. The two traveled together for four months and became lifelong friends. Bacon later designed the Lincoln Memorial in Washington D.C., his best-known work. Kahn would refer to his time with Bacon as his

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[41] Grant Hildebrand, *Designing for Industry, The Architecture of Albert Kahn* (Cambridge, MA: The MIT Press) 1974: p. 2. & "Albert Kahn, Architect 1869-1942," [obituary] *Architectural Record*, January 1943: p. 14.

[42] "Albert Kahn," *Architectural Forum*, August 1938: p. 89.

[43] Hildebrand, *Designing for Industry*: p. 7.

[44] Ibid.: p. 8.

[45] Ibid.

"real education in architecture."[46] Soon after Kahn's return to Mason and Rice in late 1891, and following a short assignment on a New York project, they promoted him to chief designer at the firm.

In 1893 the Krolik family of Detroit hired Mason and Rice to design their residence; in May 1894, Kahn was engaged to the Krolik's daughter, Ernestine. Their marriage took place on September 14, 1896.[47] In January 1896, Kahn had begun his own professional practice, partnering with two older men from Mason and Rice, George Nettleton and Alexander B. Trowbridge. The firm's name was Nettleton, Kahn and Trowbridge. When Kahn began his practice in 1896, he had artistic talent, plus travel and professional work experience. His lack of formal training gave him much in common with some of his later clients, notably Henry Ford, for whom he designed over 1,000 buildings. It also set Kahn apart from almost every other noted architect of his time. This lack of architectural literary exposure allowed him to remain relatively unaffected by popular architectural philosophies of the time that might have imbued his theoretical stance.[48]

Kahn did not bring any strong philosophical position to his new practice. For most new firms this would have been a detriment, but Kahn's approach for most of his work was pragmatic. One view on Kahn's position, expressed after his death by architect Paul Cret was, "the architecture of tomorrow had little interest for one so engrossed in creating the architecture of today."[49]

The partners in Kahn's new firm did not stay together very long; Trowbridge went to Cornell University as head of the architecture department in 1897 and the firm was renamed Nettleton and Kahn. Over the next few years, the firm designed a children's hospital, a nurse's residence, a small private library, and several private residences, all in the Detroit area. Kahn's former employer, Mason and Rice, sent some of this business their way.[50] In 1900, Kahn designed his first industrial building, a small factory. George Nettleton died in December 1900 and Kahn became the sole principal.

Kahn hired Ernest Wilby as chief designer in 1902, and from then until 1918 the firm name was Albert Kahn, Architect, Ernest Wilby, Associate. Wilby's education was at Wesley College, Harrogate, England; he brought a capability in period styles to the firm that was valuable in getting commissions. About 1902, Kahn brought his brother Julius into the firm as chief engineer, after his graduation from the University of Michigan. Julius and Albert were both interested in reinforced concrete as a building material. In addition to collaborating with Albert, Julius founded his own company, Trussed Concrete Steel Company of Detroit (ca. 1902), which manufactured his own design of steel reinforcing for concrete. Albert Kahn's firm and Julius Kahn's Trussed Concrete Steel Company worked together on building designs for at least two decades. Another brother, Louis Kahn, joined Albert's 40-person staff in 1910 and later became the second principal.[51] By 1918, when the architecture firm moved into a new space, the name on the letterhead was "Albert Kahn" and "Architects and Engineers" in bold font, with "Ernest Wilby, Louis Kahn, J. F. Hirschman, Associates" in smaller font after "Albert Kahn."[52] Between 1918 and 1927, the

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[46] Hildebrand, *Designing for Industry*: p. 14.

[47] Ibid.: pp. 16 & 23.

[48] Ibid.: pp. 18 - 20.

[49] Paul Cret, [Albert Kahn, tribute], *The Octagon, A journal of the American Institute of Architects* 15, no. 2, February 1943: pp. 15-16.

[50] Hildebrand, *Designing for Industry*: p. 25.

[51] Ibid.: p. 59.

[52] Ibid.: pp. 60-61.

firm name changed to "Albert Kahn, Inc." This name was on the title block of the Ford Motor Company Long Beach Assembly Plant drawings, the earliest of which date to January 1927.[53]

Industrial Architecture Work of Kahn's Firm

Another important event in Albert Kahn's life occurred in 1902. That year the client for his first industrial project introduced Kahn to Henry B. Joy, an executive with many connections in the Michigan community. These included associations with the University of Michigan and with other business and social organizations that later awarded Kahn large commissions. In 1903, Kahn's association with the Detroit auto industry was established when Joy, who was manager of the Packard Motor Car Company, named Kahn as Packard's architect. Modestly, Kahn explained this because no other architect wanted to design industrial buildings for an automobile manufacturer. However, Joy was a sophisticated individual, and he would have recognized Kahn's ability and passion for this type of work.[54]

From 1903 to 1906, Kahn's firm designed manufacturing buildings for Packard and for Pierce Arrow (Buffalo, NY). Their designs featured reinforced-concrete framing, large interior spacing, larger windows than were conventional, and monitors for a brighter interior. The windows used in the factories were "steel sash, a novel English designed product."[55] Most importantly, at the Pierce Arrow plant, the design situated the buildings along "lines of circulation determined by the flow of work."[56] In the Pierce Arrow complex, the manufacturing buildings designs were single-story, with the manufacturing process moving horizontally within them. This allowed Kahn's roof monitors to use natural light for virtually the entire process, freeing it from the limitations of light that only penetrates from wall windows. This introduced the auto industry to the concept of a one-story, roof-lighted industrial building with almost unlimited horizontal dimensions.[57] Many of the most renowned industrial designs of Kahn's firm developed from this concept.

In 1908, Kahn's office received a commission from Henry Ford to construct Ford Motor Company's Highland Park (Michigan) Plant, to produce Model T automobiles. Kahn's firm would design more factories for Ford than for any other auto manufacturer, and the Ford Motor Company was a mainstay of their architectural practice in the 1920s. Despite the firm's innovative use of a one-story facility at Pierce Arrow in Buffalo, the design for Ford's Highland Park Plant was a four-story building; this was in deference to Henry Ford's experimental use of gravity chutes to speed manufacturing. This system would be outmoded with Ford's 1913 introduction of a powered assembly-line system. Kahn's design of a four-story building at Highland Park gives an indication of his deference to his client's process and wishes when designing a facility. At the time, Ford believed in the efficiency of his gravity-supplied process; Kahn obliged with a multi-story building to house it. To Albert Kahn, a guiding principle in his practice was the importance of listening to the client express what they needed in an industrial building; he let the client's wishes and the manufacturing process itself direct the design of the facility. As Kahn would later state:

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[53] J. Stephen Alexandrowicz, Phillip de Barros, Lois Roberts, Allen Maben, and Buddy Mear, "Ford Motor Company Long Beach Assembly Plant," HAER CA-82, Historic American Engineering Record, National Park Service, 1991: p. 64.

[54] Hildebrand, *Designing for Industry*: pp. 26 & 28.

[55] Sol King, "Creative – Responsive – Pragmatic: 75 Years of Professional Practice, Albert Kahn & Associates, Architects – Engineers" (Printed by the Princeton University Press for the Newcomen Society in North America) 1970: p. 14.

[56] Hildebrand, *Designing for Industry*: p. 39.

[57] Ibid.

> There must be – and this is particularly important – the closest attention on the part of the architect to meeting the owner's wishes. This does not imply slavish following of instructions, but rather getting at the real wants and needs of the owner. His analysis of the problem must be the first move toward its solution. It is his wants which must be translated into a workable, practical whole.[58]

By 1918, Kahn's office had grown to eighty people and his portfolio included buildings for Chalmers Motor Company, Dodge Brothers, Hudson Car Company, B.F. Goodrich, Joseph Mack Printing Company, and Continental Motor Car Company and enlarging the facilities at Packard Motor Company and Ford Highland Park. Other renowned architects, such as Frank Lloyd Wright and Walter Gropius began to dabble in industrial buildings, but for most, it was only a digression from their typical work. Much of the other architects' industrial work was different from Kahn's, due to their preoccupation with symbolic and theoretical questions rather than the pragmatic and practical.[59] "It should be clear that these men saw the challenge of industrial architecture in a frame of reference quite different from that of Kahn. They saw it in essentially artistic terms and were profoundly concerned with making it the standard-bearer for a new message about architecture's formal potential."[60] The training of these other architects was in traditions that valued the artistic significance of architecture; for Kahn these concepts were secondary to the application of practical considerations. As Kahn said in 1940, "owners are indeed glad to possess an attractive plant, for they realize its value in prestige, advertising, the psychological effect upon workers, [and] the good will created among neighbors, but it is much more important that the plant help them produce profitably."[61]

Ford Motor Company retrofitted the Highland Park plant for the auto industry's first moving powered assembly line in 1913. Adapting the four-story plant to the line was not an ideal arrangement because ramps up or down on the moving line reduce the areas where line space can be used for actual assembly. This inefficiency was evident to Henry Ford; by 1915, he was exploring a building site southwest of Detroit for a vast, one-story plant. This site became Ford's immense Rouge River Plant. The first construction at Rouge River was a huge, steel-framed building designed by Kahn's organization. Erected in 1918, the Ford Motor Company produced 110' steel ships here, for Navy use as submarine chasers during WWI. In 1917, President Woodrow Wilson tapped Henry Ford to utilize his mass-production expertise to speed the construction of large numbers of these ships. The first building at Rouge River was the assembly plant for these submarine chasers. For this, Kahn's firm designed the 1,700' long, steel-framed building in five structural rows, each 51' wide and a minimum clear interior height of over 30'. Each row had a roof monitor. The date on the drawings is February 11, 1918, less than a month after Ford gave Kahn's team the go-ahead. Called the Eagle Plant,[62] after the Eagle-class patrol boat it produced, it was operational in May 1918, when the first keel was laid. The Eagle Plant was not a moving assembly line, but it enclosed a massive space and completion took only fourteen weeks. In August 1918, before the end of the war, the work was underway at a portion of the plant to convert to Ford automobile production.[63]

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[58] Albert Kahn, "Industrial Architecture, an Opportunity and a Challenge," *Architectural Forum*, December 1940: p. 501.

[59] Hildebrand, *Designing for Industry*: p. 61.

[60] Ibid.: p. 64.

[61] Kahn, "Industrial Architecture," *Architectural Forum*: p. 501.

[62] Internally, Ford Motor Company also referred to it as "B" Building.

[63] Hildebrand, *Designing for Industry*: pp. 92-93, 99-100.

After WWI, Kahn's firm was hired to design an expanded the Rouge River facility with more industrial buildings, and Ford shifted its manufacturing base there from Highland Park. The Kahn team designed the 212,000-square-foot Rouge Glass Plant in 1922. This plant also used steel framing, as in the Eagle Plant, because it was more efficient for a one-story building, where concrete's fireproof qualities were not quite so important. Also, steel framing was faster, since it eliminated concrete formwork and curing time. For the Glass Plant building Kahn's firm used large valley monitors to provide interior light from more than one direction and to disperse the rising heat from kilns and furnaces. The designers also used a system of trusses to span the valley of these large monitors, which opened up a great deal of floor space by avoiding a line of columns. Exterior cladding of the building was in expansive sweeps, using either corrugated steel or steel-sash glazing above a masonry base. Placing the cladding outside the line of the structural columns allowed for a smaller number of typical connection details on the building frame. This meant the ability to produce drawings faster, quicker and more reliable bidding, and simpler scheduling and construction. The Glass Plant was a remarkable design at a time when most other manufacturers still built multi-story structures of reinforced concrete. The design of its framing was in response to the needs of the manufacturing process. The cladding of the frame used large swathes of materials, increasing efficiency of design and construction.[64] Kahn's firm used these principles on later construction at Rouge River and elsewhere for other clients through the 1920s. Although steel framing had its advantages, the Kahn office still used reinforced concrete in some applications, including the single-story Ford Engineering Laboratory in Dearborn, Michigan, constructed in 1922-1923. Not a manufacturing facility, this building is notable for its open interior with concrete columns and steel framing of the two-tiered monitors, which flood the interior of the building with light.

Rouge River was a mainstay of Kahn's office during the 1920s, but it was not the only large project. The firm designed thirty-five branch plants for Ford. These branch plants followed the Rouge River scheme of steel-frame, single-story buildings with monitors for lighting. Kahn also gained other automotive clients, producing steel-framed and reinforced-concrete designs for Studebaker, Fisher Body, Chrysler, and Plymouth. An employee, who started at Albert Kahn, Inc. in 1935 and who rose to become president of Albert Kahn & Associates, stated that Albert Kahn's "coordination of unprecedented functional efficiency and improved working conditions resulted in an overwhelming stream of commissions from all the auto manufacturers."[65]

In 1929, the office also began doing work for the aircraft industry with a Maryland plant for the Glenn Martin Company, a facility similar to the Ford Engineering Laboratory. By 1929 Kahn's staff of over 400 was producing about one million dollars' worth of construction per week. Within this organization, although Kahn maintained ultimate authority and could be rigorous, he valued teamwork above all else. Through the 1920s and until 1935, the firm did not hire college graduates with architectural degrees. This was because Kahn felt that academically trained architects would place self-expression over team cooperation and would not be suited for his organization. Kahn viewed himself as conductor of a symphony with few solo performances.[66]

Kahn's firm began to take industrial commissions in the Soviet Union, the first coming in April 1929. These proved extremely valuable to his practice after the stock market crash in October 1929 and the ensuing Great Depression stopped the flow of domestic commissions. The first project the Soviet government asked him to design was a forty-million-dollar tractor-manufacturing facility at Chelyabinsk. They hinted that other commissions would follow. Kahn hesitated to accept the offer, because business in the United States was still widely available and because the U.S. did not recognize the communist

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[64] Hildebrand, *Designing for Industry*: pp. 92, 109 & 111.

[65] Sol King, "Creative – Responsive – Pragmatic": p. 16.

[66] Hildebrand, *Designing for Industry*: p. 127.

government. However, he accepted the project because Kahn felt that the plant would be of great help to the Russian people. After beginning the work at the Detroit office, the firm opened a branch office in Moscow. The staff there also gave technical assistance and training to the local drafters and designers. By the time the commissions ended in March 1932, Albert Kahn, Inc. had designed 521 plants in the Soviet Union. The firm modeled many of the larger facilities after their work at Rouge River. Kahn stated that because the Soviet government demanded that the large plants be over-designed (probably because of the expectation that they would eventually be used for war production) the construction there did not make efficient use of materials.[67]

In 1932, when Kahn closed the Moscow branch, he felt that business in the United States was at a low point. It might have been then, but the automobile manufacturing industry was poised to have an upswing that would begin in 1933. This required new construction to replace older plants in poor condition and to house new manufacturing techniques, made necessary during the depression. The previous three years of depression had pushed many high-prestige automakers out of business. The net result was that some manufacturers of economy models, such as Plymouth, expanded. Kahn's firm did much of the work for this expansion. The growing aircraft industry also meant new work for the office. Kahn's firm had a lean period after ending operations in Moscow, but by 1935 it was growing.

