United States Department of the Interior

NATIONAL PARK SERVICE
Pacific West Region
909 First Avenue, Fifth Floor
Seattle, Washington 98104-1060

January 2, 2018

Polly Tice
Mason Architects, Inc.
119 Merchant Street, Suite 501
Honolulu, HI 96813

Re: HAER No. HI-139

Dear Ms. Tice,

The National Park Service, Pacific West Regional Office-Seattle, acknowledges the receipt of and accepts the Historic American Engineering Record documentation for Hawaiian Electric Company, Honolulu Power Plant, HI-139. The completed documentation will be transmitted to the Prints and Photographs Division of the Library of Congress. The records are in the public domain and will be accessible through the library.

Sincerely,

Christy Avery
Historian

**HAWAIIAN ELECTRIC COMPANY, HONOLULU POWER PLANT** **HAER No. HI-139**
**(Unit 5, Unit 7, and Leslie A. Hicks Power Plant)**
**(Bishop Street Plant & Alakea Street Plant)**
**170 and 222 Aloha Tower Drive**
**Honolulu**
**Honolulu County**
**Hawaii**

**PHOTOGRAPHS**

**WRITTEN HISTORICAL AND DESCRIPTIVE DATA**

**HISTORIC AMERICAN ENGINEERING RECORD**
**U.S. Department of the Interior**
**National Park Service**
**909 First Avenue**
**Seattle, WA 98104**

**HISTORIC AMERICAN ENGINEERING RECORD**

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170 and 222 Aloha Tower Drive
Honolulu
Honolulu County
Hawaii

Silverhouse Photographic, Athens, GA, Photographer November 2012

HI-139-1 AERIAL OBLIQUE OF HAWAIIAN ELECTRIC COMPANY (HECO), HONOLULU POWER PLANT UNIT 5, UNIT 7, AND LESLIE A. HICKS POWER PLANT. VIEW FACING SOUTHEAST.

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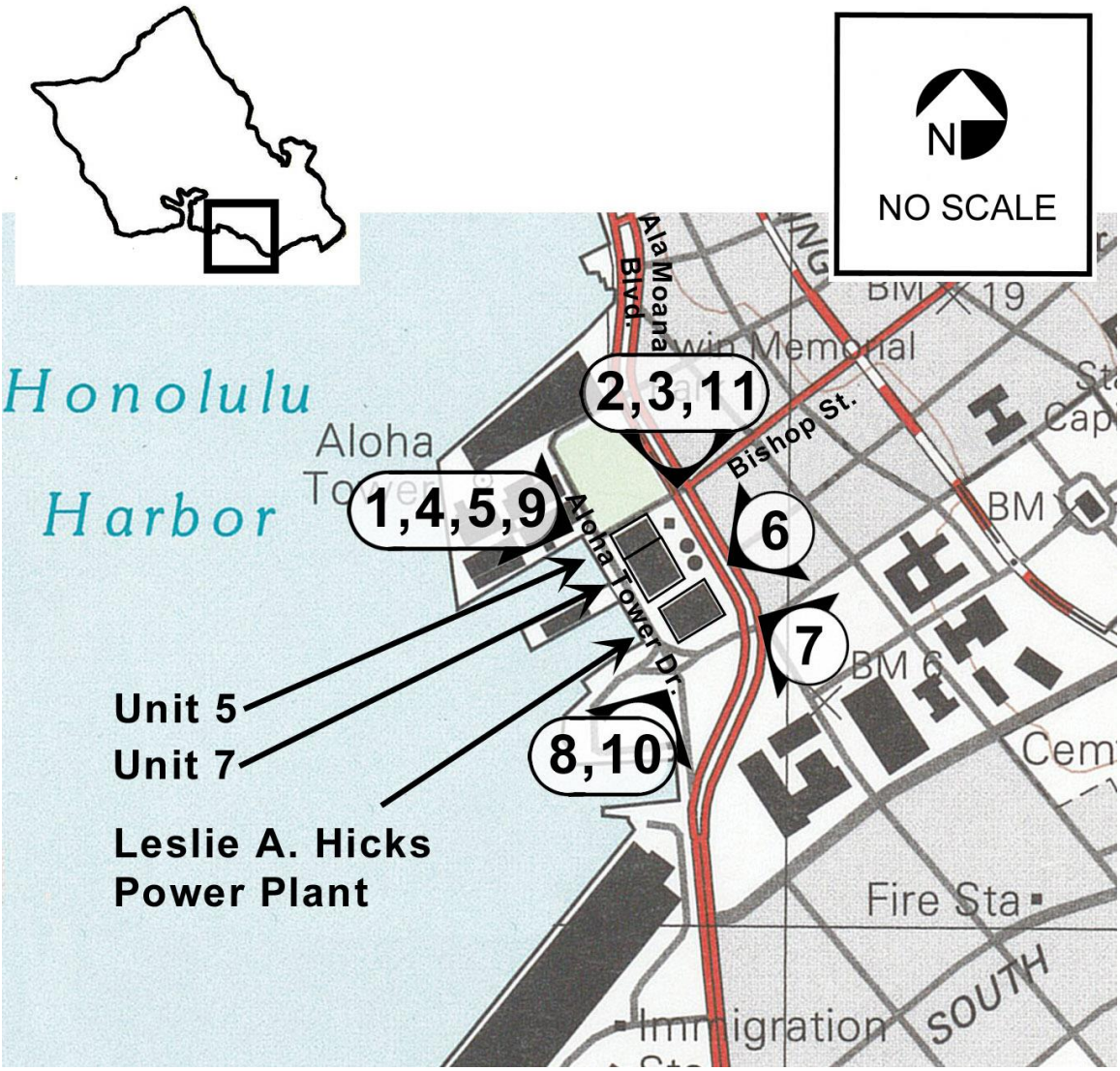
PHOTO KEY



**HISTORIC AMERICAN ENGINEERING RECORD**

# HAWAIIAN ELECTRIC COMPANY, HONOLULU POWER PLANT
## (Unit 5, Unit 7, and Leslie A. Hicks Power Plant)
## (Bishop Street Plant & Alakea Street Plant)

**HAER No. HI-139**

**Location:** 170 and 222 Aloha Tower Drive
Honolulu
Honolulu County, Hawaii

**Lat./Long. Coord.** 21.306240
-157.864070

**Date of Construction**: Buildings were erected in 1920 (Unit 7), 1930 (Unit 5), and 1955 (Leslie A. Hicks). Power generation equipment was installed in Unit 7 in 1944.

**Owner**: Hawaiian Electric Company, Inc. (HECO)

**Present Occupant** HECO

**Present Use**: Unit 5 and Unit 7 are decommissioned. Leslie A. Hicks plant is mothballed.

**Significance:** The HECO Honolulu Power Plant/Units 5 and 7, and the Leslie A. Hicks Power Plant, are significant for their association with the development of electric power on Oahu. They are also significant as examples of a distinctive period of power generating technology; the 1944 equipment installation at Unit 7 was the first hydrogen-cooled generator in Hawaii.

**Historic Name**: When constructed in 1920, Unit 7 was called the Alakea Street Plant, and it housed the first, second, and third power generating units installed at this site. It received its Unit 7 name later, in 1944, when the seventh power generating unit was installed in it.

When constructed in 1930, Unit 5 was called the Bishop Street Plant, and it housed the fifth power generating unit (boiler and generator) that was installed at this site.

After the buildings were constructed, HECO began referring to them by the number that referenced the power generating units they contained (Unit 5, Unit 7), which are their recognized historic names.

The two units were adjoining and in ca. 1936 they collectively became known as the Honolulu Power Plant to differentiate them from the Waiau Power Plant, then under construction.

The Leslie A. Hicks Power Plant built in 1955, was named for the HECO President on November 9, 1957.

**Project Information:** This report is part of the documentation for properties identified as adversely affected by the Honolulu Rail Transit Project (HRTP) in the City and County of Honolulu. This documentation was required under Stipulation V.C. (1, 2) of the Honolulu High-Capacity Transit Corridor Project (HHCTCP) Programmatic Agreement (PA), which was signed by

the U.S. Department of Transportation's Federal Transit Administration, the Hawaii State Historic Preservation Officer, the United States Navy, and the Advisory Council on Historic Preservation. After consultation with the City and County of Honolulu, the National Park Service, Pacific West Regional Office, in a letter dated June 29, 2011, described the details of the required documentation efforts, including HAER documentation for this and other properties affected by the HRTP. Onsite photography and archival photographs of historic views of the building at the Hawaii State Archives were taken by Silverhouse Photographic, Athens, GA in November 2012. This report was researched and written by Dee Ruzicka, Mason Architects Inc., Honolulu in 2016. Request for permission to access and entry on to the property were denied.

**Prepared by**: Dee Ruzicka
Architectural Historian
Mason Architects, Inc.
119 Merchant Street, Suite 501
Honolulu, HI 96813

**Date of Report**: October 2017

## PART I HISTORICAL INFORMATION

### A. Physical History

#### 1. Date of Construction

Unit 7 Building – July 1920

Unit 5 Building – May 1930

Leslie A. Hicks Building – December 1954

#### 2. Engineer

Unit 7 Building - Designed by HECO Chief Engineer, H. W. Marvin with Westinghouse, Church, Kerr & Co. as consulting engineers.[1]

Unit 5 Building – Dwight P. Robinson & Co., Inc., Engineers, New York.

