



352

United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in National Register Bulletin, *How to Complete the National Register of Historic Places Registration Form*. If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. **Place additional certification comments, entries, and narrative items on continuation sheets if needed (NPS Form 10-900a).**

1. Name of Property

historic name Marconi Wireless Telegraphy Station
other names/site number _____

2. Location

street & number 56-1095 Kamehameha Highway not for publication
city or town Kahuku vicinity
state Hawaii code HI county Honolulu code 03 zip code 96731

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended,
I hereby certify that this X nomination ___ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.

In my opinion, the property ___ meets ___ does not meet the National Register Criteria. I recommend that this property be considered significant at the following level(s) of significance:

___ national X statewide ___ local

[Signature] 4/11/13
Signature of certifying official/Title Date

State or Federal agency/bureau or Tribal Government

In my opinion, the property ___ meets ___ does not meet the National Register criteria.

Signature of commenting official Date

Title State or Federal agency/bureau or Tribal Government

4. National Park Service Certification

I hereby certify that this property is:

entered in the National Register determined eligible for the National Register
 determined not eligible for the National Register removed from the National Register

___ other (explain:)

[Signature] 6/4/2013
Signature of the Keeper Date of Action

Marconi Wireless Telegraph Station Honolulu
 Name of Property

Hawaii
 County and State

5. Classification

Ownership of Property
 (Check as many boxes as apply.)

- private
- public - Local
- public - State
- public - Federal

Category of Property
 (Check only one box.)

- building(s)
- district
- site
- structure
- object

Number of Resources within Property
 (Do not include previously listed resources in the count.)

Contributing	Noncontributing	
4		buildings
		sites
6	1	structures
		objects
10	1	Total

Name of related multiple property listing
 (Enter "N/A" if property is not part of a multiple property listing)

NA

Number of contributing resources previously listed in the National Register

0

6. Function or Use

Historic Functions
 (Enter categories from instructions.)

Industry
Communications Facility

Current Functions
 (Enter categories from instructions.)

Vacant

7. Description

Architectural Classification
 (Enter categories from instructions.)

Other
Industrial

Materials
 (Enter categories from instructions.)

foundation: concrete
 walls: concrete
 roof: Clay tile, metal
 other: _____

Marconi Wireless Telegraph Station
Name of Property

Honolulu

Hawaii
County and State

Narrative Description

(Describe the historic and current physical appearance of the property. Explain contributing and noncontributing resources if necessary. Begin with a **summary paragraph** that briefly describes the general characteristics of the property, such as its location, setting, size, and significant features.)

Summary Paragraph

The Marconi Wireless Telegraph Station sits on a fairly level, approximately 89 acre, ocean front parcel in Kahuku on the island of Oahu's north shore. This rural parcel is flanked on one side by the Turtle Bay golf course and on the other by shrimp farms. The unpaved, single lane Marconi Road traverses much of the property and serves as an access to the telegraph station buildings from Kamehameha Highway. The fenced property is overgrown with low lying shrubs and grasses, with only the area around the complex's four buildings maintained. The four concrete buildings range from one to two and a half stories in height, and are in varying states of repair. The major building, the 96'-7" x 174'-9" power house/operating building stands two and a half stories in height, while the L-shaped hotel is two stories, and the manager's cottage and administration building are each a single story. Ample open space separates the four buildings and their distinct functions, with a recently made shrimp pond situated between the power house/operating building and the manager's cottage and administration building. The manager's house is situated approximately 250' to the northeast of the large power house/operating building. The hotel is sited approximately 240' to the northwest of the power house/operating building and the administration building is approximately 250' to the north of the power house/operating building and approximately 100' east of the hotel (see map A). In addition to the four buildings several foundations of ancillary structures remain on the property, including a pair of octagonal structures mauka (south) of the power house/operating building, which served as foundations for liquid fuel storage tanks. In addition, an octagonal shaped, concrete reservoir with side walls measuring 8'-3" long on each side and a 17' x 22' concrete framed well with walls rising approximately 2'-3" above ground level are to the west of the power house/operating building. The latter was the foundation for a cooling tower. A former tennis court remains in place but has been converted into an aquaculture pond and no longer retains its integrity. A naupaka (*Scaevola sericca*) covered dune, approximately 16' above sea level, separates the inland part of the property (approximately 11'-12' elevation) from the ocean with its sandstone shelf. On the inland side of the dune a segment of a former airplane runway, constructed by the military during World War II, lies buried under the sand.

Narrative Description

The Marconi Wireless Telegraph Station Historic District includes four buildings: the power house/operating building, hotel, administration building, and manager's cottage.

The power house/operating building is an industrial style, poured in place, reinforced concrete building, which is divided into two distinct parts. The large southern or *mauka* (towards the mountains) section measures 78' x 88'-4" and rises two stories, while the 48'-3" x 96'-7" northern or *makai* (towards the ocean) section is one and a half stories in height. A 21'-2" x 23'-4", two-and-a-half story, almost square tower rises at the intersection of the two sections on the west side. Both sections of the building are covered by low pitched gable roofs with ridgeline monitors, while the tower features a hipped roof. All roofs have reinforced concrete decks originally covered by clay tile, and the east and west elevations feature stepped parapets with centered chevrons. The *mauka* section's roof retains its clay tile, while the *makai* now has a composition cladding.

Windows are primarily industrial in character with centered pivot windows of various sizes, usually with six or eight pane surrounding sashes. In addition there are some double hung sash windows. Originally all the windows were of metal and had metal frames. However, because of the corrosive sea air, all windows were converted to wood and wood frames within the first decade of the building's existence.

The larger, *mauka* section of the building is six bays wide and four bays deep, with a set of industrial windows in every bay on both the first and second stories. It originally served as the boiler room, but none of its oil fired boilers, fire brick furnaces, condensers or other equipment remain. Also the cylindrical, brick smoke stack, which stood outside this section of the building on the east side, was dismantled sometime after 1924, when the use of steam power was abandoned. The 17" high, octagonal shaped foundation of the chimney remains in place, approximately 11'-8" away from the east wall of the building. The foundation measures approximately 12'-6" across.

Marconi Wireless Telegraph Station
Name of Property

Honolulu

Hawaii
County and State

A concrete floored mezzanine encircles three sides of the boiler room space. Five metal, modified Queen Post trusses span the breadth of the room and support the roof. The truss webs to either side of the center post each have five 12" I-beam posts, with the bracing members made of 12" channels. The columns supporting the trusses consist of two 5" x 23" channels riveted together and filled with concrete. The end bays are further stabilized by cross bracing between the end wall trusses and their neighbor. Three industrial style pendant lights with metal reflector shades are suspended from each truss. The walls still retain several sconces with similar shades.

The roof's centered monitor encompasses two bays, in both directions. It has a four sided, pyramidal, concrete ceiling and features a pair of fourteen pane windows in each of its side bays. A large ventilating fan is in the west end of the monitor.

This large open space is entered via large double doorways in the *mauka* (south) end bays of both the east and west walls, which have modern concrete ramps leading up to them. In addition, another wide, ramped opening is on the west side, adjoining the base of the tower. A pedestrian doorway with a concrete stoop with four side facing steps is centered on the west façade. A wide, flat arched opening in a reinforced concrete partition wall leads into the *makai* (north) section of the building. The *mauka* most bay of the *makai* section serves as a transition space between the boiler room and the power and transmitting plant, and functioned as a work shop and storage area. Concrete walls divide this into four spaces, two of which were rooms with doors. Above this space is the mezzanine, which once held the switchboard gallery, and which overlooks both the *mauka* and *makai* sections. From this mezzanine wood stairs, that are no longer intact, accessed the upper reaches of the tower.

The *makai*, northern section of the building originally housed the power and transmitting equipment for the station. This area is four bays wide and five bays deep, with six trusses, similar in design to the boiler room's truss system, spanning the width and demarcating each bay. All the trusses are reinforced with cross-bracing between them. A ridgeline monitor, which runs above the three middle trusses provides ventilation and illumination with a pair of twelve lite windows in each of its three bays on each side. The southern side of this section's gable roof is in the process of collapsing. On the northern (*makai*) wall, each bay contained a large industrial window which extended from the first to the second story; however, these have been removed to facilitate access to a modern hollow tile addition with a corrugated plastic shed roof, which is not historic and was added when the structure was used for aquaculture.

A set of eighteen metal steps runs along the *mauka* (south) wall of this section, and provided access to the mezzanine above. Its solid treads have a diamond pattern, and it features a pipe railing. At the northeast corner of the power and transmitting room a small room has been constructed, which appears to be of more recent vintage. Its hollow tiles walls only extend to a height of approximately eight to nine feet.

The west exterior elevation of this section features the tower in its *mauka* most bay, while the other three bays feature a centered double doored entry with an entry ramp, flanked on either side by industrial windows. Industrial windows are situated on the second story for all three of these bays.

A red tiled, shed roofed, single story office wing, measuring 17'-5" x 61'-2", is appended to the east side of this section and connected to the main room by way of a standard doorway, whose door is not original. This office wing is part of the original design of the building and includes three office spaces, a lobby and two restrooms.

The power plant originally housed three 500 horse power steam turbines to drive the electric generators which powered the Marconi disc dischargers, oscillating transformers, and alternators, and another two 200 horse power steam turbines powered the generators providing electricity for lighting and other uses at the station. By 1924 this equipment was considered obsolete and in part replaced by a pair of Alexanderson high frequency alternators. No equipment remains in this space, nor do the octagonal, seven ton, solid concrete foundations on which the disc dischargers were mounted, although several raised, square, concrete aquaculture tanks have been constructed on the floor, from when the space was most recently used for aquaculture purposes.

The building, although vacant and in deteriorated condition retains its integrity. Its design is similar to the powerhouse for the transmitting station located in Bolinas, California.

The hotel is an L-shaped, two story building with a 70' frontage and 61' long rear wing, that sits on a reinforced concrete foundation with a shallow basement. Both the wing and main body are 23' wide, and have reinforced concrete walls and floors. The building no longer has its tiled hipped roof, and its wood partition walls, stairways, and second story windows

Marconi Wireless Telegraph Station
Name of Property

Honolulu

Hawaii
County and State

and window frames no longer remain. The hotel's original layout, with its fifteen bedrooms, reading room, club room, library, dining room, and kitchen, however, is discernable, thanks to remaining fabric. Reinforced concrete interior walls remain intact, and most of the first story window frames are extant, with even a 6 x 1 double hung sash window, albeit in poor condition, remaining in the dining room.

An inset, 9'-3" wide lanai runs across the front of the building on both the first and second stories, and on the second story wraps around the building to extend part way down the rear wing. The front of the building is eight bays wide, with each bay demarcated by a flat arched opening. The second story lanai openings are adorned with shallow, incised pediments. The rectilinear posts supporting the flat arches are chamfered and a number have spalling problems. Originally the lanai were screened, but these no longer remain. Four bedrooms fronted on the first floor lanai, each with its own access door and one rear facing window. The reinforced concrete front wall of the rooms remains standing, as does a reinforced concrete partition wall between the second and third bedrooms. The wood partition walls between the first & second and third & fourth bedrooms are no longer extant. A narrower room is between the four bedrooms and the intersection of the L between the main body of the hotel and its rear wing. This was a bathroom, and like the bedrooms has a rear window opening.

Two sets of three concrete steps with concrete shoulders access the ground floor lanai at its *makai* (north) end and at the façade's second bay from the *mauka* (south) end. The floors of both the first and second story lanai are scored in a diamond pattern and a narrow gutter runs along the periphery to afford drainage. Immediately aligned with the front steps is the main entry to the building, which was comprised of three standard size doorways, which opened onto the reading or club room. Three window openings traverse the south wall of this room and a round arched opening in the north wall led to the no longer extant main stairway to the second floor. A second, flat arched, doorway in the north wall leads into a storage space under the stairway. A wide flat arched opening, with three fixed transoms above, opens onto the dining room. The opening is flanked on either side by openings which appear to have contained fixed pane windows. The dining room was cross ventilated by three windows in its north and south walls. The rear, west wall has a wide opening with a wood post in the middle, and appears to have at one time framed a pair of swinging doors which led into the butlers' pantry and the kitchen. Inside and the left of the doorways is a small office, with two window openings in its south (*mauka*) wall. To the right of the doorways a remnant of a built-in buffet remains affixed to the east wall. The rear of this pantry/kitchen area is dominated by the niche formerly occupied by the stove. The stove chimney remains intact. To the rear of the stove is a food preparation area on the *mauka* (south) side and on the right rear is an insulated refrigeration closet and a food storage room, which is two steps above the kitchen floor level. A doorway at the *makai* (north) end of the hallway formed by the refrigerator-store room wall and the back wall of the stove niche, leads to the outdoors. The doorway retains its frame, but the door is missing, although a three lite transom remains. Three concrete steps lead down to the ground. The shadow of an earlier gable roof that sheltered this service entry is quite evident.

