
Section 4 Results of Fieldwork

4.1 Survey Findings

This archaeological inventory survey was conducted under archaeological permit number 09-20 issued by the Hawai'i State Historic Preservation Division (SHPD), Department of Land and Natural Resources (DLNR), per Hawai'i Administrative Rules (HAR) Chapter 13-282. CSH archaeologists Gerald K. Ida, B.A., Nancine 'Missy' Kamai, B.A., Kaipo Akana, and Kendy Altizer, B.A. Fieldwork was conducted intermittently between May 21 and February 16, 2010, under the general supervision of Hallett H. Hammatt, Ph.D. (principal investigator). The field work required approximately 29 person-days to complete.

A total of 15 sites were recorded as a result of the current inventory survey (Figure 23, Figure 24, and Figure 25). Of these sites, two were documented as part of a previous survey (Hammatt 1990) and have already been given state site numbers. These sites were revisited and updated as part of the current inventory. Of the sites recorded within the current project area by Hammatt in 1990, two were not relocated and are thought to have been destroyed by Hurricane 'Iniki in 1993. Sites documented during the current inventory survey include 2 walls related to plantation-era sugar cane cultivation and/or ranching activities (Site 50-30-11-422 [CSH 1] and Site 50-30-11-423 [CSH 2]); 2 pre-contact habitation terraces (Site 50-30-11-2086 [CSH 3] and Site 50-30-11-2094 [CSH 12]); Nāwiliwili Harbor Light and associated features (Site 50-30-11-2087 [CSH 5]); the remains of a historic communications tower (Site 50-30-11-2088 [CSH 6]); a possible burial mound Site 50-30-11-2089 [CSH 7]); a military gun emplacement (Site 50-30-11-2090 [CSH 8]); 2 sites related to historic residences (Site 50-30-11-2091 [CSH 9] and Site 50-30-11-2092 [CSH 10]); 1 plantation-era earthen drainage ditch (Site 50-30-11-2093 [CSH 11]); 1 pre-contact activity area (Site 50-30-11-2095 [CSH 13]) and 2 historic concrete drainage ditches (Site 50-30-11-2096 [CSH 14] and Site 50-30-11-2097 [CSH 15]). A brief summary of each site is listed below.