Leslie A. Hicks Building – Merrill, Simms & Roehrig, AIA, Architects, Honolulu. Bechtel Co., Engineers, San Francisco.

#### 3. Builder

[1] "Hawaiian Electric Company's New Power Plant," *Honolulu Star Bulletin*. February 4, 1918. P. 10.

Unit 7 Building – Woolley and Beeton, Contractors, Honolulu.

Unit 5 Building – Unknown.

Leslie A. Hicks Building – Hawaiian Dredging Co., Ltd, Contractors, Honolulu.

**4. Original and Subsequent Owners**

HECO has remained the owner of all buildings throughout their history.

**5. Periods of Development**

**a. Original Plans and construction:**

The only original plans found for this report are for Unit 5, by Dwight P. Robinson & Co., and dated May 1929.

Alteration drawings showing the 1944 cooling water tunnels at Units 7 and 5 are by HECO, dated March through July, 1941.

An architectural elevation showing the 1944 rooftop alteration of Unit 7 are by HECO, dated December, 1942.

Engineering drawings showing the equipment layout of the 1944 installation of Unit 7 are also by HECO, dated May and September, 1943.

**b. Changes and Additions:**

1920 – Unit 7 building was built in June. This building originally housed power generating units 1 (installed in 1920), 2 (installed in 1922), and 3 (installed in 1924). Each of these was a 10,000kw (kilowatt) unit.

1930 – Unit 5 building was built in May. This building originally housed power generating Unit 5, a 20,000kw unit.

1933 – Units 1, 2, and 3 were overhauled and Unit 6, a 10,000kw topping turbine, was installed in Unit 7 building.

1944 – Unit 7 power generating unit (35,000kw) was installed in Unit 7 building. This work was begun in March 1941 and completed in October 1944. During this installation, new cooling water tunnels were built from Honolulu Harbor to Unit 5 and Unit 7 Buildings. Unit 7 Building also received alterations to the roof, with the addition of penthouse structures. At this time, the building became known as Unit 7.

1954 – The Leslie A. Hicks building was constructed and Unit 8 (50,000kw) installed. Construction of this building was begun in March 1953. The building completed and Unit 8 was tested in December 1954.

1957 – Unit 9 was installed in the Leslie A. Hicks building and the building dedicated with that name on November 9.

Ca. 1967 – Unit 5 generator was converted to hydrogen gas cooled.

1982 – Unit 5 decommissioned March 31, 1982.

1983 – Unit 7 decommissioned December 1, 1983.

2014 – Units 8 and 9 in Leslie A. Hicks building mothballed ca. January 2014.

## B. Historical Context

### 1. Development of HECO

#### a. Early electric power in Honolulu (1880s-1899)

Electric power in Hawaii dates from September 22, 1881, when the first electrical systems in Hawaii was installed on Maui when generators at Hawaiian Commercial & Sugar Co's (HC&S) Spreckelsville (mill number one) and Puunene sugar mills provided demonstrations of electric lights. Later, the electric power produced at these mills allowed them to operate around the clock during semi-annual harvests.

Around the same time, in September 1881, Hawaii's King Kalakaua, then on a world tour, visited Thomas Edison at his Menlo Park, New Jersey workshop. He was greatly impressed by Edison's demonstration of electric lighting and sustained his enthusiasm for the new technology after his return to Hawaii. Kalakaua was often courted by entrepreneurs seeking to sell generating systems to his government. In 1886, Charles Otto Berger had an electric dynamo[2] installed to operate off the steam engine at the Honolulu Iron Works pattern shop on Marin Lane near Queen Street. On July 19 and 20, 1886, wires were strung from the dynamo to Iolani Palace, and on the evening of July 21, he gave a demonstration of five 2,000 foot-candle power carbon arc lamps lit with the electric current produced.[3]

Meanwhile, at the same time that Berger was arranging his demonstration, a rival entrepreneur, David B. Smith, went before the Hawaii Legislature and attempted to gain a franchise to provide street lighting for Honolulu. Smith was the Hawaii representative of the Thompson-Houston Electric Company of Lynn, Massachusetts. Although Smith's request for a fifteen year franchise was seen as too expensive, Kalakaua agreed that Smith could provide a demonstration on the occasion of the King's 50$^{th}$ birthday on November 16, 1886. Smith installed a small steam engine and a dynamo at the east corner of the palace grounds and strung temporary wires to the Hawaiian Hotel (no longer extant) at Hotel and Richards Streets for advance demonstrations. Seeing these, Kalakaua instructed Smith that no wires were to be strung for the birthday demonstration, so Smith buried the approximately 200 feet of line leading to the palace. Smith's November demonstration was a success. Apparently, Kalakaua was enthusiastic and the Legislature suitably impressed to authorize Smith to install a permanent system.

On May 4, 1887, the Legislature authorized Smith to proceed with the plans for a lighting system for Honolulu. He ordered a fifty light electric plant consisting of a coal-fired boiler and a dynamo from Thompson-Houston for $11,535.80. Smith also hired W. O. Faulkner, formerly of Thompson-Houston, as superintendent. When this system was installed on the palace grounds the following month, it contained an additional twelve light dynamo that was powered from the

[2] A dynamo is a direct current electrical generator.
[3] Carl Myatt, *Hawaii, The Electric Century, A Special Edition for Hawaiian Electric Company*. (Honolulu: Signature Publishing Company). 1991. P. 130.

Thompson-Houston boiler.[4] This was likely the dynamo from Berger's Honolulu Iron Works installation that was purchased by the government.[5]

The $35,000 Legislative appropriation for the Palace system was quickly eroded by the purchase cost, installation costs, and salaries for Smith, Faulkner, two assistant superintendents, an engineer, and a fireman. In addition, the cost of coal proved expensive. However, with increasing government and public interest in electric lighting, a government-funded street lighting system for Honolulu was set up in 1888. This system used hydroelectric power from Nuuanu Stream. David Smith was authorized to construct this hydroelectric power plant to run streetlights in downtown Honolulu. The two-story powerhouse tapped into the Nuuanu Valley water main that supplied Honolulu at a site on the west side of Nuuanu Avenue west of the Dowsett Tract.[6]

The Nuuanu hydroelectric system became operational on March 23, 1888 when Princess Kaiulani ceremoniously threw the switch to light Honolulu's streets. The water wheel of the system powered two dynamos; a new forty-two horse power (hp) dynamo, and a ten hp dynamo that was brought to the site from the Palace grounds. In August, the 130 pounds per square inch (psi) water of the main ripped two vanes loose from the Leffel-type waterwheel that powered the dynamos. The damaged wheel was replaced with a Pelton-type water wheel.[7]

A small reservoir was built at the hydroelectric site to improve power generation when water was low, and in 1889, an auxiliary boiler and two additional dynamos, each with a 1,000-light capacity, were authorized. Interest in the system grew and electric service was offered to the public. Some of the first buildings electrified in Honolulu were the residence of C. Bolte in Nuuanu, Criterion Saloon, Hollister & Co., H.J. Nolte on Fort Street, Germania Market, and the Honolulu Rifle's Armory. By December 1889, almost 800 private buildings were electrified. Despite attempts to make hydroelectric generation work, service was often interrupted because of insufficient water. Heated debate in the Hawaii Legislature of 1890 roiled around the question of whether or not the system would ultimately be viable. Although the Legislature was uncertain about the future of the Nuuanu plant, the public was in love with electrification and wanted service.[8]

### b. HECO Formation (1890s)

In 1890, the Honolulu firm of E. O. Hall & Son, a hardware and ship chandlery, began advertising its installation of small electric plants in individual homes and businesses. In March 1891, Honolulu attorney Jonathan Austin had a small generating system set up at his Merchant Street law office that powered an incandescent lamp. A fan, sewing machine, or another small

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[4] Myatt, *Electric Century*. P 131.
[5] Hawaiian Electric Company (HECO), "Milestones of the Hawaiian Electric Company," *The Load Builder*, (Newsletter of the Hawaiian Electric Co.). September 1939. .
[6] Myatt, *Electric Century*. P 131. Hawaiian Electric Company (HECO), *75 Years of Light and Power for Honolulu, The Diamond Anniversary Story of Hawaiian Electric Company*. (Honolulu: Hawaiian Electric Company). 1966. Np.
[7] A Leffel-type waterwheel uses flat vanes, a Pelton-type uses cup-shaped vanes. In most applications, the Leffel is less efficient because as the water flow strikes the edge of the flat vane it is split, creating a dead water area that does no work.
[8] Myatt, *Electric Century*. P 132. HECO, *75 Years*.

appliance could be operated in lieu of the lamp. That month, Austin proposed founding a private company to generate and sell electricity in and around Honolulu.[9]

On May 7, 1891, a co-partnership named Hawaiian Electric Company (HECO) was formed with Austin and three men from E. O. Hall & Son: William W. Hall, Edwin O. White, and William V. Lockwood. HECO leased a lot on King Street near Richards Street in July 1891 and constructed a single story building to house a coal fired boiler and dynamos. Austin's original business plan for HECO took the cost of coal into account and still projected a monthly profit. On August 22, 1891 HECO electrified its first building from the King Street plant, the Egan & Gunn store on Fort Street.