In the 1920s and 1930s, Albert Kahn had administrative assistance from two of his brothers, Louis and Moritz. Louis had been second in command starting in the 1920s and continuing until Albert's death in 1942; from that date, Louis took over management until his own sudden death in 1945. Moritz Kahn had been with brother Julius at Trussed Concrete and Steel Company from 1906 until 1923, then joined Albert's firm as an associate. The three brothers and their secretarial staff handled administration; the rest of the firm had two divisions -- technical and executive. The technical division, incorporating architects, plus structural and mechanical engineers, handled the work up to the signing of a construction contract. The executive division then took over and executed the job, from signed contract drawings to client occupancy.[68]

In 1935, the firm designed the Chevrolet Commercial Body Plant in Indianapolis; its steel-framed main building measured 1,122' x 322', with two-tiered monitors extending the entire length. Keeping the cladding and sash as an independent curtain, outside the building frame, helped make it economical, easy to design, bid, and build.

> The firm had to some degree been able to reduce its experience to a formula, to standardize an approach, and to develop some basic criteria of wide applicability. . . . To some extent it is analogous to the creation of a style, which establishes a common vocabulary of approach to a more or less diverse series of problems. Kahn's situation, however, was unique in two ways. First, the “vocabulary” was expressible in relatively specific forms. . . . Second, the “style” was quantifiably testable in terms of speed of construction, dollar cost, illumination of the working plane, number of manufacturing processes per unit of floor area, costs of operation and maintenance, and costs of change.[69]

Other commissions followed Chevrolet's Indianapolis plant, using the same “style” of steel frame with curtained cladding. These included De Soto Press Shop (1936 & 1941) in Detroit, Curtis-Wright Shops

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[67] Hildebrand, *Designing for Industry*: pp. 129-130.

[68] Ibid.: pp. 153-54.

[69] Ibid.: p. 164.

(1938) in Buffalo, Chrysler Half-Ton Truck Plant (1938) in Detroit, and Glenn Martin Company buildings (1937-1939 & 1941) in Baltimore and Omaha.

In the few years before America's entry into WWII, the firm received some large Navy contracts, in addition to its usual volume of work for private clients, many of whom were producing vehicles for the military. In the late 1930s, the staff numbered about 600. In 1940, the firm elevated 25 key employees to principal/owner status; and its name changed again to Albert Kahn Associated Architects and Engineers, Inc.[70]

Albert Kahn's firm designed the Chrysler Tank Arsenal near Detroit in 1940. This facility produced 1,300 M3 tanks beginning in April 1941, five months ahead of schedule. About April 1942, Chrysler converted it to M4 tank production, and later produced the M26 version here. On August 10, 1942, this was the first factory to receive the Army-Navy "E" award for production excellence during WWII. Other wartime commissions of Kahn's firm were the Amertorp Torpedo Plant (1942) in Chicago and the Ford Willow Run (Michigan) Plant that produced B-24 bombers.

In addition to their innovative designs, the firm was renowned for their speed and efficiency in producing drawings for manufacturing facilities during WWII. During the first year of the war, there were a number of articles in the journal *Architectural Record* featuring Albert Kahn and the work of his office. The articles reported on the firm's practical and efficient approach to industrial design, and illustrated some of the wartime-constructed factory buildings in use for war production. These articles lauded Kahn's office for "miracles of speed in design and construction,"[71] "miraculous accomplishments,"[72] and for "rapidly creating a new industrial skyline across the nation."[73]

Kahn's firm was able to accomplish the rapid design and construction of wartime factories by utilizing their highly developed system of coordinating the planning procedures. All the major divisions of the office worked simultaneously on the project instead of in successive stages.[74] During wartime, the process began with the client establishing the layout of manufacturing machinery, before the architects designed the building, to ensure the proper clearances for assembly equipment. At the same time, other designers were plotting the ancillary departments in the facility and placing orders for structural steel in available, stock dimensions. Architectural and mechanical design work progressed while excavation and foundation work started, to be ready when the steel arrived. Contracts for the balance of the work quickly followed. Using this system, Albert Kahn Associated Architects and Engineers, Inc. was able to bring the 650,000 square foot Chrysler Tank Arsenal building from concept to occupancy in six months (September 1940 to April 1941).[75]

Albert Kahn died suddenly on December 8, 1942 of a bronchial infection. Albert's brother Moritz had died in 1939 and Julius had died earlier in 1942. Control of Albert Kahn Associated Architects and Engineers, Inc. passed to Albert's youngest brother, Louis, until his death in 1945. The firm completed an impressive amount of work during the war and after.

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[70] Sol King, "Creative, Responsive, Pragmatic": p. 18.

[71] "Producer of Production Lines," *Architectural Record*, June 1942: p. 39.

[72] "Industrial Buildings," *Architectural Record*, January 1942: p. 65.

[73] "Architecture for War Production," *Architectural Record*, June 1942: p. 43.

[74] Cydney Millstein and Mary Ann Warfield, "Pratt & Whitney Plant," HAER MO-118, Historic American Engineering Record, National Park Service, 2012: p. 23.

[75] Albert Kahn, "Architects of Defense," *Atlantic Monthly*, March 1942: pp. 355-356.

Albert Kahn was a major contributor to the field of architecture during his career. One biographer described how Kahn provided a different view of the role of architects:

> His pragmatic approach allowed him to ignore preconceptions to a rare degree in approaching the problem of factory design. . . . He was able to see that taking the practical aspects of building design really seriously . . . would require that performance specialists other than architects . . . be a genuine part of the design team. . . . Thus Kahn developed a new view of the role of the architect, and he demonstrated the importance of this new view by producing an evolutionary series of buildings. . . . As an architect, he has made large contributions to architecture; but he is especially important because his strengths are not those for which his profession has been noted.[76]

Many prestigious institutions honored Albert Kahn for his industrial design work. He received honorary degrees from the University of Michigan (L.L.D.) in 1933 and from Syracuse University (Ph.D. Fine Arts) in 1942. In 1937 he received a gold medal at the Paris International Exposition of Fine Arts and Sciences; the Republic of France also gave him their highest recognition of merit, making him a Chevalier Legion D'Honneur. The American Institute of Architects awarded him two recognitions in 1942, a special award at their annual meeting and a medal for distinguished wartime service. In 1943, in recognition of his industrial architecture, he posthumously received the Frank P. Brown medal from the Franklin Institute of Philadelphia.[77]

Non-Industrial Designs of Firm

During the first two decades of the twentieth century, Kahn's office executed many non-industrial designs. Residences that his firm designed during this period typically were brick, two-story with orderly and restrained rectangular massing, and hip roof with dormers.

Beginning in 1903, the office designed many buildings for the University of Michigan. The 1911 Hill Auditorium is notable. With its monumental entry and surrounding band of ornament, it is reminiscent of the work of Louis Sullivan and was likely an Ernest Wilby design. Designs from Kahn's office rarely repeated this style. Kahn himself had admired the work of McKim, Mead and White from his early days at Mason and Rice. In one historian's opinion, “only a few of Kahn's other nonindustrial commissions come up to the quality of Hill Auditorium.”[78]

The 1914 Detroit Athletic Club building was a commission that Kahn got from Henry Joy, club vice-president. Kahn was very proud of this seven-story building, designed in the Beaux Arts style of McKim, Mead and White; and he intended it to be his monument. For some of his non-industrial work, Kahn's designs were not particularly dependent on solving any practical problems and he indulged himself by designing buildings in styles then popular. The design of the Detroit Athletic Club and others may have stemmed from the client's desire for dignified elegance.

Many of Kahn's non-industrial designs throughout his career were remarkably conservative. This probably made Kahn more acceptable to conservative clients than a more artistically liberal architect. Most of Kahn' clients were businessmen who were inclined to accept a more radical interpretation of a factory, if it could be demonstrated that the economics were favorable. However, in non-industrial

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[76] Hildebrand, *Designing for Industry*: pp. 3-4.

[77] University of Michigan, Bentley Historical Library, “Albert Kahn papers 1896-2011, Biography” (Ann Arbor, MI: University of Michigan) on website http://quod.lib.umich.edu/b/bhlead/umich-bhl-0420?byte=106927109;focusrgn=bioghist;subview=standard;view=reslist, accessed May 2014: no pagination.

[78] Hildebrand, *Designing for Industry*: p. 73.

buildings, these clients seemed to prefer conservative design.[79] Kahn did a number of commercial buildings in Detroit from 1907 to 1914 – Palmer Building, Ford Motor Company Service Building, Detroit Free Press, and the Kresge Building. These all used a typical facade of the time, grid with glass infill and decorative cornice.

Through the first decades of the twentieth century, Kahn's firm, in its non-industrial work, frequently utilized designs reminiscent of McKim, Mead and White or other neo-classical types. One notable building that alluded to McKim, Mead and White was the 1919 General Motors Building in Detroit. This fifteen-story, 1,320,000-square-foot building was the firm's largest structure to that date. With eight large wings projecting from a central building spine, its design had a subdued classical order, including an arcade motif at the base. It had an Ionic order at the first floor with the second floor incorporated into the base arcade, under a horizontal molding between the second and third stories. The next ten stories (floors three to twelve) had very simple fenestration; horizontal moldings emphasized the thirteenth floor, and the top two floors had Corinthian order columns. In addition to the General Motors Building, many of Kahn's 1920s designs for the University of Michigan, as well as for municipal and bank buildings in Detroit, refer to McKim, Mead and White.[80]

Another notable non-industrial design of the 1920s was the 1927 Fisher Building design by Kahn's firm, probably inspired by Eliel Saarinen's entry in the Chicago Tribune Tower design competition of 1922.[81] Their design featured a spired, cornice-free tower for the building's massing. Kahn's office had previously used this treatment for two other Detroit buildings in the mid-1920s. The stepped-back massing and strong vertical elements of the 28-story Fisher Building are powerful references to the Art Deco style, which was popular during the 1920s. In 1928, the Architectural League of New York recognized the Fisher Building as the most beautiful commercial structure of the year. In 2000, the Detroit Chapter of the American Institute of Architects named it the "Building of the Century."[82]

The eclectic repertoire of styles extended to the 1920s residential commissions of Kahn's office. His 1927 home for Edsel Ford was elaborately Tudoresque and based on English architecture of the Cotswold Hills. The firm had previously designed other Tudor residences in 1903 and 1905.[83] The variety of designs in the non-industrial projects showed the firm's "facility with a broad palette of historical styles."[84]

Department of Defense Projects by Albert Kahn's Firm

The first known collaboration of Albert Kahn's firm and the U.S. military occurred just before WWI. About 1916 the Army Air Service hired Kahn's firm to design buildings for at their newly commissioned Langley Field in Virginia.[85] These included the Aviation School Laboratory Building and hangars.[86]

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[79] Ibid.: p. 86.

[80] Hildebrand, *Designing for Industry*: p. 135.

[81] Ibid.: p. 147.

[82] University of Michigan, Bentley Historical Library, "Albert Kahn … Biography."

[83] Hildebrand, *Designing for Industry*: pp. 146-47.

[84] University of Michigan, Bentley Historical Library, "Albert Kahn … Biography."

[85] Michael A. Pedrotty, Julie L. Webster, Gordon L. Cohen, and Aaron R. Chmiel, "Historical and Architectural Overview of Military Aircraft Hangars: A General History, Thematic Typology, and Inventory of Aircraft Hangars Constructed on Department of Defense Installations." Prepared for the United States Air Force Headquarters, Air Combat Command (Champaign, Illinois: United States Army Construction Engineering Research Laboratory) May 2001: p. 1-7.

[86] W. Hawkins Ferry, *The Legacy of Albert Kahn* (Detroit: Wayne State University Press) 1970: pp. 67-69.

Because of the 1917 U.S. entry into WWI, the Army delayed construction of these permanent buildings until 1919. Unlike the concrete industrial buildings designed by Kahn's firm in the early 1900s, these Langley Field permanent structures were brick and in a style similar to Louis Sullivan. They did have the large steel-sash windows typical of the firm's industrial work.

With the start of U.S. involvement in WWI, the Army contracted the firm of Albert Kahn to design standard plans for airfields and their buildings. The building materials were wood and others suitable for temporary construction, such as asphalt shingles. The Kahn office produced a standard flying field design that occupied a one-mile-square section of land. It:

> included 12 aircraft hangars and 54 other buildings meant to accommodate 100 aircraft and 150 student pilots. Kahn supplied a standard plan for the 12 hangars, referred to as the Signal Corps Mobilization Hangar.[87]

No evidence of Navy contracts awarded to Kahn's firm during WWI was found. There is no mention of his firm in the index to the book on the Navy's WWI activities.[88]

The firm's WWI record of work for the Army Air Service, plus its pre-eminent experience with industrial buildings, made Albert Kahn, Inc. the logical choice when design commissions for military air bases started to increase in the late 1930s. "The government was pleased with Kahn's work, so it was natural that the Navy turned to him when air station plans became a top priority item" in the build-up to WWII.[89] In 1938, Kahn's firm had about 400 employees, of whom about 300 were engineers, architects, or draftsmen.[90]

By the time that the U.S. military began building up its infrastructure in anticipation of entering WWII, the reputation and qualifications of Kahn's firm were well known and proven. The Navy needed architecture and engineering support quickly because the magnitude of the pre-WWII build-up threatened to overwhelm the Navy design sections. Kahn understood that two factors were critical in producing buildings for the war effort: speed of construction and a pure utilitarian design.[91] For the three years between December 1939 and December 1942, Albert Kahn's firm (under the name Albert Kahn, Inc. until 1940, Albert Kahn Associated Architects and Engineers, Inc. after that) received commissions worth $200,000,000 from the U.S. government. During this time Kahn's firm, with its 450-member professional staff, produced about 1650 drawing for new bases the Navy was building,[92] under one major contract and six supplemental agreements.

The Navy awarded design contract NOy-3560 to Albert Kahn, Inc. on August 12, 1939, a week after authorization of the CPNAB construction contract NOy-3550.[93] This first Navy contract obligated Kahn's firm to produce all the construction documents for the majority of buildings at NAS Kaneohe and at five other air stations (two in Alaska, Midway Island, San Juan, Puerto Rico, and Jacksonville, Florida). There were six Supplemental Agreements (SA) to the original contract. The first SA added engineering drawings to the firm's workload: for water, fire protection, sewer, steam, electrical, and telephone

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[87] Pedrotty *et al.*, "Historical and Architectural Overview of Military Aircraft Hangars": p. 2-6.

[88] C.W. Parks (Rear Admiral), *Activities of the Bureau of Yards and Docks, Navy Department, World War 1917-1918* (Washington, D.C.: Government Printing Office) 1921.

[89] Charles F. O'Connell, Jr., "Quonset Point Naval Air Station," HAER RI-15, Historic American Engineering Record, National Park Service, 1979: p. 43.

[90] George Nelson, *Industrial Architecture of Albert Kahn* (New York: Architectural Book Publishing Company, Inc.) 1939: p. 19.