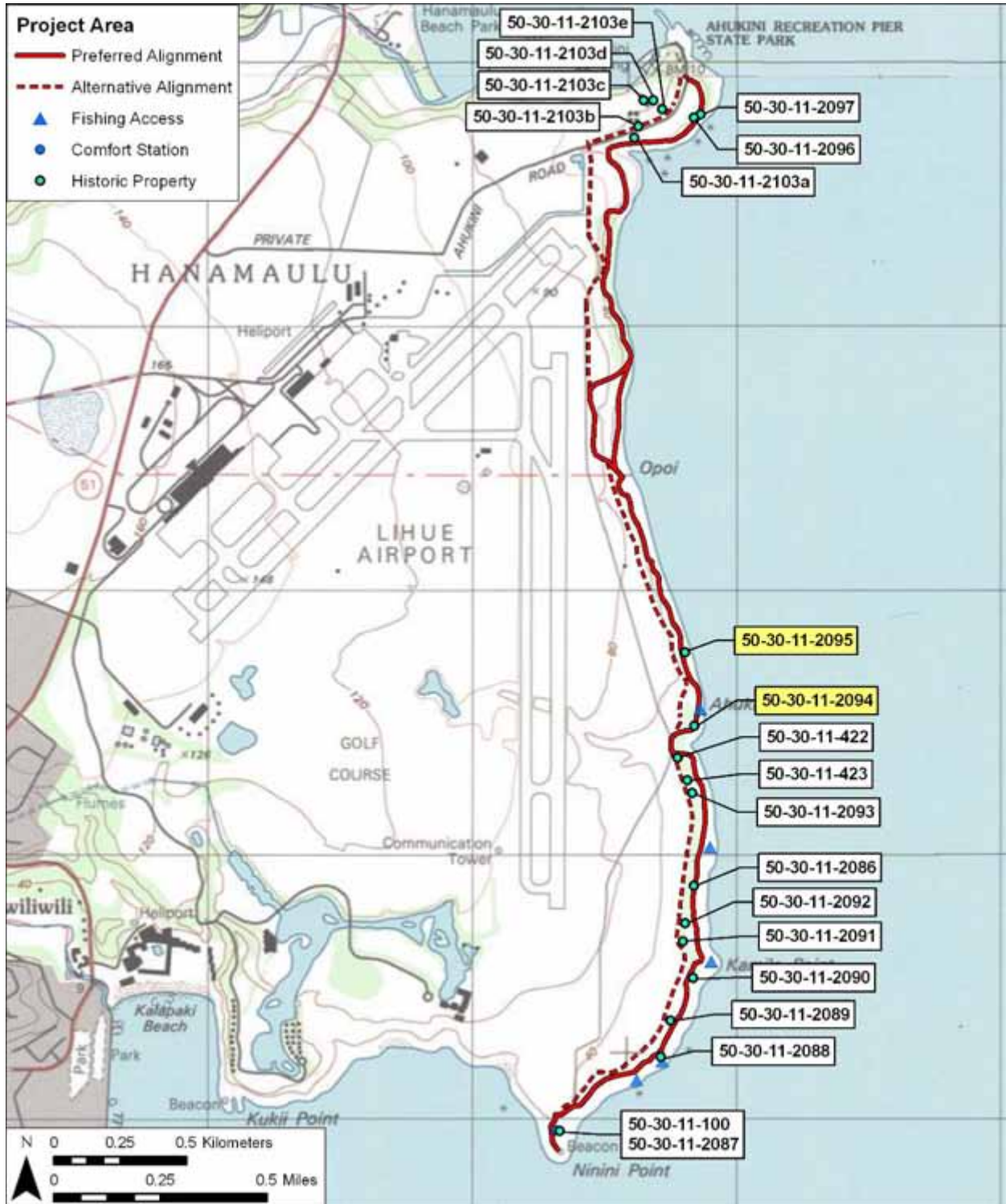


Figure 23. Portions of the U.S. Geological Survey 1996 Lihue Kapa'a quadrangles, 7.5-minute Topographic Map showing sites located during the current inventory survey; sites in yellow where tested.