On October 13, 1891 HECO was incorporated with William W. Hall as President, William V. Lockwood as Vice-president, and Edwin O. White as Secretary. That night, the generating system at the HECO plant was sabotaged by someone who obstructed the steam line, bringing the system down temporarily.[10] Service was resumed and in December the rates were raised from one cent per light per hour to fifty cents per light per month and twenty cents per 1,000 watts per month. Lockwood was then authorized to add as many lights and customers as the system could carry.

On January 12, 1893, as one of her last official accomplishments, Queen Liliuokalani of the Kingdom of Hawaii approved legislation that empowered the government to provide and regulate the production of electricity in Honolulu.[11] This legislation allowed the Hawaiian Government to nationalize HECO. Liliuokalani's monarchy was overthrown five days later.

The January 17, 1893 overthrow of the Hawaiian monarchy was finessed with the help of the thirteen-member Committee of Public Safety, an expedient offshoot of the Annexation Club, which was attempting to seek annexation of Hawaii to the United States to protect business interests in light of Queen Liliuokalani's attempts to restore power to the throne.[12] Some members of the Committee of Public Safety were intimately involved with HECO, and the overthrow of the monarchy just days after HECO was effectively nationalized, served to neutralize that legislation. HECO President, William W. Hall, was a member of this committee, as was Jonathan Austin, the attorney who set up a small generating plant in his Merchant Street office in 1891 and formed the original co-partnership.

On May 3, 1893 HECO (the only bidder) was granted a 10-year franchise by the provisional Hawaiian Government to supply electricity to anyone in Honolulu who wanted to be a customer.[13] The government retained control of the hydroelectric plant at Nuuanu and maintained it to operate streetlights when it was able. HECO quickly began planning a new facility to take the place of the King Street plant. In June, lots at Alakea and Halekauwila Streets were purchased for the new plant and construction commenced.

### c. Alakea Plant (1894)

The new HECO complex at Alakea began operations in 1894 and was dedicated on January 25 of that year. It contained two 20' x 60' boilers, two steam engines (150 hp and 200 hp), a 2,000

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[9] Myatt, *Electric Century*. P 133. HECO, *75 Years*. "In the office of Mr. Jona. Austin," Pacific Commercial Advertiser. March 26, 1891. P 3. "Preliminary Prospectus," Pacific Commercial Advertiser." March 26, 1891. P. 3.
[10] HECO, "Milestones." *The Load Builder*.
[11] Myatt, *Electric Century*. P 134.
[12] Gavan Daws. A Shoal of Time, A History of the Hawaiian Islands. (Toronto: Mcmillian Company). 1968. P. 272.
[13] Myatt, *Electric Century*. P 135.

light Thompson-Houston alternating-current generator, and two 720 light Edison dynamos.[14] This was the first HECO installation at the Alakea Street site and is no longer extant. HECO also equipped the 1894 Alakea site with ice making equipment. Initially, there was power to spare from the dynamos, which HECO used to make ice for Honolulu's breweries and meat packers.[15] Ice remained a part of the HECO business plan until 1947, when the operation was shut down.

The 1894 HECO complex at Alakea took up about half of the block (northeast half) bounded by Alakea, Halekauwila, Kilauea, and Allen Streets. It consisted of four adjoining masonry buildings with gable roofs and parapets at the front façades. Each building was about 100' long with varying widths between about 30' and 60'. Three of the buildings were oriented with their front façades on Alakea Street. Progressing southwest from the corner, these contained the dynamos, an ice making plant, and a cold storage warehouse. The fourth building, which contained the boilers, was oriented with its front façade toward Halekauwila Street, and was located at the rear of the other three. Northwest of the boiler building, at the corner of Halekauwila and Kilauea Streets, were small buildings for transformers, a garage and a machine shop. Behind the cold storage warehouse were two fuel oil tanks. After the 1894 HECO complex was built, the remaining portion of the block became a coal yard used by the U.S. Navy for storing this fuel for its ships.

In 1895, HECO took control of the Republic of Hawaii's Nuuanu power station, leasing it for $200 per month and using it as part of their supply network. A line was extended into Waikiki in 1897. In the following year a 2,000 volt generator was purchased for the Alakea Street plant. In 1900 a new office building was built on King Street.[16] This extant building is at 223 South King Street. Through the end of the 1890s and into the early 1900s, HECO worked to expand its market for electricity. By 1906 HECO had installed power lines to bring electricity from its Alakea Street facility to Manoa Valley and a second line into Waikiki, reaching over 2,500 customers.

HECO's government franchise was up for renewal in 1903. Hawaii was a U. S. Territory and the franchise renewal required approval from the U.S. Congress. On April 4, 1904 it was ratified by Congress as a perpetual franchise. In 1908, the first steam turbine generator in the Territory of Hawaii, a 750kw unit, was installed at Alakea Street. In 1910 and 1913 1,500kw and 2,500kw steam turbine units were brought on line at that site as well.

At this time, electricity was primarily used for lighting, and its demand was almost exclusively confined to the few hours before dawn on workdays and in the evening. Previously, customer rates had been based on the number of electric lights used until midnight. Customers were expected to not use them after midnight. This presented a challenge to HECO in monitoring compliance. Generally, customers abided and most went to sleep. However, in Chinatown, drinking and gambling went on through the night and lights blazed until dawn. HECO inspectors prowled Honolulu, noting the addresses which typically violated the midnight rule. For these customers, a special rate was established, known as "the Chinatown rate" of about twenty-five percent higher than others. This rate was usually paid without complaint. An important milestone was reached in May 1909, when HECO first established daytime service. Although HECO service after 1909 ran through the daylight hours, each day for about twenty

[14] HECO, "Milestones." *The Load Builder*.
[15] Myatt, *Electric Century*. P 138.
[16] Myatt, *Electric Century*. P 136-137.

minutes the entire system was shut down to perform maintenance on the turbines. Customers were generally accepting of this practice.[17]

Another unusual feature of HECO in these early years was the team of wiremen and helpers who did electrical wiring inside of customer's buildings, just as electrical contractors do in 2017.

In 1910, most of HECO's electrical system was confined to the general city limits of Honolulu, with a few lines extending to outlying areas. Ten single-phase 2,300 volt circuits and three direct current circuits (500 and 110 volts) were carried via overhead lines from the Alakea plant to Nuuanu Valley, Moanalua, and Waialae. After 1910, expansion of residential, military, and other areas pushed lines to Kakaako, Makiki, Fort Ruger, Kamehameha Schools, Kahala, Kaimuki, and Punchbowl.

By 1916, HECO had installed a distribution system of substations fed by high voltage transmission lines. This system transmitted electric power better over longer distances and as it came into use it replaced the older system of low voltage lines. Transformers were installed at Alakea that increased the voltage to 11,000 volts to the substations, where it was reduced to a lower voltage through the distribution lines to customers. This high voltage system allowed HECO to provide power to windward Oahu and to Pearl Harbor.

Schofield Barracks, Fort Kamehameha, and Pearl Harbor were supplied with a 44 kV (kilovolt) transmission line.[18] The new 44 kV line supplied military installations in rural Oahu, but it became clear that greater generating capacity was needed to provide power to other potential customers, including the military, which became one of HECO's largest customers.[19] Later, in the 1920s, lines were extended to rural Oahu sugar plantation areas such as Kahuku, Waialua, Oahu Sugar, and Ewa Plantation.[20]

### d. HECO Expansion on Oahu and Neighbor Islands, Hawaii (20th Century)

In 1920 HECO completed a new building adjacent to its 1894 plant, to house three 10,000kw units; Honolulu Power Plant Units 1, 2 and 3. (See section 2.a.i. for more information.) About the time that Unit 2 came online in that building (1922), HECO made the decision to terminate power generation at the old government hydroelectric plant at Nuuanu. This was likely an easy decision as its modernization cost was estimated at over $750,000. About 1925 after power generation at the Honolulu Power Plant was underway with all three units, the former generating areas of the Alakea Plant were relegated to ice production.

HECO constructed a new office building that opened on July 25, 1927. It was (and still is in 2017) located on the corner of Richards, King, and Merchant Streets. It was built adjacent to the former (1900) King Street office. The land for this building was leased from Bishop Estate for $9,000 per year. This building originally had a generous amount of its ground floor space dedicated as showroom for the various electrical appliances that HECO marketed.

By about 1927 an increasing number of industrial customers such as pineapple canneries, can factories, and manufacturing plants were producing their own electrical power from generators fed by their own boilers. This drop in demand for HECO power was offset by an aggressive campaign to attract more residential customers.

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[17] Myatt, *Electric Century*. P 139. HECO, "Milestones." *The Load Builder*
[18] Myatt, *Electric Century*. P 144.
[19] Myatt, *Electric Century*. P 141.
[20] Myatt, *Electric Century*. P 145.

