

Addendum To:

U.S. NAVAL BASE, PEARL HARBOR

Pearl Harbor

Honolulu County

Hawaii

HABS No. HI-60

HABS

HI

2-PEHA,

188-

WRITTEN HISTORICAL DATA

**HISTORIC AMERICAN BUILDINGS SURVEY
National Park Service
U.S. Department of the Interior
Oakland, California**

HISTORIC AMERICAN BUILDINGS SURVEY
Appendum to:
U.S. NAVAL BASE, PEARL HARBOR

HABS
HI
2-AEHA,
188-
HABS No. HI-60

Location: Pearl Harbor Naval Base
City and County of Honolulu, Hawaii

A larger polygon, roughly enclosing most of the Pearl Harbor Naval Complex, has the following numbered Universal Transverse Mercator (UTM) coordinates, while a separate smaller polygon, with lettered UTM coordinates, encloses the Red Hill area:

USGS Waipahu, Pearl Harbor, Honolulu, and Kaneohe Quadrangles, Hawaii 1999 7.5 Minute Series (Topographic) (scale - 1:24,000)

UTM coordinates for most of Pearl Harbor Naval Complex:

1	04.611480.2364310	8	04.608930.2354780
2	04.611480.2361450	9	04.605610.2354780
3	04.614160.2360720	10	04.605610.2357450
4	04.613910.2359650	11	04.601150.2361700
5	04.607330.2360520	12	04.601150.2363770
6	04.607470.2357520	13	04.604880.2365520
7	04.608930.2357520	14	04.607510.2365620

UTM coordinates for the Red Hill area:

A	04.615560.2364040	F	04.613280.2363060
B	04.615400.2363960	G	04.613200.2363160
C	04.615440.2363730	H	04.613160.2363600
D	04.614270.2363220	I	04.615260.2364270
E	04.613940.2363420		

Present Owner: U.S. Navy

Present Use: Naval installation

Significance: In 1964 the U.S. Naval Base, Pearl Harbor was designated a National Historic Landmark (NHL). The 1962 study of potential NHLs noted that the U.S. possession of Pearl Harbor and "the development of a naval base and headquarters there after 1898 were important factors in the rise of United States naval power in the Pacific. The dispute of this power by Japan, in turn, eventually contributed to the precipitation of war between the United States and Japan, the significant opening shots of which occurred at Pearl Harbor on December 7, 1941. The site, then, appears intimately associated with the rise of the United States as a world power" (Hussey 1962: 167).

The Pearl Harbor area has also been recognized for its archaeological significance, as well as for its military history. Okiokiolepe fishpond, built in the pre-contact period, is listed on the National Register of Historic Places, but a few others are also extant and as many as 25 fishponds,

fish traps, and other aquacultural features previously existed within the Pearl Harbor basin. There are also archaeological sites related to agricultural and residential activities in the pre-contact and early historic periods (Helber Hastert & Fee, Planners 2002: 3-19).

PREHISTORY AND EARLY HISTORY OF THE PEARL HARBOR AREA

The Pre-Contact Physical and Cultural Environments

The complicated geologic history of Pearl Harbor (Pu'uloa) is tied to the island-building forces of the Waianae and Ko'olau volcanoes, erosion, and the fluctuating sea level over the past two million years. The configuration of the harbor, before dredging and filling associated with the military use of the harbor, represents a series of drowned river valleys. Each of the lochs is a former drainage (in the case of East Loch, two drainages) that came to a confluence at the mouth of the harbor. The narrowness of the harbor entrance is a function of the erosion-resistant coral that forms the substrate of the coastal plain, and the broadness of the headward areas of the lochs is a testament to the deep alluvial soils present along the inland portions of the harbor. These soils supported a coastal vegetation assemblage probably similar to that of the Barbers Point area (Davis 1990), with wetland habitats dominated by sedge and other marshland species. The more inland portions likely exhibited a mixed grass-scrub vegetation regime, which may have included such species as *milo* (*Thespesia populnea*), *kou* (*Cordia subcordata*), *wiliwili* (*Erythrina sandwicensis*), and *'ilima* (*Sida fallax*). Additionally, Ford Island was a noted (Sterling and Summers 1972) source of *pili* grass (*Heteropogon contortus*), an economically important wild species, used for roof thatching prior to adoption of imported building materials. These conditions provided for environments, both terrestrial and marine, that afforded the prehistoric inhabitants of the area excellent opportunities for resource procurement, enhancement, and development. And it is within this environmental context that the prehistory of the Pearl Harbor region developed.

Kirch (1985) presents a generalized single culture-historical sequence for all the Hawaiian Islands that in its generalities is useful in interpreting the prehistory of the Pearl Harbor Naval Complex (PHNC) area. This sequence is presented below interspersed with relevant PHNC regional information.

Although the exact timing of the initial colonization of the Hawaiian Islands has not been firmly established, the earliest inhabitants were most certainly from central East Polynesia. Kirch (1985) defines the first period in the Hawaiian developmental sequence as the Colonization Period (AD 300-600). Evidence from the few archaeological sites (windward O'ahu and South Point, Hawai'i Island) dating to this period suggests that the early settlers relied heavily on marine resources as a subsistence base. Artifacts recovered from these early sites also indicate that the colonists brought with them agricultural crops, likely including the coconut palm. It is estimated that by the end of the Colonization Period the population of the islands was on the order of 1000. There is no firm evidence of habitation or use of Pearl Harbor during this period.

Following the Colonization Period is what has been termed the Developmental Period (AD 600-1100). It was during this period that the inhabitants of the Hawaiian Islands diverged from their central East Polynesian cultural patterns to form a uniquely Hawaiian culture. Archaeological

sites dating from this period are more common than from the previous period as settlements expanded to cover many areas of the islands. Maritime subsistence strategies became more specialized and agricultural practices expanded. Pig and dog populations increased and also become a significant part of the prehistoric diet. Social and political systems also evolved during this period; however, it is likely that the ancestral central East Polynesian pattern of descent groups remained intact. At the close of the Developmental Period, the archipelago-wide population is estimated to have been no more than 20,000.

It is toward the end of this period (roughly AD 1000) that the first unequivocal archaeological evidence of occupation on the 'Ewa Plain, and presumably Pearl Harbor, is documented (Tuggle 1997). The marine and wetland resources in and around the harbor were no doubt attractive to inhabitants along the 'Ewa coast, and differential access to these resources may have fostered the development of economically based social distinctions among the early Hawaiians. However, the rigid class stratification and ultimate severing of the connection between commoners (*maka'ainana*) and elites (*ali'i*) had not yet developed (this separation did come about during the subsequent Expansion Period).

The Expansion Period (AD 1100-1650) saw the swelling of the population into the hundreds of thousands. Areas that were previously uninhabited (predominantly leeward regions) saw an influx of settlement. Accompanying the exponential population increase and expanded settlement was an intensification of all aspects of Hawaiian life. Large-scale irrigated and dryland agricultural systems were established, and the first evidence of aquaculture (fishpond technology) was seen. Citing genealogical data, Kirch (1985) suggests that the earliest fishponds were constructed in the fifteenth century; however, a recent study in the West Loch area (Wolforth et al. 1998) provides radiometric data indicating that at least some fishponds were created in the late AD 1200s. It is during this period that the Pearl Harbor area became a center for agriculture and aquaculture. Archaeological sites dating from this period in the Honouliuli, Waikele, and Waipi'o areas surrounding Pearl Harbor provide ample evidence for substantial pondfield agriculture and fishpond technology (Dicks et al. 1987, Jensen and Head 1997, Kennedy et al. 1992, and Wolforth et al. 1998). Handy and Handy make specific reference to the cultivation of taro in the Waipi'o portion of the current PHNC:

The area between the West Loch of Pearl Harbor and Loko Eo (the fishpond at the north end of Waipi'o peninsula) was terraced throughout, continuing for more than a mile up into Waikele Stream. The lower terraces were watered from the great spring at Waipahu . . . No area better exemplified the industry and skills of the Hawaiian chiefs and their people than do the terraced plantation areas and numerous fishponds of 'Ewa (Handy and Handy 1972: 471-472).

Hawaiian historian Samuel Kamakau provides a traditional perspective as to the value of lands like those within PHNC, which formerly contained taro-producing areas and fishponds:

Fishponds, *loko i'a*, were things that beautified the lands, and a land with many fishponds was called "fat" land (*'aina momona*). They date from very ancient times . . . The making of fishponds and their walls is very ancient. It is known which chiefs built some of them, but the majority of their builders is not known. However, one can see that they were built as "government" projects . . . *Pu'uone* ponds and taro patch ponds, *loko i'a kalo*, belonged to commoners, land holders, and land agents, the *maka'ainana*, *haku*, and *konohiki*. The ponds cultivated for a

chief, *pu'uone haku ko'ele*, belonged to the holder of the land, *haku 'aina*, as did the taro patch ponds [on *ko'ele* lands].

The *pu'uone* ponds near the sea (*loko kai pu'uone*) were much desired by farmers, and these ponds were stocked (*ho'oholo*) with fish . . . the "native sons" (*keiki papa*) of places that had taro patches and *pu'uone* fishponds loved the lands where they dwelt (Kamakau 1976: 47-50).