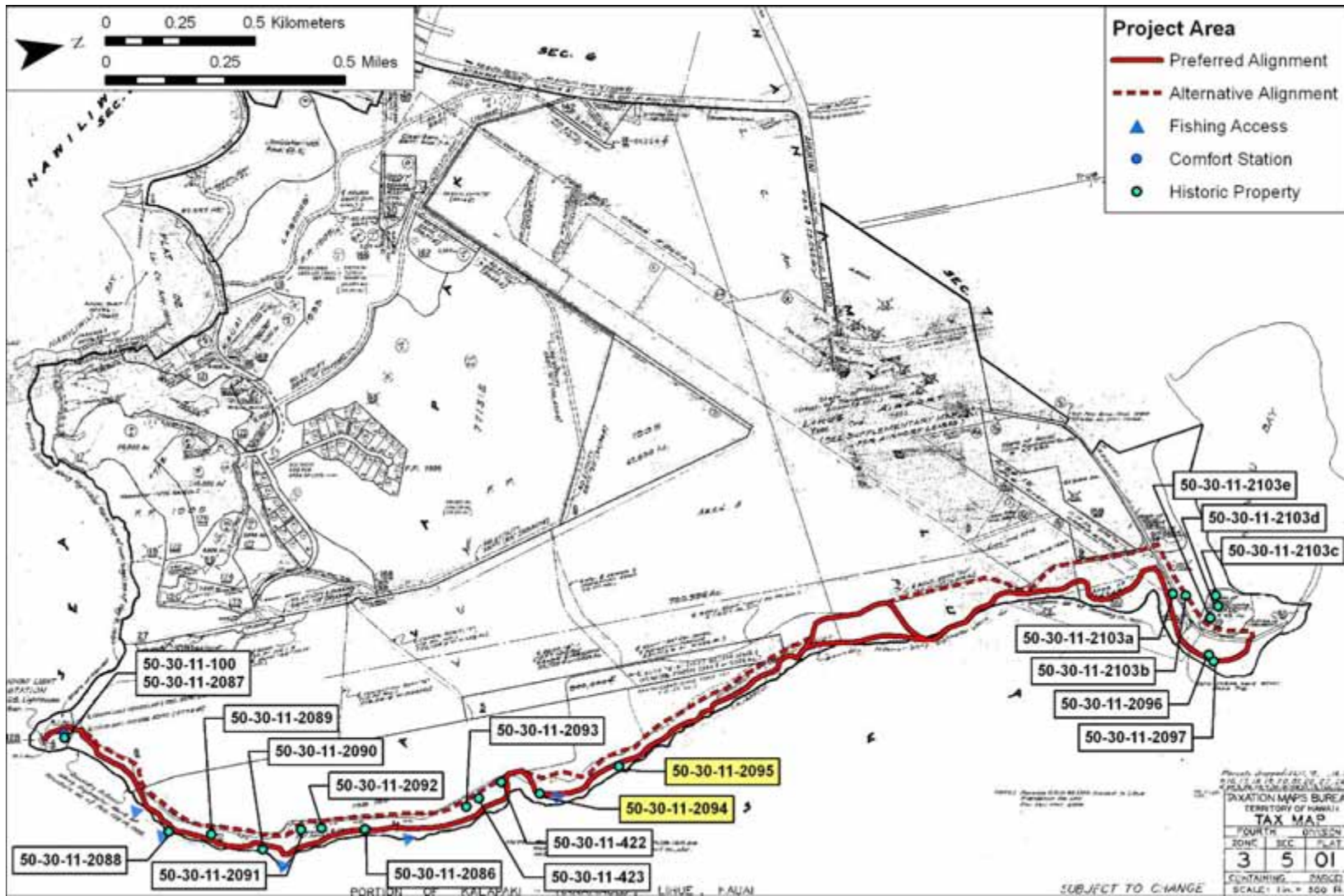


Figure 24. TMK showing sites located during the current inventory survey; sites in yellow where tested



Figure 25. 2009 Google Earth aerial photo showing sites located during the current inventory survey; sites in yellow were tested.

4.2 Site Descriptions

4.2.1 Site 50-30-11-422 (CSH 1)

SITE TYPE: Wall
FUNCTION: Agriculture; field divider
FEATURES: 1
DIMENSIONS: Approx. 13 m long
CONDITION: Poor
PROBABLE AGE: Plantation-era
TAX MAP KEY: [4] 3-5-01: 102
UTM COORDINATES: NAD 83 UTM Zone 4 N
 465776.71 mE 2429366.83 mN

DESCRIPTION:

Site 50-30-11-422 is the remnants of a plantation-era wall measuring 13 m northeast-southwest. Remnants of the wall consist of 2 aligned basalt boulders and a small amount of stacking on the southwestern end of the alignment. Random cobbles and boulders are present in between, indicating the wall has deteriorated over time. No artifacts or features were observed on site. The site is located on a level area under a canopy of ironwood trees, approximately 62 m west of the *makai* project alignment and 10 m east of the *mauka* project alignment. Because of its style and proximity to what were formerly sugar cane fields, Site 50-30-11-422 is likely the remnants of a plantation-era field divider (Figure 26 and Figure 27).

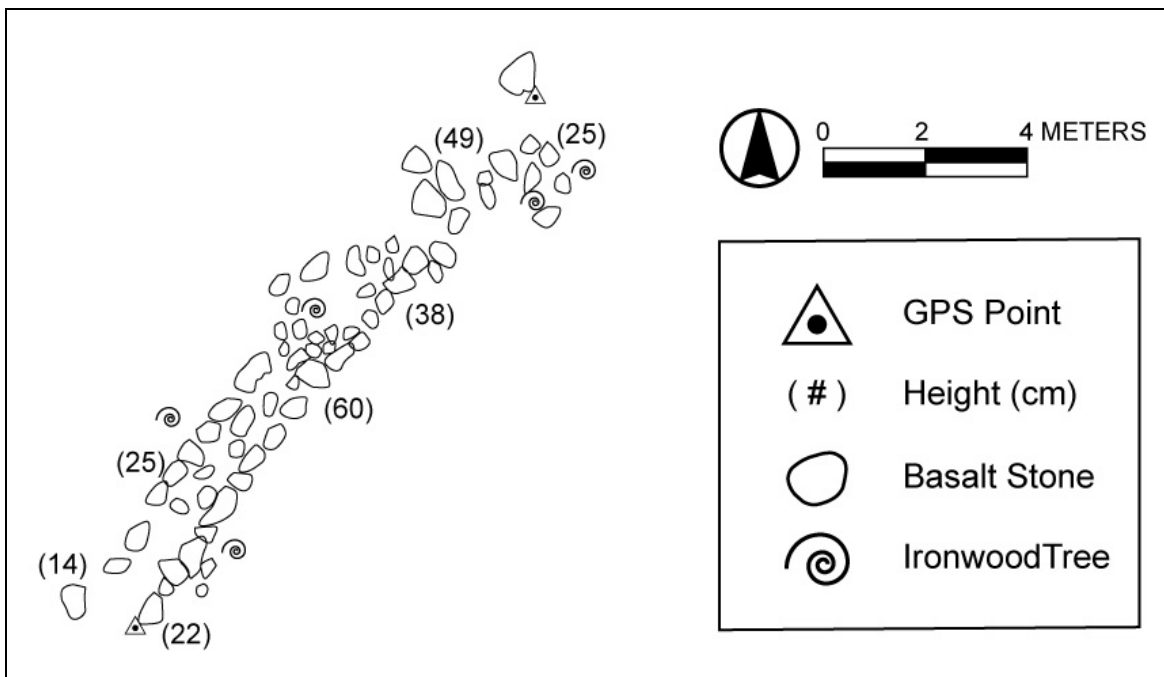


Figure 26. Plan view map of Site 50-30-11-422 (CSH 1)