[91] O'Connell, HAER RI-15: pp. 43-44.

[92] Federico Bucci, *Albert Kahn, Architect of Ford* (New York: Princeton Architectural Press) 1993: p. 110.

[93] CPNAB: p. A-542.

distribution systems at the five other NAS (the BY&D had already done the utility drawings for NAS Kaneohe). Other SAs added designs of hangars at seven locations, including Guantanamo, five buildings at the Pearl Harbor Navy Yard, and various facilities at installations in Alaska, Virginia, and Rhode Island. Another contract, awarded in May 1941 (NOy-4832), commissioned designs for more buildings at NAS Kaneohe, at the Midway air station and submarine base, at four Navy installations in Alaska, and a six-story concrete warehouse at Pearl Harbor's Navy Yard (Facility 167). The CPNAB report concluded that the "service of the Kahn organization . . . expedited realization of the Navy's shore facilities expansion program."[94]

Overview of Work by Albert Kahn's Firm in Hawaiian Islands

In the Hawaiian island chain, MCB Hawaii (former NAS Kaneohe) has the largest extant cluster of buildings designed by Albert Kahn's firm. Many of the buildings by his firm at NAS Midway were demolished when the Navy closed the installation there and transferred the property to the U.S. Fish & Wildlife Service. There are a few buildings by Kahn's firm at other installations on Oahu. These are listed after the NAS Kaneohe buildings designed by Albert Kahn, Inc.

Buildings at NAS Kaneohe

Most of the earliest buildings at NAS Kaneohe were Albert Kahn, Inc. designs. Facility 215 is one of these buildings; a following section discusses its post-design history. The 1940s hangar drawings and drawings for expansions of earlier Albert Kahn, Inc. buildings have title blocks with the new firm name – Albert Kahn Associated Architects & Engineers (see Table 1). The initial work at NAS Kaneohe was all permanent construction and this station was given a high priority among the numerous other NAS authorized for the Pacific, Alaska, and the U.S. mainland, under the Navy War Construction Program.[95] "At Kaneohe more than seven million dollars would be spent – better than half of what Congress had allotted to the whole Pacific group" of Navy installations in that program.[96]

Designers at Kahn's firm worked quickly on the drawings for Facility 215. The firm submitted the original set of twenty-three drawings to the Navy on October 9, 1939, just over nine weeks after signing the design contract. The title block heading for these drawings shows the firm name as Albert Kahn, Inc. Louis Kahn signed the drawings. The drawings were approved by the BY&D on December 9, 1939 and are countersigned on that date by a representative of the Chief of the Bureau.[97]

In addition to Facility 215, Albert Kahn, Inc. submitted drawings for eight other facilities at NAS Kaneohe on October 9, 1939 – about 160 drawings for the nine facilities on that date. The following week Albert Kahn, Inc. submitted another thirty-two drawings for an additional five facilities at NAS Kaneohe. Some of these drawings developed by Albert Kahn, Inc. for NAS Kaneohe "became virtual standard designs for many types" and used at other Navy bases.[98] For example, the NAS Kaneohe

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[94] CPNAB: pp. 43-46 [Basic].

[95] CPNAB: p. A-542, and Bentley Historical Library, University of Michigan, Albert Kahn Papers 1896-2011, Correspondence 1917-1970: commendation to Albert Kahn, Inc. from B. Moreell, March 29, 1943.

[96] David O. Woodbury, *Builders for Battle, How the Pacific Naval Air Bases Were Constructed* (New York: E.P. Dutton and Company, Inc.) 1946: p. 81.

[97] Albert Kahn, Inc., "U.S. Naval Air Station Kaneohe, (Oahu) T.H., Administration and Operations Building," Drawing #s 136520 - 136542. December 9, 1939.

[98] CPNAB: p. 43 [Basic].

Aircraft Armament Shop (Facility 201) is very similar to buildings at other Navy installations in the Pacific: NAS Barbers Point Torpedo and Bombsight Shop (Facility 115), NAS Pearl Harbor [Ford Island] Bombsight and Torpedo Workshop (Facility 86), and NAS Midway Islands Torpedo Overhaul Shop (Facility 357).[99]

In May 1941, shortly after the February 15, 1941 commissioning of NAS Kaneohe, Kahn's firm signed Navy contract NOy-4382 for additional work at NAS Kaneohe, Pearl Harbor, Midway, Sitka, Kodiak and Unalaska. Under this contract, for a fee of three percent of cost (based on thirty-five cents per cubic foot of living and operational space, twenty cents per cubic foot for concrete storehouses, and sixteen cents per cubic foot for steel structures) the firm agreed to provide complete designs. This meant all services, including preliminary sketches, estimates, working drawings, specifications, detail drawings for architectural, structural, sanitation, plumbing, sprinkler, heating, ventilation, and electrical work required at Naval bases. This contract also allowed the Navy to use the designs at bases elsewhere, accounting for much of the similarity found at many WWII-era Navy bases.[100]

The design for Facility 215 at NAS Kaneohe was recycled for the 1942 Administration Building at NAS Barbers Point (Facility 1).[101] The two sets of drawings produced for the original construction at NAS Kaneohe and NAS Barbers Point are almost identical. Facility 215 was designed (October 1939) and built (1940) first. For Facility 1 at NAS Barbers Point, the 14th Naval District took the original twenty-three Kahn drawings and produced a set of twenty-one drawings (numbered 180012 to 180032) for Facility 1. These twenty-one drawings are dated December 5 and 6, 1941. The heading of the title blocks reads "14th Naval District"; however, they have a sidebar reading "Albert Kahn, Architect."[102]

By the late 1930s, when the firm designed the buildings at NAS Kaneohe, Albert Kahn himself was concentrating almost exclusively on designing industrial buildings.[103] Other staff at Albert Kahn, Inc. managed the1939-designed buildings at NAS Kaneohe, as indicated by the initials of the Design and Project Managers on the drawings. Some of the 1939 buildings at NAS Kaneohe, including Facility 215, show features of the International Style. This would have been typical for Albert Kahn's firm, in that they most frequently designed non-industrial buildings using architectural styles that were popular at the time. The firm's non-industrial portfolio on the U.S. mainland used designs that generally followed the styles popular at the time, including Tudor, Beaux Arts, and Sullivanesque for the early decades of the Twentieth century. By the 1930s, the International and Moderne Styles were popular on the mainland[104] and were frequently seen in Hawaii buildings also. It would have been a natural design decision for Kahn's office to utilize the popular International Style when working on Facility 215 in 1939. The simplicity of the style and its lack of ornamentation also accorded well with the Navy's need for speedy and efficient construction.

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[99] Glenn Mason, "Naval Air Station Barbers Point, Torpedo & Bombsight Shop and Storehouse, Facility 115," HABS HI-279-N, 1995. Ann Yoklavich, "U.S. Naval Base Pearl Harbor, Bombsight & Torpedo Storehouse and Workshop, Facility 86," HABS HI-374, 2002. Ann Yoklavich, "Naval Air Station Midway Islands, Torpedo Overhaul Shop 1, Facility 357," HABS UM-1-Q, 1996. (All three for Historic American Buildings Survey, National Park Service.)

[100] O'Connell, HAER RI-15: pp. 43-44, and CPNAB: p. 46 [Basic].

[101] CPNAB: pp. A-347 & A-351.

[102] Glenn Mason, "Naval Air Station, Barbers Point, Administrative Office Building, Facility 1," HABS HI-279-G, Historic American Buildings Survey, National Park Service, 1995.

[103] Hildebrand, *Designing for Industry*: p. 213.

[104] Virginia and Lee McAlester, *A Field Guide to American Houses* (New York: Alfred A. Knopf) 1996: pp. 465-69.

The design of Facility 215 is a very close conjunction with most of the accepted tenets of the International Style. It has a number of character-defining features that distinguish the style: flat roof, metal-sash windows in bands set flush with outer walls, smooth unadorned wall surfaces with no decorative detailing at doors or windows, and asymmetrical facade. The building also has several variations that are common to the style, such as a rounded projecting bay and cantilevered ledges or roof slabs over doors and windows.[105]

Like Facility 215, the design of two other non-industrial buildings at NAS Kaneohe (Facilities 216 and 219) closely follow the International Style. The firm's relied on popular architectural styles for non-industrial buildings, as reflected in the 1939 designs of these three buildings. In addition, a Navy directive of May 20, 1941, specified that building design should be no more elaborate than was essential.[106] This directive for omitting ornamentation on buildings acquiesces to International Style tenets and would most likely already have been policy among the Kahn designers of 1939, when the plans for NAS Kaneohe were developed.

Other NAS Kaneohe buildings designed by Albert Kahn Inc. refer to the International Style in lesser degrees, with many of them having a more apparent relationship to his early twentieth-century industrial buildings. Although none is a manufacturing building, several contain shop or warehouse functions that are common in industrial complexes. The General Storehouses (Facilities 209 and 250) are examples of this similarity to large industrial buildings by Kahn's firm. These NAS Kaneohe buildings have exterior cladding and glazing applied in wide sweeps and use monitors to help naturally light the building. These are markers, or character-defining features, of large industrial buildings by Kahn's firm on the U.S. mainland. Even some of the smaller buildings at NAS Kaneohe designed by Albert Kahn, Inc., such as Facility 201 and Facility 202, appear to use these tenets of the firm's larger industrial works.

Even the largest buildings at NAS Kaneohe by Kahn's office are dwarfed in size when compared to that firm's renowned industrial buildings on the U.S. Mainland. However, most of the buildings by Kahn's firm at NAS Kaneohe, large or small, exhibit some of the features of their notable industrial buildings. The use of a single-story format for industrial buildings is quite evident in the collection of buildings at NAS Kaneohe by Albert Kahn, Inc. Among these, the use of monitors to light the interior is very common. Facilities 201, 202, 206, 209, 212, and 250 all have monitors for natural lighting.

Another character-defining feature of industrial designs by Albert Kahn's firm is the use of large areas of exterior cladding. These expansive sweeps of cladding allow for a more efficient construction process. The limited variations in materials and fasteners (for steel-frame buildings) allowed construction (and bidding) to move more quickly. Multi-light, steel-framed windows are another widespread design feature of industrial buildings by Kahn's firm. Buildings at NAS Kaneohe designed by Kahn's office used these extensively, almost to the exclusion of any other window type.

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[105] McAlester, *A Field Guide to American Houses:* pp. 469-70.

[106] U.S. Navy, Bureau of Yards and Docks, *Building the Navy's Bases in World War II*, Vol I. (Washington, D.C: United States Government Printing Office) 1947: pp. 13-14.

Table 1. Buildings at NAS Kaneohe designed by Albert Kahn's firm.

(Note that three representative photographs of each of these facilities are in the Field Records for this HABS report.)

Facility #(s) and Historic Name	Date of Drawings Submitted by Kahn	Kahn job number	Signature	Number range of drwgs (Y&D Nos.)	Corporate name on title blocks	Year Built
102 Hangar (NW quarter)	October 9, 1939	1820-A	Louis Kahn	136475 - 136500	Albert Kahn, Inc.	1939
102 Hangar Extension, 101 (rebuilt), 103, 104, & 105 Hangars	October 13, 1941	1820-AB	Louis Kahn	164312 - 164335	Albert Kahn Associated A & E, Inc.	1942 1943 (105)
201 Utility Shop/ Parachute Loft	October 19, 1939	1820-M	Louis Kahn	136667 - 136677	Albert Kahn, Inc.	1941
202 Torpedo Shop	October 9, 1939	1820-V	Louis Kahn	136718 - 136722	Albert Kahn, Inc.	1941
203 Bombsight Shop	October 11, 1939	1820-U	Louis Kahn	136713 - 136717	Albert Kahn, Inc.	1941
204 Garage & Station Maintenance	October 9, 1939	1820-Q	Louis Kahn	136683 - 136690	Albert Kahn, Inc.	1941
206 Laundry	October 18, 1939	1820-S	Louis Kahn	136695 - 136700	Albert Kahn, Inc.	1941
208 Commissary & Cold Storage	October 9, 1939	1920-T	Louis Kahn	136701 - 136712	Albert Kahn, Inc.	1941
209 General Storehouse	October 18 & 19, 1939	1820-G	Louis Kahn	136617 - 136628	Albert Kahn, Inc.	1941
211 Brig	October 18, 1939	1820-W	Louis Kahn	136723 - 136727	Albert Kahn, Inc.	1940
212 Messhall	October 18, 1939	1820-D	Louis Kahn	136543 - 136556	Albert Kahn, Inc.	1940
– Messhall Extension	June 18, 1941	1820-Z	Louis Kahn	164277 - 164287	Albert Kahn Associated A & E, Inc.	1942
214 Paint & Oil Storehouse	October 9, 1939	1820-N	Louis Kahn	136678 - 136682	Albert Kahn, Inc.	1941
215 Administration	October 9, 1939	1820-C	Louis Kahn	136520 - 136542	Albert Kahn, Inc.	1940
216 Dispensary	October 9, 1939	1820-B	Louis Kahn	136499 - 136419	Albert Kahn, Inc.	1941
– Dispensary Extension	June 18, 1941	1820-Y	Louis Kahn	164257 - 164277	Albert Kahn Associated A & E, Inc.	1942
218 Gatehouse	October 18, 1939	1820-R	Louis Kahn	136691-136694	Albert Kahn, Inc.	1941
219 Rec. Facilities, Enlisted Men	October 9, 1939	1820-L	Louis Kahn	136645 - 136666	Albert Kahn, Inc.	1941
220 - 224 Barracks	October 9, 1939	1920-E	Louis Kahn	136557 - 136573	Albert Kahn, Inc.	1941
225 - 230 Additional Barracks	June 10, 1941	1820-AA	Louis Kahn	164294 - 164311	Albert Kahn Associated A & E, Inc.	1942
250 General Storehouse	October 18 & 19, 1939	1820-G	Louis Kahn	136617 - 136628 (see Fac. 209 above)	Albert Kahn, Inc.	1943
301 Squadrons Office	October 20, 1939	1820-J	Louis Kahn	136629 - 136644	Albert Kahn, Inc.	1941
503 BOQ	October 9, 1939	1820-F	Louis Kahn	136574 - 136616	Albert Kahn, Inc.	1941
– BOQ Extension	January 13, 1942	1820-AC	Louis Kahn	168110 - 168117	Albert Kahn Associated A & E, Inc.	1943
996-1106 Walkways	October 9, 1939	1820-E		136558 (see Fac. 220-230 above)		1941

Buildings by Kahn's Firm at Other Navy Installations on Oahu and Midway Atoll

In addition to the buildings at Kaneohe, Albert Kahn's firm designed at least twenty-one other Navy buildings on Oahu and on Midway Atoll in the years just before WWII. See Table 2. As noted in the previous section, the designs were all for buildings at Navy installations, due to their contracts with the Navy BY&D. The Kaneohe designs became the standard for many Navy building types. Twelve of the buildings at the other installations have designs recycled from those done by Kahn's office for NAS Kaneohe facilities, as noted in the right-hand column. [Note that two HABS reports for NAS Kaneohe buildings by Kahn's firm are in the Library of Congress: Facility 104, Hangar (HABS No. HI-311-A) and Facility 250, Storehouse (HABS No. HI-311-H).]