Behind the office and to the *mauka* (south) side of the stove area a set of stairs, no longer extant, led to the second floor. A door sized and shaped opening is at the approximate location of its former landing. The second floor is completely gutted, except for a concrete partition wall which continues the rear wing's *makai* (north) wall into the intersection of the L with the main building. This wall enclosed one side of the common bathroom and is outlined by a raised concrete curb on its other three sides. Its tile floor still remains. Towards the rear end of the rear wing is another, smaller bathroom, as denoted by the presence of similar tile flooring. Most likely the kitchen staff was housed at this end of the hotel and this served as their bathroom.

The Kahuku station hotel is substantially smaller than that built at Koko Head, as transmitter sites required fewer staff. The Koko Head hotel is similar in design to those found at the receiving stations at Belmar, New Jersey and Marshall (formerly named Marshalls), California. However, the Belmar hotel was constructed of hollow tile filled with concrete and faced with red brick.

The building, although now missing its roof and most of its interior finishes contributes to the character of the district and retains sufficient integrity to make rehabilitation feasible.

The manager's house is a 50'-2" x 40'-2", single story reinforced concrete bungalow with a red tile hipped roof with overhanging, closed eaves. The roof has a 4 in 12 slope and the metal channels which frame the roof are in deteriorated condition. It sits on a raised reinforced concrete foundation and has a suspended reinforced concrete floor. The bungalow's original, five bay, façade length lanai, wraps partially around the *makai* (north) side of the house, and has been enclosed. However, its flat arches capped by recessed pediments, similar to those on the hotel's second story, remain evident as do the supporting chamfered concrete posts. Six, centered concrete steps lead up to the lanai and a

Marconi Wireless Telegraph Station
Name of Property

Honolulu

Hawaii
County and State

non-original door framed with screened sidelights and transom serves as the entry to the dwelling. The lanai has a scored concrete floor. The house originally had six rooms; however, with the enclosing of the lanai and the partitioning of the lanai and living room the number of rooms has increased. Five sets of French doors, each with twelve lites, provide a facile flow between the lanai and the two public rooms on the interior. Wood floors are present throughout the interior. The *makai* side living room features a brick fireplace with a wood mantel with a pair of sconces above. This room has been partitioned into two spaces. In addition to the pair of French doors, which have a 6 x 6 double hung sash window in between them, the room is ventilated by two sets of three sliding windows, each with twelve panes. The other public space is centrally located. It features a picture rail, while three sconces provide illumination. Off the *mauka* (south) side of this room a short, lateral running hallway leads to two bedrooms and a bath. All the original, single panel doors are intact, and the three rooms all are ventilated by 6 x 6 double hung sash windows, with sash slugs. The two bedrooms doors each have a transom above them, and the front bedroom has a single panel door which led out to the original lanai, but now accesses a bedroom/office space made by the partitioning of this end of the lanai. The rear, kitchen space appears to have been reconfigured and now includes a small laundry area, a bedroom and a rear exit. The latter opens onto a scored concrete floor mudroom, and six concrete steps run down to the back yard.

The house is similar in style to the Belmar, Marion, and Chatham managers' cottages, although both the New Jersey and Massachusetts station manager's residences were constructed of hollow tile filled with concrete and faced with red brick. The chief and assistant engineers' houses at Marshall are also similar in design, and like Kahuku are made of reinforced concrete.

Although minor alterations have transpired with some of the interior spaces and the enclosing of the lanai, this building is very much intact and retains its integrity and contributes to the character of the district.

The administration/auxiliary operating building measures 40' x 70' and served as the station's main office, as well as housing the station's sending and receiving offices and storage space. This single story, reinforced concrete building sits on a raised foundation with a suspended reinforced concrete floor. Its original Spanish tiled hipped roof has been supplanted by a lateral running metal gable roof. However, it retains its original inset lanai, which wraps around the *mauka* (south) and west sides. The lanai has segmental arched openings and chamfered columns. This building has been remodeled, with all its original doors and windows replaced. The interior has also been gutted and remodeled in a modern manner, with a large single space presently serving as an exercise room. A modern, hollow tile bathroom has been added to the rear (*makai*) side of the building.

At Marion, Massachusetts a similar building was constructed of hollow tile filled with concrete and faced with red brick.

This building retains its original design intent, although it has been insensitively remodeled. It contributes to the character of the district and retains sufficient integrity to encourage appropriate rehabilitation.

The steel antenna masts no longer remain on the site, as their obsolescence led to their removal between 1931 and 1933. The original masts were sectionalized, steel tubular structures bolted to reinforced concrete foundations which were poured in place in approximately 12' deep holes, and secured by guy wires. The masts came in sections, with two sections bolted together making a joint 10' high. This type of mast, developed in 1909 by Andrew Gray, Marconi's chief engineer, proved to be the most resistant to storm winds, and soon became standard, supplanting the previous use of wood towers. The masts were manufactured by the McMyler Interstate Company of Cleveland, Ohio. Sets of the masts were laid out in two parallel rows, one set of fourteen facing directly away from Japan, running from the powerhouse in a southeasterly direction toward the O.R. & L. tracks for a mile and a quarter. These towered 475' in the air. Another set of twelve masts, each 325' high, ran in a southwesterly direction away from the powerhouse and faced directly away from California. These masts were the largest for their time in the Marconi system and carried thirty five miles of antenna wires, and were held stationary by the aid of 155,000 feet of guy wires. The guy wires were capable of withstanding a pull of 80,000 pounds. Marconi had discovered in 1905 that an antenna wire provided stronger reception or transmission when its free end was pointing away from the station with which communication was intended. His patent for the Bent Aerial Antenna providing directional transmission and reception was registered on July 18, 1905. This new antenna arrangement constituted a significant advance in terms of range and strength of signal, and also was cheaper to construct than the earlier inverted cone and umbrella type antenna previously used. Today only one concrete guy wire foundation remains evident above ground, although the mast foundations most likely are intact but buried on the property.

The district includes all four of the original buildings constructed for the Marconi transmitting station at Kahuku, as well as such remaining structures as the well and reservoir and the chimney and liquid fuel storage foundations. The buildings

Marconi Wireless Telegraph Station Honolulu
Name of Property

Hawaii
County and State

are readily recognizable as contemporaries, employing similar materials, methods of construction and design elements, and exhibit similar levels of craftsmanship. As such the district retains its integrity and stands as a strong reminder of the early years of trans-Pacific telegraphic communications in Hawaii.

Marconi Wireless Telegraph Station Honolulu
Name of Property

Hawaii
County and State

8. Statement of Significance

Applicable National Register Criteria

(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

- A Property is associated with events that have made a significant contribution to the broad patterns of our history.
- B Property is associated with the lives of persons significant in our past.
- C Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- D Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations

(Mark "x" in all the boxes that apply.)

Property is:

- A Owned by a religious institution or used for religious purposes.
- B removed from its original location.
- C a birthplace or grave.
- D a cemetery.
- E a reconstructed building, object, or structure.
- F a commemorative property.
- G less than 50 years old or achieving significance within the past 50 years.

Areas of Significance

(Enter categories from instructions.)

Communications

Period of Significance

1914-1962

Significant Dates

1914

Significant Person

(Complete only if Criterion B is marked above.)

Cultural Affiliation

Architect/Builder

J. G. White Engineering Corp.

Period of Significance (justification)

Although the period when the station was in operation ran from 1914-1978, the period of significance ends with 1962 in accordance with National Register guidelines.

Criteria Considerations (explanation, if necessary)

NA

Marconi Wireless Telegraph Station
Name of Property

Honolulu

Hawaii
County and State

Statement of Significance Summary Paragraph (Provide a summary paragraph that includes level of significance and applicable criteria.)

The Marconi Wireless Telegraph Station at Kahuku is significant at the state level under criterion A for its associations with the development of wireless communications in Hawaii and the role it played in providing the islands with worldwide wireless telegraphic, and later telephonic, communication.

Narrative Statement of Significance (Provide at least one paragraph for each area of significance.)

Until 1840 any immediate communication between human beings was limited to the range of the eye or the ear. In nations such as France, Russia, and Great Britain, fire signal towers stretched the length of the country to serve as early warning systems. During the nineteenth century scientists and inventors came to better understand electricity's ability to transmit sound, and with this understanding came such inventions as the telegraph by Samuel Morse in 1840, the telephone by Alexander Graham Bell in 1875, and the phonograph by Thomas Alva Edison in 1877. In addition to these new wonders came such scientific advances as James Clerk Maxwell's 1865 theory, which postulated electromagnetic waves existed and moved at a uniform speed, but varied in length and frequency, and Heinrich Hertz's 1888 proof of this theory by demonstrating that electricity could bridge a gap from one coil to produce a current in another. These all laid the groundwork for humanity's delving into the possibility of wireless communication.

A number of inventors strove to develop Hertzian waves as a means to convey thoughts and information between humans; however, none could achieve a range beyond a few yards. It took the twenty one year old Guglielmo Marconi (1874-1937) to think to attach the transmitting and receiving equipment to elevated antenna, and grounding one pole of both his transmitter and receiver. To this apparatus he incorporated some additional components which allowed him to transmit Morse telegraphic signals via the Hertzian waves. He offered to demonstrate his astounding new invention to the government of Italy, his native land, but they declined, leading Marconi to travel to England, in hopes of interesting someone in his device. He carried out demonstrations to the British Post Office, which administered the British public telegraph system, and the War Office, transmitting signals one and three quarter miles. While undertaking these demonstrations Marconi applied for a patent for his wireless telegraphy device, which was granted, with the complete specifications filed on March 2, 1897. Four months later, on July 20, 1897 Marconi formed the Wireless Telegraph and Signal Company, Limited, and by October of that year had expanded his range to thirty four miles, communicating between Salisbury and Bath. Marconi undertook a number of other demonstrations of his equipment, which brought admiration, but no contracts.

In March 1899, in a demonstration to the French government Marconi transmitted the first wireless messages across the English Channel. This news caught the eye of the editor of the Honolulu based magazine, *The Friend*, and in the May 1899 issue a small piece noted,

Telegraph communications seems likely soon to be in operation between our islands. Marconi has successfully sent telegrams across the British channel without a wire. An invisible electric ray is flashed from a lofty mast, directed to a receiver thirty miles away, which records it. So Hawaii will not need an inter-island cable. Rain, fog and darkness do not obstruct the ray. [page 86]

At that time the sole means of communications between the islands was by mails carried on the inter-island steamships. In 1889, a telegraph cable connecting Oahu and Molokai had been laid across the deep, rugged and uneven ocean floor; however, after transmitting one message the cable broke and its repair was ineffective, bringing this venture to a close, and discouraging others from trying. With Hawaii's various islands in close proximity to each other (Kauai is only sixty one miles from Oahu, Molokai just thirty miles from Oahu and Lanai, and Maui only ten miles from Molokai and forty three from the island of Hawaii), Marconi's new invention held forth a promising solution for inter-island communication.

Like the editor of *The Friend*, Fred J. Cross, an expert electrician and former resident of Buffalo, New York who had arrived in Hawaii during 1897, saw the potential of Marconi's new invention. On June 28, 1899 he formed the Inter-Island Telegraph Company, receiving backing from major businesses in Honolulu, and in September-October 1899, traveled to

Marconi Wireless Telegraph Station
Name of Property

Honolulu

Hawaii
County and State

New York, where Marconi was promoting his wireless equipment by reporting on the America Cup yacht race for the *New York Herald* and the *Evening Telegram*. His operators were placed on ships following the race and they transmitted news of the race's progress to shore. Following the race Marconi successfully carried out demonstrations for the U.S. Navy, covering ranges up to thirty five miles. The demonstrations on the warship *New York* were attended by Cross, as well as U.S. Navy Rear Admiral Norman Von Heldreich Farquhar, the Commander and Chief of the North Atlantic Station, and former Chief of the Navy's Bureau of Yards and Docks.