Figure 27. Site 50-30-11-422 (CSH 1), view east

4.2.2 Site 50-30-11-423 (CSH 2)

SITE TYPE: Wall
FUNCTION: Agriculture; field divider
FEATURES: 1
DIMENSIONS: Approx. 24.5 m long
CONDITION: Fair
PROBABLE AGE: Plantation-era
TAX MAP KEY: [4] 3-5-01: 102
UTM COORDINATES: NAD 83 UTM Zone 4 N
465814.15 mE 2429281.07 mN

DESCRIPTION:

Site 50-30-11-423 is the remnants of a plantation-era wall measuring 24.5m long, northeast-southwest, and 1.6 cm wide. It is constructed of small-to-large basalt boulders stacked one-to-four courses high, with a maximum height of 0.88 m. The western portion of the wall is deteriorated and all that remains are a few scattered basalt cobbles and boulders. A bull dozer push pile of large basalt boulders is present just east of the alignment. The site is located on a gently sloping-to-level area, void of ground vegetation, under a canopy of ironwood trees. It is approximately 56 m west of the *makai* project alignment and 22 m east of the *mauka* project alignment. No artifacts were observed on site. Because of its style and proximity to what were formerly sugar cane fields, Site 50-30-11-423 is likely the remnants of a plantation-era field divider. Vegetation in the area includes ironwood trees (Figure 28 and Figure 29).

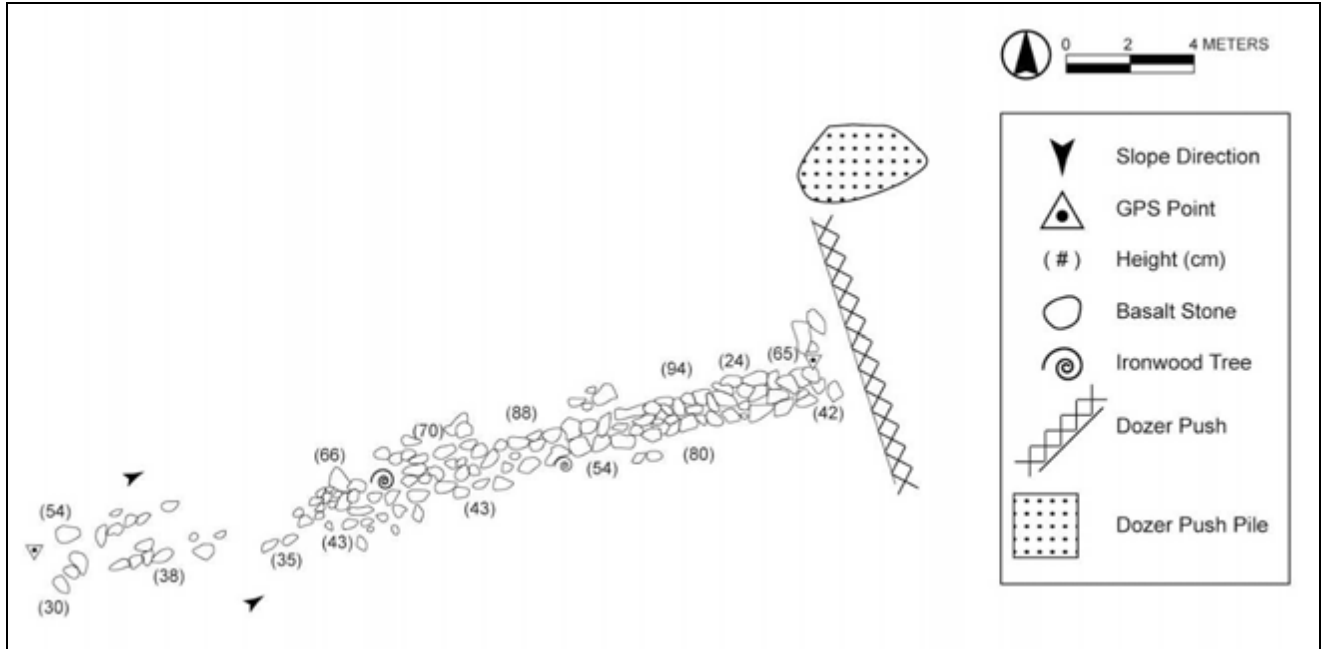


Figure 28. Plan view of Site 50-30-11-423 (CSH 2)