Kamakau goes on with specific reference to Pearl Harbor:

At Pu'u'loa on Oahu were two unusual ponds [fish traps]—Kapakule and Kepo'okala. Kapakule was the better one. The rocks of its walls, *kuapa*, could be seen protruding at high tide, but the interlocking stone walls (*pae niho pohaku*) of the other pond were still under water at high tide. Kapakule was a pond famous from the ancient days; many fish came into it, and very uncommon ones—only the whale did not enter it. It was said to have been built by the 'e'epa people at the command of Kane ma. It enclosed about four acres more or less. The wall (*pae pohaku*) on its *makai* side was a little higher, and at high tide could be seen jutting eastward as far as the edge of the channel, *kali awa*. Then it stretched in a curve along the edge of the channel and made an arc toward the upland (*i uka*). From it a short stone wall made another curve toward the upland and the edge of the channel, and a row of tree trunks continued on from it *i uka* of the *kali awa*. On the mauka side of the pond was the opening where the fish went in and out.

This is how the fish entered the pond. At high tide many fish would go past the mauka side of the pond, and when they returned they would reach the row of tree trunks seaward [of them]. They would become frightened by the projecting shadows of the trunks, and would go into the opening. The fish that went along the edge of the sand reached the seaward wall, then turned back toward the middle and entered the *anapuni* (arched portion of the trap). A man ran out and placed a "cut-off" seine net (*'omuku lau*) in the opening, and the fish shoved and crowded into it. The fish that were caught in the net were dumped out, and those not caught in the net were attacked with sharp sticks and tossed out, or were seized by those who were strong (Kamakau 1976: 88).

Hawaiian social and political organization underwent its most dramatic changes during the Expansion Period. The apparent abundance of resources available in the fishponds and cultivated fields in and around Pearl Harbor provided the much needed economic base for the competitive endeavors of the developing *alii*.

The Pearl Harbor ponds were stocked with various kinds of fish, but especially mullet, because these inland waters were the summer home of the mullet of Oahu. There were [also] traps in which deep-sea fish, especially *akule*, were caught. One trap was named Ka-pa-akule (The-*akule*-enclosure). Another attraction was the great variety of shellfish found in the Pearl Harbor. The most important was the Hawaiian pearl oyster or *pipi*, which was eaten raw. The shells were valued because they furnished shanks for bonito hooks (Handy and Handy 1972: 470).

The adjoining low country is overflowing both naturally and by artificial means, and is well stocked with taro [taro]-plantations, bananas, etc. The land belongs to the many different proprietors; and on every estate there is a fishpond surrounded by a stone wall, where the fish are strictly preserved for the use of their rightful owners, or tabooed [kapu], as the natives express it. One of particularly large dimensions belongs to the King (Mathison 1825: 416).

Toward the end of the Expansion Period, as a result of the growing population and evolving political system, descent group organization was dismantled and replaced by the highly stratified sociopolitical structure and corresponding *ahupua'a* land tenure system that was documented by Western explorers and native historians. This newly evolved land tenure system included a hierarchical ordering of land units, the management responsibilities (and rights to the benefits) of each being commensurate with status within the sociopolitical structure. On each island, large districts called "*moku o loko*" were formed. On O'ahu, six *moku o loko* became established; 'Ewa, in which the PHNC is located, was one of the more prominent. To facilitate management of the land units, the large districts were divided into '*okana* and/or *kalana* (regions smaller than the *moku o loko*, yet comprising several other smaller units of land such as the *ahupua'a*). PHNC is situated in a large land area comprising the coastal and offshore portions of thirteen *ahupua'a*, which was poetically referred to as "*Ke awa lau o Pu'uloa*" (The many harbored-sea of Pu'uloa [the *ahupua'a* land divisions of 'Ewa were fronted by the coves and harbors which made up Pu'uloa, or Pearl Harbor]) (Pukui 1983: 1686).

Ideally, *ahupua'a* are wedge-like subdivisions of land that extend from the ocean to the islands' interior, and like the larger districts, the *ahupua'a* were also divided into smaller, more manageable parcels. These small land units, called '*ili*, '*ili lele*, *kīhāpai*, *māla*, *kō'ele*, or *mo'ō*, were inhabited and managed by extended families of *maka'āinana*. The common people who lived within individual *ahupua'a* generally had access to all of the resources, from the *ulu lā'au* (forests) and *kō kula uka* (mountain slopes) to the *kō kula kai* (coastal plains). Their rights also extended to the area of inshore fishing, to the area where the *honua nalu* (large waves) formed. Thus, the people had access to most of the resources necessary to sustain life.

Entire *ahupua'a*, or portions of them, were generally under the jurisdiction of appointed *konohiki* or lesser chief-landlords who answered to an *ali'i 'ai ahupua'a* (chief who controlled the *ahupua'a* resources). The *ali'i 'ai ahupua'a* in turn answered to an *ali'i 'ai moku* (chief who claimed the abundance of the entire district). Thus, *ahupua'a* resources also supported the royal community of either regional or island chiefdoms, or both. This system of subdivisions within districts was integral to Hawaiian social and political life; and it is within this setting that we can begin to get a sense of the significance of *Ke awa lau o Pu'uloa* and its component *ahupua'a*. These included, counterclockwise from east to west, Pu'uloa, Honouliuli, Hō'ae'ae, Waikele, Waipi'o, Waiawa, Mānana, Waimano, Waiau, Waimalu, Kalauao, 'Aiea, and Hālawa.

This hierarchical land tenure system formed not only the basis for Hawaiian social and political organization, but also affected the religious system. Ceremony and ritual were transformed during the Expansion Period; and it is likely that the *makahiki* ritual cycle (essentially a form of taxation imposed on the tenants within *ahupua'a* land units) reached its elaborated form during this period. One can only imagine the vast amount of resources extracted from the native tenants of the thirteen *ahupua'a* that encompass Pearl Harbor. In preparation for *makahiki* tribute, to conserve and amass the more desirable food (taro and fish resources), commoners likely altered their consumption patterns much in the same way as is described for famine

periods by John Papa I'i, born in the *ahupua'a* of Waipio and a leading authority on Hawaiian history:

Here is a wonderful thing about the land of Waipio. After a famine had raged in that land, the removal of new crops from the taro patches and gardens was prohibited until all the people had gathered and the farmers had joined in thanks to the gods. This prohibition was called *kapu 'ohi'a* because, while the famine was upon the lands, the people had lived on mountain apples (*'ohi'a 'ai*), tis [ki, *cordyline terminalis*, roots], yams, and other upland foods. On the morning of Kane an offering of taro greens and other things was made to remove the *'ohi'a* prohibition, after which each farmer took of his own crops for the needs of his family (I'i 1959: 77).

Further insights into native beliefs and practices of residents in the Pearl Harbor area (Honouliuli) are contained in the recollections of another important native Hawaiian informant, Mary Kawena Pukui:

At the age of twelve, I was taken to the cave of Ka'ahupahau, Cloak-well-cared-for. Most of the cave was deep under water. A small plant laden with red berries hung over the entrance, and when I reached to pluck one, my uncle pulled my hand back quickly and chided me. Those belonged to Ka'ahupahau. Ka'ahupahau had a brother Kahi'uka, The smiting tail, whose stone form was a good distance away from the cave, lying deep in the water. Yet it was plainly seen from the surface. Ka'ahupahau's son, Ku-pipi, had his home where the drydock was built and sank about thirty years ago. These were not the only sharks at Pu'uloa, for like all members of royalty there were others to stay about and serve them. Ka'ahupahau was the chiefess of sharks in the length and breadth of the Pearl Lochs, hence the old saying, "*Alahula Pu'uloa he alahele na Ka'ahupahau*," "Everywhere in Pu'uloa is the trail of Ka'ahupahau" (Pukui 1943: 57).

In telling the story of the goddess Ka'ahupahau, Pukui provides information about the goddess' shark brother and the relationship which people living in the area had with the sharks:

Her brother and she were born, not as sharks, but as human beings. One day a shark god saw them and converted them into sharks like himself. Every day they swam up a stream at Waipahu and there they were fed on *awa* by relatives. *Awa* was always the food of the gods. When they became too large to swim upstream, the offerings of food were carried to the lochs for them (Pukui 1943: 57).

Because the sharks, though numerous, were not harmful within Pearl Lochs, the natives used to have fun mounting on their backs and riding them as cowboys ride horses. To turn them around, a little pressure was used just back of the eyes. Is this a tall fish story of men riding sharks? No, it is not. My uncle said that it was true and so did the historian Kamakau (Pukui 1943: 59).

These historical narratives illustrate that for the *maka'ainana*, one's place of origin was more important than one's genealogy. The shark deities had a reciprocal custodial relationship with the "natives" of the area, which was considered a familial, spiritual connection, described by the term *'aumakua*.

At the entrance [of Pu'uloa] was a pond built out into the water in the shape of a tennis racket. This pond, called Kapakule, was said to have been the labor of the Menehune. . . On the left side of the pond stood the stone called Hina, which represented a goddess of the sea by that name. Each time the sea ebbed, the rock became gradually visible, vanishing again under water at high tide. Ku, another stone on the right, was never seen above sea level. This stone represented Ku'ula, Red Ku, a god of fish and fishermen. From one side of the pond a long wall, composed of driven stakes of hard wood, ran toward the island in the lochs. When the fish swam up the channel and then inside of this wall, they invariably found themselves in the pond. A short distance from the spot where the pond touched the shore was a small *ko'a* or altar composed of coral rock. It was here that the first fish caught in the pond was laid as an offering to the gods. At the time I last saw it in 1907, this altar was fenced in by Edwin P. Mikalemi, the caretaker of the place and brother-in-law of Akoni Kawa'a [an uncle of Pukui]...There were times when the sharks were caught in the pond at low tide, but no Hawaiian there ever dreamed of molesting them. Never shall I forget the day when a *haole* guest of Mikalemi went to harpoon one of the sharks in the pond. My uncle shouted for him to get away from there and swore as I had never heard him swear before. Those sharks were as dear to him as a relative, and he did not want to see them speared any more than he wanted us to be hurt in the same way (Pukui 1943: 56).