Cross and Marconi's company entered into a contract on October 31, 1899 presenting Marconi's Wireless Telegraph and Signal Company with its first major order for ground wireless stations. The contract called not only for the supply of materials and equipment and their installation, but also for their operation and maintenance, as the company was required to train Hawaiian operators, teaching them the Morse code and sufficient electrical theory and practice to enable them to service and maintain the equipment.

Fear of the Bubonic Plague slowed the arrival of Marconi's representatives to Hawaii, with Thomas Bowden, who had transmitted the America Cup reports, landing in Honolulu on May 2, 1900 with Messrs. B. E. Hobbs and John Pletts arriving ten days later. The three men were charged with setting up five stations to be located at Kaimuki on Oahu; Lighthouse Point (Ka Lae o ka Laau), Molokai; Keomoku, Lanai; Makena, Maui; and Mahukona on the island of Hawaii. The stations would be able to communicate with their neighboring stations as well as ships equipped with Marconi wireless telegraph equipment. From the stations messages would be telephoned to their intended on-island recipients.

In early June the *Australia* delivered the necessary equipment from England, and on June 14 a successful demonstration of the new wireless telegraph was made between the grounds of Iolani Palace and the Kaimuki station, a distance of four miles. The message, "Hello! Is anybody out there?" was the first wireless telegraph message transmitted west of the Rockies. For the next two hours messages were sent and received between the two locations. The *Pacific Commercial Advertiser* described the "new marvel" as "telegraphing without wires, communicating between far distant and mutually invisible points by means of the ether which is believed to exist as a sort of cement holding the molecules of the atmosphere together." [June 16, 1900]

By July the 150'-200' tall wooden masts of the antennas were rapidly going up throughout the island chain, and *The Friend* expectantly declared, "A certain ponderous decasyllable has lately been set forth as the longest word in the English language. It may now be put to a legitimate use in the observation, that our islands will very soon have passed out of their former condition of telegraphic 'non-in-ter-com-mu-ni-ca-bil-i-ty.'" [July 1900, page 55] Despite the magazine's optimism, establishing communications between the islands proved challenging, and it was not until November after Andrew Gray, who would shortly assume the position of Marconi Company's chief engineer, arrived in the islands that the difficulties were overcome. Gray discovered that the guy wires supporting the antenna masts were absorbing an excessive amount of energy, and to solve the problem he broke the guy wires into short lengths by inserting dead-eyes and rope lanyards, which henceforth became standard design at all Marconi stations of the period. In addition, the stations on Oahu, Maui and the island of Hawaii were relocated closer to the shore, to assure a better ground for the receiving antenna, with Waialae becoming the Oahu location and Lahaina the Maui one. With these successful adjustments, reliable transmissions were obtained, and the Inter-Island Telegraph Company opened for business on March 2, 1901, the first point to point, commercial wireless telegraph service in the world. However, business was slow as the operators were inexperienced and some of the instruments broke. The inability to obtain replacement parts led to the discontinuing of service in August 1901. After ten months of non-operation, the requisite parts arrived, the equipment repaired and business re-commenced in July 1902. In January 1903 additional stations were established at Kaena Point, Oahu and Nawiliwili, Kauai, expanding the system to cover all the main islands. Hawaii's successful installation and use of the wireless telegraph, placed the islands on the cutting edge of this form of communication. In 1902, Hawaii's five stations represented twenty percent of the twenty five such stations in the world, and at the end of 1904 the islands seven stations still accounted for over ten percent of the world's sixty nine wireless telegraph stations. In 1906, another station was constructed in the islands, when the U.S. Navy instituted its own station to handle government messages to and from ships at sea. Also in that year, on the other side of the Pacific, stations were built to place Australia and Tasmania in wireless telegraphic contact.

The incredible, mind-boggling, routine presence of wireless telegraphy on these tiny islands in the middle of the Pacific in the opening years of the twentieth century, was well articulated by David L. MacKaye, a reporter for the *Pacific Commercial Advertiser*, who recalled his arrival to Honolulu in 1909,

Marconi Wireless Telegraph Station
Name of Property

Honolulu

Hawaii
County and State

I came from an enlightened and enlightening city, and had a good sense of proportion. I believed, together with other superstitions, in dusky islanders, dolce far niente days, the great "Beach," in shipwrecks, pith helmets and coconut fronds. As I believed, so I expected.

I remember the distinct shock of receiving wireless messages at sea. Once on shore (my beliefs and expectations by this time tattered and pitiful) I felt numbed when they offered me, as the customary and unwonderful means of communication, wireless telegraphy.

It is because the wireless is today so common and so commonly accepted that I still remember vividly how great was my surprise when I first saw it as a public utility. There could have been but one reason for it. I had come from a world to which the wireless was unknown except as a plaything, a ludicrous attempt to play superman, into a world where it had been in ordinary use for several years. Alas for provincialism! [Thurms, 1915, pp. 85-86]

During the next few years, the management of the Inter-Island Telegraph Company underwent changes in personnel as well as name, becoming the Wireless Telegraph Company in approximately 1907, and then Hawaiian Telegraph & Telephone Company by 1909. The 1909 name reflected the company's ambition to expand into the realm of telephone service as well as telegraph; however, insufficient financial support for this new endeavor led the company in 1910 to merge with the Mutual Telephone Company, under the latter's name. The merger proved beneficial to Hawaii, as the Hawaiian Telegraph & Telephone Company had been exploring the provision of automatic telephone service through the use of dial telephones, a direction which Mutual followed. Mutual's installation of such equipment in 1910 made Hawaii one of the earliest places in the United States to have dial telephones.

In 1913 Hawaii became involved in a new phase in its adventure with wireless telegraphy when the American Marconi Company constructed transoceanic wireless stations at Koko Head and Kahuku on the island of Oahu. These two plants were envisioned to be important stations in an effort to link the globe with wireless telegraphic communications by connecting North America to Asia. In the intervening decade since Hawaii first pioneered the use of wireless telegraphy, many advances had been made in both Hawaii's communications with the mainland and the field of wireless telegraphy. In 1903 the Trans-Pacific cable landed in Hawaii, connecting the islands to the mainland by telegraph. In addition, in July 1912 the Federal Telegraph Company, using the system of wireless telegraphy developed by the Danish inventor Valdemar Poulsen, established a high power station at Heeia, Oahu, placing Hawaii in direct wireless contact with San Francisco. However, this system was only capable of operating at night and was not always dependable.

Outside the islands, Marconi had worked to greatly increase the range of his equipment and in October 1907 initiated the first regular trans-Atlantic wireless telegraph service, after many successful experiments carried out from December 1901 onward. In addition, in 1900 Marconi had developed a syntonic tuning system which allowed for the reception of messages from multiple stations without jamming, an important development as more and more wireless stations appeared, and by 1907 he had invented the multiple tuner to facilitate this process. By 1909 the wooden masts used in Hawaii and elsewhere to support the antenna were no longer installed at new stations, abandoned in favor of wire-stayed, sectionalized, tubular steel masts.

From 1911 onward, as a result of the above innovations and other advances, Marconi worked toward establishing global coverage, having by this time constructed long distance stations not only in England, France and the United States, but also Spain, Italy, Egypt, India, and Argentina. Hawaii was viewed as a bridge facilitating wireless communication between California, Hawaii and Japan as well as Australia. Thus in 1912 F. M. Samis of the Marconi Company came to Hawaii to determine where it might be best to construct a station. Lands at Koko Head were leased from the Bishop Estate for use as a receiving station, while at Kahuku lands were leased from Campbell Estate for a sending station. The stations were sufficiently separated so as to allow "wireless duplex telegraphy," that is the simultaneous sending and receiving of messages. The siting of the Marconi sending station at Kahuku resulted in the Mutual Telephone Company moving their inter-island Kahuku station to a location where it and the Marconi stations would not interfere with each other. Marconi's operations only involved transoceanic messages, while Mutual Telephone continued to handle all neighbor island and ship communications in Hawaii.

Marconi Wireless Telegraph Station
Name of Property

Honolulu

Hawaii
County and State

At the same time these two new stations on Oahu were under construction, the American Marconi Company was also erecting long distance, paired sending and receiving stations at Bolinas Point and Marshalls (presently named Marshall), California, located eighteen miles north of San Francisco, and at Belmar and New Brunswick, New Jersey. All six of these stations were designed and built by J.G. White Engineering Corporation. In addition, this New York City based engineering and contracting company in 1914 started work on the Marconi stations at Marion and Chatham, Massachusetts. Harry M. Dougherty was J.G. White's superintendent of construction in Hawaii. To reduce the potential for fire, all the buildings at the various stations employed masonry construction, using either concrete filled tile with a brick facing or reinforced concrete, and the roofs featured steel frames and Spanish tiles. In a number of instances similar plans were used for buildings at the various stations, although the stations did not utilize the same designs for every building.

On January 29, 1913, Nugent H. Slaughter of the American Marconi Company arrived in Honolulu on board the *Manchuria* to oversee the construction of the two stations. Work commenced in March 1913, but did not move forward in earnest until July 1913, when most of the equipment and materials, which came from a number of locations in the United States were on island. Cement and lumber were shipped from California, and most of the machinery, structural steel, and other large parts were shipped from New York to Port of Mexico and then carried across the Isthmus Tehuantepec, and then shipped to Hawaii, this route being less expensive than shipping by rail across the continent. All the wireless apparatus was manufactured by the American Marconi Company at their factory in Aldene, New Jersey. Because of the number of stations Marconi had simultaneously under construction around the globe, manufacturers were hard pressed to meet the demand, and as a result materials, such as the steel masts, were delivered in piecemeal lots as they became available. The size of the Kahuku sending station also contributed to manufacturing slow downs, as much of the equipment had to be specially designed and constructed. The Kahuku site was chosen not only for its distance from Koko Head, but also its proximity to the O.R. & L. railway, facilitating the delivery of construction materials and equipment to the site. Compared to Kahuku, the Koko Head location presented huge transportation challenges, for although it was located a mere eight miles east of Honolulu, it was accessed only by horse drawn wagons on a dirt road, portions of which were submerged under the high tide for large parts of the day.

In October 1913 the *Pacific Commercial Advertiser* reported the Koko Head station was nearing completion, while, "on the level plain of Kahuku, two miles nearer to Honolulu than the plantation mill, are now rising the first great steel masts of what is to be with one exception, the greatest long distance wireless plant in the world." (page 1) Construction went slower at Kahuku than Koko Head as the contractor encountered difficulties when attempting to pour the concrete foundations for the antenna masts, as well as the powerhouse/operations building's foundation, because of Kahuku's porous coral substrate and high water table. To control the water flow while laying the foundation for the powerhouse's condenser pit, a battery of three, four and six inch pumps proved inadequate and eight inch pumps had to be added to the array. The anchorage foundations for the masts were poured into pits lined with water tight wood cribs.

The boilers for the plant were sufficiently large that they were hoisted into position by cranes and suspended in position in the air from a wood framework while their firebrick furnaces were constructed underneath them. Once this work was completed the powerhouse walls and roof were constructed.

By July 1914, preliminary tests were started between Hawaii and California, and transoceanic service was officially opened for business on September 24, 1914, approximately two months after the start of World War I in Europe. One hundred and ninety eight guests attended the formal opening of the Kahuku Telegraph Station, arriving at 11:40 on a chartered train, which departed Honolulu at 9 in the morning. At an al fresco luncheon, Governor Lucius Pinkham opened the new station by touching a small silver telegraph key which set Kahuku's equipment in motion. The first message was sent from the governor to the President of the United States, Woodrow Wilson, and the second to California Governor Johnson. The first message read,

With time and distance annihilated and space subdued through wireless triumphs and impulse, the Territory of Hawaii conveys its greetings, profound respect and sympathy to Woodrow Wilson, president of the United States, as he so earnestly seeks the blessings of peace and good will for all men and all nations. [*Star Bulletin*, September 24, 1914, p. 1]

The President responded with a short, "May God bring the nation together in thought and purpose and lasting peace."