Figure 29. Site 50-30-11-423 (CSH 2), view east

4.2.3 Site 50-30-11-2086 (CSH 3)

SITE TYPE: Terrace
FUNCTION: Habitation
FEATURES: 2
DIMENSIONS: Approx. 20 m x 8 m
CONDITION: Poor
PROBABLE AGE: Pre-contact
TAX MAP KEY: [4] 3-5-01: 102
UTM COORDINATES: NAD 83 UTM Zone 4 N
465838.21 mE 2428882.76 mN

DESCRIPTION:

Site 50-30-11-2086 (CSH 3) consists of the remnants of two terraces. The walls of the lower terrace have completely eroded away. The upper terrace is composed of an alignment of cobbles and boulders stacked one-to-three courses high on bedrock outcrop. The maximum height of the upper terrace is 0.70 m and its interior consists of a level area of stone. The terrace measures 3.0 m east-west by 4.0 m north-south. Coral and marine midden fragments were observed scattered about the area; they include *Cellana sp*, *Cypraea sp*, and *Bivalvia*. Site 50-30-11-2086 is located on a gently sloping-to-sloping area, on the path of the *makai* project alignment and approximately 20 m from the ocean (Figure 30-Figure 32). Vegetation consists of ironwood trees, various grasses, *'ilima*, *pa'u o lu 'iakea*, and *naupaka*.