As previously noted the shift from kin-based (genealogical) to territorial (*ahupua'a*) social units likely took place during the latter half of the Expansion Period. This shift paved the way for domination and conquest by individuals within the highest levels of Hawaiian society, and ultimately a single chief's, Kamehameha's, interisland conquests.

The final period in Kirch's developmental scheme is the Proto-Historic Period (AD 1650-1795), during which economic intensification, both agricultural and aquacultural, continued unabated from the previous period. It has been forwarded (Dye 1994) that during this period, and prior to Western contact, the Hawaiian population experienced a significant decrease in numbers. Hawaiian culture, however, went largely unchanged except that an elaboration of chiefly wealth and status may have occurred (the archaeological record for this period reveals a proliferation of status items). The chiefly class was no doubt in direct control of the large economic resources and technologies. This was especially true for fishponds, which proved to be stable and predictable economic, and by corollary political, resources. Many of the leading O'ahu chiefs are credited for building and naming some of the Pu'uloa fishponds (Davis 1990); and although their primary residences were in Waikiki, some had "sumptuous temporary resorts" in the 'Ewa District (Kalākaua 1973: 219).

Kirch includes Kamehameha's conquest of O'ahu in 1795 as the final chapter in the non-Western influenced history of the Hawaiian Islands. The subsequent subjugation of people and resources, particularly the agricultural fields and fishponds of leeward O'ahu (including those of the Pearl Harbor region) served to further strengthen the emerging royal class. "The primary reason for 'Ewa's prominence in history and as an *alii* stronghold was undoubtedly the existence of the great number of fishponds at different points around Pearl Harbor" (Handy and Handy 1972: 470). However, such strength would be increasingly put to the test as the growing Western population of the islands was becoming more and more powerful.

Historical Transformations

From the late 1790s through the 1840s, the Hawaiian Kingdom underwent radical changes. During this period, a significant decline in the Hawaiian population began throughout the islands as a result of military strife and western-introduced diseases. Many historical accounts from the mid to late nineteenth century document an increasingly barren and desolate landscape between scattered settlements. Also during this period, many members of the *ali'i* were becoming strongly influenced by western culture and technology. These trends had a profound and permanent effect upon the traditional Hawaiian political and economic systems, and the environment.

Following the conquest of O'ahu in 1795 by Kamehameha I, an increasing number of foreigners were visiting and settling in the Hawaiian Islands. Western missionaries and entrepreneurs became particularly influential among the Hawaiian elite, some of whom became trusted advisors to Hawaii's monarchs. The customs and practices of Christianity gained support among the kingdom's rulers, and soon after the death of Kamehameha I in 1819, the traditional *kapu* system was abolished.

Hawaii was gradually brought into the ever-expanding global trade network, providing provisions for ships and trade goods for export. Western goods became highly desirable among both the *ali'i* and commoners. Western warfare technology was also a prized commodity and, together with western advisors to the Hawaiian elite, influenced the outcome of battles and the balance of power between ruling chiefs.

Don Francisco de Paula Marin, a Spaniard, was one of the early westerners who became an important business advisor and interpreter for Kamehameha I in his trading with visiting ships. Marin was granted use of Moku'ume'ume (later called Ford Island) in Pearl Harbor, and other lands for raising his livestock and crops. He lost use of half the island in 1820 and none was "in his possession at the time of his death" (Gast 1973: 37). He was famous for his vineyard, near what became Vineyard Boulevard and River Street, and experimented in planting a variety of edible crops. Marin made wine from his grapes and "manufactured kukui-oil and coconut oil, candles, tiles, hay, cigars, beer and brandy" (Mamiya Medical Heritage Center 2004). The products of his lands and labor were the source of his ship-provisioning business (Gast 1973: 57).

One of the more important natural resources during this early historical period was sandalwood (*santalum freycinetianum*). Sandalwood, which once blanketed the southwest slopes of the Ko'olau Range and Wai'anae Mountains, became a very valuable resource, and Hawaii's leaders sold or traded great quantities to westerners involved in trade with China. Hawaiian commoners were forced by *ali'i* to provide their tax payments in sandalwood. Sandalwood was aggressively collected; forests were even reportedly burned so the scent could be detected. The sandalwood trade peaked between 1815 and 1830, and resulted in the decimation of the sandalwood forests on O'ahu. The shift of labor from agricultural production to sandalwood collection led to famine as well as to exhaustion of the sandalwood resource.

Pressure to change the traditional political system and the traditional land tenure system was mounting both from within Hawaii, from the growing population of foreigners and their economic interests, and from without, as the prospect of a take-over by a foreign power increased. Kamehameha III and his chiefs under the guidance of their western advisors enacted the Bill of Rights in 1839, followed by the first constitution of the Hawaiian Kingdom in 1840.

In 1848, during the reign of Kamehameha III, the traditional land distribution and tenure system (*ahupua'a* system) was replaced with a Western-style ownership system. This radical restructuring was called the Great Mahele (Great Division). The Mahele defined the land interests of the King, the high-ranking chiefs, and the *konohiki* (those who were in charge of land on behalf of the king or a chief).

The Mahele did not convey title to any land; rather, the chiefs and *konohiki* were required to present their claims to the Land Commission to receive awards for lands quitclaimed to them by Kamehameha III. They were also required to pay commutations to the government in order to receive royal patents on their awards. Until a fee was paid and an award issued, title remained with the government. The lands awarded to the chiefs and *konohiki* became known as Konohiki Lands. Because there were few surveyors in Hawai'i at the time of the Mahele, the lands were identified by name only, with the understanding that the ancient boundaries would prevail until the land could be surveyed. This expedited the work of the Land Commission and speeded the transfers (Chinen 1961).

During the Mahele process all land in Hawai'i was placed in one of three categories: Crown Lands, Government Lands, and Konohiki Lands. These major divisions, however, were subject to the rights of native tenants, the common people who lived on the land and worked it for their subsistence. A council was established to create laws that would protect the rights of commoners. The council's resolutions authorized the Land Commission to award fee simple title to native tenants who occupied and improved any portion of Crown, Government, or Konohiki Lands. These awards were to be free of commutation, with few exceptions. However, before receiving their awards, unlike chiefs or *konohiki*, the native tenants were required to prove that they cultivated the land; and they were not permitted to acquire wastelands or lands that they cultivated for the sole purpose of enlarging the holdings. Once a claim was confirmed, a survey was required before the Land Commission could issue an award (referred to as an LCA). These parcels became known as Kuleana Lands (Chinen 1958). Despite the fact that numerous claims were made, less than 30,000 acres within the entire Hawaiian archipelago were awarded as Kuleana Lands.

The documentation required to substantiate a *kuleana* claim was recorded in volumes of registry and testimony. These volumes are a valuable source of data and include information on land use, crop production, economic resources, existing structures, and place names of the time. Several *kuleana* LCAs were made within *'ili* and *ahupua'a* (traditional Hawaiian land divisions) that are now within the land controlled by PHNC, primarily in and around the McGrew Point and Pearl City Peninsulas. Information from the Native Registry and Native Testimony indicates that these areas supported extensive pondfield taro cultivation. This agriculture was performed adjacent to fishponds and within low-lying marshland. Both temporary and permanent residential sites were associated with these agricultural fields.

Extreme economic pressure, both foreign and domestic, during the late 1800s led to the decline of traditional subsistence pursuits including aquaculture and traditional agriculture; fishponds fell out of use and into disrepair. Traditional lowland agricultural was displaced by new agricultural practices, such as rice paddies and watercress farms. Most of the upland cultivatable land in and around Pearl Harbor was consolidated to support large-scale agricultural production, such as sugarcane and pineapple. As a result of these changes and the subsequent military use of

Pearl Harbor, evidence of earlier occupation has been greatly disturbed and in many areas completely destroyed.

MILITARY HISTORY OF PEARL HARBOR

Though Congress did not appropriate money for constructing the Pearl Harbor Navy Yard until May 1908, the U.S. Navy had been aware of the strategic military significance of the harbor for many years. The harbor had been known to Westerners since the late 1700s during their attempts to develop trade with the Far East.

The first U.S. warship to visit O'ahu was the USS *Sir Andrew Hammond* commanded by Captain John Gamble in 1814. Numerous visits occurred thereafter by merchantmen and naval ships, especially as interest in the whaling industry developed. Pearl Harbor was first surveyed by a U.S. Navy Exploring Expedition in 1840. At that time, Commodore Charles Wilkes, USN, made soundings across the reef at the harbor's mouth and up the channel to Bishop Point. Afterwards, he reported that "if the water upon the bar should be deepened, which I doubt not can be effected, it would afford the best and most capacious harbor in the Pacific" (Dillingham 1928:4).