Table 2. Other buildings in the Hawaiian Island chain designed by Albert Kahn's firm.

Location	Facility # and Name	Covered by HABS #	Design based on NAS Kaneohe Fac. # and Name
NAS Barbers Point			
	1 Administration	HI-279-G	215 Administration
	110 & 111 Hangars	HI-279-M	101-105 Hangar (as originally constructed with monitors)
	115 Torpedo Shop	HI-279-N	201 Utility Shop and Parachute Loft
Naval Base Pearl Harbor			
	67A Electrical Shop	HI-492	
	155 Shipfitters Shop	HI-496	
	167 General Storehouse	HI-497	
	3A Instrument Shop	HI-445	
	175 & 176 Hangar (Ford Isl.)	HI-400	
	86 Bombsight Shop (Ford Isl.)	HI-374	201 Utility Shop and Parachute Loft
	4A Pipe Shop (demol.)	HI-360	
	472 Repair Shop (demol.)	HI-335	
NAS Midway			
	151 Hangar	UM-1-X	101-105 Hangar (as originally constructed with monitors)
	357 Torpedo Overhaul	UM-1-Q	201 Utility Shop and Parachute Loft
	335, 336, 578, 579 Barracks	UM-1-F	220-230 Barracks
	356 General Storehouse	UM-1-U	209 & 250 General Storehouse
	393 General Storehouse	UM-1-W	

History of the Administration and Operations Building, Facility 215

Physical History, including Alterations

Facility 215, the first dedicated Administration and Operations Building at NAS Kaneohe had about thirty offices on its three floors when constructed in 1941. On the first floor, at the rear (south) end of the building were several offices for the Public Works department, including the public works office (Room 101), blue print room (room 128), inspectors surveyors drafting room (Room 129), and chief clerk (Room 100). There were separate toilets for officers (Room 103), enlisted men (Room 104), and women (Room 127). Corridor 130 separated the women's toilet from the men's and led to the rear entry. The east wing

on the first floor had the telephone exchange and equipment (Room 104), Officer of the Day (Room 108) with adjacent toilet (Room 105), and an office for duty men and guards (Room 109), all accessed by Corridor 107. The wing extending west of the lobby includes Corridor 118 and rooms with the following labels: Chief Clerk Station (Room 114), Personnel Officer (Room 115), Personnel Clerks and Files (Room 116), Station Disbursing Officer (Room 117), Station Accounts (Room 119), Station Disbursing (Room 120), and Station Clerks and Files (Room 121). In the center of the building was the lobby (labeled as 110), stairway (labelled as 111), storage (Room 122), and the rounded projecting bay, which was the second space labelled Officer of the Day (Room 113).

At the second floor of Facility 215, rear (south) wing, had Wing Commander (Room 200), Chief of Staff (Room 201), wing radio room (Room 220), wing radio office (Room 221), and disbursing office (Room 222). The west wing had a conference room (Room 206), office (Room 207), Executive Officer (Room 208), ante room (Room 209), Commanding Officer (Room 212 at the north corner of the building), station clerk and files (Room 213), station radio and telegram (Room 214), and communication officer (Room 215). The third floor had only one office, for the aerological room (Room 300), located two floors above the building lobby. The aerological unit was the term the U.S. Navy used, until 1957, for its meteorological service.

The original room layout was slightly modified between design and construction. The 1939 drawings show spaces for a transformer (Room 123), a heater (Room 125) and storage (Room 124), with exterior doors for the first two rooms. However, Room 123 incorporated all those spaces, without an exterior door, as shown on the November 1941 plumbing plan (drawing no. 050123). The layout has remained remarkably stable since WWII, so the building retains most of its design integrity. Changes to finishes and other alterations have been made over the years. These are outlined below, by date if known, and the drawings that document the alteration projects are noted in parentheses.

1953: Four movable plywood panels, about 10' square, were added at the west side of the second-floor conference room (Room 206). These horizontally sliding panels are extant, and can be moved to cover the extant 1938 map of the world mounted on the wall. A chalkboard is mounted on one of these panels. (Drawing from MCB Hawaii, Kaneohe Bay, Facilities Department, electronic file number 215-22 "Building 215 Moving panels for lecture room" February 25, 1953.)

1961: Facility 215 was re-roofed with new built-up roofing. (Drawing from MCB Hawaii, Kaneohe Bay, Facilities Department, electronic file numbers ROOF-11 and ROOF-12 "Buildings 215, 301, & 302 Reroofing" August 4, 1961.)

Pre-1976: Room 108 was renovated to add the (extant) corner flag case at an unknown date before 1976. (Drawings from MCB Hawaii, Kaneohe Bay, Facilities Department, electronic file numbers 215-24 "Remodel office, Rm. 108" and 215-28 "Replace steel sash windows" September 24, 1976.)

Ca. 1976-79: Original steel-sash windows were replaced with jalousie windows or a combination of jalousies and fixed light topped with solid opaque panels. Note that the original window in Room 123 was not replaced and is extant, but altered for insertion of an air conditioning unit. (Drawings from MCB Hawaii, Kaneohe Bay, Facilities Department, electronic file numbers 215-28 through 215-38 "Replace steel sash windows, Bldg 215" various dates 1977 through 1979.)

Ca. 1977: Rooms 212, 209, 213 and the adjacent hall way were remodeled. The toilet and closet between rooms 212 and 209 were removed, a toilet room was added at the end of the hallway between rooms 212 and 213, and a partition was added in Room 213 to create another office. (Drawings from MCB Hawaii, Kaneohe Bay, Facilities Department, electronic file numbers: 215-20 "Plan Second Floor Revisions" [n.d.], 215-35 "Replace Steel Sash Windows" revised 1978, and 215-29 "Replace Steel Sash Windows" 1976.)

1986: Facility 215 was rewired to replace most existing light fixtures, outlet boxes, receptacles, and wiring. (Drawings from MCB Hawaii, Kaneohe Bay, Facilities Department, electronic file numbers M-914 through M-926 "Electrical Repairs Building 215" May 20, 1986.)

Ca. 1989: Room 204 was remodeled to serve as an office for the Worldwide Military Command and Control System (WWMCCS). Security screens and window air-conditioning units were added to the window openings. WWMCCS, developed in the 1960s, provided military leaders with a means to receive intelligence and warning information and to provide unified orders to support military missions. WWMCCS was in operation until August 30, 1996 when it was replaced by the Global Command and Control System.[107] (Drawings from MCB Hawaii, Kaneohe Bay, Facilities Department, electronic file number 215-39 and 215-40 "Construct WWMCCS Rm at Bldg 215" December 14, 1988.)

Ca. 1991: A concrete ramp (extant) was added for handicapped access to the rear (southwest) entry of the building. (Drawing from MCB Hawaii, Kaneohe Bay, Facilities Department, electronic file numbers 215-44 "Handicapped improvements Bldg 215" July 27, 1991.)

1993: A fire alarm system was added to Facility 215. (Drawings from MCB Hawaii, Kaneohe Bay, Facilities Department, electronic file numbers FIREPROT 99 through FIREPROT 106, FIREPROT 112 through FIREPROT 115, and FIREPROT 187 through FIREPROT 194 "Fire protection improvements for Buildings 215, 279, & 401" June 2, 1993.)

Post-1996: The first-floor courtroom was built by consolidating Rooms 121, 114, 115, and the adjacent corridor. (Drawing from MCB Hawaii, Kaneohe Bay, Facilities Department, electronic file number FIREPROT-100 "Fire Protection Improvements" October 31, 1996.)

No dates or drawings were found for the following changes to the building. At an unknown date the aerological instrument tower on the third-story roof and the radio antenna poles on the second-story and third-story roofs were removed. The extant radio antenna on the third-story roof is a replacement. Either the two flagpoles on the third-story roof are replacements for the original radio antenna poles there, or they are the original antenna poles, shortened and fitted as flagpoles.

At an unknown date the original multi-light, metal-sash windows in the lobby were replaced with fixed picture windows, the original doors replaced with metal-frame storefront-like glass doors, and a large display case built inside the lobby on the south wall. The left portion of this display case (facing the case) either removed or covered the door to the second original telephone booth.

Historical Role of Facility 215 in WWII and Continuing Importance on the Base

The Administration and Operations Building (Facility 215) was among the first group of structures designed and constructed at NAS Kaneohe, but it was not the first completed. Two barracks buildings were the only ones ready for occupancy when the first group of station personnel arrived on December 7, 1940. Therefore, the first office for the Commanding Officer at NAS Kaneohe was "a barracks room equipped with an old table, a typewriter box used for a chair, and an old-style country telephone."[108] Facility 215 was nearly complete on February 15, 1941, the date of the station's commissioning. Commanding Officer Harold Martin conducted the ceremonies to commission the station near the

[107] Federation of American Scientists, "Worldwide Military Command and Control System," on website http://fas.org/nuke/guide/usa/c3i/wwmccs.htm, accessed July 14, 2014.

[108] "History of the Naval Air Station Kaneohe Bay": p. 24.

flagpole at the front of the building.[109] Captions on historic photos note the building as completed on April 9, 1941.

Originally, Facility 215 had a large radio antenna and a tall instrument tower on its roofs. The most prominent was the four-legged tower on the third-story roof of the aerological room. The name of this tower is "Aerological Instrument Tower" on original drawings and probably contained weather instruments.[110] The tower was 50'-0" in height, with its four legs of 3½" steel angles set in a 12'-0" square at its base. From the base, the legs tapered inward to join at the top of the tower. About 5' below the top, there was a 5'-0" diameter platform with a metal-pipe railing. A ladder provided access to the platform. The tower structure had horizontal struts at varying spacing from 8'-0" to 4'-0". Diagonal tie rods between the horizontal struts provide additional bracing. An undated photo of the building, taken between April 1941 and September 1945, shows an instrument shelter added on the third-story roof, between the legs of the tower.[111]

The radio antenna atop Facility 215 was strung on eight 25'-0" high poles, which were mounted on the second-story and third-story roof of the building. The poles were located at the four parapet corners of the third-story roof and on the second-story roof near the apex of the rounded projecting bay, the two west corners, and the southwest corner. These poles are 4½" diameter galvanized steel pipe. The four antennae at the third-story roof used a bracket extending from the parapet for support and the four antenna on the second-story roof used diagonal bracing of 2" pipe at their bases.

During WWII, the antennae were important for communication between the station and its patrol wings. On the morning of December 7, 1941, the radio communication office in Facility 215 received a transmission from one of its Patrol Wing One aircraft that it released a depth bomb near an enemy submarine outside the entrance to Pearl Harbor. Communication staff did not believe the report, thinking either that the message had been sent in error by using the wrong code, or that the patrol craft had bombed a U.S. submarine by mistake.[112] Before confirmation of that transmission was obtained, Japanese aircraft attacked NAS Kaneohe.[113]

On that morning, Station Commander Harold Montgomery Martin was at home in his quarters on base at the north side of Puu Hawaiiloa when the attack began. He quickly drove from there to his office at Facility 215, a distance of about one mile. He then telephoned 14th Naval District Headquarters at Pearl Harbor and learned that the attack on NAS Kaneohe was not an isolated event.

Facility 201, the Utility Shop and Parachute Loft, had an ordnance storage room[114] that likely served as the armory for the station. That building was an important gathering point for sailors during the attack. However, officers and enlisted men on duty at Facility 215 retrieved arms from the Officer of the Day who controlled the armory in Room 113. This armory held primarily .45 caliber pistols, which the men used to fire at the attackers, using Facility 215 as cover. Commander Martin quickly summoned the Marines from nearby barracks (today's Facility 227, across Dewey Square). The Marines arrived at Facility 215 with .30

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[109] "NAS Kaneohe was Commissioned only 30 Months Ago Tomorrow," *Kaneohe Klipper*, August 14, 1943: p. 1.

[110] Albert Kahn, Inc., Drawing #136529, dated October 9, 1939 (from NAVFAC Pacific Plan Files).

[111] Cover photo, *The Klipper*, September 29, 1945.

[112] This patrol aircraft dropped a depth charge to assist the destroyer USS *Ward*, which fired shots at a Japanese submarine about 6:45 am.

[113] K. McGinnis, "Patrol Wing One Report for Pearl Harbor Attack," After-action report to Commander-in-Chief, U.S. Pacific Fleet, from Commander Patrol Wing One, NAS Kaneohe Bay, January 1, 1942. On website www.history.navy.mil/docs/wwii/pearl/PH12, accessed on August 11, 2014.

[114] Albert Kahn, Inc., Drawing #136668, dated October19, 1939 (from NAVFAC Pacific Plan Files).

caliber Springfield rifles. They divided into four groups; each dispersed to one side of the building and began firing at the attacking aircraft, using Facility 215 at their backs for cover.[115]

The Administration building continued to be the nerve center of the station during WWII. Topics addressed there and problems requiring solutions changed somewhat over the war years, but many remained the same as those addressed on December 10, 1941. These included the need for "more quarters, food storage, cooking and food serving facilities, morale, recreation, expansion of A & R [Assembly and Repair] facilities."[116] Before the attack, there were already plans for expansion of the station to accommodate at least eight patrol squadrons. Seventy-eight Squadrons cycled through (several of them more than once) NAS Kaneohe between October 1942 and August 1945. The Carrier Aircraft Service Units repaired and maintained the planes of eighty-eight aircraft carrier squadrons in the last two years of the war.[117] Functions originally housed in the Administration and Operations Building included such critical ones as communications, public works, accounting and personnel. Some of these, such as communications, moved out to other buildings as their equipment and staff grew during WWII.[118]

After WWII, the Administration building remained a crucial facility on the station. The closure ceremony for NAS Kaneohe occurred in front of this building in the spring of 1949. The station was inactive for about two and a half years, until commissioned as Marine Corps Air Station, Kaneohe in January 1952.[119]

ARCHITECTURAL DESCRIPTION

Site

The Administration and Operations Building (Facility 215) is located near the center of the cluster of Albert Kahn, Inc. buildings at NAS Kaneohe. It is somewhat isolated by the large amount of open space near the building, but the building has a strong axial position in terms of the road grid nearby and the flagpole area in front of it. It is aligned so the front of the building faces the symmetrical cinder cone of Puu Hawaiiloa. The Conference Room and original Commanding Officer's room were designed to have views of this geological feature.

The setting immediately surrounding Facility 215 has changed little since the end of WWII. The Navy and the Marine Corps retained the buildings and open space around it. The most notable change is the growth of the landscaping; this includes the nearby monkeypod trees along two sides of Dewey Square, monkeypods and other trees along E Street at the front of Facility 219 and along 4th Street near Facility 216. The monkeypod trees, now with mature canopies and heights of about 40', either were saplings or not yet planted in 1945. Likewise, the large Cook Island pines in the flagpole area fronting Facility 215 are not visible in a September 1945 photo of the area (see historic photo section of report). Two small palms and two plumeria flanking the front entry path plus another tree near the northwest corner of Facility 215's facade were also planted after that 1945 photo. The plumeria trees have matured and they do somewhat alter the immediate setting of Facility 215 by obscuring the view of the front facade. During WWII the front of the building was fully visible from the driveway at the flagpole area.