In the mid-1920s HECO undertook an extensive program to place electrical power lines underground running through downtown Honolulu.[21] This undergrounding was continued into the 1930s with a $760,000, two-year plan in 1930 that included burying lines on Fort Street. In 1925, HECO undertook its first wiring of a large commercial building, the Damon Building (demolished 1994), for the Bank of Bishop & Co.[22]

In 1930 a new power plant building housing a 20,000kw steam turbine was built adjacent to the northwest of the 1920 building (extant Honolulu Power Plant/ Unit 7 Building) housing Units 1, 2, and 3. This 1930 building is the extant Honolulu Power Plant/ Unit 5 building. In 1933 Units 1, 2, & 3 were overhauled with the installation of an additional 10,000kw turbine and boiler that was designated Honolulu Power Plant/ Unit 6.

With increasing electric use in the 1930s, HECO needed to augment its existing generating facilities at the Honolulu Power Plant. An additional plant was planned in 1936 when HECO Board of Directors authorized construction of a new facility, Waiau Power Plant, near Pearl Harbor. Waiau was to "take care of the rapidly increasing load and to provide a greater factor of safety in service to the territory west of [the] Iwilei Substation."[23] The military installations, canneries, factories and manufacturing plant were the principle customers that prompted the construction of additional generating facilities at Waiau.[24] HECO engineering staff designed the plant and construction commenced on June 3, 1937 by Hawaiian Contracting Co. on an approximate 8 acre parcel at Waiau.

The layout of the building at Waiau allowed for the installation of two generating units. Waiau/ Unit 1 (7,500kw) was installed and running in the completed building on June 20, 1938. In late 1938, after only a short time of operation of Waiau/ Unit 1, HECO outlined plans for the addition of a second generating unit in the completed building there. This second unit had been anticipated in the 1936 design of the Waiau facility, which provided for a second unit in the building and for the expansion of additional units in a future adjacent building. Waiau/ Unit 2 was a 15,000kw turbine generator that was placed into service on August 27, 1940.

In 1940 HECO also purchased over 8 acres of additional land at Waiau from the Territory of Hawaii, which brought the area of the site to almost 17 acres. HECO erected ten wooden dwellings on a portion of this land for employee housing, citing the advantages of having Waiau employees near the plant in the event of a power emergency in Honolulu.[25] This housing area was called Honokawailani Place and it was located southeast of the Waiau power generating complex. The housing area existed until at least the 1950s.

During World War II, electric power use on Oahu climbed, with the military and a growing population placing demand on HECO to expand its production. HECO provided vital electric power to the military for the war effort, sometimes curtailing residential service to be able to meet military demands. More often, coordination between military government and the private sector even impacted the hours of operations and labor for industrial facilities so that HECO's power supply to military installations was unimpeded.

Construction on a new building at Waiau began in 1945. This housed a 40,000kw Waiau/ Unit 3 (December 1947) and 40,000kw Waiau/ Unit 4 (November 1950). In the interim while Unit 3 was under construction, HECO leased a former US Navy floating power barge, YFP-1 *Jacona*,

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[21] Myatt, *Electric Century*. P 146.
[22] Myatt, *Electric Century*. P 146.
[23] HECO, "Annual Reports, Hawaiian Electric Co., Inc." 1936. p. 8.
[24] "Waiau Plant Takes Form," *The Load Builder*, March 1938. p. 1.
[25] HECO, "Annual Reports, Hawaiian Electric Co., Inc." 1940. pp. 9-10.

to provide power to the Oahu grid. Providing about 20,000kw, the *Jacona* was moored offshore of Waiau from March 1946 to provide additional electricity. In 1947 the HECO engineering and operations divisions moved into new quarters on Ward Avenue.

Major additions were made to the site as well as HECO infrastructure in the following decades. The Honolulu Power Plant received major additions in 1955 and 1957 with the installation of two 50,000kw units (Units 8 and 9) that were placed in a new (1954) building sited just southeast of Unit 7 building. The 1954 building and these two units were named the Leslie A. Hicks Power Plant in 1957 after the President of HECO. At Waiau in late 1959, outdoor generating Waiau/ Unit 5 was brought on line at a location east of the Unit 3 & 4 Building. In August 1961 it was joined by Waiau/ Unit 6, in the same structure. A third power plant location was built in 1963 at Kahe Point in Leeward Oahu with a generating capacity of 86,000kw. In late 1964, Kahe Point received a second 86,000kw unit. Both units were reheat steam turbine type systems. The Kahe Point site was originally considered for a nuclear power plant, but in the early 1960s nuclear plants of the small size that HECO needed were not available in the United States. Kahe Point would become the main power generating station for HECO, with six turbines supplying a total of 648,000kw in the early 1990s. On December 1, 1966 at Waiau, outdoor generating Waiau/ Unit 7 became operational in a structure east of Units 5 and 6. On December 1, 1968 it was joined by Waiau/ Unit 8 in the same structure.

In late 1962, HECO discontinued selling consumer electrical appliances. HECO began expanding its corporate structure outside of the Island of Oahu in 1968, with the acquisition of Maui Electric Company (MECO). HECO expanded onto Hawaii Island in 1970 with the purchase of Hilo Electric Light Company. In 1975, Hilo Electric Light Co. changed its name to Hawaii Electric Light Co. (HELCO).

In 1981 a holding company, Hawaiian Electric Industries (HEI) was formed as a way to maintain corporate growth and profits during this time of a receding economy in Hawaii. HEI took control of the outstanding stock of HECO, MECO, and HELCO in addition to acquiring several other corporations during the 1980s. They included Hawaiian Tug & Barge Corp., Young Brothers, Ltd., Hawaiian Insurance Group, and American Savings Bank. Expansion continued in the 1980s as MECO acquired the Lanai City Power Plant in 1988 and the Molokai Electric Company in 1989.

## 2. Development of Honolulu Power Plant and Leslie A. Hicks Power Plant

### a. Unit 7/Alakea Street Plant

#### i. Units 1, 2 and 3 (1920 – ca. 1924)

To provide for the further electrification of Oahu during the 1920s, HECO planned construction of a new plant on property adjacent to the existing Alakea plant (1894). Some of this property had previously been purchased ca. 1903-04 by then Vice-president John A McCandless, who had quietly bought lots for the company in anticipation of such an expansion. HECO purchased additional property adjacent to the Alakea Street site in 1918, and in total its land amounted to the entire block bounded by Alakea, Halekauwila, Bishop, and Allen Streets. New construction and equipment installation ensued, and in 1920 HECO opened a new facility there that was built on the former Navy coal yard adjacent to the 1894 Alakea Street complex. This new plant was designed to house three generating units. The first, Honolulu Power Plant/ Unit 1, came online in June of 1920 and had a 10,000kw unit. In 1921 HECO began supplying power to sugar mills and Kahuku as well as Ewa Plantations were added in that year. In October 1922 the 1920 building received a second unit of the same 10,000kw capacity, providing service to Waialua. This was Honolulu Power Plant/ Unit 2.

About 1924 another 10,000kw unit (Honolulu Power Plant/ Unit 3) was added to the 1920 building. This housed Units 1, 2, and 3 and is the extant Honolulu Power Plant/ Unit 7 building. It was erected by contractor Wooley and Beeton for about $218,917 and opened on July 1, 1920 with the activation of Unit 1. It was designed by HECO Chief Engineer, H. W. Marvin with Westinghouse, Church, Kerr & Co. as consulting engineers.[26] Its boilers were oil-fired. The original 1920 configuration of Unit 7 had a boiler room in the northwest part of the building and a turbine room at the south east part of the building. Originally, until at least June 11, 1924, there was only one smoke stack at Unit 7. The second stack was added sometime later, it appears in a dated photo from 1928.[27]

### ii. Overhaul of Units 1, 2, and 3 and Installation of Unit 6 (1933)

Electrical consumption on Oahu increased steadily in the late 1920s and through the 1930s, largely due to the introduction of new household appliances like the electric refrigerator. In 1933 Honolulu Power Plant/Units 1, 2, and 3 in the extant Unit 7 building were overhauled and a new high pressure boiler and turbine were added to the building. The new boiler supplied 650 psi steam to the new 10,000kw topping turbine that was known as Unit 6. A topping turbine is designed to operate with input steam at a much higher pressure than earlier types. The topping turbine would exhaust its steam at a lower pressure, approximately 250 psi, which was the standard pressure then used for most turbines. This lower pressure steam exhausted from the topping turbine, was then fed into the existing turbines at overhauled Units 1, 2, and 3 already in use.

### iii. Installation of Unit 7 (1944)

In 1944, the Honolulu Power Plant complex received a new 35,000kw unit (Honolulu Power Plant/ Unit 7) that augmented Units 1, 2, 3, and 6 in the 1920 building. This installation involved work in the former boiler room of Unit 7 Building where a new boiler and a new turbine (Unit 7) were added. This was a 700 psi boiler in the west end of the boiler room that fed the new turbine, which was located in the northwest portion of the boiler room. Units 1, 2, 3 & 6 remained in service.[28] The design of Unit 7 was initiated in December 1940 and work on the installation began in March 1941. Unit 7 also had a hydrogen cooled generator.

Additional modifications were made in 1944 which altered the roof configuration. It was raised about 25' and a penthouse (footprint about 50' x 50') was added above the new boiler. In addition, the original smokestacks which protruded through the roof near the northeast edge were removed and new stacks built nearer to the center of the building, above the location of the two boilers. The original stacks were very tall, extending about 180' above the original building roof. The 1944 stacks were much shorter, only reaching about 75' above the height of the original building roof. Unit 7 was later decommissioned on December 1, 1983.