The only other place in the northern Pacific that the U.S. had considered developing into a harbor during the 1800s was the atoll of Midway. This uninhabited group of small, sandy islands, although geographically part of the northwest Hawaiian Island chain, was not officially part of the Kingdom of Hawai'i. Discovered by Captain N. C. Brooks in 1859, the atoll was claimed for the U.S. in 1867 by Captain William Reynolds, commanding the USS *Lakawanna*. The coral ring that enclosed the Midway lagoon required blasting and dredging in order for large ships to enter. In 1870 the U.S. Congress appropriated \$50,000 and the USS *Saginaw* was dispatched to Midway to accomplish this work. They not only failed at this task, but the ship was wrecked on Kure Atoll after leaving Midway.

Many in Honolulu and elsewhere argued that expending money on a harbor on O'ahu, where men and supplies were available, was a more sensible idea. However, Hawai'i was an independent kingdom; and the U.S. Congress was reluctant to pay for harbor improvements in another country, unless the U.S. could be guaranteed exclusive control and use of the harbor.

The Sugar Plantation Era

In the 1840s the first sugar mill was established in Hawai'i. In subsequent decades sugar became increasingly important as the main cash crop and export item of the kingdom. U.S. military and commercial interest in the Hawaiian Islands continued to increase during the 19th century as the Pacific area gained importance in the world political situation. In early 1873, Major General John M. Schofield visited O'ahu to inspect its defensive capabilities. Upon his return to the mainland, he and his subordinate, Lieutenant Colonel Burton S. Alexander, reported to the Secretary of War:

With one exception, there is no harbor on the islands that can be made to satisfy all the conditions necessary for a harbor of refuge in time of war. This is the harbor of "Ewa" or "Pearl River." . . . Pearl River is a fine sheet of deep water

extending inland about six miles from its mouth. . . . The depth of water, after passing the bar, is ample for any vessel.

. . . . At the entrance of the harbor is a coral reef some two hundred and fifty to three hundred yards in width with a depth of water of only two to three fathoms on the reef at low water. . . . This coral, found at the entrance to Pearl Harbor is "dead" – That is it is not growing, and the reef is therefore not increasing in size. This ridge of coral forms a barrier, or bar, across the entrance of this harbor.

If this coral barrier were removed, Pearl River Harbor would seem to have all, or nearly all, the necessary properties to enable it to be converted into a good harbor of refuge. . . . Its waters are deep enough for the largest vessels of war and its locks [*sic*], particularly around Rabbit [Ford] Island, are spacious enough for a large number of vessels to ride at anchor, in perfect security against all storms (Schofield and Alexander 1873).

In summing up their report, the two officers stated:

It is to be observed that if the United States are ever to have a harbor of refuge and naval station in the Hawaiian Islands in the event of war, the harbor must be prepared in advance by the removal of the Pearl River bar. When war has begun, it will be too late to make this harbor available, and there is no other suitable harbor on these islands (Schofield and Alexander 1873).

This report recommended that the United States obtain a cession of Pearl Harbor, together with its shore for four miles back from any anchorage. They suggested that this might be deeded free of cost to the United States in return for a reciprocity treaty that would allow Hawaiian sugar to enter the country duty free.

Apparently, this report made a great impression upon many leaders in Washington, D.C. but the idea of cession of Pearl Harbor was not popular with the Hawaiian legislature, although it was pushed by the kingdom's sugar planters. A reciprocity treaty was concluded in 1875 without any mention of Pearl Harbor as a U.S. Naval installation. This treaty was to run seven years and could subsequently be terminated by either party with one year's notice. After 1883, American sugar businessmen and others in the United States frequently petitioned the U.S. Senate to terminate the treaty and, thus, terminate the Hawai'i's sugar growers' trade privileges. Hawai'i's sugar planters were eager to retain those privileges, however, and sought to have the treaty extended. Meanwhile, the United States Navy had established a coaling station in Honolulu Harbor.

During negotiations for a seven-year treaty extension, the U.S. asked for more concessions. The U.S. Senate proposed in 1886 the insertion of new language, that King Kalākaua would grant "to the Government of the United States the exclusive right to enter the harbor of Pearl River . . . and to establish and maintain there a coaling and repair station for the use of vessels of the United States, and to that end the United States may improve the entrance to the said harbor and do all other things needful to the purpose" (Tate 1968: 184). This issue was debated in Hawai'i and abroad for over a year, as it was tied to concepts of national sovereignty and international trade. Convinced that this grant would essentially be a lease and not a cession of

land and authority, King Kalākaua directed his minister in Washington to ratify renewal of the Reciprocity Treaty, which was accomplished in November 1887.

The 1887 extension of the Reciprocity Treaty of 1875 included official recognition that the United States possessed sole rights to Pearl Harbor as a port. No work was done to deepen the water at the mouth, and no use was made of Pearl Harbor by the U.S. during the nineteenth century. Most of the land near Pearl Harbor, including Ford Island, was planted in sugar cane, especially after the Reciprocity Treaty and its extension made exporting sugar easier and more profitable. Sugar plantation development in the lands around Pearl Harbor was spurred by the 1887 "Land Colonization Scheme" of Walter Dillingham (Hawaii State Archives 1887). His company, called Oahu Land & Railway (OR&L) involved a railroad system for transportation to and from the plantations. The drilling of artesian wells in the 'Ewa plain by the McCandless brothers during the 1890s also was a factor in the development of a sugar plantation there.

In early 1893 Queen Lili'uokalani, who had succeeded Kalākaua as Monarch, was overthrown and a Provisional Government established. After a petition for annexation to the United States was withdrawn by President Grover Cleveland, the Republic of Hawai'i was established in 1894, with Sanford B. Dole as President. In 1897, with U.S. President William McKinley in office, the petition was resubmitted. The Hawaiian Islands were annexed by Congressional joint resolution (not by treaty) in July 1898, just at the end of the four-month Spanish-American War, when the U.S. was also acquiring other island possessions, including Cuba, Puerto Rico, Guam, and the Philippines. Hawai'i did not become a Territory of the United States until 1900.

There were three primary sugar plantations surrounding the Pearl Harbor basin. The first was located to the east and north of Pearl Harbor. The Honolulu Plantation Company (HPC) extended from the area around the Pu'uloa Camp in Moanalua to the upland slopes of Waiawa. The HPC mill was in Aiea. Second, the Oahu Sugar Company (OSC) lands were mostly north of the harbor, extending from Waipi'o to Ho'ae'ae, but also included Ford Island (for a few years), and Waipio Peninsula. The OSC mill was in Waipahu. The third was Ewa Plantation Company (EPC), covering the areas of Honouliuli and the 'Ewa plain, on the west side of Pearl Harbor. The town established around the mill was also called 'Ewa.

There are very few known physical remnants of the sugar plantation era at Pearl Harbor. On Ford Island there are possible ruins of the ferry landing that was used to bring the yield of the island's fields to the OSC rail lines on Waipi'o Peninsula. There are no known remains of the homes or summer cottages of 19th and early 20th century residents of the island. The OR&L railroad tracks that once supported transportation of the cane to the mills and commuters to Honolulu with spur lines to Pearl Harbor have mostly been removed. Much of the main OR&L right-of-way near Pearl Harbor has been converted to a bike path.

Initial Base Development

As early as 1894, appropriations had been sought to dredge the reef that blocked Pearl Harbor, but Congress refused to provide funding. A thorough survey of the harbor was made in 1897 by the USS *Bennington*. Following annexation in 1898, initial Navy development in Hawai'i centered on the coaling station in Honolulu Harbor. In 1900 an appropriation of \$100,000 was authorized for dredging the sand in the channel leading into Pearl Harbor. The contract was, however, won by a company that did not have adequate equipment to do the job, and they eventually subcontracted this preliminary dredging to Cotton Brothers and Company through the

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Hawaiian Dredging Company (Dillingham 1928: 11). The work was completed in August 1903. This contract, limited to removing sand only, resulted in a channel that required sharp turns between coral points. Therefore, navigation of large craft, like battleships, into Pearl Harbor was impractical.

The appropriation for fiscal year 1902 included \$150,000 "to acquire land for a naval station and harbor and channel defense at Pearl Harbor, Hawaii." Condemnation proceedings began in December 1901 (Dillingham 1928: 12). The land acquired in this action included Kuahua Island and the area along the harbor shoreline that includes most of the current Submarine Base, Naval Station, and Shipyard, as well as a narrow strip on the southeast shoreline of Ford Island.

Among the earliest priorities of the Navy were the railroad lines for the base. Rail cars supplanted animal-drawn wagons and were used both during initial construction and to transport supplies on the base for four and a half decades. The Oahu Railway and Land (OR&L) Company lines ran along the South Avenue boundary of the base and approximately along the current North Road alignment. A rail line with numerous spurs to individual buildings was built on Kuahua Island. Also in the early base development period, many additional railroad tracks were laid in the Shipyard, where some remnants are still visible. As the base expanded, spur rail lines were added in other areas, such as West Loch, where there are also extant track remnants. The railways were heavily used through World War II and one facility (Fac. 58) with direct connection to this part of Pearl Harbor's transportation history remains.

The Act of Congress of 13 May 1908 authorized the first major expenditure of funds to develop Pearl Harbor. It included \$400,000 for dredging a channel from the harbor to the sea, of sufficient depth and width "to admit the largest ships." The contract was let to the Hawaiian Dredging Company, the first of many awarded to the company. The Act of 13 May 1908 also directed the Secretary of the Navy to erect at Pearl Harbor "all the necessary machine shops, storehouses, coal sheds, and other necessary buildings, and to build there one graving dry dock capable of receiving the largest war vessels of the Navy." At the same time, it was determined that Pearl Harbor should not be considered as a site for new ship construction and that all facilities be built strictly with reference to the necessities of a ship repair and outfitting yard.