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[115] Randolph S. D. Lockwood, Transcript of Interview with Dr. Ronald E. Marcello, OH#250, (Denton, Texas: University of North Texas Oral History Collection) 24 August 1974. pp. 34.

[116] "History of the Naval Air Station Kaneohe Bay": p. 51.

[117] "History of the Naval Air Station Kaneohe Bay": pp. 29 & 205-214.

[118] Albert Kahn, Inc., Drawings 136521 & 136522, dated October19, 1939 (from NAVFAC Pacific Plan Files) & "History of the Naval Air Station Kaneohe Bay": p. 115.

[119] Steele, "Myths, Martyrs and Marines of Mokapu," 1965: pp. 63 & 67.

There are several expansive open areas around Facility 215 -- Dewey Square to the east, the flagpole area to the north, and open grounds to the west. These all existed at the end of WWII, much as they appear today, with the primary change the above-noted tree growth. All the major buildings around Facility 215 (Facilities 216, 218, 219, 212, 213) were built during WWII; and the same firm, Albert Kahn, Inc., designed them all, except for Facility 213. This contributes to the cohesive character of the setting. Some of the surrounding buildings have been expanded since 1945; however, this has not had appreciable effect on their massing and spatial relation to Facility 215 and to the prominent, historic open spaces that make up its immediate setting. Larger replacement signaling guns were installed in the flagpole area. Although altering the look of this area somewhat, these replacement guns have not affected the setting in any important way.

Exterior

Facility 215 is a reinforced-concrete building whose irregular T-shaped footprint has overall dimensions of about 153' x 117'. The massing of the building is also irregular; the main section is a two-story L-shape in plan, with a single-story wing creating the short arm of the T footprint. A third-story room, which is 26'-10" square, creates a tower form at the intersection of the wings. The height of the single-story wing, to the top of its parapet, is approximately 18'. The flat roof of the two-story part of the building is 25'-6" above grade. The distance from grade to the top of the third-story parapet measures about 40'. In addition to the varied heights, the building also has a two-story rounded projecting bay at the front facade. The projection has walls perpendicular to the front facade for about 6', but its front end is rounded in plan. It measures 18'-0" wide and projects approximately 15' from the main front wall. Only one other building on the base, Facility 219, has a similar rounded projecting bay.

The building rests on a foundation of concrete piers and footings[120] with a perimeter concrete foundation wall that elevates the concrete slab of the first floor about 3' above grade. There is an opening in the foundation wall with a padlocked cover over the access to the crawl space. There is a smooth transition from the concrete foundation walls to the plain concrete walls of the building. The exterior surface of the building has a painted concrete stucco finish. The structural framing consists of mostly 18'-0" bays, with 8"-0" hallway bays. The main entry bay is 26'-0" wide because it combines the width of a typical bay with a hallway width. Regular spacing of the wall segments between the typical windows indicates the modular structural system. The wide (26'-0") concrete entry steps extend between the rounded projecting bay of the facade and a 4'-0" wide cheek wall. The stair leads to the roofed entrance porch, measuring about 12' x 26', in front of the recessed entry door and flanking windows. There are narrower (8'-0" width) stairs leading to recessed entry doors at the ends of the southwest and northwest (two-story) wings. At these entries, 2'-0" wide concrete cheek walls flank both sides of the concrete stairs.

The front entry has metal-frame, storefront-like, double glass doors under a fixed transom light in an opening measuring 6-0" wide and 9'-9" high. Flanking the entry door are fixed plate-glass windows measuring 7'-0" x 7'-0". The doors are inset about 3' more than the plane of the windows flanking the entry. There are short concrete wall segments framing the door, which originally also had double screen doors at the plane of the windows. These wall segments are rounded on their exterior and interior ends, creating the impression of plain, 1'-0" diameter pilasters with no base or capital.

The southwest (rear) and northwest entries also have metal-frame, storefront-like, double glass doors with fixed transom lights. The openings, including transoms, measure 10'-0" high x about 6' wide. The rear entry has an added, U-plan, concrete ramp with a metal pipe railing, providing handicapped access between grade and entry level. The 6'-0" wide opening from the third-floor Aerological Room to the second-story roof has flush metal double doors.

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[120] Albert Kahn, Inc., Drawing #s136520 and 136533, dated October 9, 1939 (rom NAVFAC Pacific Plan Files).

The first- and second-story window openings are typically 7'-0" high, with varying widths. The exceptions are located over the main entry -- two second-story, glass-block windows, measuring 6'-0" x 2'-1". At present, most other window openings have sets of jalousies that replaced original steel-sash casement windows. Some corner offices on the first and second stories have slightly different windows – their 10'-9" wide openings contain a large central fixed light with flanking jalousies. Almost all sets of jalousies and the fixed lights are a little over 5' tall, usually topped with solid opaque panels. The solid panels create horizontal bands in the window openings that contrast with the vertical lines of the jalousies' framing. Most of the window openings have widths of either 14'-0" or 10'-6" and so contain either five or four sets of jalousies, each measuring a little less than 3' wide. There are a few narrower windows in toilet rooms (5'-0" or 2'-6"), at the ends of second-floor halls (3'-6"), and in the stair hall (3'-6"). These narrower windows have one or two sets of jalousies, usually topped by a single opaque panel. However, the window in the stair hall has two sets of jalousies filling its full 8'-10" height. The rounded projecting bay at the building's front facade has nine sets of jalousies, at both the first- and second-floor rooms, to form its curved end. The sets are about 3'-6" wide and placed at 10-degree angles to adjacent ones to create the rounded projection. The window openings in toilet rooms and the third-floor Aerological Room are 5'-6" high rather than 7'-0" high. The window openings on three sides of the Aerological Room measure 17'-6" in width and have six sets of jalousies. On the wall with the double doors to the roof, the window opening is about 14' wide, with four sets of jalousies. There are no opaque panels in the third-floor window openings.

One original steel-sash window remains in the building, although it has been somewhat altered. This steel-sash window is in Room 123 and fills a 7'-0 x 7'-0" opening. This window originally consisted of sixteen lights, with the top four fixed above operable three-light casement sash. The fixed lights at the top of the window are painted. Only one three-light casement sash is now operable. In the half of the window that is closest to the internal corner of the building, installation of a window air conditioning (ac) unit required removal of a vertical muntin and the two bottom lights. Because of the ac unit, the casement sash on that half is inoperable.

Thin, cantilevered concrete ledges, which are almost continuous around the building, shade the first-floor windows and doors. They project at right angles from the wall, in a plane just above the windows and doors, and extend out about 4'. The concrete roof slab extension (approximately 4') protects the second-floor windows. The edges of the main roof and of the ledge wrapping around the single-story wing are bordered by square-profile metal gutters connected to metal downspouts. There are four similar ledges over the windows and door of the aerological room. These separate concrete ledges project about 3' from the exterior wall faces.

The flat roof of the third-story has a 3'-1" high concrete parapet that surrounds the slightly sloping, built-up roofing surface. On top of this is a 1½"-diameter metal pipe rail that rises 12" above and then parallel to the top of the concrete parapet. At the north and east corners are flagpoles, each projecting about 12' higher than the parapet. At the parapet's west corner is a replacement antenna (non-original) rising about 15' above the parapet top. This antenna is made of metal pipe (about 2" diameter) and is attached to the parapet by two metal brackets. At the south corner is a small antenna, also not original. There is an opening in the parapet, on the southwest side, for a metal staircase between the second- and third-story roofs. The flat second-story roof also has a slightly sloping, built-up roofing surface, but no parapet. The single-story wing's roof is like that on the tower room, but without any poles or antenna attached to its parapet, and without a railing on the parapet.

Interior

The typical interior wall, floor and ceiling finishes of Facility 215 are, respectively: painted concrete stucco walls, vinyl composition tiles on the floor, and acoustic tile ceilings. Some areas have alternate materials: wood paneling on the walls, carpeting on the floor, and concrete ceilings without acoustic tiles. These ceilings are the painted concrete underside of the floor or roof slab above. In many of the larger rooms (such as the lobby and the Aerological Room) the ceilings have concrete beams, approximately 1' wide, evidence of the structural supports of the floor or roof slab above.

In the south corner of the first-floor lobby is a historic door that formerly opened into one of two telephone booths that are shown on the original drawings. This 2'-6" wide, flush wood door has fixed louver vents. Door hardware is ball-tipped hinges and oval metal doorknobs with beveled escutcheon plates. The telephone booth has been removed and this door opens into a storage area under the stairs.

The half-turn stairway from the first to the second floor is about 5' wide with a landing and a round wood handrail with a natural finish. The stairs have vinyl-surfaced treads with a non-skid pattern. The landing finish is vinyl composition tiles. The stairway from the second floor to the third floor Aerological Room is straight-run with a width of about 3'.

Typical interior doors are flush wood with a large vision panel of either clear or obscure glass. Some interior doors are flush metal with no vision panel and others are wood with a smaller vision panel. Light fixtures are typically flush-mounted fluorescent lights; there are also some pendant fluorescents.

The former Conference Room on the second floor, Room 206, has mostly windows around its projecting bay and northeast wall. Its northwest wall measures about 11' tall and 22' wide (from the window to the west corner of the room). A large map occupies almost the entire height of this wall and about 15' of its width. The map title block reads:

THE WORLD,
Compiled and drawn under the direction of the Chief of Engineers,
by the
Army Map Service (SN), U.S. Army, Washington D.C.
Scale 1:11,000,000 (approximate)
Boundaries in Europe as of 1 January 1938.

At the floor and ceiling in front of this map, tracks carry four large sliding plywood panels, each about 10' square. The panels can move on the tracks to display about half of the map at a time, or to conceal it completely. The panel closest to the wall between Rooms 206 and 207 has a black chalkboard mounted on it. These panels were added ca. 1953.[121]

[121] Drawing from MCB Hawaii, Kaneohe Bay, Facilities Department, electronic file number 215-22 “Building 215 Moving panels for lecture room,” February 25, 1953.

SOURCES

A. Architectural Drawings:

Scans of microfilms of drawings for Facility 215, including originals by Albert Kahn, Inc., are located on a dedicated computer at NAVFAC Pacific Plan Files in Building 258, Makalapa, Pearl Harbor. The original drawings, dated October 9, 1939 and signed by Louis Kahn, are numbered 136520 to 136542. Drawings at NAVFAC Pacific Plan Files are archived as electronic scans and are available to contractors only as 11" x 17" printouts. Electronic and paper versions of these original drawings, as well as later renovation drawings, are available at MCB Hawaii, Kaneohe Bay Facilities Division, Building 242.

B. Early Views:

Several early views of Facility 215 are available from the National Archives and Records Administration (NARA) II in College Park, Maryland. These include aerial views, plus shots of the building during construction and upon completion. The Naval History and Heritage Command (NHHC) has a 1941 interior view of Commander Harold Martin in his office. The order #s for these historic photos are:

1939 – May 23. Aerial view, building site before construction.	NARA order # 71-CB-54-10-1
1940 – August 26. Building under construction.	NARA order # 71-CA-156B-13882
1941 – April 9. Completed building.	NARA order # 71-CA-156B-14233
1941 – April 16. Completed building.	NARA order # 71-CA-156B-14234
1941 – August 11. Aerial of building and others nearby.	NARA order # 80-G-411187
1941 – November 27. Interior of Commander Martin's Office.	NHHC order # NH 96674
1945 – September 12. Aerial of building and its setting.	NARA order # 80-G-419324

A photo of the commissioning of NAS Kaneohe on February 13, 1941 shows a portion of Facility 215 in the background. This was on the front page of the August 14, 1943 station newsletter *Kaneohe Klipper*. Another early 1940s view of Facility 215 is on the cover of the September 19, 1945 *The Klipper* (later name of publication).

C. Maps

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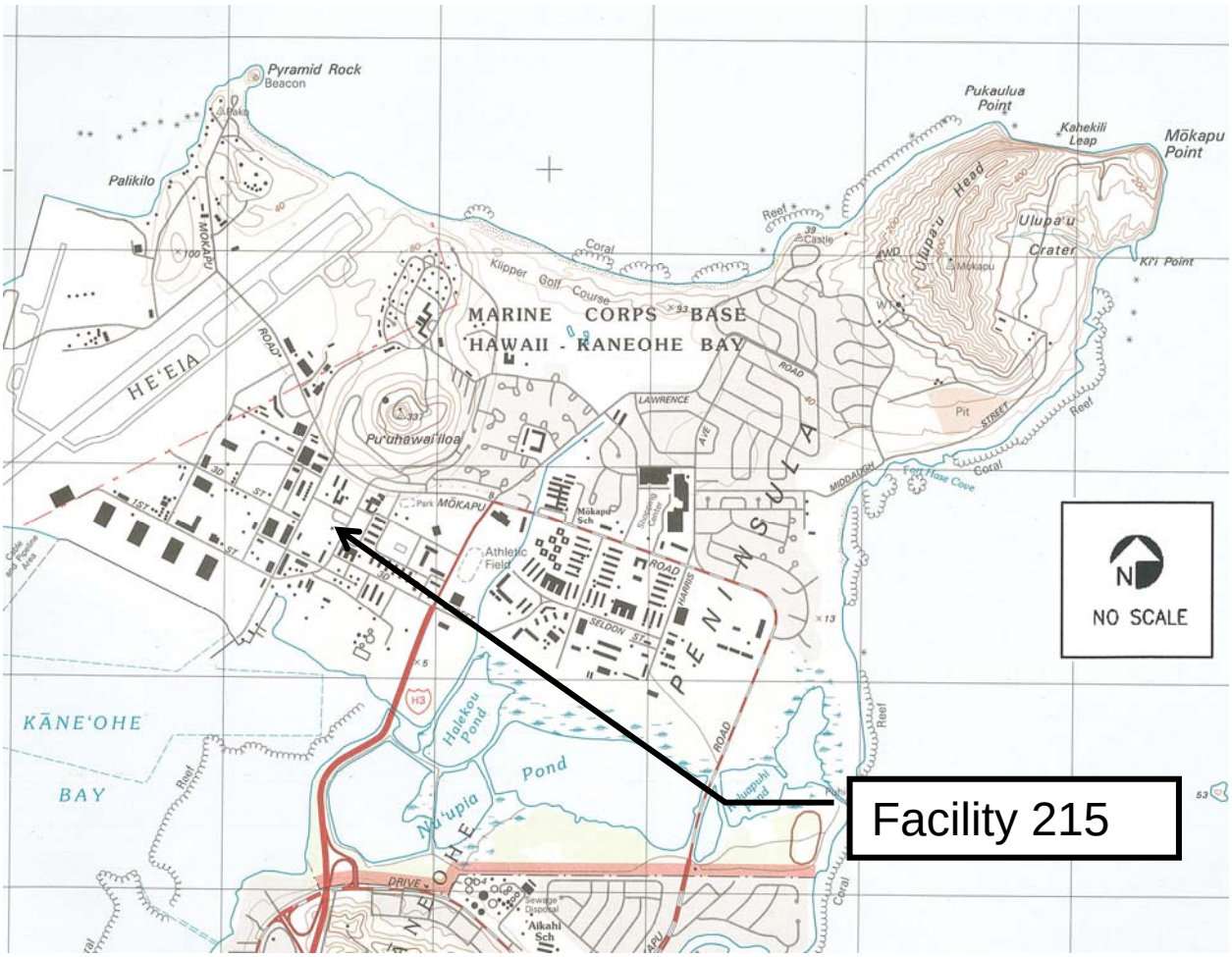
PROJECT INFORMATION

This report is being prepared in advance of repairs and alterations to Facility 215. Two exterior stairways for emergency exits are planned, jalousie windows will be replaced with steel-frame multi-light types that emulate the historic design of originals, window air conditioning units will be removed, bathrooms renovated, and hallways and doorways changed on the interior. In a letter dated May 7, 2014 (log: 2014.01770, doc: 1405AB32), the Hawaii State Historic Preservation Division of the Department of Land and Natural Resources, State of Hawaii stated that the alterations, as detailed by the Environmental Compliance and Protection Department of the United States Marine Corps. Marine Corps Base Hawaii, Kaneohe Bay, would have no adverse effect on the historic building.