Marconi Wireless Telegraph Station
Name of Property

Honolulu

Hawaii
County and State

At the time of Kahuku's opening, it was the largest wireless telegraph station in the world in terms of capacity and power. Everything in the plant was in duplicate, the one system backing up the other, so there was no reason to have to shut down operations because of a need to undertake repairs. It was estimated the station could transmit approximately thirty to forty thousand words a day, with the day rate for messages being twenty five cents a word, the same as Federal charged for its night service. Wireless Lettergrams, sent at night, were charged one dollar for the first thirteen words, and eight cents for each word after that. These would be delivered to their recipients at 8 o'clock the following morning. Saturday Lettergrams cost \$1.50 for the first twenty five words, and six cents per each additional word. They would be delivered first thing Monday morning. These rates in some areas were considerably lower than those offered by Marconi's competitors in the islands. The American Marconi Company maintained an office in downtown Honolulu at 923 Fort Street, where customers submitted and picked up their messages, which were carried by land lines to and from the two stations.

The opening of the station marked the beginning of a new era for Hawaii, for according to the *Honolulu Star Bulletin*,

Besides being included in the great chain of wireless stations which are to be erected by the Marconi Company, Hawaii has been favored with being selected as the site for the largest wireless station in the world. While situated in the middle of the Pacific ocean, isolated, as it were, from the rest of the world except for a single cable and a wireless station only capable of working at night, Hawaii will be able to throw off this isolation with the coming of the Marconi system, get into a more complete touch with the rest of the world, and be drawn into closer relations with the country of which it is a territory. [April 19, 1913, p. 16]

On September 22, 1916 regular telegraphic communication between Hawaii and Funabashi, Japan, which is located twelve miles outside Tokyo, was established, a distance of 4,200 miles, the longest distance ever undertaken by a commercial telegraph enterprise at that time.

The Kahuku station was staffed by three operators, as well as machinists, engineers, and twenty riggers, who maintained the steel masts and lines. Because of the close proximity to the ocean, rust was an on-going concern, and the masts required painting every six months. Lewis Mason Clement who graduated from University of California at Berkeley in 1914 with a degree in Electrical Engineering, was hired as the station's engineer/operator, and shortly thereafter was transferred to the Bolinas station. During World War I he and R. Heising developed for the Army Signal Corps the necessary equipment to allow air to ground communications, and in 1917 the two were the first Americans to speak from an airplane with the ground, as well as from airplane to airplane.

On April 17, 1917, following the United States' entry into World War I, the U.S. Navy took over all wireless telegraph operations in the nation, including both the Koko Head and Kahuku stations, as well as the Federal Telegraph station at Heeia and Mutual Telephone's inter-island system. Despite fears that wireless telegraphy would become a permanent government operation under the post office, as was the case in such countries as England and Japan, following World War I the stations were returned to their private owners. Albeit, the Navy purchased Federal's Heeia station, and during the next World War upgraded that station to communicate with submerged U.S. Navy submarines throughout the Pacific. To accomplish this feat, an 8,000' long antenna was strung between two peaks at the rear of Haiku valley, whose sheer cliffs towered approximately 2,000' above the valley's floor. Constructed in 1942-1943, this project included building the "Stairway to Heaven". In addition to retaining the Heeia station, the Navy at the end of World War I constructed a new long distance telegraph station at Pearl Harbor which at the time of its completion was the highest powered wireless telegraph station in the Pacific, communicating with Panama, Manila, San Francisco and Washington D.C. In 1920 the Navy also constructed a new receiving station at Wailupe, which was one of the largest receiving stations in the world for its time.

At the conclusion of the war new innovations made it evident that the existing Marconi spark method of transmission used at Kahuku would soon be obsolete, replaced by either one of three more efficient methods: arc, high frequency alternator, or thermionic tube (audion) transmission, all three of which provided continuous waves of undamped electrical oscillations instead of the damped waves of the spark systems. The replacement of damped, spark-induced waves with continuous waves offered several advantages including more precise, and in turn secure, tuning as well as more rapid transmission. More importantly, however, it opened the door for the possible development of commercial radio

Marconi Wireless Telegraph Station
Name of Property

Honolulu

Hawaii
County and State

broadcasts and also wireless telephony, as continuous waves could carry the human voice, something not feasible with damped waves.

Unfortunately, the patents on the equipment needed to build a continuous wave communications system were divided between several companies, meaning that none could legally operate such a system without infringing on the patents of others. Marconi was negotiating with General Electric for the exclusive use of the Alexanderson high frequency alternator which General Electric had developed and installed at Marconi's New Brunswick, New Jersey station in 1917, which greatly improved military communications between the United States and Europe. The U. S. Navy, with the experience of World War I and the strategic value of wireless communication fresh in its memory, requested that General Electric delay any decisions on the Marconi offer to acquire the rights to its alternator, and then proposed that a merger be made between General Electric, and the American Marconi Company, which held, an assorted number of communications patents, including those for antenna connection, inductive tuning, the coherer, the magnetic detector, and Fleming's valve, and also had the requisite expertise in wireless manufacture and operation. When brokering a merger, the Navy insisted the new company be national in character and not affiliated with any foreign entity. As a result Marconi's British company ended up selling its holdings in the American Marconi Company, and on October 17, 1919 the Radio Corporation of America (RCA) was formed with David Sarnoff (1891-1971), who had worked for Marconi since the age of fifteen, at the helm. The Navy also served as an intermediary to have the other companies holding critical patents, including Westinghouse, American Telephone and Telegraph, and the United Fruit Company, agree to a full interchange of patent rights with RCA.

As a result of the formation of RCA, the Koko Head and Kahuku stations, which were returned to the American Marconi Company after the war, were placed in the hands of the new company, and over the next several years the results of accessing all the new technology became evident. In November 1924, A. P. Taylor found that wireless telegraphy had reached a state of high reliability as,

The control which man exercises over the powerful voltage of electricity developed in the great transmitting station at Kahuku, island of Oahu, is so absolute that no thought is given to the fate of the message. It goes, and it goes straight. [*Pacific Commercial Advertiser*, magazine section, p. 3]

He then went on to note,

Radio is developing so rapidly, that what was considered an up-to-date transmitting plant three years ago is today regarded as junk. In 1915 the great Kahuku plant, erected by the Marconi Company that is now absorbed in America by the Radio Corporation of America, was considered the most remarkable installment of wireless machinery. That unit became "junk" five years ago. It cost more than a million dollars.

CHANGES ARE RAPID

A year ago the latest and most powerful invention, the Alexanderson alternator, came to the front. Only 22 alternators were manufactured by the General Electric Co., which is associated with the Radio Corporation. Two were installed at the Kahuku plant and the old machinery "junked." [*ibid.*, p. 3]

The Alexanderson alternator, with its two hundred kilowatt output, tripled the amount of electrical energy available for transmitting messages, and led not only to the increased dependability of sending wireless telegraphs, but also an increase in speed, allowing the transmission of messages at the rate of 125 words per minute, which was three to four times faster than the former equipment. At Kahuku, one alternator was dedicated to eastbound messages to California and the other to telegrams sent to Japan. These impressive alternators were in turn supplemented by shortwave tube transmitters in less than a decade. Also in 1924 the steam-driven turbines that powered the electrical generators were discarded and the power plant's tall smoke stack was eventually removed.

In addition to upgrading the transmitting station at Kahuku, RCA completely revamped its receiving operations at Koko Head with the stringing of an eleven mile long wire antenna from Makapuu Point lighthouse out beyond Waimanalo. This

Marconi Wireless Telegraph Station
Name of Property

Honolulu

Hawaii
County and State

new antenna and the introduction of diversity receivers made the 1914 Koko Head Station obsolete, and in 1927 the Lunalilo Trust acquired from RCA the buildings and lease for the station at Koko Head for \$75,000. The Irene Ii Estate then purchased the land in fee simple from the Bishop Estate and donated it to the Lunalilo Estate, and provided the estate with an additional \$9,000 to improve the grounds. The Lunalilo Estate remodeled the hotel to house the indigent, aged Hawaiians under their care, moving in during 1928. It retains this function to this day; however, none of the other station buildings remain. Koko Head, with its new equipment continued as a location for a receiving site until circa 1960, when this function was moved near to Kahuku.

The development of short wave transmission further revolutionized wireless telegraphy. In developing long range wireless telegraphy Marconi based his endeavors on the premises that longer wave length and increased power resulted in greater distances traversed. However, later experimentation by C. S. Franklin disclosed shorter wave lengths, requiring less power, proved best for long range transmissions. In 1916-1917 the Italian Navy had contracted with Marconi to develop secure short range intercommunications between ships, which could not be overheard by the enemy. Marconi and C. S. Franklin, who worked for Marconi, decided to try short wavelengths of only two meters and through the use of reflectors concentrated these waves to move in one desired direction. As no mechanism at this time could generate such short waves, Franklin devised a spark circuit operating in compressed air for this purpose. Following the contract, Franklin continued to experiment with the short waves, and at the end of World War I asked Marconi to undertake a test to communicate between Hendon and Birmingham, a distance of 97 miles, using a wavelength of fifteen meters and only 700 watts input. The successful test, coupled with amateur ham operators reporting occasional long distance contact despite the low wattage of their equipment, led Marconi to have Franklin further experiment with short waves. His work proved successful and in 1926 Marconi short wave band high-frequency transmitter stations were established in Bridgewater, Nova Scotia and Bodmin, Saskatchewan, Canada, proving conclusively the higher handling capacity and efficiency of short wave telegraphy. In 1927 stations were built in South Africa, India, and Australia, successfully linking the entire British Empire by short wave wireless telegraph. Later developments allowed the simultaneous transmission of two or more messages on the same antenna without mutual interference and also the mixture of telephony and telegraphy services.

Combining the developments in the areas of continuous wave and short wave transmission, Hawaii's Mutual Telephone Company was among the first commercial telephone companies to explore the possibilities of developing radio telephony. Working in collaboration with C. W. Hansell of RCA's development laboratory at Rocky Point, New York, Mutual Telephone Company's W.I. Harrington over the course of six years developed a radio telephone beam system which operated on a wave length of thirty to sixty megacycles per second. Until their development of a high-frequency line-controlled transmitter, there had been no simple method of obtaining constant frequency in transmitters operating within this wave length. In addition a new directional antenna was developed which increased transmitting power by sixteen times. Mutual established four stations: Puu Manawahua in Oahu's Waianae mountain range, on the top of the hill named Kalepa near Lihue on Kauai, at the crest of Honuaula near Ulupalakua on Maui, and at Waikii on the slopes of Mauna Kea, thus connecting all of the main islands with radio telephone service. In addition, Mutual built and maintained connecting lines to RCA's stations at Kahuku and Koko Head, where RCA relayed radio telephone messages to and from the mainland and Asia. As a result radio telephone service was established between Oahu and the neighbor islands on November 2, 1931. On December 23, 1931, such service was inaugurated between Hawaii and the mainland, using American Telephone and Telegraph stations at Dixon, California for transmission and Point Reyes, California for reception. Thanks to the new technology, by 1934 Hawaii telephone users could contact ninety two percent of the telephones in the world. Between 1932 and 1935 about seven hundred calls were placed between Hawaii and the mainland.

As a result of short wave technology and the advent of radio telephony, the impressive masts at Kahuku became obsolete, and during the course of a week in early February 1931 eight 470' masts were felled with the aid of dynamite in order to make way for approximately forty new, 100' high, wooden masts. The new masts were used by the new short wave technology and were constructed to serve the radio telephone service developed by Mutual Telephone Company and RCA. Because of the cost of removal, the remaining tall masts, which did not interfere with the station's operations, stood until May 1933, when the County Assessor decided to consider them as taxable assets, leading to their demise. The masts had not been operational since March 1930.

Marconi Wireless Telegraph Station
Name of Property

Honolulu

Hawaii
County and State

With the advent of the new single side-band system in 1937 new antennas were erected and new apparatus and equipment installed as well. The new system eliminated certain speech frequencies not essential to intelligibility, which allowed for a reduction in transmitter power and improved the quality of the received speech.