During the base establishment period, work at Pearl Harbor was conducted at a fast pace. By 1911 over \$3 million worth of dredging had been completed. On December 14, 1911, after three years of dredging, the USS *California* (BB-44) (which had a displacement of 13,860 tons and a mean draft of 24 feet), entered Pearl Harbor and anchored off the Navy Yard. She was the first large vessel to pass through the dredged channel.

Among the Navy's earliest purchases of major equipment for Pearl Harbor was a 150-ton floating crane. This was used in shoreline construction, including the first drydock, as well as for cargo and materials handling. Shore-based cranes, both fixed and on tracks, later supplemented the floating crane.

By mid-1913, many major buildings in the Navy Yard, including the shipfitters and boiler shop (Fac. 4, now gone), the pipe and plumbing shop (Fac. 2, now gone) and the woodworking shop (Fac. 7) were ready to receive machinery. The powerhouse (Fac. 8) was almost complete. The storehouse (Fac. 9), administration building (Fac. 1) and six sets of Navy Yard quarters were under contract. Construction on the coaling station (Fac. O 1) was actively underway. Plans were being prepared for the hospital complex, lumber storehouse (Fac. 15), paint shop and

rigging loft (Fac. 11), pattern shop (Fac. 14), and the latrines (Fac. 19 & 20, the latter now gone). Construction of the Naval Magazine on Kuahua Island was also in progress.

In 1913 construction also began on the Marine Barracks building (Fac. 221) and Officers' Quarters. The area set aside for the Marines was bounded by Central Avenue, South Avenue, the street along the Officers' Quarters, and the no longer extant Halawa Street. A few buildings were constructed in the Marine Barracks area during the 1920s and 1930s, but most of the land was open and served as a parade ground until World War II.

In the plans for the naval base made early in the century, it had been announced that the work shops would be one-story "steel structures covering large areas," while the storehouses would be brick or concrete structures with steel framing, "as nearly fireproof as such structures can be made" (*Pacific Commercial Advertiser* 1904). It was also reported in the same *Pacific Commercial Advertiser* article that:

Quarters and Marine Barracks will be designed especially for the climate and will form the only part of the station where architectural effects will be sought for; in the other buildings utility with conspicuous plainness of detail will be the predominating features.

Some of the initial facilities in the Marine Reservation area were designed by the Washington, D.C. firm of J. H. de Sibour, Architect, which had designed many of the Beaux Arts style facilities at the U.S. Naval Academy, as well as apartment houses and private residences in New York and Washington, D.C.

Early in the second decade of the century additional land at Bishop Point and on Waipio Peninsula was purchased for defensive purposes, as part of the Fort Kamehameha defensive complex of the U.S. Army. Two gun batteries and other buildings were constructed at Bishop Point, but nothing remains at these two locations from this initial base development period.

In August 1913 the commandant's office was transferred to the Pearl Harbor base from the Honolulu Naval Station (*Honolulu Advertiser* 1925). His office was in Facility 1, in what is now called the Shipyard, and this remains an important office building at the installation.

Many other facilities from the initial base development period, both in the Shipyard area and on Kuahua, remain in largely original condition. These are important buildings that represent the beginnings of the Navy's history in Hawai'i.

World War I

World War I ran from 1914 through 1918, with troop withdrawals extending into 1919. U.S. military involvement did not start until 1917, and Hawai'i had little direct involvement in the war, since most combat was in Europe. This period did, however, influence military and political thinking about the role of Pearl Harbor and the U.S. Navy. These years of crisis facilitated continued funding for base development. Some direct results were the build-up of shore defense facilities to protect from the potential take-over of O'ahu by a foreign power. Also surplus buildings, left over from the bases built in France during WWI, and developing war technology influenced future development of the base.

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The Navy's first high-power communications radio station in Hawai'i was activated in September 1916 at Hospital Point, Pearl Harbor, with three 600-foot steel towers. In the same area of the base, the Naval Hospital Reservation was under construction, and in July 1917 the hospital received its first patient. Some resources related to later radio and hospital developments on the base remain, although the main facilities for these functions are no longer at the Pearl Harbor complex.

Although associated as much with the initial base period as with the World War I period, one of the most important construction projects, and one that spanned the decade, was the first dry dock (Fac. S 779). The contract had been awarded in September 1909, and construction of the original dry dock had begun in early 1910. Over \$2 million had been spent on it before its destruction by hydrostatic forces in February 1913. This was described by the Secretary of the Navy as "the Naval disaster of the year." The lack of a completed dry dock delayed the full utilization of the base's potential. Construction on the new dry dock did not begin until November 1914 and was completed in 1919.

Submarines were first based in Hawai'i during the 1910s. In 1914 four F-class subs were docked in Honolulu Harbor, and from 1915-1917 four K-class subs were moored along Kuahua in Pearl Harbor. These K-boats were reassigned to Key West in 1917, just as the first timber piers for submarines at Quarry Point were funded. Six R-class submarines were assigned to Hawai'i in 1919, and they continued to be based at Kuahua Island for the rest of that year.

Before 1920, the only facilities for the submarines on Quarry Point were two wooden finger piers and a sick bay building constructed of wood from a World War I base in Ireland (de Yarmin 1984:3). In the early 1920s World War I surplus component-type buildings left over from France were used at the Submarine Base. None of these early facilities remain; however, one of the early F-Class submarines (USS *F-4*) remains buried in the harbor silt near Sierra 13. On March 25, 1915, the submarine *F-4* sunk in 305 feet of water and the entire crew of 21 died. The submarine was raised, after several months of efforts, to determine the cause of the tragedy. This was a first in deep-water recovery, with the final lifting involving the construction of special cylindrical salvage pontoons with wooden protective sheathing. "Examination of the wreck revealed design defects that were corrected in existing and future Navy submarines, greatly enhancing the safety of the undersea service" (Naval Historical Center 2004). The *F-4* submarine's hulk was later sunk in Magazine Loch. When piers were constructed in this area in the early 1940s, the hulk was reportedly rolled into an adjacent deep ditch dug by a dredge near Sierra 13/14 (de Yarmin 1984: 2). Recent magnetometer tests confirm a large buried object at this location.

At Pearl Harbor, the World War I period can be considered a continuation of the initial base period. There are only a few remaining resources directly connected to the war at the base, the most notable being two gun batteries and a World War I-type hangar (Fac. 174) on Ford Island, as well as a German torpedo on display.

In late 1917, in the second phase of fortification construction on O'ahu, the Army built Batteries Boyd and Adair (Fac. S 145 and 446) on Ford Island as land defense emplacements, part of their overall mission to defend the Naval Base and the island of O'ahu. The 1898 Armstrong rifles (6-inch diameter guns), made in England, were removed from these casemated batteries on Ford Island by 1924. The structures for Batteries Boyd and Adair have remained but they are not as well known as the U.S. Army's more prominent coastal defense batteries. Almost all

the latter lie outside the Pearl Harbor Naval Complex, most notably at Fort Kamehameha, Diamond Head, and Waikiki.

The date of Facility 174 is listed in the Navy's database as 1941, but that is the year it was relocated. It was originally built by the U.S. Army, based on a standard 1918 design called "United States All-Steel Hangar." Erected on the west side of Ford Island, it was part of the Army's Luke Field facilities, until all Army aviation activities were moved to Hickam Field in 1939. The hangar was originally located on the airfield side of Wasp Boulevard, but was relocated by the Navy to a site on the shoreline side of this street; and its use changed to practice-bomb storage during WWII.

The only World War I artifact at Pearl Harbor with signage to identify its date is a German torpedo, displayed in front of Facility 1 in the Shipyard. This torpedo is from the German cruiser *Geier*, which was interned in Honolulu Harbor on November 8, 1914 with several other German ships, when they sought refuge from British Royal Navy in the Pacific. In early 1917 the U.S. declared war on Germany and the Axis powers; these ships were seized and converted to U.S. warships.

The purchase of the rest of Ford Island by the United States was directly related to the war and developing technology, which confirmed the need for an air station in Hawai'i. The Ford Island air base was planned for joint Army-Navy use. During the last years of the World War I, the Army relocated their air base facilities from Fort Kamehameha, where seaplane efforts had started in 1911, to the northwest side of Ford Island in 1917. The Navy's aviation facilities were first located in World War I surplus canvas hangars on the site of the Repair Basin. The Navy's Air Detachment relocated a few years after the Army onto their narrow strip of land on the southeast side of Ford Island. The history of aerial and submarine warfare in World War I did have an influence on Navy planning for an air station and submarine base at Pearl Harbor in the following decades.

Between the Wars

Funding for military projects was difficult to obtain during much of the 1920s and 1930s, first as Congress sought to reduce expenditures and taxes after World War I, and later as the country fell into the Great Depression. However, Pearl Harbor continued to expand its mission and "fared better during the twenties than did other shore bases" (Coletta 1985: 448). During most of the 1930s, President Franklin D. Roosevelt, former Secretary of the Navy, favored Pearl Harbor with various Federal funding programs such as the Works Progress Administration. He also paid a personal visit to Pearl Harbor in 1936. Much of the development in these decades focused on building more permanent facilities to provide the harbor with the capability of taking care of the entire U.S. Fleet in time of war. The architecture of this period was mostly substantial, well-constructed facilities of cast concrete and plaster in a Federal and stripped-down form of Art Deco style. Although major additions were made to the Base, the quantity was minor when compared with the enormous amount of construction completed during World War II.