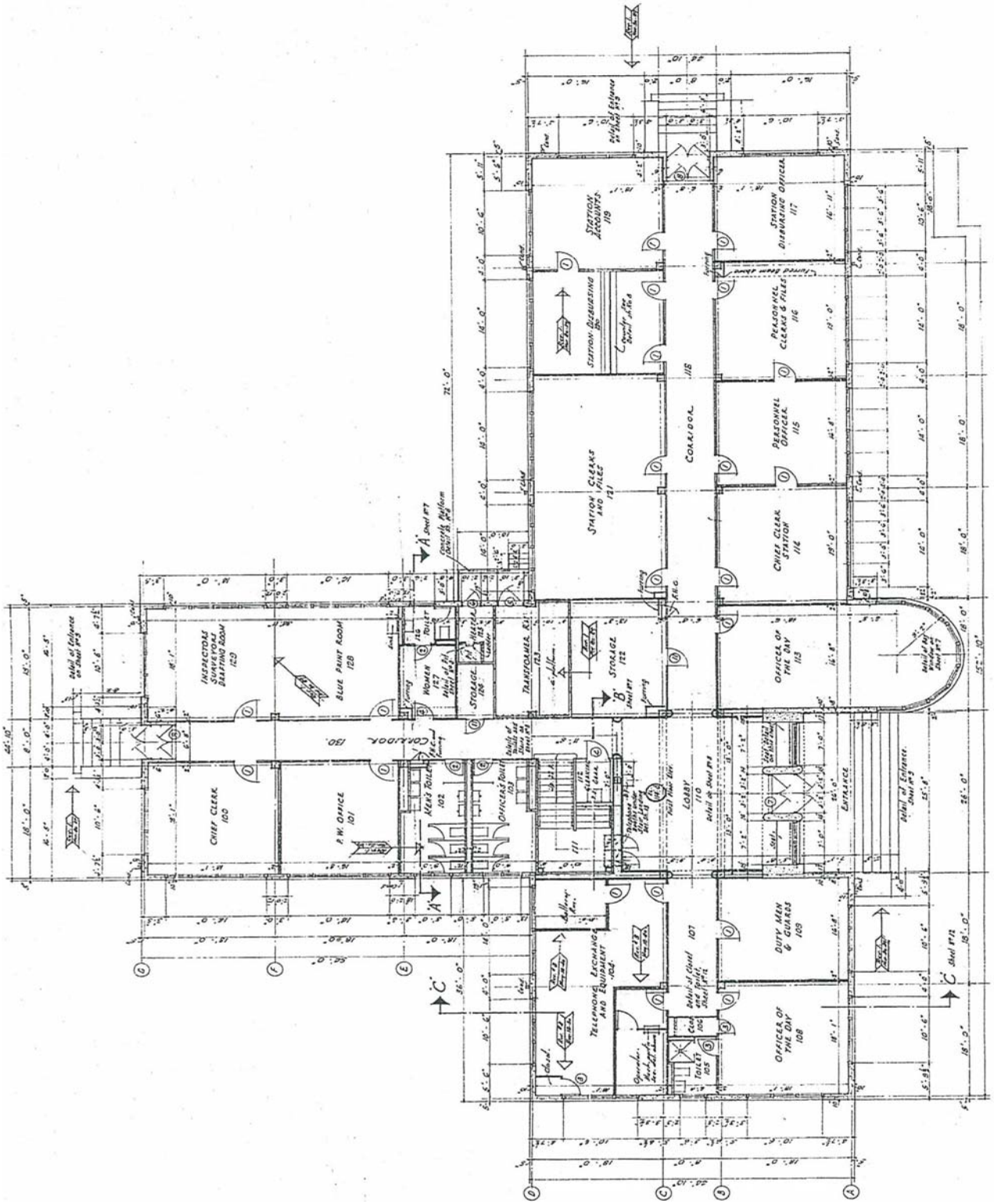
Marine Corps Base Hawaii, Kaneohe Bay is submitting this HABS documentation voluntarily. It is not a part of any mitigation requirements imposed by Hawaii State Historic Preservation Division in the above referenced letter.

As a subconsultant to Pacific Consulting Services, Inc., Mason Architects, Inc. (MAI) prepared this HABS report. Dee Ruzicka did the research, writing, and graphics. Ann Yoklavich was the editor. Both MAI architectural historians meet the Secretary of the Interior's Professional Standards under Architectural History. David Franzen, of Franzen Photography, Inc., shot and processed the archival photographs in August 2014. He has photographed thousands of views for HABS and HAER reports over the last three decades.

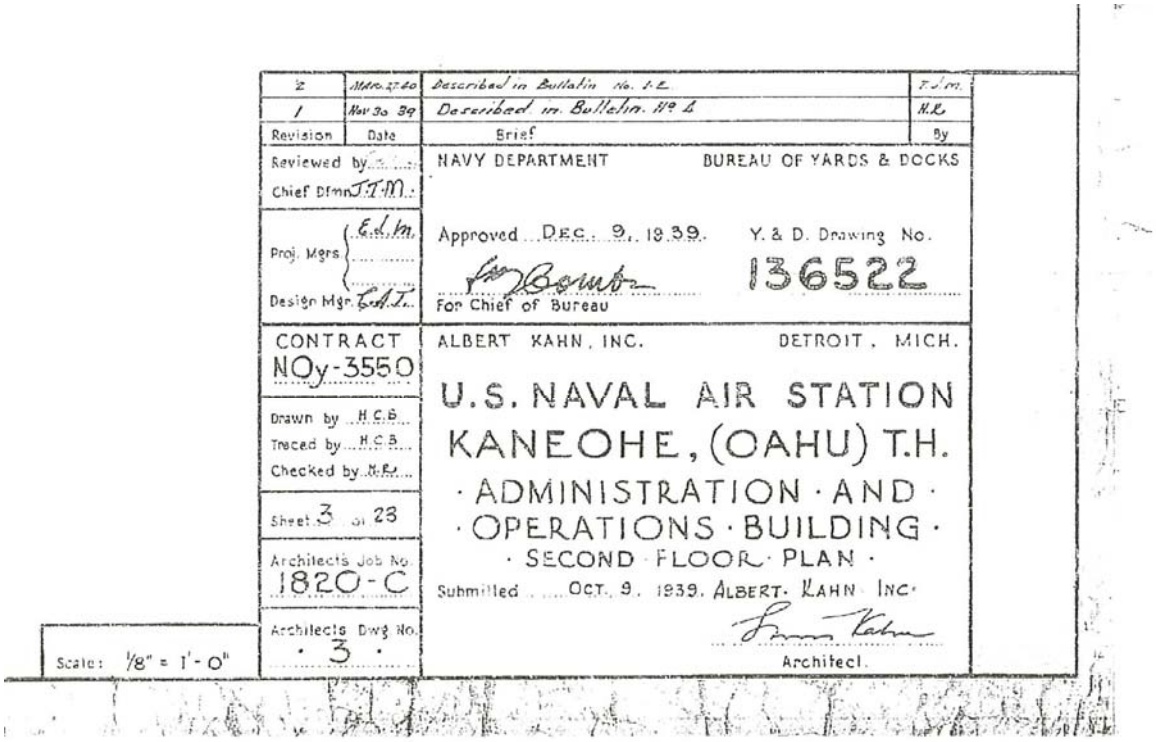
Location map



Portion of original drawing number 136521, First Floor Plan (NAVFAC Pacific Plan Files)



Detail of title block portion of original drawing number 136522, Second Floor Plan. This title block is typical of the original set of Albert Kahn, Inc. drawings, numbers 136520 to 136542. All are dated October 9, 1939 and signed by Louis Kahn.
(NAVFAC Pacific Plan Files)



Revision	Date	Brief	By
2	Mar 27 40	Described in Bulletin No. 1-2	T.J.M.
1	Nov 30 39	Described in Bulletin No 4	H.R.

Reviewed by
Chief Dfmn T.J.M.
Proj. Mgrs E.J.M.
Design Mgr. E.A.T.

NAVY DEPARTMENT BUREAU OF YARDS & DOCKS
Approved DEC. 9, 1939.
For Chief of Bureau
Y. & D. Drawing No. 136522

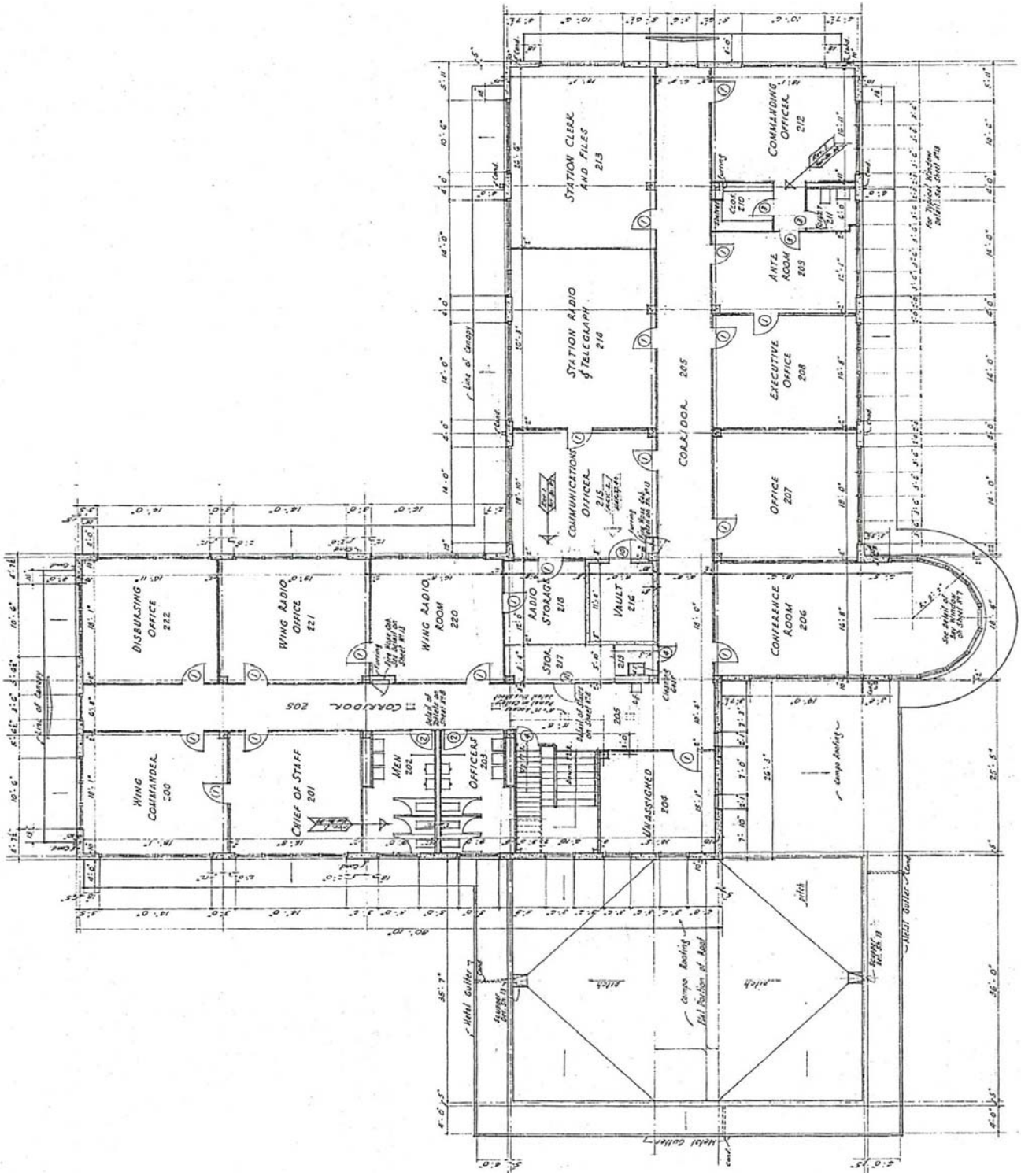
CONTRACT NOy-3550
Drawn by H.C.B.
Traced by H.C.B.
Checked by N.R.
Sheet 3 of 23
Architects Job No. 1820-C
Architects Dwg No. 3
Scale: 1/8" = 1'-0"

ALBERT KAHN, INC. DETROIT, MICH.