### b. Unit 5 Building/Bishop Street Plant (1930)

The 1930 power plant building, the extant Honolulu Power Plant/ Unit 5, was built adjacent to the northwest of the 1920 building housing Units 1, 2, and 3. It originally contained a 20,000kw

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[26] "Hawaiian Electric Company's New Power Plant." *Honolulu Star Bulletin*. February 4, 1918. P 1.

[27] Hawaii State Archives Photograph Collection. Folder PP-40-5, photos .005 (ca. 1922), .013 (1928) and .020 (June 11, 1924). Note, HECO archives has a historic photo of Unit 7 building with a circa date of 1922 that shows the building with two smoke stacks. This is judged to be an erroneous date due to the evidence of the June 11, 1924 dated photo in the Hawaii State Archives collection that shows one stack. HECO archives also has several ca. 1925 dated photos that show the building with two stacks. These may be accurate for that year.

[28] "Haw'n Electric Finishes Generator Project Here," Honolulu Star Bulletin. October 2, 1944. P. 2.

steam turbine generator. Unit 5 in this building was a complete generating plant. The building was designed by Dwight P. Robinson & Company, Inc., New York, an engineering and construction firm that was organized in 1918.[29] The firm specialized in the design and construction of steam power plants, hydro-electric developments, steel mills, industrial plants, and shop buildings for railroads and rapid transit lines. Steam power plants were designed in Seattle, Minneapolis, and Boston and hydro-power plants in Washington State, and California. Rail facilities include Coney Island Shops for the New York City Subway (1926), Birmingham AL Car Repair Shops for Southern Railway (1925), and the Wabash Railroad Car Repair Shop in Decatur IL (1926).

Construction on the Unit 5 building began about May 1, 1929. The facility was equipped with a 20,000 kw Westinghouse turbine generator and two Babcock Wilcox boilers providing 450 psi steam. The facility cost about $1.5 million and came online in May 1930.[30] Unit 5 generator was converted to hydrogen cooled ca. 1967[31] and Unit 5 was decommissioned March 31, 1982.

After the 1930 construction of Unit 5, changes in the fenestration of Unit 5 and Unit 7 appear to have been undertaken on the two facilities as one. The dates and configurations for these alterations can only be approximated from available historic photos. Sometime between 1935 and 1945, many of the large, vertically-oriented window openings that originally contained multi-light sash were in-filled. The five openings at the center of the southwest façade of the Unit 5 and Unit 7 building appear to have remained unaltered, except for a large loading or freight doorway added at the bottom of the northern-most opening. Most of the remaining vertical openings received solid panels with louvers at the top and bottom, as did smaller openings on the northwest (rear) side of the building. By 1955, some of these smaller openings had been changed back to louvers filling the entire opening.

Sometime after 1958 solid panels with rectangular sections of fixed orthogonal grilles filled the five openings at the center of the southwest façade and smaller openings in the roof penthouses.

### c. Leslie A. Hicks Power Plant (1954)

In the early 1950s HECO began planning for a new facility adjacent to Unit 7 that would become the Leslie A. Hicks Power Plant. For the site, HECO acquired the block southeast of Unit 7 that was bounded by Alakea, Halekauwila, and Richards Streets, which was the site of the former fish market, established ca. 1890. In 1916 the fish market property was acquired by the US Army and used as warehouse space. The Army returned the site to the Territory of Hawaii in 1952 and HECO acquired it in early 1953 with a payment of $210,501 and a land exchange with the Territory for some of the HECO property along Halekauwila where the 1894 plant had been located. The Territory needed this Halekauwila land for the re-routing of Ala Moana Boulevard. Also with the 1953 land swap, Alakea Street between Unit 7 and the new plant was relinquished to HECO for the development of the Hicks Plant.

Ground was broken for the new facility in February 1953 by the construction contractors Hawaiian Dredging Co., LTD, of Honolulu. The building was designed by the Honolulu architectural firm of Merrill, Simms & Roehrig, AIA. The generating equipment inside the plant was designed and engineered by Bechtel Co., Engineers, San Francisco. In February 1954 an 80-ton capacity traveling crane was installed in the new building that would facilitate the

[29] "H.E. to Spend $1,500,000 on Power Plant," *Honolulu Star Bulletin*. March 26, 1929. P. 1.
[30] Myatt, *Electric Century*. P 148.
[31] Oneida Total Integrated Enterprises (OTIE). "Honolulu Generating Station Units 5 and 7 Removal Project Honolulu Power Plant. Phase I Summary Report, Honolulu Power Plant." Report prepared for HECO. 2010. P. 2.

installation of large equipment such as the boiler, condenser, turbine, and generator. The boiler, with a drum weighing about 93,000 pounds arrived at the plant in March, 1954 and was installed in September. The condenser arrived at the plant in May of that year and the generator arrived in June. This equipment was installed during the summer of 1954. In September, the Westinghouse turbine was added.

The boiler was first lit in mid-November and steam at the new plant was operated for a system trial on December 9, 1954. The 1,250 psi steam drove the turbine to produce 50,000kw. On December 17, 1954 the new generator went into operation. The building and power generating equipment (Unit 8), representing a $10.7 million investment by HECO, was dedicated at a public event on March 4, 1955.

The new power plant was designed and built with a large vacant interior space that was planned for a second, duplicate generator. This additional unit (Unit 9) was approved by the HECO board of directors on December 20, 1955 with a $2,217,000 expenditure for the new 50,000kw unit. The reason for the large cost difference between Units 8 and 9 was because Unit 8 included costs for the building, cooling water system, fuel storage, and distributing equipment. Unit 9 costs were for the generating unit alone. Construction of Unit 9 was well underway by October 1956. On November 9, 1957, Unit 9 was dedicated. On that date the 1954 building, along with Unit 8 and Unit 9, was named the Leslie A. Hicks Power Plant. The facility operated for sixty-six years before it was mothballed in January 2014.

## PART II. Structural/ Design/ Equipment Information

### A. General Statement

### 1. Character

The HECO Power Plant Unit 5 & 7 and the Leslie A. Hicks Power Plant are large industrial buildings with modest architectural detailing. All have flat roofs and rectangular massing. Unit 5 and Unit 7 have a complex, multi-level roof. They were built with arched window openings, clerestory windows, roof parapets, belt courses, and a narrow projecting cornices below the top of the parapets. Although greatly altered, vestiges of some of these features are still visible. One trait of these two buildings that remains intact is the approximate 8'-6" high plinth with a distinctive outward flare at the top. The Hicks Plant is a slightly taller building than Units 5 & 7, and its rectangular massing is made more pronounced by the simpler, three level roof and the original full height louver panels on three sides of the building.

### 2. Condition of fabric

All buildings are in good condition and appear structurally sound. They appear to have been well maintained. Windows and doors in Units 5 & 7 have typically been replaced and are in good condition. No deteriorated or weathered areas were noted on the buildings' exteriors.

### C. Description of Exterior

### 1. Overall dimensions

Unit 5 & 7 has an irregular rectangular footprint with overall dimensions of about 150' x 252' with its longest dimension fronting Aloha Tower Drive. About 192' of this length along Aloha Tower Drive comprises Unit 7. Unit 5 is about 60' long fronting Aloha Tower Drive and it widens to about 75' long at its east side. The multi-level roof of this building has a height at the parapet of about 78' above street level. Portions of the roof at the northwest corner and at the south end are lower, at about 60'. There are two penthouses that are about 24' above the parapet height, to 102' above street level. The Hicks Plant has a rectangular footprint that measures

about 222' x 130' long (extending along Aloha Tower Drive). The 222' depth of the building (extending back from Aloha Tower Drive) is divided into three sections with different roof heights. At Aloha Tower Drive the building has an approximate 28' high entry section that extends back about 18' from the street. The building's roof level then increases to about 65' at the middle portion of the building, which is about 108' in depth x 130' in width. The east portion of the Hicks Plant building is tallest at about 108' in height and measures about 96' in depth x 130' in width. Projecting above the east portion are two smokestacks that have been constructed to a height of about 160' above street level. An approximate 60' wide driveway separates the Hicks Plant from Unit 7. A gangway enclosed with corrugated siding, and two ducts extend between these buildings about 18' above driveway level.

**2. Foundations**

No engineering plans were located for this report that provide information on the buildings' foundations. However, because of the heavy equipment these building were designed to contain, it is assumed that their concrete slab floors are supported by concrete piles or footings.

**3. Walls**

Unit 5 and Unit 7 have concrete exterior walls that are painted. Two simple belt courses go around the building at about 12' and 40' above the street level. The building has a water table that extends up about 9'-6" above street level. The top 1'-6" of this feature is flared out slightly and the bottom 2' projects out about 3" forming a plinth with a cavetto contoured top edge. The Hicks Plant has unpainted concrete exterior walls with a board–formed pattern from its construction. On the southeast, northeast, and northwest sides of the building the unfinished concrete walls are interspersed with full-height, vertical openings that are filled with fixed horizontal louvers. Each vertical panel and the section of concrete wall between them, is about 6' wide. This building sits on a base of red brick with white mortar that is about 3'-6" high. The southwest side façade of the Hicks Plant, facing Aloha Tower Drive, is the main façade of the building and has a different treatment from the other three sides. This side has the approximate 28' high entry, which has side walls (southeast and northwest sides) of red brick. The southwest wall of the entry is unpainted concrete with a board–formed pattern from its construction. At the base of this wall is a concrete planter that extends the length of this façade. At the first floor, thin, cantilevered concrete canopies provide shelter for louver vents. At the second floor of the entry section, the cornice has a thin, cantilevered concrete canopy. The southwest wall of the upper two sections of the building are also unpainted concrete with vertically oriented patterning with no other detailing. The cornice of the 60' and 108' high portions of the building is an approximate 6' in height plain band.