Following the bombing of Pearl Harbor, on December 9, 1941 the military once again took control of both the Mutual Telephone and RCA operations. Prior to the start of the war, the area around the RCA station at Kahuku was used by the Navy as a bombing range, and following the bombing of Pearl Harbor, on December 10, 1941 Hawaiian Constructors commenced construction of a runway at Kahuku, the start of the Kahuku Airfield Military Reservation, which was also known as Kahuku Air Base. The runway project was immediately beset by difficulties, the result of poor drainage, and the runway had to be relocated three times and a drainage canal system installed before the runway was successfully built. Because of difficulties with the contractors, who were responsible for numerous military construction projects in Hawaii, the Army terminated their contract in June 1942, and the runway was completed by the 1st Battalion, 370th Engineer Special Service Regiment, which was stationed at Schofield Barracks. The 200' wide, 6,500' long NE-SW runway initially was covered with Marston Mat, but was soon paved with asphaltic concrete, with compacted coral shoulders 100' in width. A second NW-SE runway was constructed after August 1942. The length and width of the runways indicate they were intended for use by B-17 and B-24 bombers, as well as cargo transports. In December 1943, the runways were widened and expanded to accommodate B-29 bombers. In addition to the runways, such support buildings as a control tower, enlisted men's barracks, officer's quarters, mess halls, dispensaries, two fire stations, a chapel, and a post exchange were constructed on the site. The RCA buildings, with the exception of the powerhouse/operating building, were also used by the air field. The hotel became the base headquarters, the administration building housed base operations, and the manager's house became the commanding officer's quarters. The April 1, 1946 tsunami devastated the Kahuku Air Base, destroying numerous buildings and covering the runways with debris. Following this tidal wave military air operations ceased at Kahuku and sometime between June 12, 1946 and March 1947 the lands were returned to Campbell Estate.

During the 1950s and 1960s the NE-SW runway was used for drag racing, until the track was opened at Campbell Industrial Park in the 1960s. The construction of the golf course for Turtle Bay destroyed most of the NE-SW runway. None of the Air Base buildings remain extant today; however, a portion of both the NE-SW and NW-SE runways remains buried on the nominated property.

Following the war, control of the property reverted back to RCA. RCA continued to operate the site for telegraphic and telephonic communications until 1978, with Leslie Leigh being the manager/operator of the site for its final ten years. In 1976 Marisat satellites were placed in operation and marine satellite communication was officially sanctioned. The establishment of satellite communication, coupled with more efficient undersea cable systems, using ultra reliable tube type repeater amplifiers and also coaxial cable, led to reduced reliance on coastal telegraph stations and to their eventual closure.

The four buildings which comprise the Marconi Wireless Telegraph Station at Kahuku constitute the most intact wireless telegraph station in Hawaii. In addition to this site, the only other reminder of the early years of wireless telegraphy in Hawaii is the Koko Head station's hotel building, which became the Lunalilo Home in 1928, a function it retains to this day.

In addition to Kahuku several long distance wireless telegraph stations remain standing in the United States. The station hotel and two engineer's cottages at the receiving station at Marshall, California have been preserved, and now operate as a Conference Center at the Marconi Cove State Park. At Bolinas, California the original transmitting station is no longer used but standing, and the hotel, two cottages, tennis court and a later RCA transmitting building are standing and have been adaptively reused. The original foundations and anchor blocks for the antennas are also visible above ground, and an antenna field, although not the original, is on the site. The Bolinas station is owned by the National Park Service, as is the later constructed receiving station at Point Reyes. These properties have been determined eligible for listing in the National Register of Historic Places, and presently a Marconi/RCA Historic District nomination is being prepared for these sites.

The buildings associated with the former receiving station at Belmar, New Jersey also remain standing, having been taken over by the military and incorporated into Fort Monmouth. Six buildings from this former Marconi wireless telegraph station are now part of the InfoAge Science-History Learning Center and Museum and are listed in the National Register

Marconi Wireless Telegraph Station
Name of Property

Honolulu

Hawaii
County and State

of Historic Places as part of the Camp Evans Historic District. Belmar's companion transmitting station at New Brunswick, New Jersey is no longer extant.

The buildings associated with the Marconi receiving station at Chatham, Massachusetts have also been preserved as the Chatham Marconi Maritime Center. These buildings also are listed in the National Register of Historic Places. The transmitting station at Marion, Massachusetts is no longer operational, however, several of its buildings remain standing having undergone adaptive reuse.

Developmental history/additional historic context information (if appropriate)

J. G. White Engineering Company of New York handled the design and construction of the two Marconi wireless telegraph stations in Hawaii, and were also responsible for the design and construction of eleven other stations for Marconi, including those in California, New Jersey, and Massachusetts. At the time of the construction of the Hawaii stations, Gano Dunn (1870-1953) was the president of J.G. White. In 1891 Dunn received from Columbia University the first degree in electrical engineering conferred in America. After graduation he worked for Crocker-Wheeler Electrical Manufacturing Company until 1911, when he joined J.G. White Engineering as a vice president in charge of engineering and construction. In 1913 he became president of this firm, a position he held until his death. In addition to building thirteen transoceanic stations for Marconi, the company also was responsible for building the United States Naval Oil Base at Pearl Harbor, the steam plant at Muscle Shoals, Alabama, the original government aviation station at Langley Field in Virginia, and the first long distance, natural gas pipeline in California. The company also constructed a number of dams and power plants in Mexico and South America and the Persian railway. In addition to his position with J.G. White, Dunn served as a trustee and president of Cooper Union for the Advancement of Science and Art. Twice Dunn was offered the presidency of M.I.T., and also the secretaryship of the Smithsonian Institute, all of which he declined. In addition in 1938, he became a trustee of RCA, at the request of David Sarnoff, whom Dunn had first met in 1911 when Sarnoff was working for Marconi.

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Honolulu

Hawaii

Name of Property

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Name of Property County and State

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Name of Property

Hawaii
County and State

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Name of Property

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[online.com/33386cgi/mweb.exe?request=keyword;keyword=wireless%20station;dtype=d;subset=350](http://sippican.pastperfect-online.com/33386cgi/mweb.exe?request=keyword;keyword=wireless%20station;dtype=d;subset=350)

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Marconi Wireless Telegraph Station Honolulu
Name of Property

Hawaii
County and State

Viewed December 12, 2011

Personal Communication and E-Mail

Edde Crowell, e-mail dated February 11, 2012, Ms. Crowell is the archivist for the Chatham Marconi Maritime Center. Ecrowell1@comcast.net

Carola DeRooy, e-mail dated February 8, 2012. Ms. DeRooy is the National Park Service archivist at Point Reyes National Seashore. Carola_DeRooy@nps.gov

Richard Dillman, e-mail dated February 9, 2012. Mr. Dillman is the chief operator of Station KSM operated by the Maritime Radio Historical Society [ddillman@iqc.org](mailto:rdillman@iqc.org)

George Leigh, Telephone Conversation, February 1, 2012. Mr. Leigh is the son of the last manager/operator, who lived on the property from 1968-1978.

Previous documentation on file (NPS):

- preliminary determination of individual listing (36 CFR 67 has been requested)
- previously listed in the National Register
- previously determined eligible by the National Register
- designated a National Historic Landmark
- recorded by Historic American Buildings Survey # _____
- recorded by Historic American Engineering Record # _____
- recorded by Historic American Landscape Survey # _____

Primary location of additional data:

- State Historic Preservation Office
- Other State agency
- Federal agency
- Local government
- University
- Other
- Name of repository: _____

Historic Resources Survey Number (if assigned): NA

10. Geographical Data

Acreage of Property 89 acres
(Do not include previously listed resource acreage.)

UTM References

(Place additional UTM references on a continuation sheet.)

1	<u>04</u>	<u>605727.692</u>	<u>2400978.773</u>	7	<u>04</u>	<u>606099.918</u>	<u>2399964.640</u>
	Zone	Easting	Northing		Zone	Easting	Northing
2	<u>04</u>	<u>606585.950</u>	<u>2400988.150</u>	8	<u>04</u>	<u>606076.793</u>	<u>2400462.636</u>
	Zone	Easting	Northing		Zone	Easting	Northing
3	<u>04</u>	<u>606557.841</u>	<u>2400937.225</u>	9	<u>04</u>	<u>605969.718</u>	<u>2400619.675</u>
	Zone	Easting	Northing		Zone	Easting	Northing
4	<u>04</u>	<u>606610.071</u>	<u>2400904.363</u>	10	<u>04</u>	<u>605989.427</u>	<u>2400637.640</u>
	Zone	Easting	Northing		Zone	Easting	Northing

<u>Marconi Wireless Telegraph Station</u>			<u>Honolulu</u>	<u>Hawaii</u>			
Name of Property				County and State			
5	<u>04</u>	<u>606420.003</u>	<u>2400490.742</u>	11	<u>04</u>	<u>605970.597</u>	<u>2400660.578</u>
	Zone	Easting	Northing		Zone	Easting	Northing
6	<u>04</u>	<u>606234.407</u>	<u>2400484.898</u>	12	<u>04</u>	<u>605952.582</u>	<u>2400647.236</u>
	Zone	Easting	Northing		Zone	Easting	Northing

Verbal Boundary Description (Describe the boundaries of the property.)

This district nomination includes all the property owned by Jeremy Henderson in 2012 as described by Tax Map Key 5-6-003: 010 and 032

Boundary Justification (Explain why the boundaries were selected.)

This is the lands historically associated with the Marconi Wireless Station.

11. Form Prepared By

name/title Don Hibbard and Mayu Ohama
organization Fung Associates date February 8, 2012
street & number 1833 Kalakaua Avenue telephone (808)-941-3000
city or town Honolulu state Hawaii zip code 96815
e-mail projects@funghawaii.com

Additional Documentation

Submit the following items with the completed form:

- **Maps:** A **USGS map** (7.5 or 15 minute series) indicating the property's location.
A **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.
- **Continuation Sheets**
- **Additional items:** (Check with the SHPO or FPO for any additional items.)

Photographs:

Submit clear and descriptive photographs. The size of each image must be 1600x1200 pixels at 300 ppi (pixels per inch) or larger. Key all photographs to the sketch map.

Name of Property: Marconi Wireless Telegraph Station

Marconi Wireless Telegraph Station Honolulu
Name of Property

Hawaii
County and State

City or Vicinity: Kahuku, Honolulu

County: State: Hawaii

Photographer: Julie Lam

Date Photographed: November, 2011

Description of Photograph(s) and number:

- 1 of 10. Overall Site, looking south
- 2 of 10. Overall of the Power House/ Operating Building, looking southeast
- 3 of 10. North Elevation of the Power House/ Operating Building, looking southeast
- 4 of 10. East Elevation of the Power House/ Operating Building, looking southwest
- 5 of 10. South Elevation of the Power House / Operating Building, looking northwest
- 6 of 10. North elevation of the Hotel, looking south
- 7 of 10. South elevation of the Hotel, looking northwest
- 8 of 10. Overall elevation of the Manager's House, looking southeast
- 9 of 10. Overall elevation of the Administration/Auxiliary Operating Building, looking northeast
- 10 of 10. South elevation of the Administration/Auxiliary Operating Building, looking northwest