The sub-contexts associated with this period between the wars include the establishment of the Submarine Base at Quarry Point, the upgrading of the Air Detachment to a Naval Air Station on Ford Island, major additions to the fuel-oil storage capacity of the Base, the transfer of the Naval Magazine from Kuahua Island to West Loch and Lualualei, and extensive waterfront work,

including dredging, and building piers, quay walls, the first marine railway, and battleship mooring platforms.

Submarine Base

From June 1920 until April 1922 Commander (later Admiral) Chester W. Nimitz was the first Commander in charge of the submarine forces at Pearl Harbor. These were administratively under the Naval Station; the first official reference to a Submarine Base at Pearl Harbor was in General Order No. 110, dated July 5, 1923. In the early 1920s the submarine facilities consisted mostly of temporary buildings, tents, and an armored cruiser, the USS *Chicago* (CL-14), which was used as a barracks for submarine and base personnel. The first permanent building was the air compressor station (Fac. 650), and by the early 1930s the Submarine Base contained numerous permanent structures, including the diving tower (Fac. S 659) and the large U-shaped barracks with associated dining building and laundry (Fac. 654). About a dozen facilities from the 1920s and 1930s, including the first permanent building, remain at Submarine Base.

Naval Air Station Ford Island

The first Navy aviators arrived in Hawai'i in 1919 as a Naval Air Detachment and established a temporary base at Pearl Harbor's Navy Yard, near where the repair basins are currently located. The long-term plan was to share Ford Island, where the Army already had established Luke Field, named after World War I ace pilot Frank Luke. The Navy planes were not moved to Ford Island until January 1923, after a permanent hangar (Hangar 6) had been constructed. The Navy's official name for its Ford Island installation was Naval Air Station Pearl Harbor. Both land planes and seaplanes were used by each service air branch (Coletta 1985: 445).

The number of Navy planes grew from four in 1919 to 39 in 1932, and the facilities expanded correspondingly. During the 1920s and 1930s the hangars and shop buildings were usually built of permanent materials, like concrete and steel, while the barracks and offices were constructed of wood. The conflict with the Army's use of Ford Island increased as both services expanded. In the 1930s some Army aviation functions were transferred to central O'ahu after Wheeler Field was developed. By 1936 carrier-based naval aviation was developing rapidly and the Navy command recognized the need for more space, for visiting fleet squadrons as well as for Hawai'i-based patrol planes (Coletta 1985: 449). The Army started plans for nearby Hickam Field as a bomber base in the late 1930s, in order to vacate Ford Island. The Navy gained complete control of Ford Island by November 1939 (Naval Air Station 1945: 13). The Army dismantled many of their facilities and relocated them to Hickam Field.

Much of the permanent construction built by the Navy from the 1920s and 1930s survives on Ford Island, although alterations have been made to several of the buildings. Most of the seaplane ramps (Fac. S 357 through S 360) built in these decades remain, although the Navy no longer uses them. There are groupings of both Army and Navy residences and other structures that illustrate the period of initial base development and the period between the wars.

Fuel Oil Facilities

By the 1920s the Navy had started to build its new ships with steam plants that burned heavy oil instead of coal, to increase the fleet's cruising range and to avoid the dust and other problems with coal (Alden 1972: 224). Although coal continued to be used for ships up through World War II, the transition to oil had started. In 1919 at Pearl Harbor some oil tanks near the coaling

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dock and a large underground fuel oil reservoir were built, of which only the pumphouse (Fac. 31) remains. In the 1920s difficulties with appropriations, rising costs of refining, and monopolistic control of oil supplies led to a complex fuel situation for the Navy. During President Warren G. Harding's term in the early 1920s Pearl Harbor became involved in the oil reserve scandal known as "Teapot Dome," although a second Naval Oil Reserve, called Elk Hills, was also involved and more directly connected to the Pearl Harbor base. The Elk Hills reserve was leased to Pan-American Petroleum and Transport Company. In return the company agreed to build oil tanks and fueling wharves at Pearl Harbor, and to fill the tanks, at no expense to the government. When the "secret" leases became known, Senate investigations, as well as civil and criminal lawsuits followed, with appeals dragging the matter through the decade. By 1928 litigation was concluded, the Pan-American Elk Hills lease canceled, and the more than \$9,300,000 in Pearl Harbor improvements were assigned cost-free to the government. Eleven facilities remain from this episode of Pearl Harbor's history, five of the 57 1924 tanks (Fac. S 754 through S 756, S 761 and S 762), the Merry Point wharves (Fac. M 1 through M 4) and two buildings there (Fac. 88 and 89).

Naval Magazine Facilities

With the expansion of the facilities for the submarine base and the air station, "the Kuahua Island ammunition depot proved to be in the wrong place – in the midst of base activities" (Coletta 1985: 448). Construction of a new depot began in 1931 in Lualualei Valley and on some land next to the West Loch of Pearl Harbor. The Kuahua depot closed on 30 April 1934, and most of the facilities were transferred to the Supply Depot. Most of the original 1930s construction at West Loch still remains.

Waterfront Facilities

Before 1920, there was limited available shoreline or pier berthing for ships at Pearl Harbor. During the 1920s there was some expansion of the waterfront facilities. In the Shipyard, the 10-10 dock was lengthened, at both ends, beyond its original 1,010 feet. In the mid-1930s, one major construction activity at the Shipyard centered on two new repair basins (Fac. B 11 to B 22) and the 200-ton stationary hammerhead crane, now removed. Other dredging and berth construction continued. A fueling pier (Fac. S 377) on Ford Island and four Submarine Base piers were built in this period, but none of these five piers are extant. Some of the battleship moorings built in the 1930s offshore of the east side of Ford Island remain; they are not in use and not in the Navy's inventory of facilities.

Other 1920s and 1930s Development at Pearl Harbor

In the period between the wars there were also some new facilities constructed within other areas of the base. Construction in the shipyard included an extension to the power plant, a large machine shop, a storehouse, and a dispensary. Several additional buildings were also erected at the Naval Hospital. And, as discussed above, the Naval Magazine was relocated to two new sites, only one of which (West Loch) is included within the Pearl Harbor Naval Complex. Expansion was also accommodated by the removal and relocation of the three 600-foot steel radio towers at Hospital Point area in 1937. Their function was superseded by the newly erected Radio Station at Lualualei.

World War II

With the outbreak of war in Europe in September 1939, President Roosevelt declared a National Emergency and an extensive amount of construction began at Pearl Harbor. Anything constructed between 1940 and 1945 at Pearl Harbor is considered World War II construction, although the U.S. did not enter the war until December 1941. There are several sub-contexts for the World War II construction, some related to the numerous new activities and locations for Navy facilities, along with the overlapping sub-contexts of the construction organizations involved in the rapid build-up of the base.

The largest amount of the World War II construction was undertaken by a consortium of building firms known as Contractors Pacific Naval Air Bases, or CPNAB. Pacific Bridge Company also built several critical facilities at the installation during World War II. After 1943 almost all building, mostly temporary wooden facilities and Quonset huts, was done through the Navy Construction Battalions, also known as CBs or Seabees.

Two architectural firms are known to have supplied many of the designs for facilities built at Pearl Harbor during World War II, in addition to plans produced by Navy employees at the Bureau of Yards and Docks or at the 14th Naval District. Many of the major facilities and quarters were designed by the firm of the well-known Hawaii-based architect Charles W. Dickey. This firm's work at Pearl Harbor is typically in a stripped-down Moderne style or in a style that could be described as Hawaiian Modern. Several buildings at the Shipyard and Ford Island were based on standard plans prepared by the well-known industrial design firm in Detroit, Albert Kahn Associated Architects & Engineers.

The land area of the Base was expanded enormously during World War II. The first additional acreage was next to the base, acquired for the housing areas. Red Hill was acquired for the enormous underground fuel facilities. In the 1940s, acreage stretching east to Pu'uloa Road, and lands on and near Pearl City Peninsula, on Waipio Peninsula, and on the west side of the harbor were added to the base, securing all lands immediately adjacent to the Pearl Harbor basin.

Contractors Pacific Naval Air Bases

The CPNAB group built extensive World War II facilities at Pearl Harbor, and elsewhere in the Pacific; their assignments were not limited to air base construction. Their work at Pearl Harbor was briefly summarized by the Navy:

Extensions to submarine facilities were undertaken.... A new supply depot on Kuahua Island, a tremendous underground fuel-storage project, . . . extensions to ammunition storage, and an extensive dredging program were also in progress at Pearl Harbor. Concurrently with these developments, five major housing projects, with a capacity of 20,000, were being built to house civilian and naval personnel [Housing Areas I through IV and Makalapa]. These were accompanied by an extensive program for making personnel, power, and communication structures bombproof (U.S. Navy, Bureau of Yards and Dock 1947: Vol. II, 122).

CPNAB erected numerous new buildings in all the established areas of the base, including Ford Island, Shipyard, Submarine Base, West Loch Ammunition Depot, and especially Kuahua, which was transformed from an island to a peninsula during World War II, due to the filling in of

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adjacent fishponds with excavation spoils from Red Hill. Kuaehua became headquarters for the Naval Supply Center, a new activity that evolved from the Supply Department of the Navy Yard. Through the Supply Center flowed almost all the equipment used by the U.S. Forces in their drive across the Pacific, a role that should not be underestimated in significance. Most of the shoreline and pier berthing facilities at Pearl Harbor were built in this period by CPNAB. Essentially the entire shorelines of the Submarine Base and Kuaehua were provided with wharves. An additional repair basin was built in the Shipyard. The large fuel pier at the base of Kuaehua peninsula, as well as the WWII wharves at Ford Island, Pearl City Peninsula, and West Loch were also constructed.