**4. Structural system, framing**

Units 5 and 7 are built with reinforced concrete frames. Unit 7 has a steel truss-framed roof.[32] The structural system of the Hick Plant is not known. From the configuration of the vertical louver panels on the exterior of the building, it is presumed to be steel-framed.

**5. Chimney, stacks**

The Hicks Plant has two smoke stacks that project from the tallest section of the building. Each is about 10' in diameter and project about 50' above the roof of the 108' high section, to an altitude of about 160' above street level.

**6. Openings**

[32] HECO. Historic photos from HECO archives. Various dates.

**a. Doorways and doors:**

Facing the streets, Unit 5 and Unit 7 have large scale door openings that are enclosed with chain-link fencing to provide security and ventilation inside the building. At Aloha Tower Drive, the Hicks Plant has a large entry that is secured by a metal roll up door and chain link fencing. The main entry of the Hicks Plant is a glazed, metal storefront that includes a double door with fixed transom and sidelights at the Aloha Tower Drive facade. At the side of the main entry is a large plaque that reads:

LESLIE A. HICKS POWER PLANT

named for our President

in honor of his

outstanding leadership to this company

and in recognition of his unselfish service

to our community

THE HAWAIIAN ELECTRIC COMPANY, LIMITED

November 9, 1957

THIS PLANT DEDICATED TO PUBLIC SERVICE

March 4, 1955

All side and rear facades of the buildings feature equipment and pedestrian doors of varying configurations that could not be closely examined due to lack of access.

**b. Windows and shutters:**

Unit 5 and Unit 7 have all window openings on the street facing facades filled with either solid panels, louver vent panels, or grid-pattern perforated grilles. At the rear sides, Unit 5 and Unit 7 have various windows and vents that could not be examined due to lack of access. The Hicks Plant has two small, two light windows at the second floor of the Aloha Tower Drive façade. At the first floor of this side of the building are two horizontal bands of fixed louver vents flanking the large scale door. The rear and sides of the Hicks Plant have no windows, only the full-height vertical panels of ventilation louvers.

**7. Roof**

**a. Shape, truss type, covering:**

Units 5 and 7, and the Hicks Plant have flat roofs. The roof of Unit 7 is supported by steel trusses. All buildings are presumed to have built- up roofs.

**b. Cornice, eaves:**

Units 5 and 7 have thin, rectilinear cornices at the top of the parapets. The Hicks Plant has a band at the cornice that is approximate 6' in height.

**c. Monitors:**

The south portion of the Unit 7 building has a sloped roofed monitor that extends northeast to southwest near the centerline of this section of the building.

### D. Description of Interior

Request for permission to access and entry into the property and buildings were denied.

### E. Site layout

1. Outbuildings: East of Units 5 and 7, the lot is fenced at Ala Moana Boulevard. This enclosed area holds parking, work areas, three liquid storage tanks that are splinter-proofed with concrete sides, and a two-story building with a footprint that is about 60' x 70'. Two of the liquid storage tanks are about 50' in diameter and about 45' in height with the splinter-proofing concrete that extends to a height of about 36'. The third tank is about 15' in diameter and about 36' high with splinter-proofing concrete extending up to about 28'. The fencing at the Ala Moana side of the lot extends to enclose the area east and south of the Hicks Plant. This area east of the Hicks Plant provides additional parking, equipment storage, and two metal storage tanks about 15' in diameter and 22' high. To the south of the Hicks Plant, the fenced area contains a large open air electrical substation.

## PART III. Operations and Process

### A. Operations

The boilers at the Honolulu Power Plant were fired with fuel oil stored in nearby tanks. The steam thus produced stayed in a closed system that cycled distilled water through each boiler. Live steam was piped from the boiler to spin the turbine, which rotated the generator and produced electricity. The power generated was sent through switches and breakers of the main distribution center and then out to substations on Oahu as needed. Electric power cannot be stored, it must be created as demanded, so oftentimes boilers and turbines are kept operating under limited power so they can be brought on line quickly if demand rises. When the distilled water steam had done its work in the turbine, it was sent to the condenser, which transformed it back to water that was returned to the boiler to be heated again into pressurized steam. This system, although closed, does need replenishment with distilled water. To accomplish this, an evaporator between boiler and turbine utilized heat from the steam to distill water. The distilled water was added to the boiler supply water as needed.

A separate system circulates cooling water through the condensers to transform the steam back into water for reuse in the boilers. This cooling system draws water from Honolulu Harbor via tunnels located between Piers 7 and 8. This cooling water is drawn through a screen to remove debris and pumped to the condensers where it cools the distilled water flowing in the boiler/ turbine system. Cooling water leaving the condensers is discharged back into Honolulu Harbor via tunnels located between Piers 6 and 7.

### B. Technology

Steam turbines for generating electricity were first used on Oahu in the 1908 installation of a 750kw generator at the 1894 plant, now demolished. Prior to this, generators were driven by reciprocating steam engines. All steam generating units installed after this 1908 installation used turbines, including Unit 5, Unit 7, and the Leslie A, Hicks Power Plant.

Topping turbines[33] were first used on Oahu in the 1933 installation of Unit 6, which was a retrofit of Units 1, 2, & 3. Originally, topping turbines were used as an efficient addition to an existing (lower-pressure) system of steam turbines. Along with the topping turbine, a new high-pressure boiler was installed that supplied high-pressure steam to the topping turbine. The topping turbine was a non-condensing turbine that exhausted its entire flow of steam at a lower pressure that was then utilized by the existing turbines at Units 1, 2, & 3. After this 1933 retrofit, subsequent units at the Honolulu Power Plant as well as Waiau were designed to operate high pressure turbines.

A hydrogen cooling system for generators was first used on Oahu in the 1944 installation of Unit 7. A ca. 1967 retrofit of Unit 5 added a hydrogen-cooled generator. The hydrogen cooling system for the generators operates by maintaining a circulating hydrogen atmosphere within the generator housing where the rotor spins. Hydrogen has a higher thermal conductivity than air and cools the unit more efficiently. In addition, its lower density provides less resistance to the spinning rotor, increasing the efficiency of the generator. An explosive atmosphere is avoided by constant monitoring to maintain a hydrogen to air ratio of 75 percent or more.

### C. Workers

All units of the Honolulu Power Plant utilized workers of varying skill levels, backgrounds, and ethnicities. Day to day operations required boiler operators with journeyman abilities acquired through trade school and/ or apprenticeship. In addition to daily operations, these workers were responsible for maintenance and would have relied on other tradesman, such as welders and pipe fitters. Engineers had a greater responsibility for plant operations that required engineering degrees. These workers were responsible for managing the generation and transmission of power, providing oversight for operations and planning for improvements.

### D. End Product

The product of Honolulu Power Plant Units 5, 7, and Leslie A. Hicks was electrical power. When completed, Unit 5 produced 20,000kw, Unit 7 produced 35,000kw, and Leslie A. Hicks produced 100,000kw.

## PART IV. SOURCES OF INFORMATION

A. Architectural Drawings:

HECO declined to make architectural drawings available for review for this report. Only a limited number of historic drawings were available for this report:

Unit 5 Building

Dwight P. Robinson & Company. “Drawing No. 2944-H-35, Floor Plan at El. 100'-6" and 113'-6".” *Arch Power Plant Extension - Honolulu, T.H. The Hawaiian Electric Company.* New York, May 6, 1929.

_____. “Drawing No. 2944-H-36, Floor Plans at El. 130'-6" and 148'-6".” *Arch Power Plant Extension - Honolulu, T.H. The Hawaiian Electric Company, Ltd.* New York, May 6, 1929.

[33] High pressure, non-condensing turbines.

_____. “Drawing No. 2944-H-37, Floor Plan at El. 162'-0".” *Arch Power Plant Extension-Honolulu, T.H. The Hawaiian Electric Company, Ltd.* New York, May 6, 1929.

_____. “Drawing No. 2944-H-38, Roof Plan.” *Arch Power Plant Extension-Honolulu, T.H. The Hawaiian Electric Company, Ltd.* New York, May 6, 1929.

Unit 7 Building

HECO Engineering Department. "Circulating Water Development, Honolulu Central Station" Drawings H-10210 through H-10223. 1941.

_____. "Unit No. 7 Addition, Honolulu Generating Station. Drawing A-10246. 1942.

_____. "Equipment Plan, Alakea Street Plant." Drawings A-8246 through A-8248. 1943.

Unit 5 and Unit 7 Buildings

HECO Engineering Department. "Longitudinal Section Showing Boilers, Power Plant, Hawaiian Electric Co. LTD." Drawing H-1291. 1932.