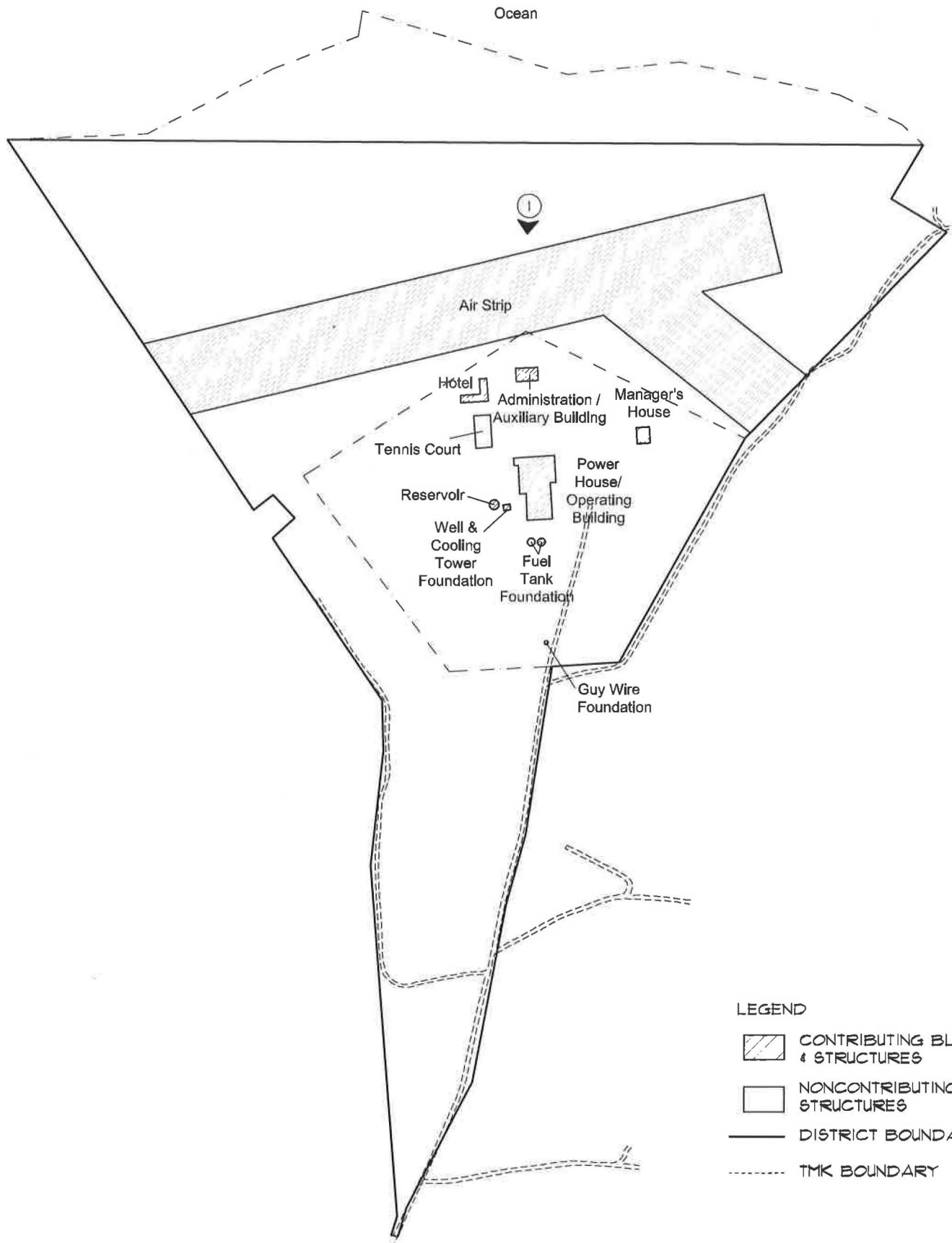
Property Owner:

(Complete this item at the request of the SHPO or FPO.)





name Makai Ranch, LLC
street & number 3540 West Sahara Avenue, # 729 telephone _____
city or town Las Vegas state Nevada zip code 89102

Paperwork Reduction Act Statement: This information is being collected for applications to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C.460 et seq.).

Estimated Burden Statement: Public reporting burden for this form is estimated to average 18 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Office of Planning and Performance Management, U.S. Dept. of the Interior, 1849 C. Street, NW, Washington, DC.



LEGEND

-  CONTRIBUTING BLDG. & STRUCTURES
-  NONCONTRIBUTING STRUCTURES
-  DISTRICT BOUNDARY
-  TMK BOUNDARY

MARCONI WIRELESS TELEGRAPHY STATION - SITE PLAN



SCALE: 1:5000

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Marconi Wireless Telegraphy Station

Name of Property

Honolulu, Hawaii

County and State

Name of multiple listing (if applicable)

Section number Historic Photos

Page 1

1. Administrative Building, Circa 1916

Reference Number: H-00003-21-A



2. Construction Hotel, circa 1916

Reference Number: H-00003-20-B



**United States Department of the Interior
National Park Service**

**National Register of Historic Places
Continuation Sheet**

Marconi Wireless Telegraphy Station

Name of Property

Honolulu, Hawaii

County and State

Name of multiple listing (if applicable)

Section number Historic Photos

Page 2

3. Power House/ Operating Building, circa 1916
Reference Number: H-00003-21-D

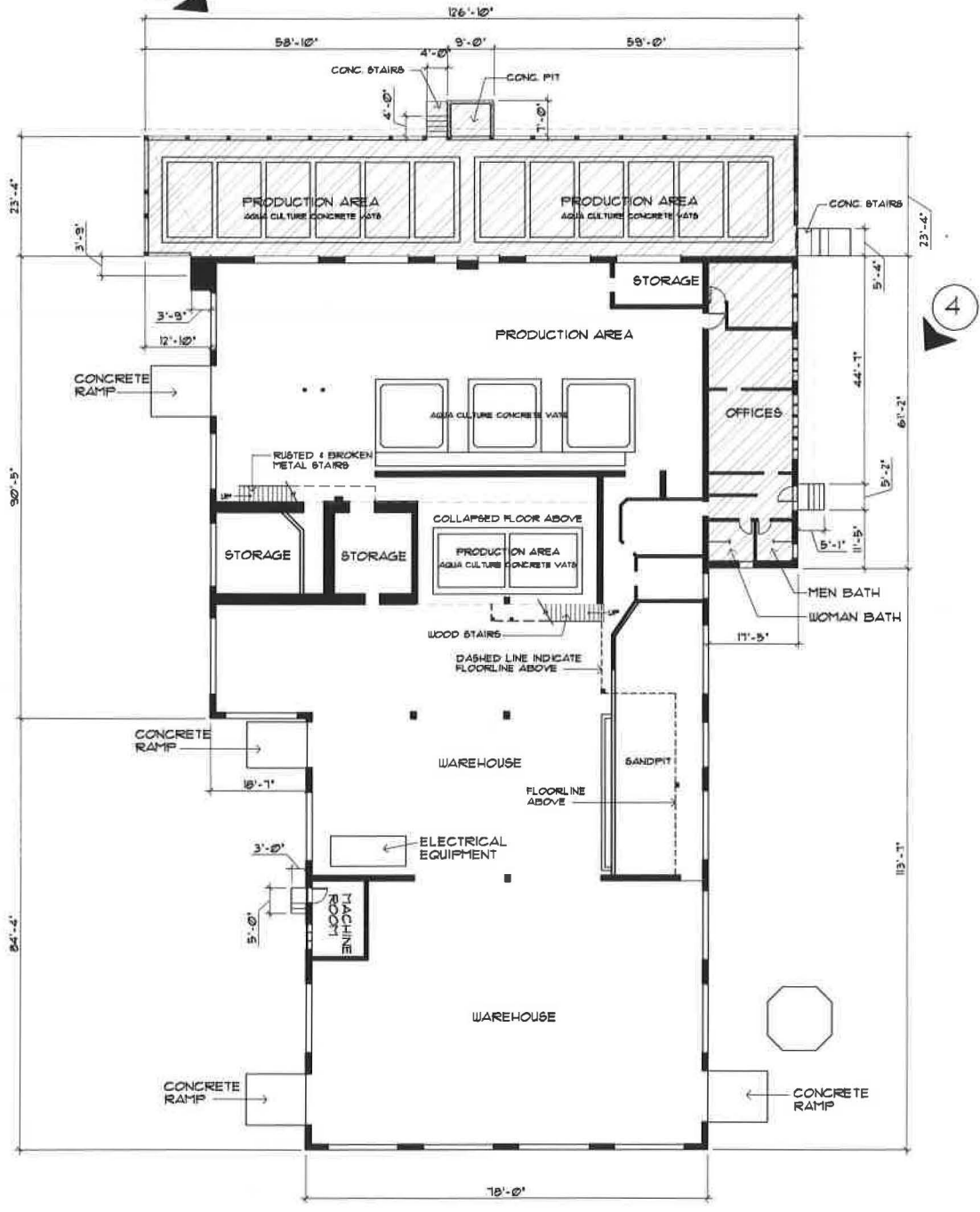


4. Power House/ Operating Building, circa 1910
Reference Number: H-00008-34



2

3



4

AREA CALCULATIONS

FLOOR 1	19335 S.F.
FLOOR 2 - MEZZANINE	3196 S.F.
FLOOR 3 - ABOVE MEZZANINE	496 S.F.
TOTAL FLOOR AREA	23027 S.F.

 ADDITION

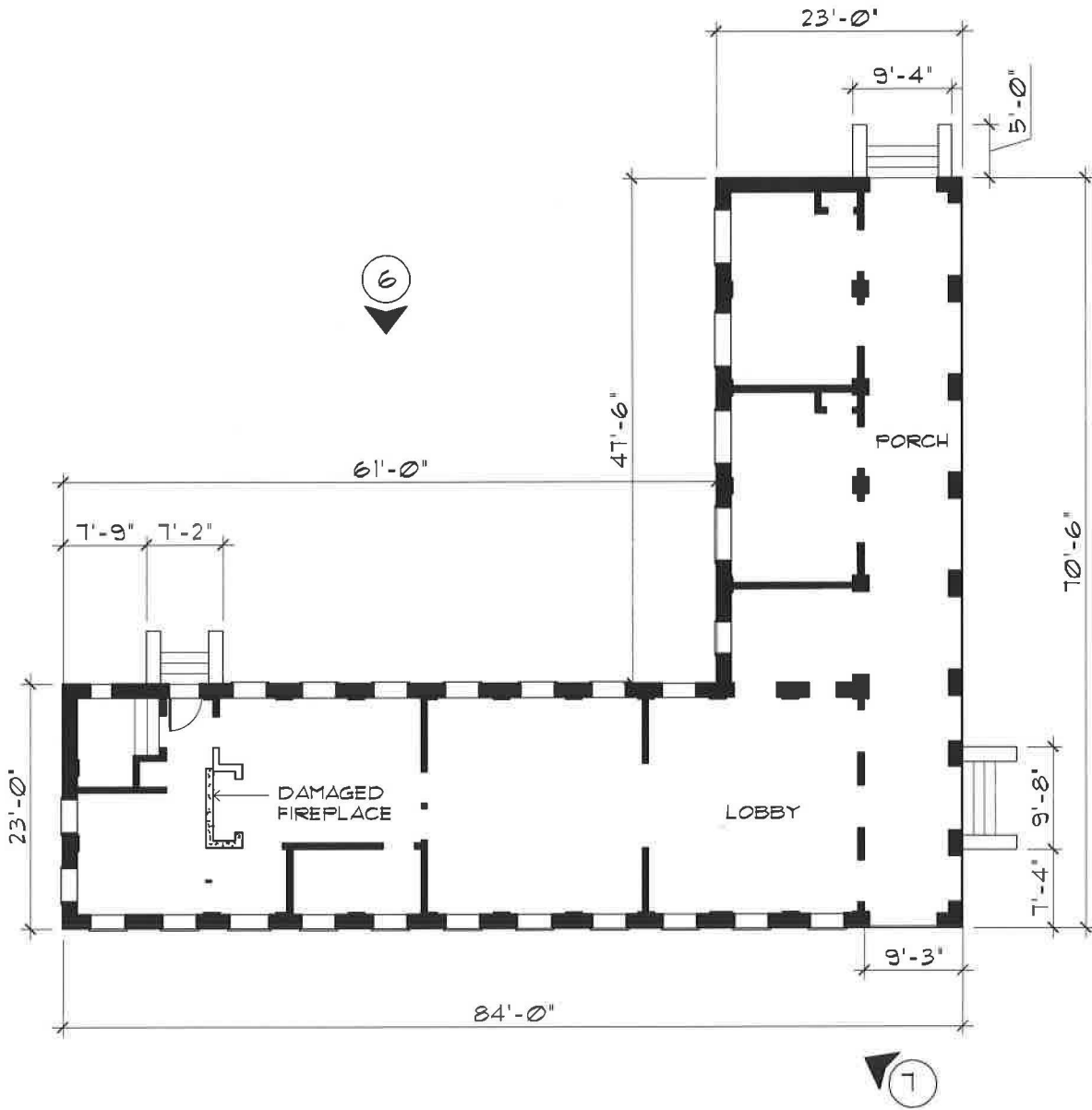
POWERHOUSE/OPERATING BUILDING

SCALE: NTS

 PHOTO NO.



 DIRECTION OF PHOTO



AREA CALCULATIONS

HOTEL AREA (FIRST FLOOR)	2373 S.F.
PORCH AREA (FIRST FLOOR)	652 S.F.
HOTEL AREA (SECOND FLOOR)	3025 S.F.
TOTAL FLOOR AREA	6050 S.F.