Several major groups of facilities were built by CPNAB, in areas outside the pre-World War II Pearl Harbor boundaries. Some of these areas, such as Camp Catlin and the expanded part of West Loch, were composed almost entirely of temporary buildings, such as Quonset huts, tents, and wooden structures. The majority of temporary structures have been removed, and, in many cases, replaced by new construction during the 50-plus years since the war. Some areas that were constructed with "permanent" buildings, such as Naval Housing Areas I and II (later called Hale Moku and Hokulani, respectively) have also been replaced by newer buildings. The areas added to Pearl Harbor during WWII that have numerous extant CPNAB-built facilities are: Red Hill underground fuel system, Makalapa, Richardson Recreation Center, and Bishop Point.

One of the most significant construction and engineering efforts during World War II was the Red Hill fuel project. The scope was immense; the facility could store six million barrels of fuel oil and included seven miles of tunnels. There was no precedent for the size and vertical orientation of the twenty tanks that were excavated. The massive fuel pier was also part of this effort. The system was finished ahead of schedule and it remains largely as it was built.

Pacific Bridge Company

Another construction firm, Pacific Bridge Company, did some of the major World War II projects at Pearl Harbor. Their work included three new drydocks, a new marine railway, a new bombproof power plant, and an improved electrical distribution system, including bomb-resistant substations. Their contract also included erection of cranes and some salvage work after the December 7, 1941 attack, most notably on the USS *Okalahoma* (BB-37) and USS *Utah* (AG-4). All the permanent facilities built by this contractor, except for the marine railway and one substation, remain in use.

December 7, 1941

Although the attack on Pearl Harbor by the Japanese was a surprise, relations between the United States and Japan had been deteriorating since the 1930s, with the Japanese series of conquests in Asia. For several years various events raised tensions even as diplomatic efforts to resolve differences were underway. Japan started planning an attack on Hawai'i as early as 1940, choosing war with the United States rather than changing its expansionist policies.

On November 25, 1941, as diplomatic negotiations were failing, a Japanese fleet of 25 Japanese warships, including six aircraft carriers and 432 planes, sailed for Hawai'i on a course north of the usual shipping lanes. Approximately 30 submarines, five carrying midget subs, sortied a day later to approach from the southwest.

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At 0600 on Sunday, December 7, 1941, Japan launched the initial strike force of 183 aircraft. At about 0645, an unidentified submarine was depth-charged at the Pearl Harbor entrance. Subsequently, approaching unidentified aircraft were detected by radar, a new technology still in its infancy. Although U.S. forces were on war alert, these indicators of the impending attack were not communicated to those in command. The first wave of aircraft struck at 0755 in an attack that lasted half an hour. After a lull, the second wave began at 0845 and lasted another hour.

Pearl Harbor was not the only target. Other military installations on O'ahu and elsewhere in the Pacific were attacked to prevent interdiction of the striking forces; several hundred U.S. aircraft were damaged or destroyed. Pacific Fleet aircraft carriers and battleships were to be the primary targets. Fortunately, the three Pacific-based aircraft carriers, USS *Enterprise* (CV-6) and USS *Lexington* (CV-2) were at sea and USS *Saratoga* (CV-8) was in its homeport of San Diego. Eight battleships in port [USS *Nevada* (BB-36), USS *Oklahoma* (BB-37), USS *Pennsylvania* (BB-38), USS *Arizona* (BB-39), USS *Tennessee* (BB-43), USS *California* (BB-44), USS *Maryland* (BB-46), and USS *West Virginia* (BB-48)] were attacked with bombs and torpedoes designed for the shallow waters of Pearl Harbor. Five battleships and three other ships were sunk or beached; three battleships and ten other ships were damaged. Over 2,000 sailors lost their lives in the attack, along with several hundred members of other services and civilians caught by strafing or return fire.

Without doubt this day is the most famous in Pearl Harbor history, and resources associated with it are considered very significant. Some of the physical reminders of that day are the remains of the devastation, such as the USS *Arizona* (BB-39), USS *Utah* (AG-4), and other evidence of bomb damage from the Japanese planes. Some resources that were not touched can also be associated with the attack. For instance, a fatal flaw in the Japanese attack was to not follow through with the plan to also bomb the oil tanks and permanent repair facilities within Pearl Harbor. The first two waves concentrated exclusively on ships and airplanes, and facilities were to be attacked in later phases, which never happened. The large anti-aircraft response at Pearl Harbor likely played a role in Japanese abandonment of any further attack. Consequently, ship repair work began almost immediately following the attack, and the Navy did not have to pull its Fleet back to the West Coast ports.

Many of the defensive structures that were built after December 7, 1941 can also be directly related to the attack. For instance, many portable pre-cast concrete arched bomb shelters and underground bomb shelters were built throughout the base, by both contractors' forces and Navy personnel, in response to the attack.

Construction Battalions and Temporary World War II Construction

Navy Construction Battalions (CBs or Seabees) had been sent to Midway, Palmyra, and Johnston islands as early as the summer of 1942. This action was taken to avoid having civilian contractors subject to enemy capture, as some had been in Guam, Wake, and Cavite. Seabees were used in Hawai'i as early as the spring of 1943, to help expedite the contractors' work, at least partly offsetting a tight labor market from the loss of personnel to the war effort. "Initially these battalions undertook new projects, supplementing the contractors' forces, but eventually they replaced the contractors' personnel and brought about a gradual curtailment of contract activities" (U.S. Navy, Bureau of Yards and Docks 1947: Vol. II, 122). The Navy found Seabee labor to their advantage both because it was cheaper, and because the contractors were having a hard time finding experienced workers due to the draft and enlistments.

Most of the buildings erected by the Seabees were a temporary type of construction. The wooden buildings they erected were mostly standard designs creatively adapted for a range of functions, including quarters, administrative offices, and warehouses. They also built Quonset huts everywhere, with a wide range of uses. A small percentage of the total of such Seabee construction remains on the Navy inventory today. Many of the areas where the Seabees constructed buildings, such as the Damon Tract and the Manana warehouses, have been returned to civilian use in the years since World War II. Modern Navy housing has replaced most of the Quonset huts and wooden warehouses in areas such as Iroquois Point and the former Salt Lake Advanced Base Construction Depot, in the area north of the Honolulu airport.

In summary, the World War II period was extremely important in this installation's history. Pearl Harbor was the most important base in the Pacific Theater during World War II, due to its location and its repair and support facilities. Construction in all parts of the base boomed to allow full utilization of its military potential. In 1998 about 600, or over half of the extant facilities that predated 1956, were from this five-year period. About one-third of these are insignificant utility or other type structures.

Post World War II

By the time the Japanese government officially surrendered to the allied forces in September 1945, Pearl Harbor was one of the most extensive, if not the most extensive, defense installation in the world. The end of the war also halted the program of major construction work and physical development of the base. As the world entered a new era of atomic warfare, there was no reason to continue expanding facilities suitable for supporting a more conventional type of war. Also, there have been almost continuous post-war cutbacks in military spending. There was some increase in personnel and money to support the wars in and Vietnam, but relatively few major operational facilities were built at Pearl Harbor during those conflicts.

Pearl Harbor Naval Complex housed a small nuclear submarine fleet and was an intelligence center during the Cold War period, but these Cold War functions took place mostly in buildings constructed during World War II or earlier. New buildings erected during the Cold War were largely barracks, family housing, recreation, and personnel support facilities such as a library and medical centers. These new facilities often replaced World War II or earlier structures. Usually Cold War functions were accommodated in World War II or earlier buildings by adaptive re-use and/or adding to the older structures. D. Colt Denfeld, Ph.D. (1998) assessed the Cold War resources and features at Pearl Harbor. Although Denfeld noted that declassification of materials might change assessments of some Cold War facilities at Pearl Harbor, his study did not find any that are eligible for listing in the National Register of Historic Places. The Cold War Era use of selected facilities, however, does enhance the significance assigned to those facilities as a result of earlier historical events and, in some cases, may be important to the heritage of the installation. Many of the World War II and earlier buildings at the installation were recognized as significant as early as 1962, when the first National Historic Landmark study that included Pearl Harbor Naval Base was performed.

The Establishment of the Pearl Harbor National Historic Landmark

Pearl Harbor was declared a National Historic Landmark (NHL) by the Secretary of the Interior in 1964. The legal basis for designating National Historic Landmarks was established in the Historic Sites Act of 1935. This law authorized a national survey of sites of exceptional value in United States history. The National Park Service (NPS) studies and nominates landmarks, which are evaluated by an advisory board. This process predated the establishment of the National Register, which was created by the National Historic Preservation Act of 1966 (NHPA). Following passage of the NHPA, all NHLs, including Pearl Harbor, were added to the National Register of Historic Places.

In 1962 the NPS undertook a study of Hawai'i history under the general theme "Political and Military Affairs, 1865-1910" (Hussey 1962). Many sites were surveyed, and ten sites of exceptional value, including Pearl Harbor Naval Base, were identified. The 1962 study noted that the U.S. possession of Pearl Harbor "and the development of a naval base and headquarters there after 1898 were important factors in the rise of United States naval power in the Pacific." The December 7, 1941 attack on Pearl Harbor was mentioned, because the "disputing of this power by Japan, in turn, eventually contributed to the precipitation of war between the United States and Japan."