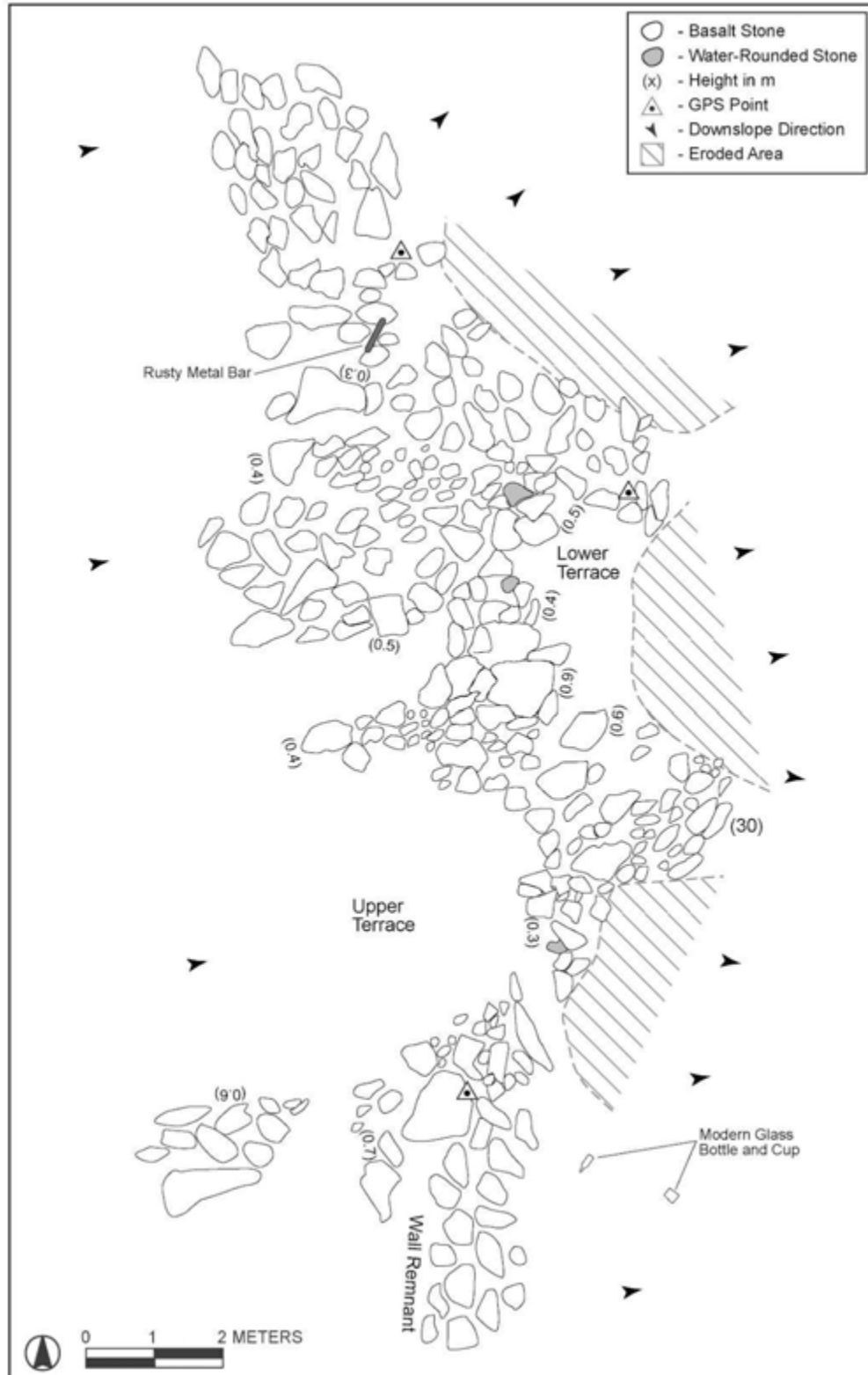


Figure 30. Plan view of Site 50-30-11-2086 (CSH 3)



Figure 31. Site 50-30-11-2086 (CSH 3), eroded lower terrace, view southwest



Figure 32. Site 50-30-11-2086 (CSH 3), upper terrace, view northeast

4.2.4 Site 50-30-11--2087 (CSH 5)

SITE TYPE: Nāwiliwili Harbor Light, wall remnants, and building foundations
FUNCTION: Lighthouse and associated remnants of caretaker's quarters
FEATURES: 6
DIMENSIONS: Approx. 120 m x 40 m
CONDITION: Fair
PROBABLE AGE: Historic
TAX MAP KEY: [4] 3-5-01: 128
UTM COORDINATES: NAD 83 UTM Zone 4 N
 465330.96 mE 2427953.86 mN

DESCRIPTION:

Site 50-30-11-2087 consists of three walls (Features A, B, and C), Nāwiliwili Harbor Light (Feature D), and associated structural remnants related to the lighthouse caretaker's residence (Features E, F, and G; Figure 33-Figure 42). The site is located on Ninini Point and the U.S. Coast Guard manages the upkeep of the lighthouse and surrounding area. Feature A, the longest wall, begins along the east side of Nāwiliwili Harbor Light and measures 120 m long, north-southeast, with varying thicknesses between 0.5 m and 0.9 m; its height also varies between 0.5 m and 2.2 m. There is a break in the northern portion of Feature A and a concrete walkway is present perpendicular to the wall. Figure 36 clearly shows the sidewalk and the break in Feature A. The smallest of the three walls, Feature B, is present approximately 20 m north of the southern terminus of Feature A. It is attached to Feature A on the west side and measures approximately 10 m long, northeast-southwest, is 0.5 m thick, and 1.3 m high. A utility pole is present approximately 2 m northwest of Feature B, and a concrete footing is present approximately 1 m southeast of Feature B. Feature C is present approximately 4 m north of Feature A and measures 24 m northwest-southeast, is 1 m thick, and has a maximum height of 1.2 m. The northwest portion of Feature C is not standing but remnants of boulders and cobbles from the wall are present in the area. All three walls are constructed of small-to-large sized boulders stacked two-to-eight courses high. Mortar is present in some areas of the walls, while others are dry-stacked. Of particular note is evidence of curbing present in the wall construction, observed in Feature A (Figure 39). This is typical of historic street features in Lihū'e.

Nāwiliwili Harbor Light (Feature D) is the only remaining fully functional structure on site. It consists of a concrete foundation, 86-ft tall cylindrical tower, and an automated lens. This structure was built in 1933 (Dean 1991). There is a concrete foundation (Feature E) present in the northeast corner of Features A and B. A depression (Feature F), measuring approximately 20 m northwest-southeast by 10 m east-west, is present northwest of Feature B and west of Feature A. The function of the depression is unknown, however the paint storage shed was once located in the depression and stairs were present on its north side (Figure 34). A concrete foundation (Feature G) is present approximately 2 m southwest of the northwest end of Wall C. Its function is unknown.