B. Early Views:

The Hawaii State Archives has numerous folders that contain photographs showing the buildings either as the main subject or in the background.

Folder PP-8-7 Buildings, Business, Hawaiian Electric Company.

Folder PP-8-8 Buildings, Business, Hawaiian Electric Company.

Folders PP-38-5 through PP-39-7 Honolulu, City, various years.

Folders PP-40-5 and PP-40-6 Honolulu Harbor, aerial, 1920s – 1940s.

Hawaii State Archives Aerial photographs showing the buildings are in:

Folder PPA-44-1, photo #M56.56, ca. 1939-41.

Folder PPA-63-4, photo #4-34, December 31, 1952.

Folder PPA-62-2, photo #94-171, ca. 1952.

Folder PPA-48-3, photo #2CC 206, January 12, 1963.

Folder PPA-50-14, photo #5064-10, October 1969.

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"Dirt, Fish and Mud Served Nuuanu Through Turbines of City Lighting Plant." *Honolulu Star Bulletin*. July 29, 1920. P. 1.

"Electric Co. Expansion Plans OD'd." *Honolulu Advertiser*. July 27, 1940. P. 1.

"Electric Co. Plans #760,000 Improvements." *Honolulu Star Bulletin*. May 12, 1930. P. 1.

"Electric Co. Starts Huge Installation." *Honolulu Advertiser*. March 14, 1941. P. 1.

"Hawaiian Electric Builds Generator." *Honolulu Star Bulletin*. October 12, 1956. P. 1-B.

"Hawaiian Electric Company's New Power Plant to Cost Over $500,000." *Honolulu Star Bulletin*. February 4, 1918. P. 10.

"Haw'n Electric Finishes Generator Project Here at Cost of 4 Million." *Honolulu Star Bulletin*. P. 2.

"H.E. to Spend $1,500,000 on Power Plant." *Honolulu Star Bulletin*. March 26, 1929. P. 1.

"HECo. Plans $10 Million Power Plant." *Honolulu Star Bulletin*. February 21, 1952. P. 9.

"HECO Plans $53 Million Expansion, Five-Year Program To Increase Power." *Honolulu Star Bulletin*. January 17, 1957. P. 1-B.

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Johnson, Robert. "Hawaiian Electric Installing Huge Turbine for New Plant." *Honolulu Star Bulletin*. September 3, 1954. P. 14.

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"New Electric Power Plant Dedicated." *Honolulu Advertiser*. March 5, 1955. P. B4.

"New HECO Power Unit Is Approved." *Honolulu Advertiser*. December 21, 1955. P. 1.

"New Power Plant To Be Dedicated on February 25." *Honolulu Star Bulletin*. January 31, 1955. P. 2.

Oneida Total Integrated Enterprises (OTIE). "Honolulu Generating Station Units 5 and 7 Removal Project Honolulu Power Plant. Phase I Summary Report, Honolulu Power Plant." Report prepared for HECO. 2010.

"Power Plant Is Named for Hicks." *Honolulu Advertiser*. November 10, 1957. P. B9.

Sanborn Fire Insurance Maps. 1914, 1927, 1950-51, 1957. Available on microfilm at Hawaii State Library, Main Branch.

"'Shake-Down' Run Of H.E. Generator Termed Successful." *Honolulu Star Bulletin*. December 10, 1954. P. 9.

"Steady Progress Made in Erection of New H.E. Co. Ala Moana Power Plant." *Honolulu Advertiser.* February 12, 1954. P. D4.

"Steam Turned On At New H.E. Plant on Ala Moana." *Honolulu Advertiser*. November 14, 1954. P. A14.

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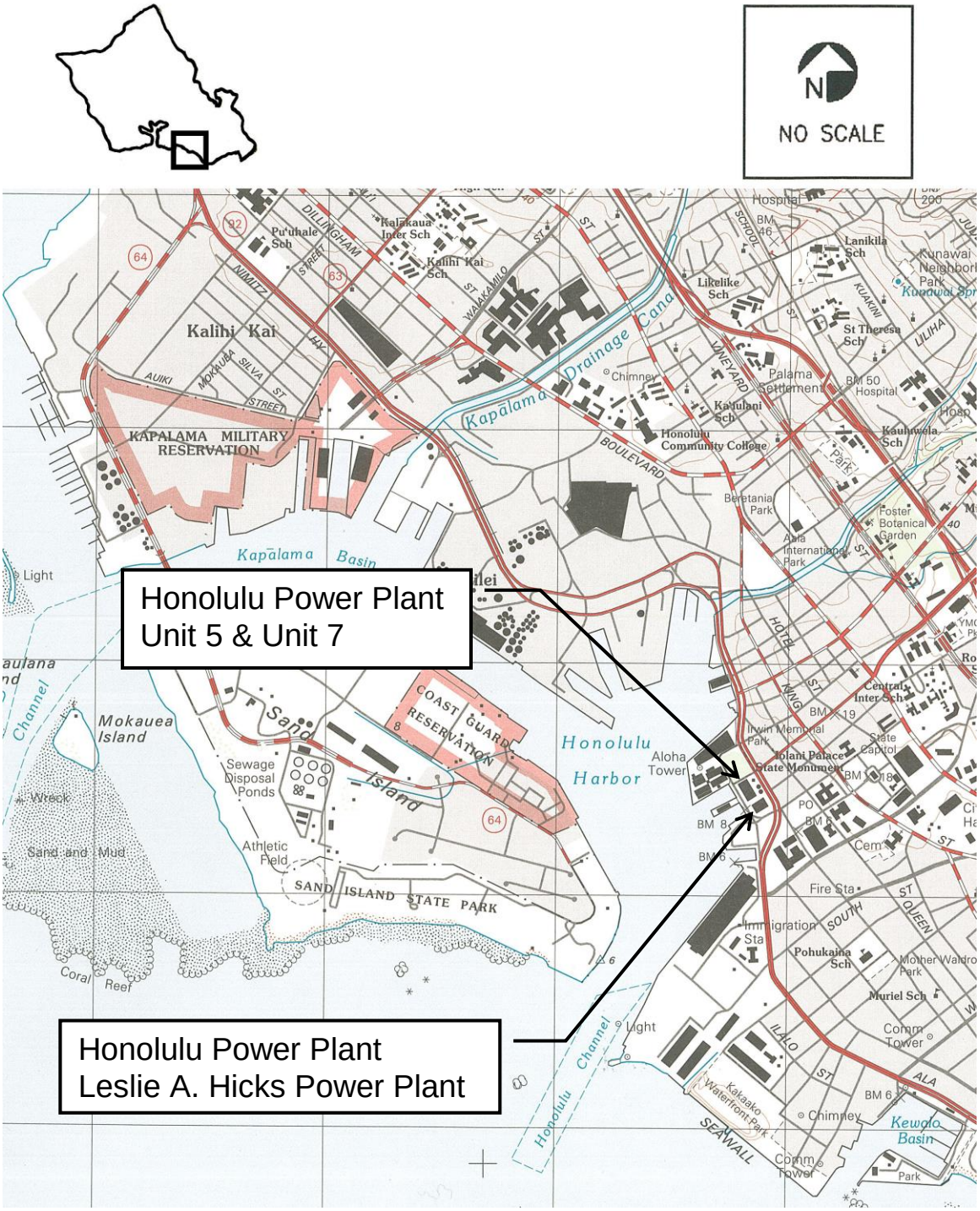
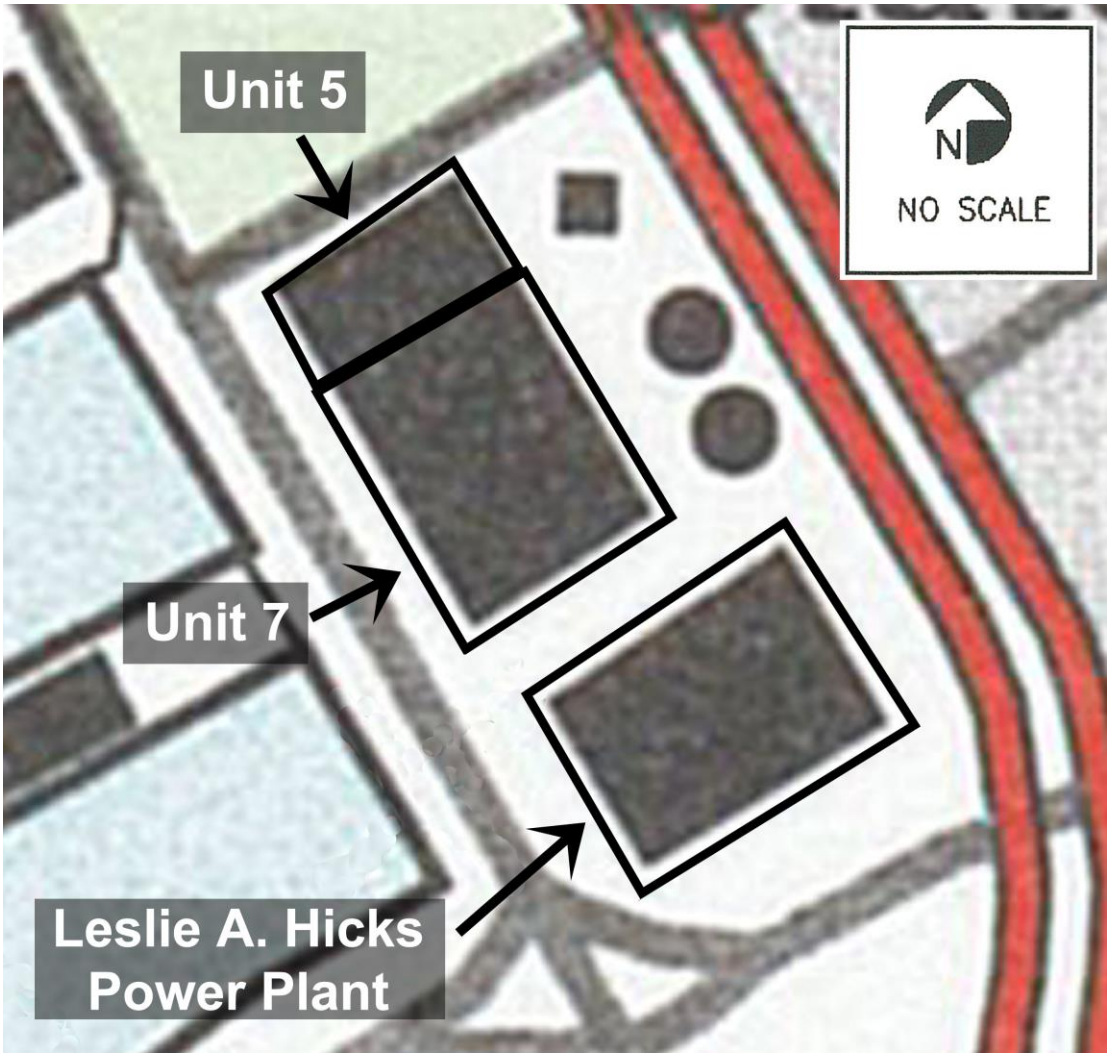
"$10 Million Power Plant Due on Site of Old Fish Market." *Honolulu Advertise*r. January 29, 1953. P. 1.