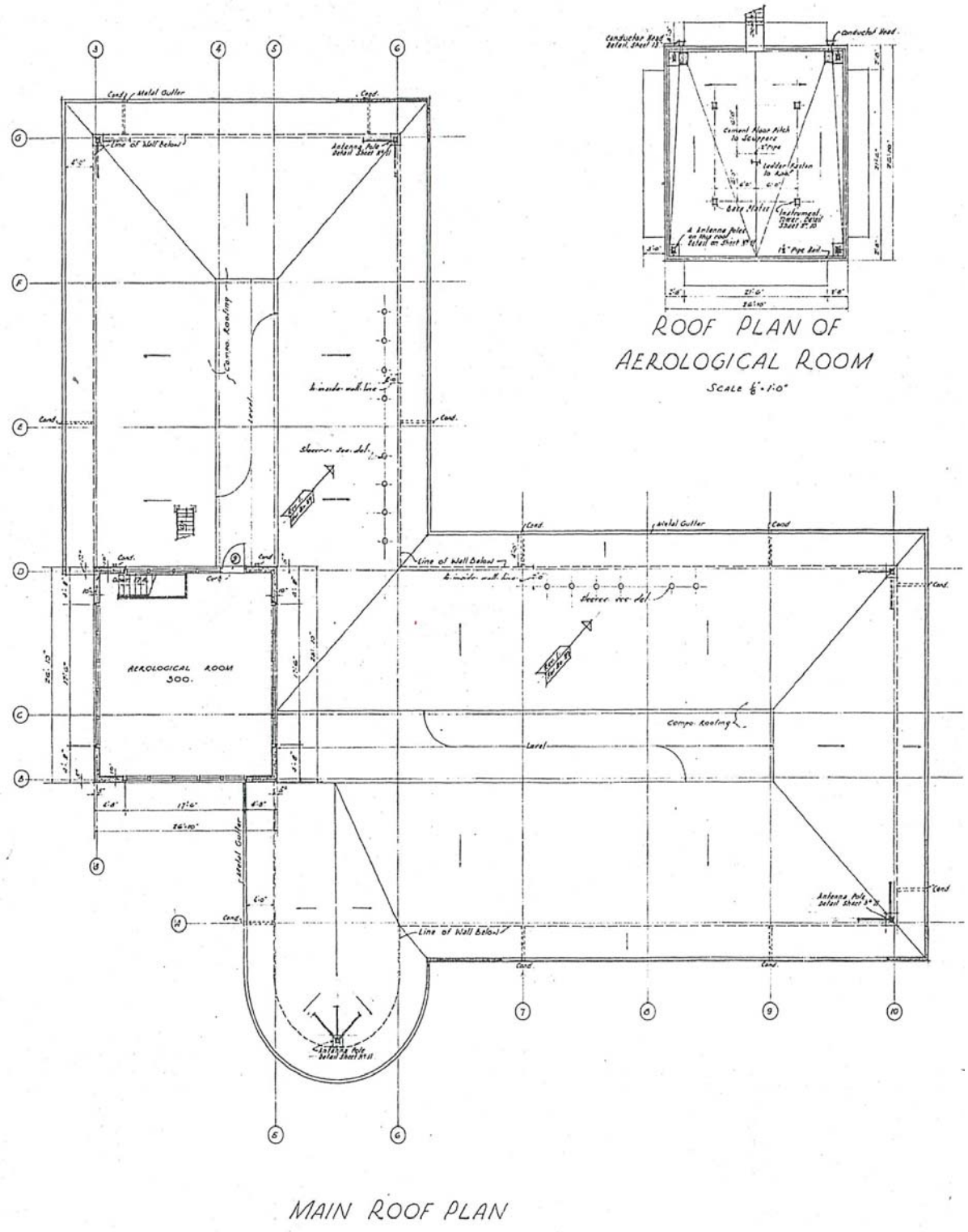
U.S. NAVAL AIR STATION
KANEOHE, (OAHU) T.H.
· ADMINISTRATION · AND ·
· OPERATIONS · BUILDING ·
· SECOND FLOOR PLAN ·

Submitted OCT. 9, 1939. ALBERT KAHN INC.
Architect.

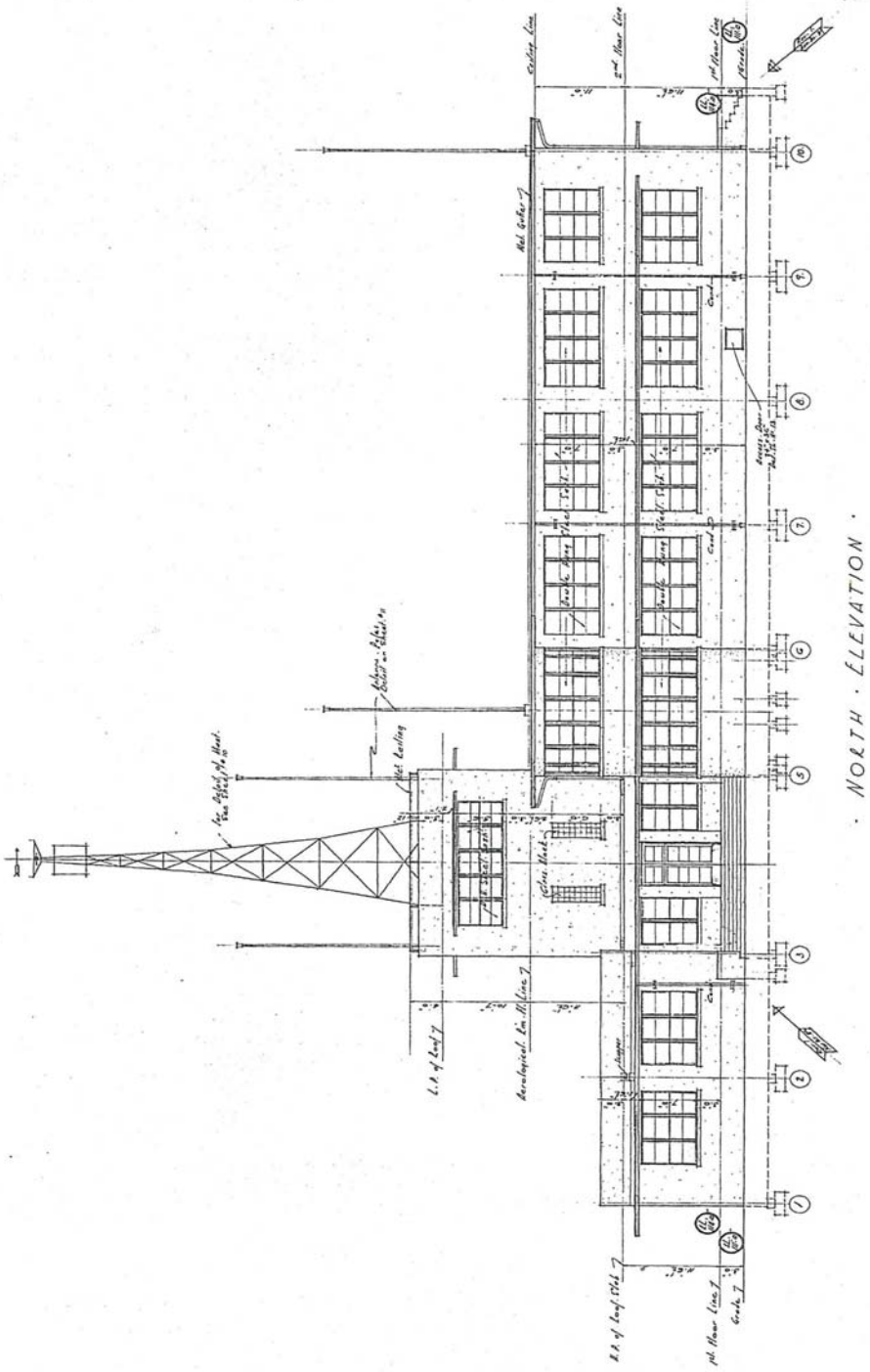
Portion of original drawing number 136522, Second Floor Plan (NAVFAC Pacific Plan Files)



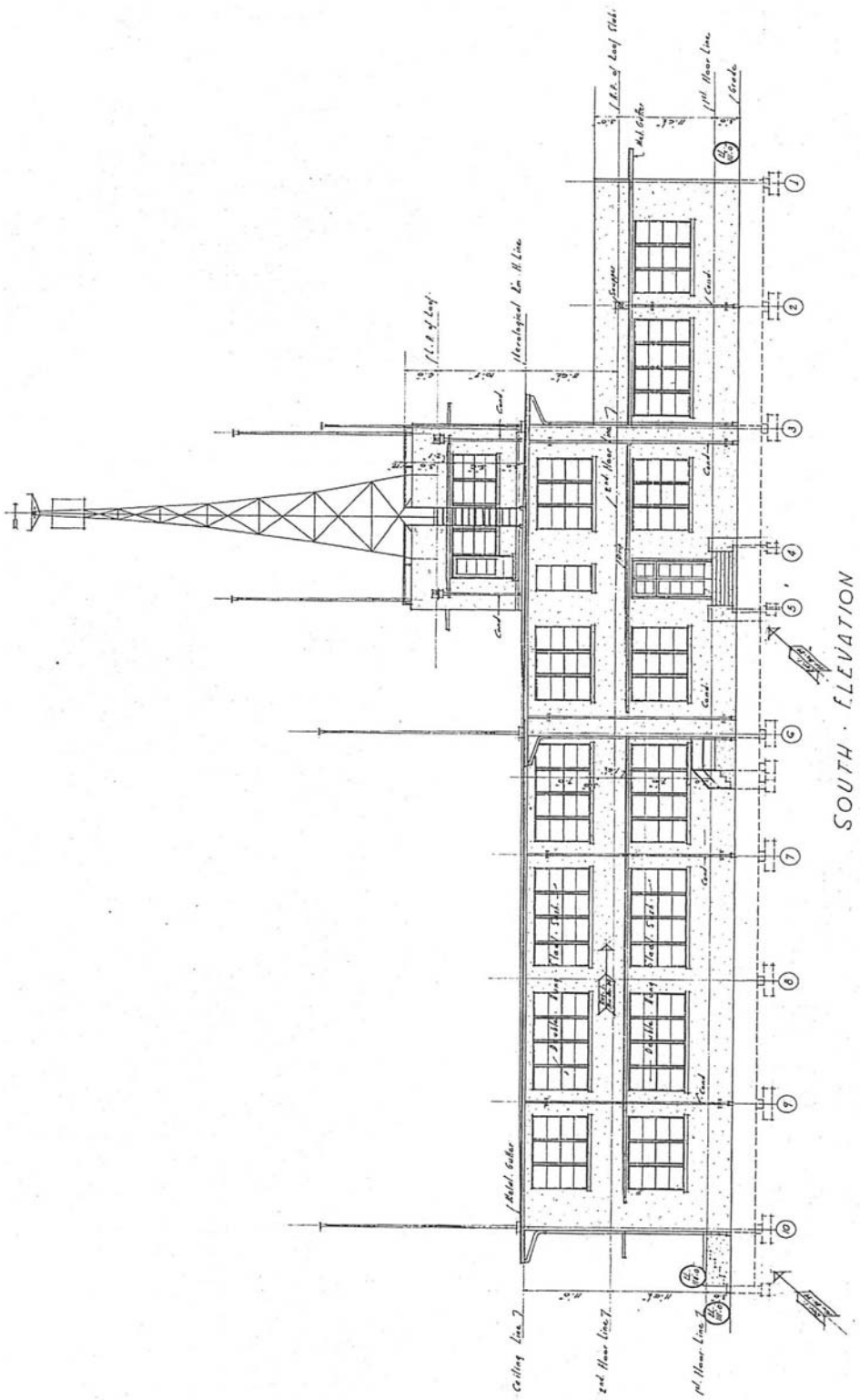
Portion of original drawing number 136523, Main Roof Plan (NAVFAC Pacific Plan Files)



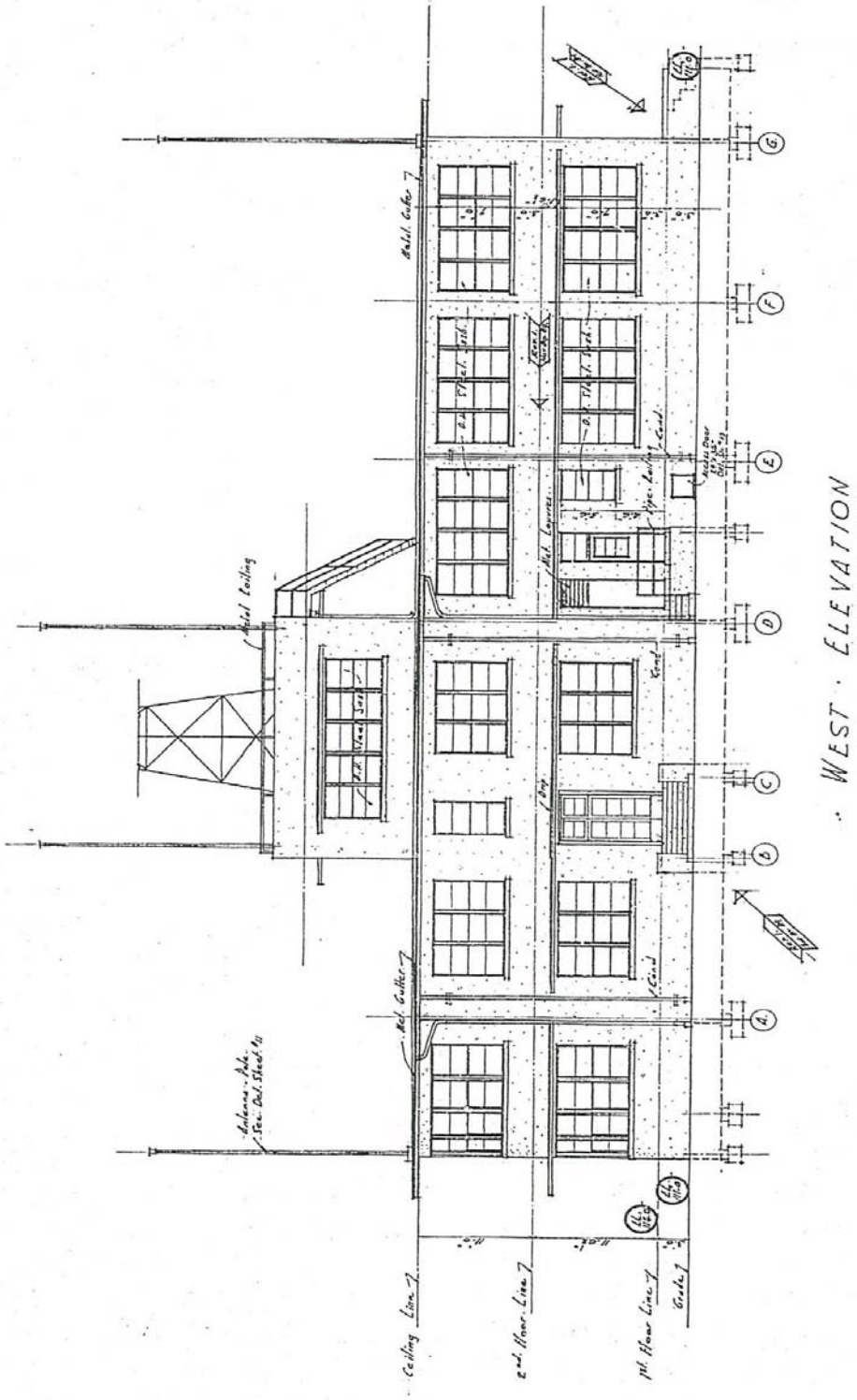
Portion of original drawing number 136524, North and East Elevations (NAVFAC Pacific Plan Files)



Portion of original drawing number 136525, South and West Elevations (NAVFAC Pacific Plan Files)



Portion of original drawing number 136525, South and West Elevations (NAVFAC Pacific Plan Files)



Aerial photo dated May 23, 1939 showing building site for Facility 215 (circle highlight added).
NARA II, 71-CB-54-10-1.