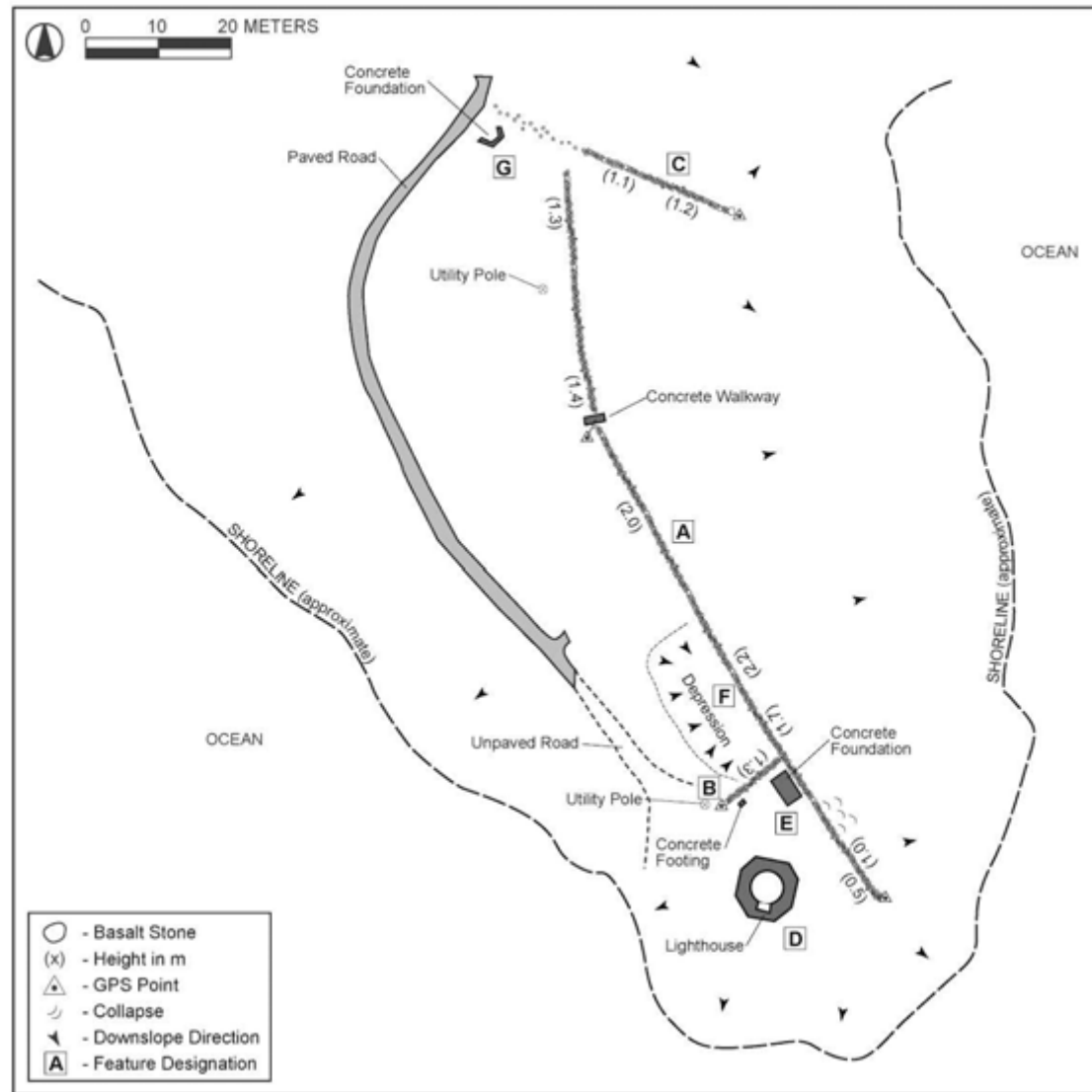


Figure 33. Plan view of Site 50-30-11-2087 (CSH 5)