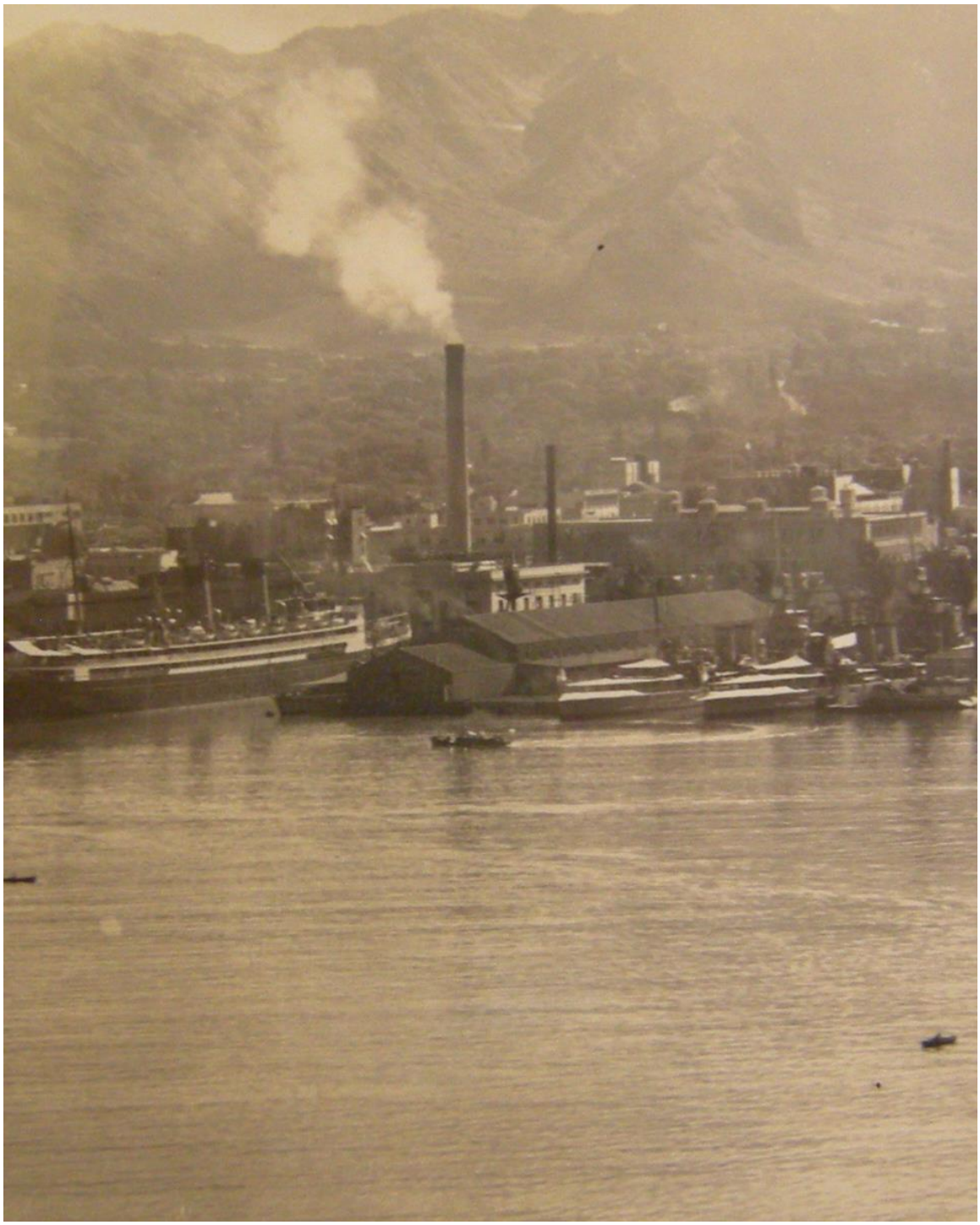
Location map



Site plan for HECO Unit 5, Unit 7, and Hicks Power Plant.



Portion of historic photo dated June 11, 1924 showing the Unit 7 building as originally constructed with one smoke stack. Photo was taken by the US Army Air Corps, 11th Photo Section and is in the public domain. *Photo from Hawaii State Archives collection folder PP-40-5, photo 20. June 11, 1924.*



Portion of historic photo dated ca. 1950 showing the Honolulu Power plant Unit 5 & Unit 7. Note the former fish market to the right of the power plant. This would later be the site of the 1954 Leslie A. Hicks Power Plant. Photo was produced by the Hawaii Territorial Government for the Hawaii Statehood Commission and is in the public domain. *Photo from Hawaii State Archives collection folder PP-39-7, photo 58. Ca. 1950.*

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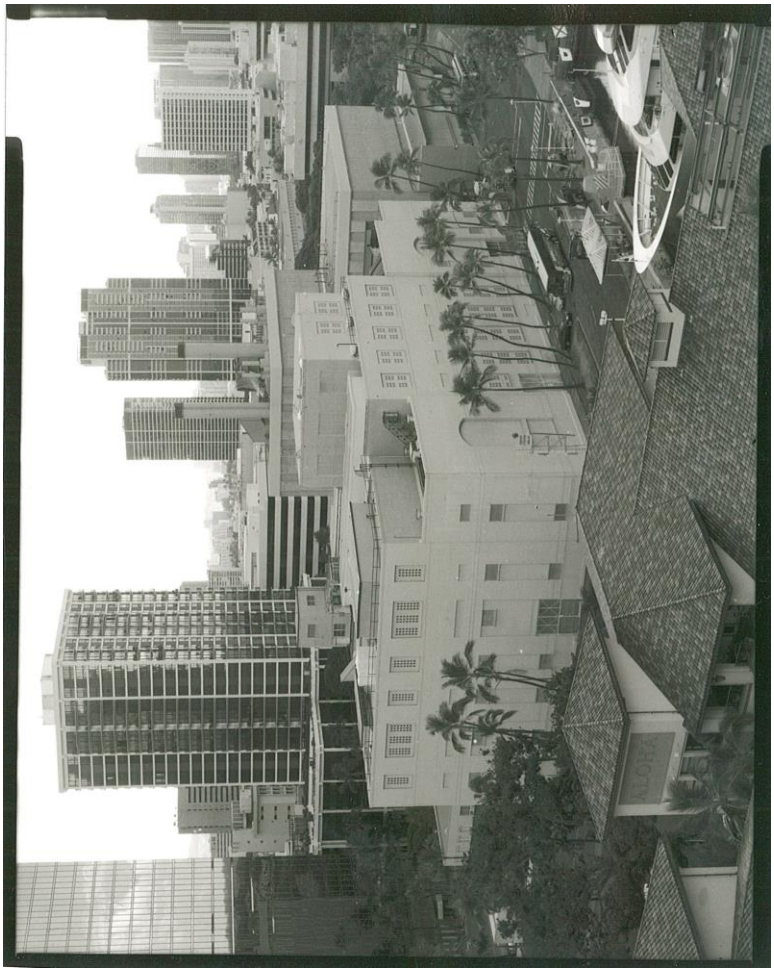
**HAER No. HI-139-1**



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HAER No. HI-139-11