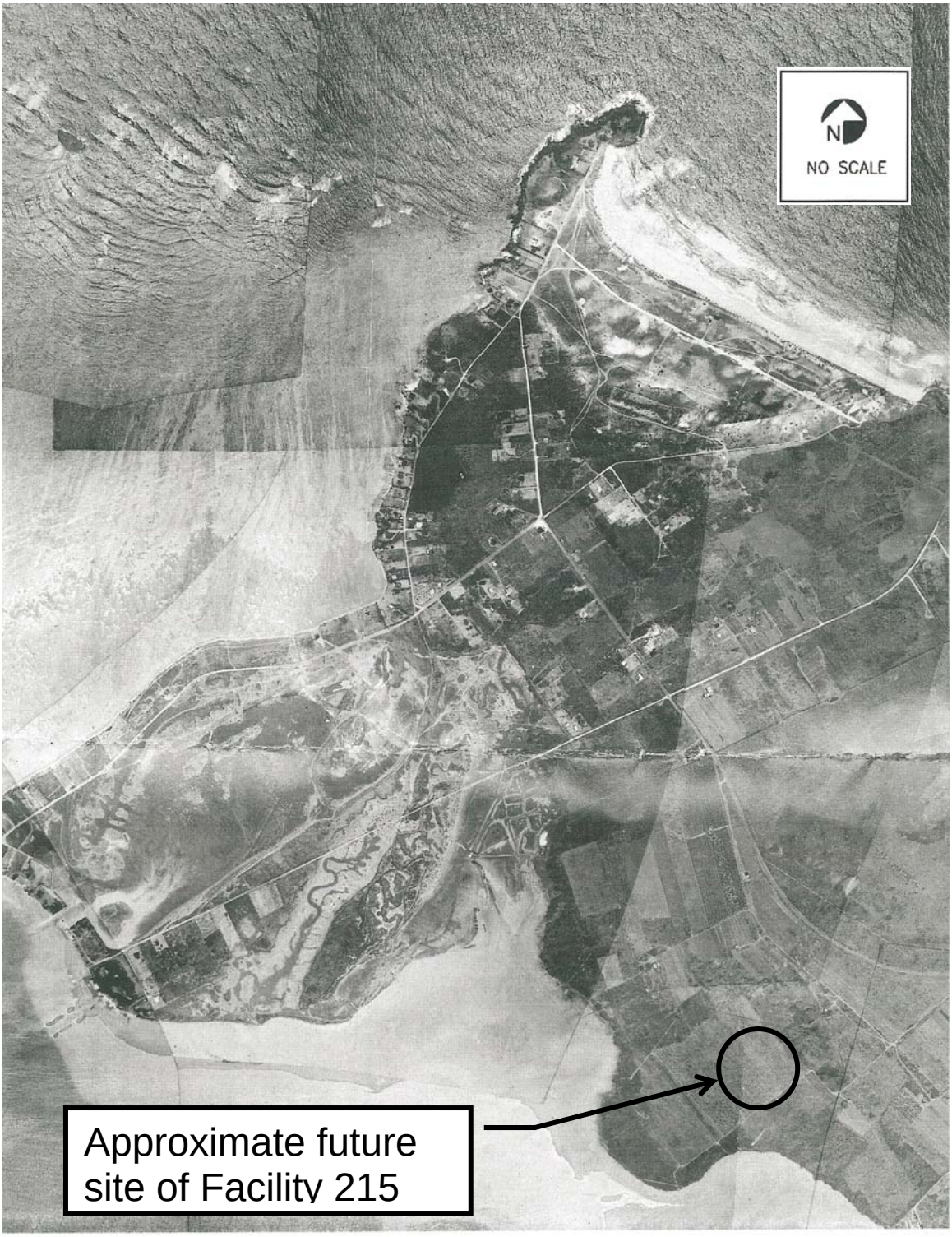


Photo dated August 26, 1940 showing Facility 215 under construction.
NARA II, RG-71-CA-156B-13882.

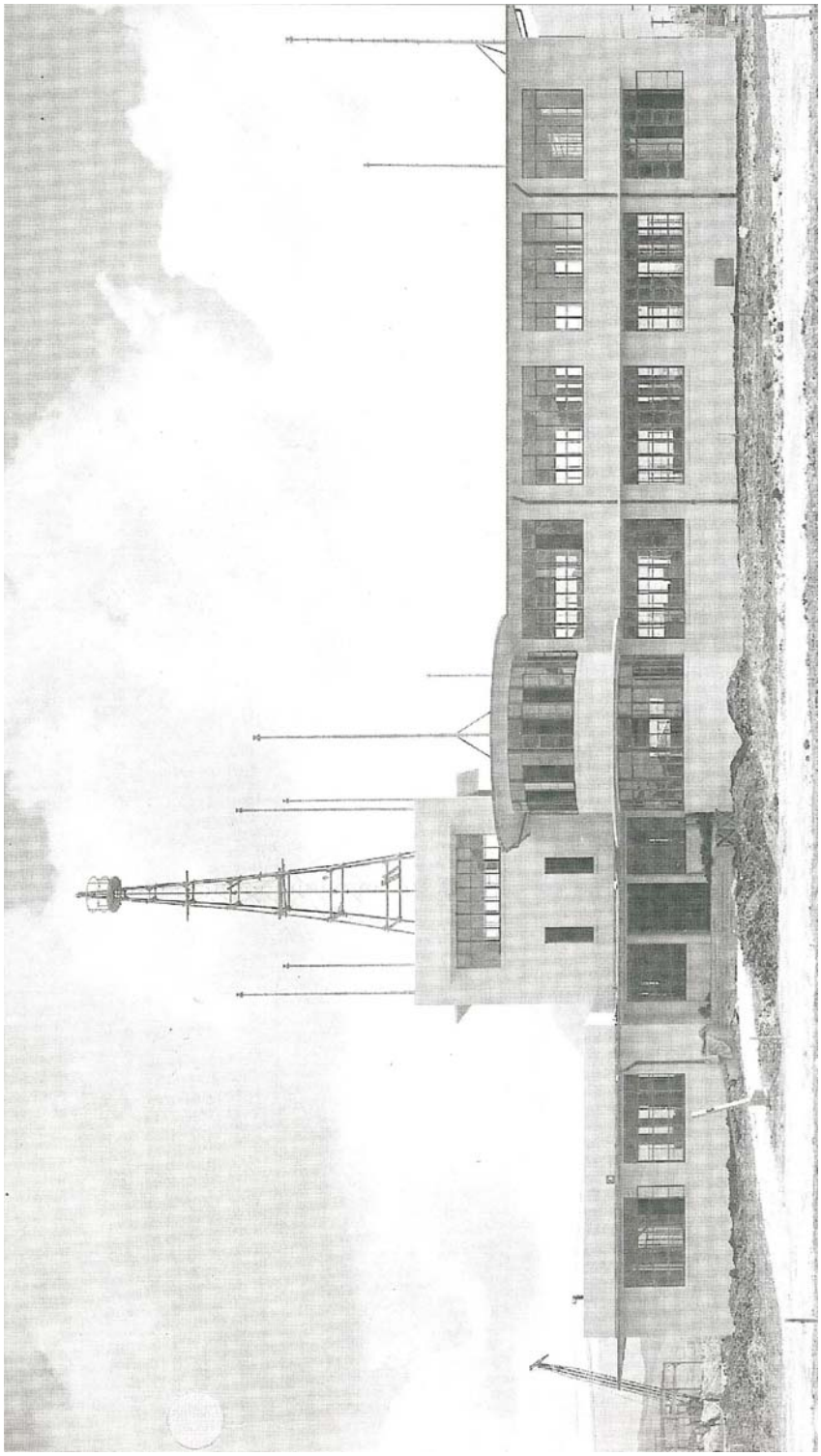
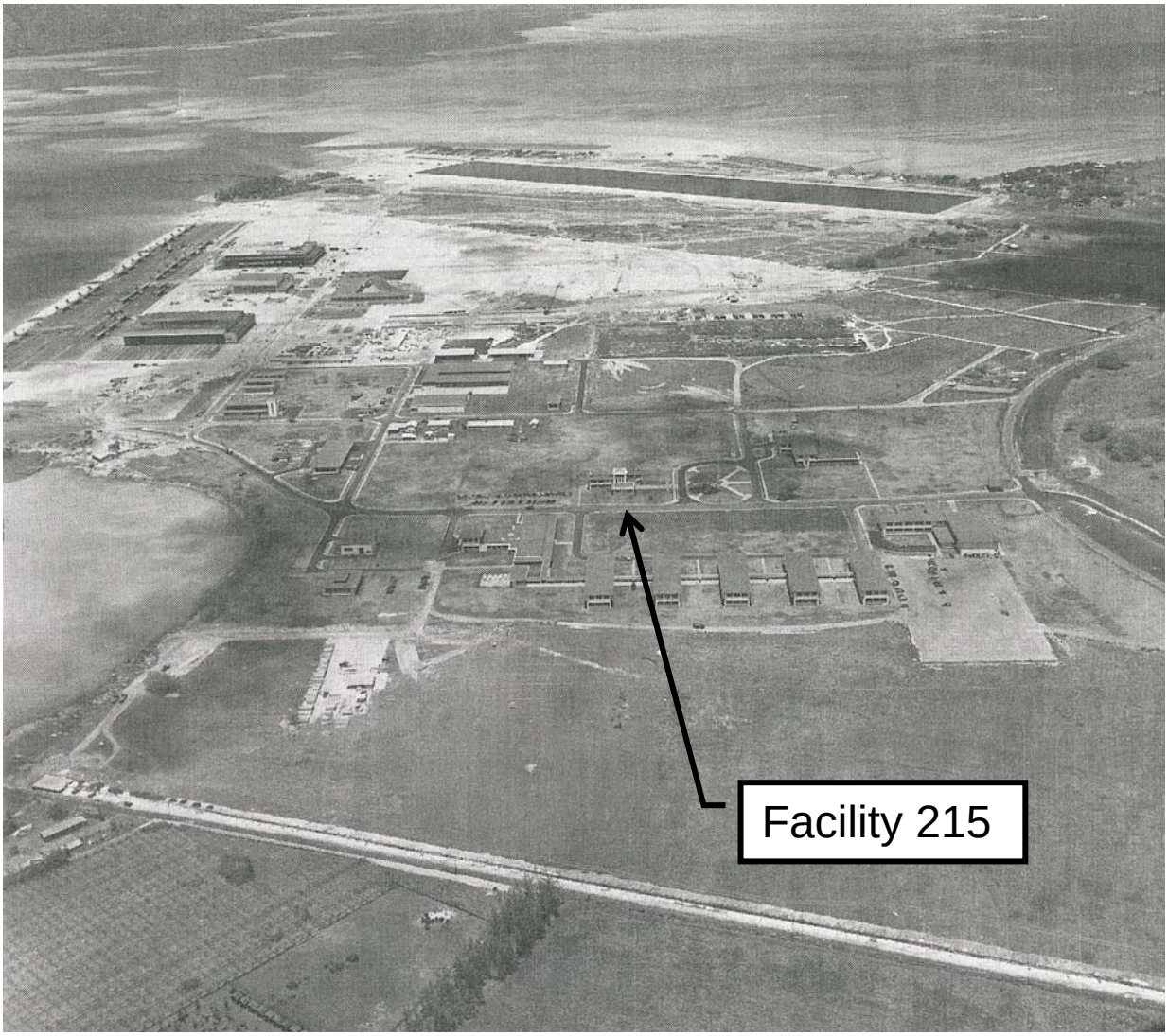
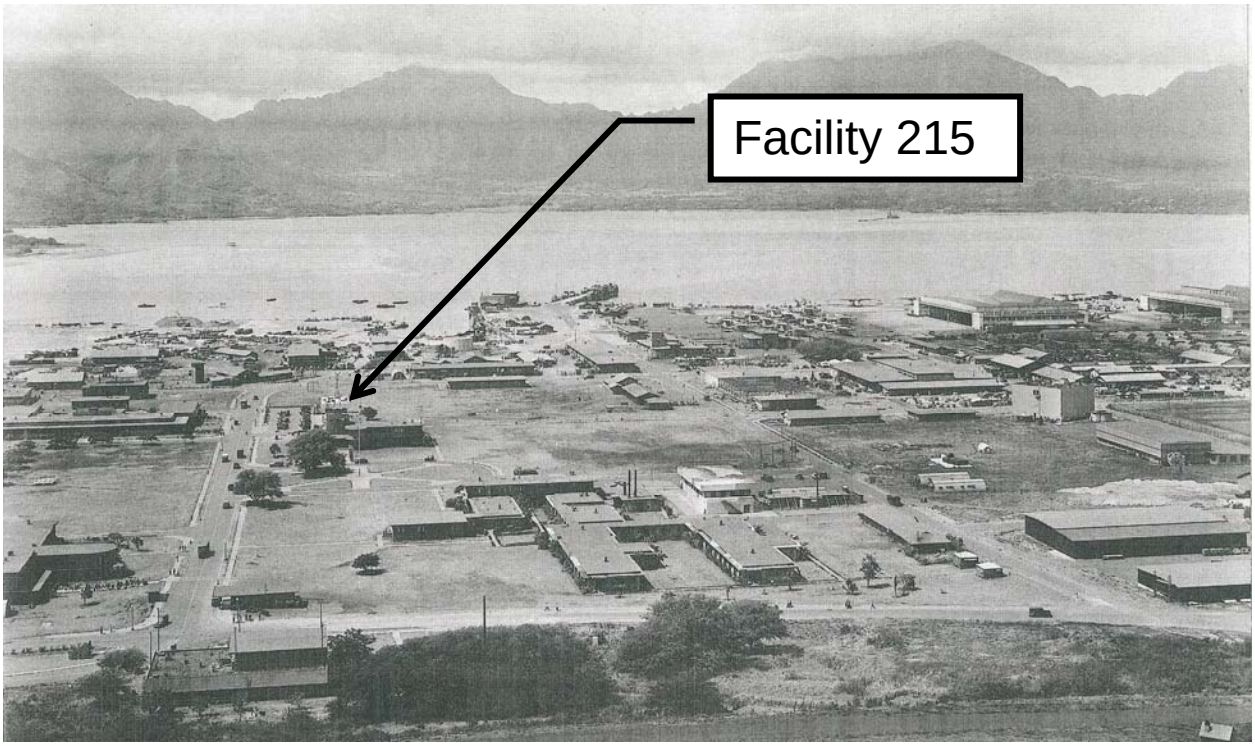


Photo dated April 9, 1941 showing Facility 215 upon completion.
NARA II, RG-71-CA-156B-14233.

Photo dated April 16, 1941 showing Facility 215 upon completion.
NARA II, RG-71-CA-156B photo 14234.

Aerial photo dated August 11, 1941 showing Facility 215 (highlight arrow added).
NARA II, 80-G-411187.



Interior photo dated November 27, 1941 showing NAS Kaneohe Commanding Officer Harold Montgomery Martin in his office. This second floor office is at the north corner of the building. Note the view out the window is over the flagpole area north of the building with Facility 218 visible on the left and Puu Hawaiiloa cinder cone in the background.
NHHC, #NH 96674.

Aerial photo dated September 12, 1945 showing Facility 215 (highlight arrow added).
NARA II, 80-G-419324.