HOTEL FLOOR PLAN

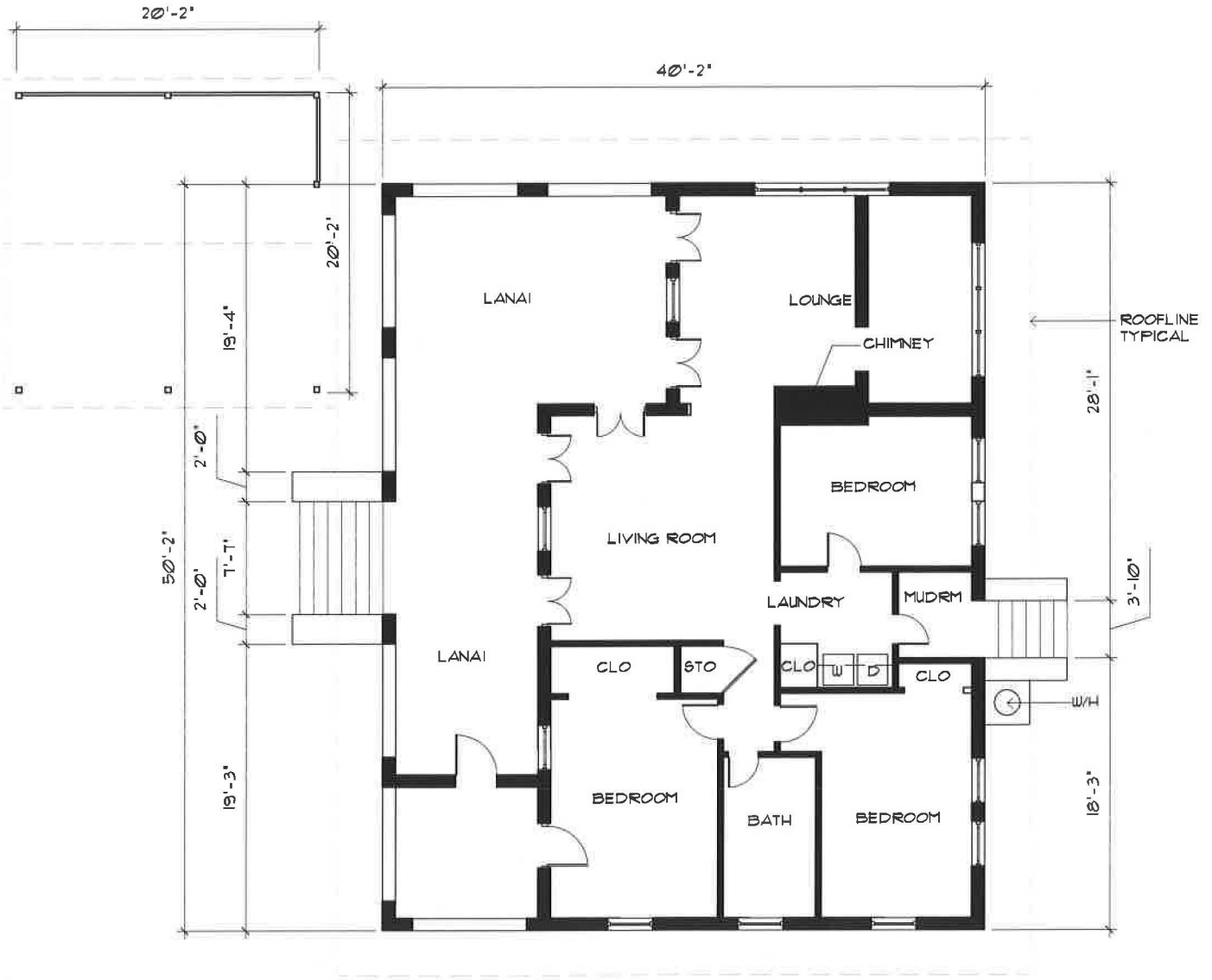
SCALE: NTS



○ PHOTO NO.

▲ DIRECTION OF PHOTO

8



AREA CALCULATIONS

FARM DWELLING

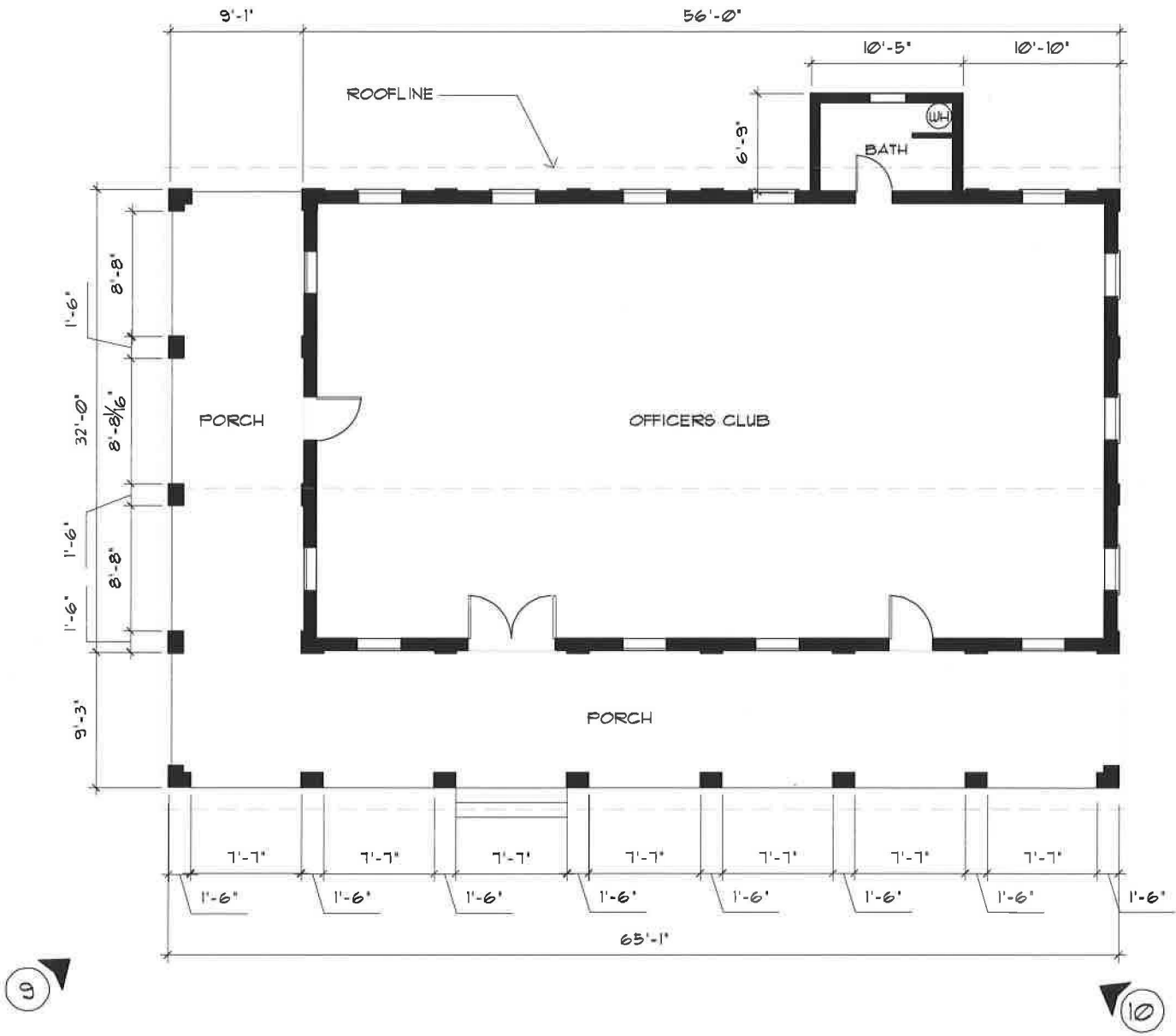
2016 SF.

MANAGERS HOUSE
SCALE: NTS



○ PHOTO NO.

▲ DIRECTION OF PHOTO



AREA CALCULATIONS

OFFICER'S CLUB AREA	1863 S.F.
PORCH AREA	893 S.F.

ADMIN./AUXILIARY OPERATING BUILDING

SCALE: NTS



PHOTO NO.



DIRECTION OF PHOTO

Marconi Wireless Telegraphy Station

Name of Property

State

Honolulu, HI

County and

Photographs:

Name of Property: Marconi Wireless Telegraph Station

City or Vicinity: Kahuku

County: Honolulu State: Hawaii

Photographer: Julie Lam

Date Photographed: November, 2011

Description of Photograph(s) and number: Overall Site, looking south

1 of 10.



Marconi Wireless Telegraphy Station

Name of Property
State

Honolulu, HI

County and

Name of Property: Marconi Wireless Telegraph Station

City or Vicinity: Kahuku

County: Honolulu

State: Hawaii

Photographer: Julie Lam

Date Photographed: November, 2011

Description of Photograph(s) and number: Overall of the Power House/Operating Building, looking southeast

2 of 10.



Marconi Wireless Telegraphy Station

Name of Property
State

Honolulu, HI

County and

Name of Property: Marconi Wireless Telegraph Station

City or Vicinity: Kahuku

County: Honolulu

State: Hawaii

Photographer: Julie Lam

Date Photographed: November, 2011

Description of Photograph(s) and number: North elevation of the Power House/ Operating Building, looking southeast

3 of 10.



Marconi Wireless Telegraphy Station

Name of Property
State

Honolulu, HI

County and

Name of Property: Marconi Wireless Telegraph Station

City or Vicinity: Kahuku

County: Honolulu

State: Hawaii

Photographer: Julie Lam

Date Photographed: November, 2011

Description of Photograph(s) and number: East elevation of the Power House/ Operating Building, looking southwest

4 of 10.



Marconi Wireless Telegraphy Station

Name of Property
State

Honolulu, HI

County and

Name of Property: Marconi Wireless Telegraph Station

City or Vicinity: Kahuku

County: Honolulu

State: Hawaii

Photographer: Julie Lam

Date Photographed: November, 2011

Description of Photograph(s) and number: South elevation of the Power House/ Operating Building, looking northwest

5 of 10.



Marconi Wireless Telegraphy Station

Name of Property
State

Honolulu, HI

County and

Name of Property: Marconi Wireless Telegraph Station

City or Vicinity: Kahuku

County: Honolulu

State: Hawaii

Photographer: Julie Lam

Date Photographed: November, 2011

Description of Photograph(s) and number: North elevation of the Hotel, looking south

6 of 10.



Marconi Wireless Telegraphy Station

Name of Property
State

Honolulu, HI

County and

Name of Property: Marconi Wireless Telegraph Station

City or Vicinity: Kahuku

County: Honolulu

State: Hawaii

Photographer: Julie Lam

Date Photographed: November, 2011

Description of Photograph(s) and number: South elevation of the Hotel, looking northwest

7 of 10.



Marconi Wireless Telegraphy Station

Name of Property
State

Honolulu, HI

County and

Name of Property: Marconi Wireless Telegraph Station

City or Vicinity: Kahuku

County: Honolulu

State: Hawaii

Photographer: Julie Lam

Date Photographed: November, 2011

Description of Photograph(s) and number: Overall elevation of the Manager's House, looking southeast

8 of 10.



Marconi Wireless Telegraphy Station
Name of Property
State

Honolulu, HI
County and

Name of Property: Marconi Wireless Telegraph Station

City or Vicinity: Kahuku

County: Honolulu **State:** Hawaii

Photographer: Julie Lam

Date Photographed: November, 2011

Description of Photograph(s) and number: Overall elevation of the Administration/Auxiliary Operating Building, looking northeast

9 of 10.