Two updates to the Pearl Harbor NHL were made in the 1970s on NRHP forms by the NPS. The 1974 update explained more of the development history of the base, and established boundaries for the NHL (Apple 1974). The 1978 update (Levy 1978) slightly amended the 1974 one; it deleted a few pages of the 1974 update but included by reference the 1978 *Pearl Harbor Historic Preservation Plan* (PH HPP), specifically its list of historic facilities. The boundary of the Pearl Harbor NHL was certified in 1978.

The 1978 PH HPP was the first inventory of historic facilities undertaken at Pearl Harbor, and subsequent partial updates for individual buildings or groups of facilities were made through 1996. In 1997-98 an update of the inventory was done for all pre-1956 facilities at Pearl Harbor, except housing. This report was finalized in 2000 as the *Pearl Harbor Naval Complex Cultural Resources Management Plan*, or CRMP (Paul H. Rosendahl, Ph.D., Inc. et al. 2000). Meanwhile, another inventory update, which included the housing, had started and the final report was published in 2002 as the *Integrated Cultural Resources Management Plan*, or ICRMP for the Pearl Harbor Naval Complex (Helber Hastert & Fee, Planners 2002). The ICRMP inventory, in database format, proposed a list of facilities that are potentially eligible for listing in the National Register and/or are contributing elements to the National Historic Landmark. While any of the facilities categorized as historic properties are protected under the NHPA, the historic properties associated with the Pearl Harbor NHL are considered to possess exceptional value as commemorating or illustrating the history of the United States, and are to be afforded special consideration.

SOURCES OF INFORMATION

A. ARCHITECTURAL DRAWINGS AND MAPS

Early maps of Pearl Harbor were provided by Jeffrey Dodge, Historic Preservation Specialist with the Naval Facilities Engineering Command, Pacific. Some other useful maps prepared

by the U.S. Navy were found in the Plan Files of the Naval Facilities Engineering Command, Pacific. Other repositories which have historic maps of Pearl Harbor Naval Base include the Cartographic Section of the National Archives II in College Park, Maryland; Navy files at the National Archives, Pacific Sierra Region in San Bruno, California; and the Naval Facilities Engineering Command Archives in Port Hueneme, California.

B. EARLY VIEWS

In addition to the historic photographs of Pearl Harbor Naval Base that have been reproduced in several books listed below, several other photo collections provided useful historic views: the Hawaii State Archives, the Bishop Museum Archives, the 14th Naval District Collection maintained by the USS *Arizona* Memorial Association, the Naval Facilities Engineering Command Archives at Port Hueneme, California, the Naval Historical Center in Washington, D.C., the Still Photos Section of the National Archives II in College Park, Maryland, and Navy files at the National Archives, Pacific Sierra Region, in San Bruno, California.

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D. LIKELY SOURCES NOT YET FULLY INVESTIGATED

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- National Archives, Pacific Sierra Region, 1000 Commodore Drive, San Bruno, California 94066, ph (415) 876-9009.
- Naval Historical Center, 805 Kidder Breese St., Washington Navy Yard, Washington, D.C. 20374, ph. (202) 433-4131.
- Port Hueneme NAVFAC Archives, 621 Pleasant Valley Road, Port Hueneme, California 93043, ph. (805) 982-5563.

PROJECT INFORMATION

Commander Navy Region (COMNAVREG) Hawaii has embarked on a program of documentation of historic properties within its area of responsibility, with the goal of recording historic information about each property type or set of facilities. In order to establish the context of significance for the approximately 1,500 resources dating from WWII or earlier that exist in the Pearl Harbor Naval Complex, this overview report was prepared. This information will assist COMNAVREG Hawaii in the appropriate management of these properties, be it routine repair

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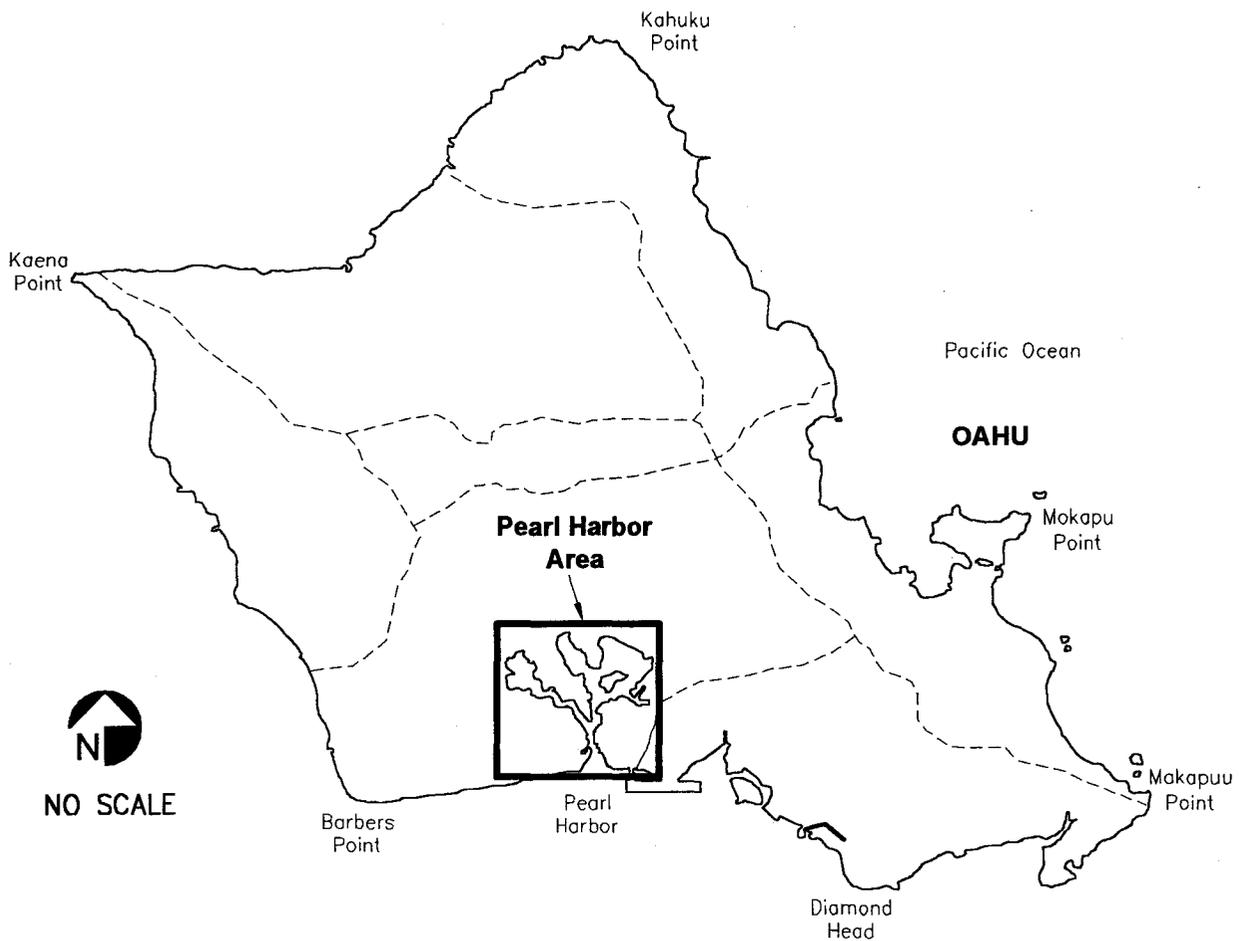
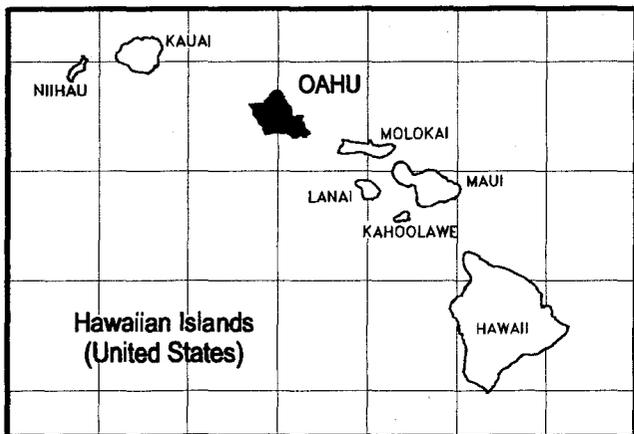
and maintenance for continuing use, rehabilitation for continuing use / adaptive reuse, or demolition. This report was prepared under a Historic Preservation Services contract (N62742-97-D-3502) awarded to AMEC Earth and Environmental, the prime contractor, by the U.S. Navy, Naval Facilities Engineering Command, Pacific. The contract was funded through the Cultural Resources Program of COMNAVREG Hawaii. This report was based on the history section of the *U.S. Naval Base, Pearl Harbor, National Historic Landmark, Historic Preservation Plan* (Pacific Division, Naval Facilities Engineering Command 1978: section II), as expanded by Ann Yoklavich and with the addition of the prehistory and early history sections prepared by Robert Rechtman, Ph.D., for the *Pearl Harbor Naval Complex, Cultural Resources Management Plan* (Paul H. Rosendahl, Ph.D., Inc. et al. 2000: 12-30). The maps were prepared by Nestor Beltran of NAB Graphics.

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