Marconi Wireless Telegraphy Station

Name of Property
State

Honolulu, HI

County and

Name of Property: Marconi Wireless Telegraph Station

City or Vicinity: Kahuku

County: Honolulu

State: Hawaii

Photographer: Julie Lam

Date Photographed: November, 2011

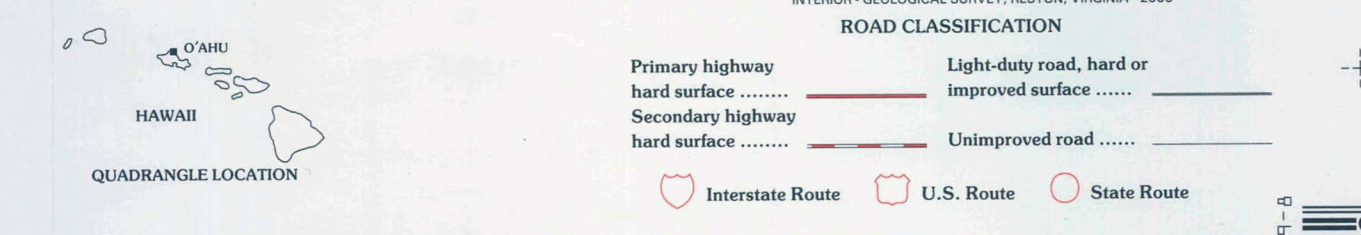
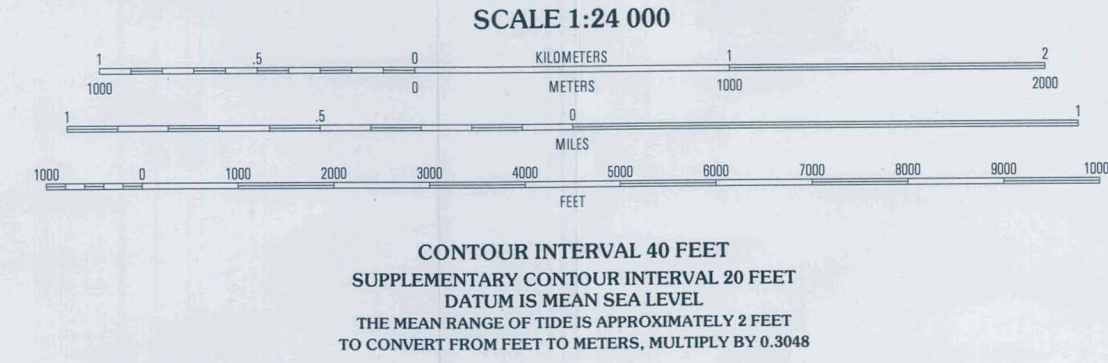
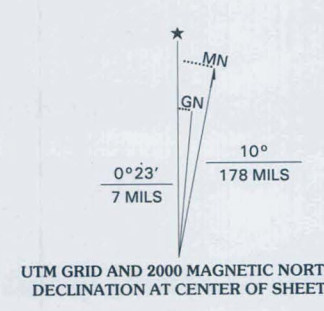
Description of Photograph(s) and number: South elevation of the Administration/Auxiliary Operating Building, looking northwest

10 of 10.





Produced by the United States Geological Survey
in cooperation with National Imagery and Mapping Agency
Topography compiled 1951. Planimetry derived from imagery
taken 1998 and other sources. Survey control current as of 1981
Boundaries current as of 2000
North American Datum of 1983 (NAD 83). Projection and
1 000-meter grid: Universal Transverse Mercator, zone 4
10 000-foot ticks: Hawaii Coordinate System of 1983
(zone 3)
Old Hawaiian Datum is shown by dashed corner ticks
The values of the shift between NAD 83 and Old Hawaiian Datum for
7.5-minute intersections are obtainable from National Geodetic
Survey NADCON software
There may be private inholdings within the boundaries of the
National or State Reservations shown on this map
Landmark buildings verified 1999



1	2	3	4
5	6	7	8

ADJOINING 7.5' QUADRANGLE NAMES

KAHUKU, HI
1998
NIMA 5421 III NW-SERIES W833























UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES
EVALUATION/RETURN SHEET

REQUESTED ACTION: NOMINATION

PROPERTY NAME: Marconi Wireless Telegraphy Station

MULTIPLE NAME:

STATE & COUNTY: HAWAII, Honolulu

DATE RECEIVED: 4/19/13 DATE OF PENDING LIST: 5/17/13
DATE OF 16TH DAY: 6/03/13 DATE OF 45TH DAY: 6/05/13
DATE OF WEEKLY LIST:

REFERENCE NUMBER: 13000352

REASONS FOR REVIEW:

APPEAL: N DATA PROBLEM: N LANDSCAPE: N LESS THAN 50 YEARS: N
OTHER: N PDIL: N PERIOD: N PROGRAM UNAPPROVED: N
REQUEST: Y SAMPLE: N SLR DRAFT: N NATIONAL: N

COMMENT WAIVER: N

___ACCEPT ___RETURN ___REJECT _____DATE

ABSTRACT/SUMMARY COMMENTS:

The Marconi Wireless Telegraphy Station meets National Register Criterion A at the state level in the area of Communications. Completed and operational by 1914, the Station represents the most intact wireless communications facility remaining in Hawaii. Using the latest in technological equipment, the Hawaii station played an important role in the initiation of trans-Pacific radio communication, a technological development of regional and international consequence.

RECOM./CRITERIA Accept Criterion A

REVIEWER Paul R. Lusignan DISCIPLINE HISTORIAN

TELEPHONE _____ DATE 6/4/2013

DOCUMENTATION see attached comments Y/N see attached SLR Y/N

If a nomination is returned to the nominating authority, the nomination is no longer under consideration by the NPS.

NEIL ABERCROMBIE
GOVERNOR OF HAWAII



WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
ESTHER KIA'AINA
FIRST DEPUTY
WILLIAM M. TAM
DEPUTY DIRECTOR - WATER
NAT. REGISTER OF HISTORIC PLACES
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KAIHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD STE 555
KAPOLEI HI 96707

DATE: April 12, 2013

LOG: 2013.2693

DOC: 1304RS13

TO: Paul Lusignan
Historian
National Register of Historic Places
1201 I (Eye) Street NE #2280
Washington, DC 20005

SUBJECT: Marconi Wireless Telegraphy Station Submission for Listing on the National Register of Historic Places

ADDRESS: 56-1095 Kamehameha Highway, Kahuku, HI 96731

HRS NO: 80-02-9112

TMK: (1) 5-6-003:032

Enclosed are materials for listing the above property on the National Register of Historic Places. If you have any questions, please contact me immediately at (808) 692-8028 (office) , (808) 679-9060 (cell), or ross.w.stephenson@hawaii.gov.

Mahalo for your assistance.

A handwritten signature in black ink, appearing to read "Ross W. Stephenson".

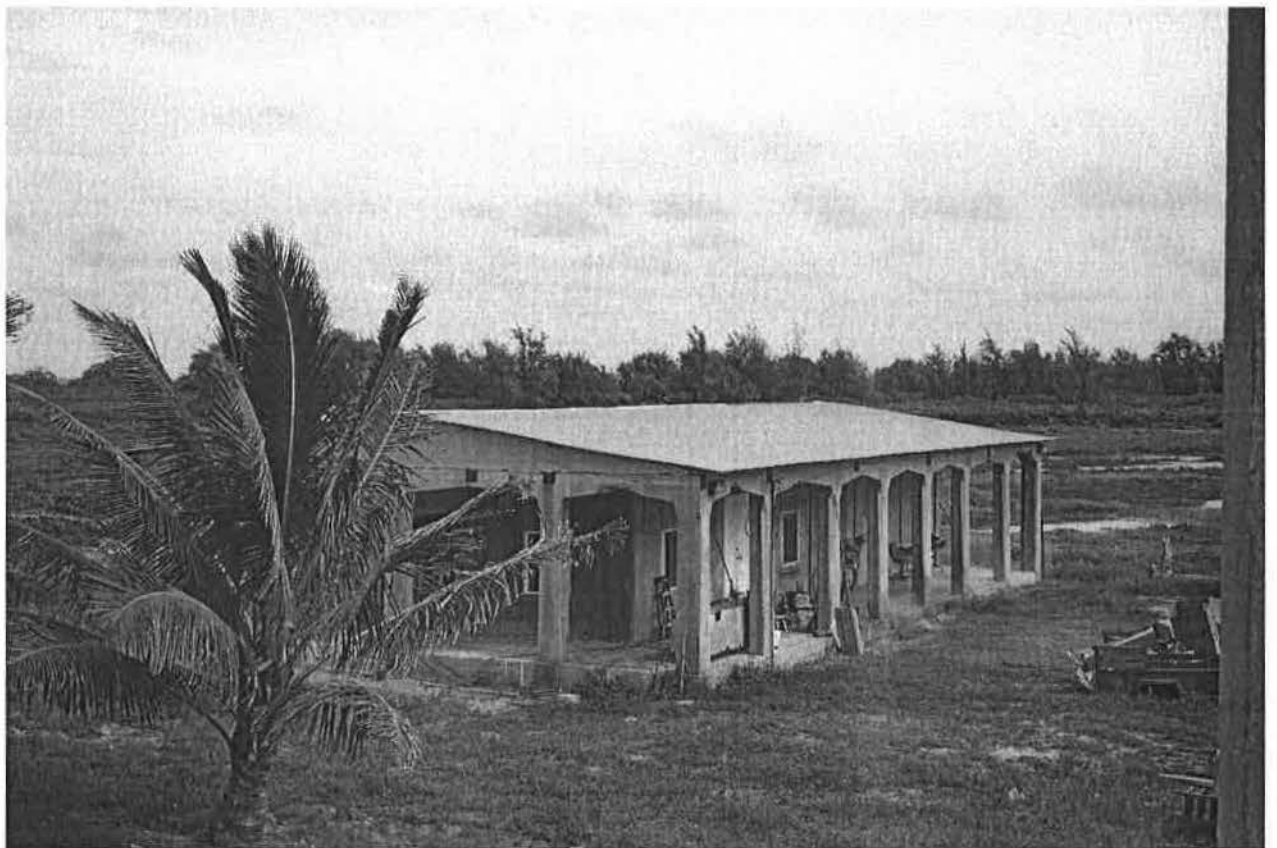
Ross W. Stephenson, PhD

Historian, Hawaii Historic Preservation Division, Department of Land and Natural Resources













Re: Marconi Station nomination 

Ross W Stephenson to: Lusignan, Paul, ross.w.stephenson@hawaii.gov



Dear Paul,

I am sending you Fed Ex the improved photographs you requested on the Marconi Wireless Telegraphy Station. If you have any questions on this or the other nominations, just let me know at (808) 679-9060 or this email address.

Mahalo nui loa for your help,

Ross

Ross W. Stephenson, PhD
Historian
Keeper of the Hawaii Register of Historic Places
Hawaii State Historic Preservation Division, DLNR
(808) 692-8028

From: "Lusignan, Paul" <paul_lusignan@nps.gov>
To: "NR--HI: ROSS STEPHENSON (E-mail)" <ross.w.stephenson@hawaii.gov>,
Date: 06/05/2013 07:33 AM
Subject: Marconi Station nomination

Hi Ross,

I've completed our review of the documentation for the Marconi Wireless Telegraphy Station. It looks fine. They did an excellent job of describing the resources, justifying their significance in light of the integrity issues, and providing a solid context for understanding the resources. I am going to go ahead and process the nomination for listing.

There was one technical element that I would like to see corrected. The electronic images provided on the disk were saved at only 72 dpi. We normally require that the images be at a minimum of 300 dpi. for printing and archival purposes. Can you ask the consultants if they have the originals electronic files and can provide them at the correct resolution. (Often times, the original .tiff images may be fine, but somewhere in the translation to computer files and disk they get altered.)

Just send the replacement disk when you have the corrected files.

Thanks.

--

Paul R. Lusignan
Historian
National Register of Historic Places
National Park Service
202-354-2229, fax 202-371-2229

RECEIVED
HISTORIC PRES. DIV.
DEPT. OF LAND &
NATURAL RESOURCES



2013 JUN 10 P 2:53
FUNG ASSOCIATES INC.

architecture ■ preservation ■ planning ■ interiors

FAX COVER SHEET
TRANSMITTAL

Date: June 6, 2013

To: Ross Stephenson
Keeper of the Hawaii Register
SHPD

From: Fung Associates, Inc.

Cc:

Project Name: Marconi National Register Nomination

Fax No.:

Tel No.:

Address:

**No. of pgs
incl. this pg:**

Urgent As Requested For Comment For Review
 For Approval Resubmit Record For Your Information

ITEMS TRANSMITTED

Quantity	Description
2 CDs	Photos and form for National Register per Paul Lusignan request

COMMENTS:

Ross,

Thanks for moving this forward. Would greatly appreciate a cc of the letter that goes out to owner when it is placed on the National Register.

If you have any questions, please contact:

Tonia Moy
941-3000
tonia@funghawaii.com

Thank you.