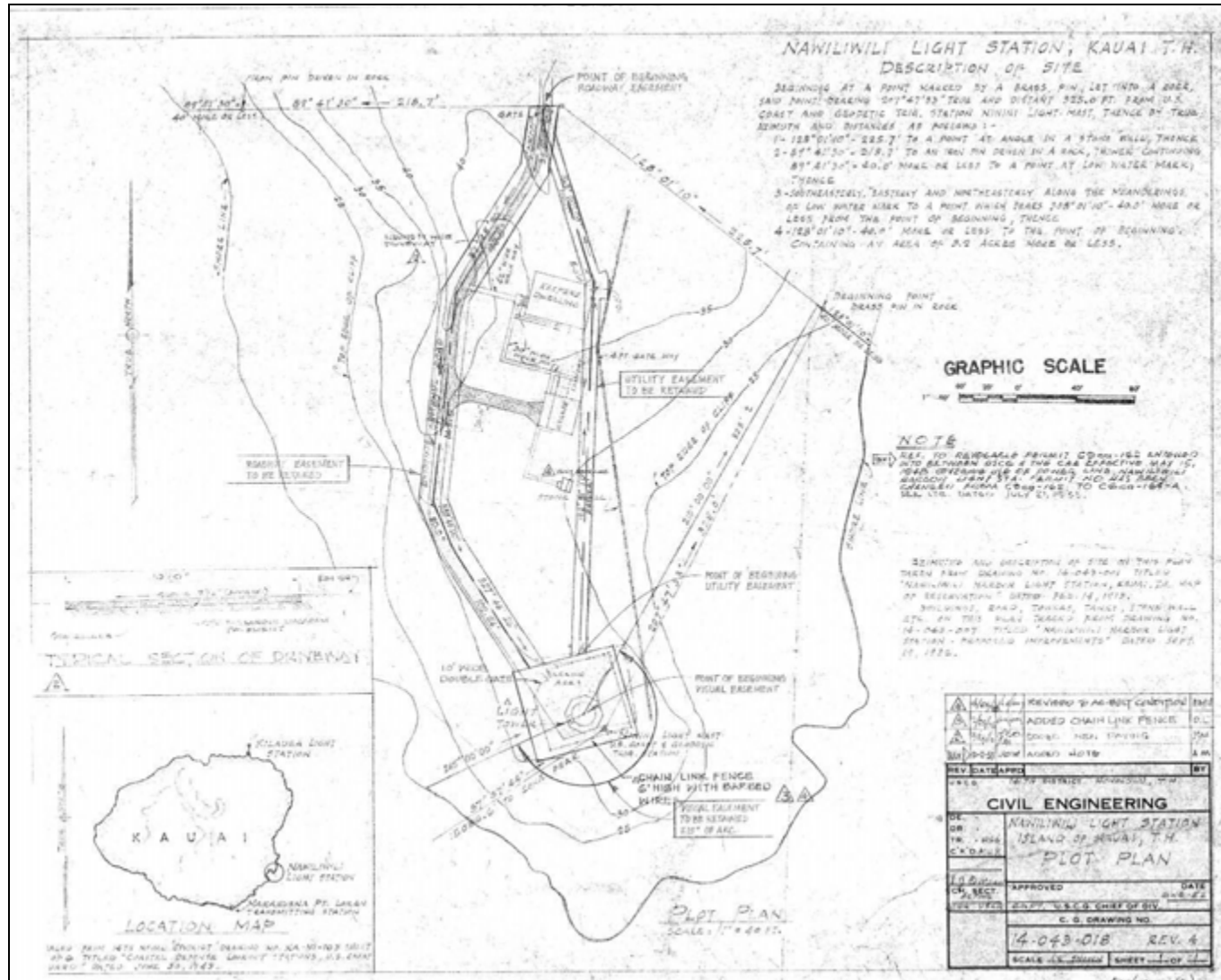


Figure 34. 1978 revision of the light house complex plans which were traced from a 1943 drawing by the U.S. Coastguard



Figure 35, 1934 photo of portions of Site 50-30-11-2087, the caretaker's residence with Nāwiliwili Harbor Light in the background. Feature A is just visible to the left side of the house, view east. Original caption: "Nawiliwili Hbr. Lt. Station [;] Photo taken in March 1934 by Senda Studio. Tower accomplished [sic] in 1932, and lantern established in 1933. New dwelling constructed in 1933."; photo dated March, 1934; Photo No. "Book 9 Film No. 38"; photo by "Senda Studios" (photo courtesy of the U.S. Coast Guard)



Figure 36. 1962 aerial photo of Site 50-30-11-2087, Nāwiliwili Harbor Light and associated structures, view east. Original caption: "Nawiliwili Light, Hawaii."; No date, probably 1962; Photo No. 14CGD-052862(09); photographer unknown. (photo courtesy of the U.S. Coast Guard)



Figure 37. 1967 aerial photo of Site 50-30-11-2087, Nāwiliwili Harbor Light and associated structures, view southwest. Original caption: none; photo stamped "Feb 10 1967"; Photo No. 05286208; photographer unknown. (photo courtesy of the U.S. Coast Guard)



Figure 38. Site 50-30-11-2087, close up photo of mortar covered rock in Feature A



Figure 39. Site 50-30-11-2087, close up of curb stone present in Feature A



Figure 40. Site 50-30-11-2087, overview of Feature A, view east



Figure 41. Site 50-30-11-2087, break in Feature A with sidewalk present, view northeast



Figure 42. Site 50-30-11-2087 (CSH 5), Nāwiliwili Harbor Light, view east

4.2.5 Site 50-30-11-2088 (CSH 6)

SITE TYPE: Foundation
FUNCTION: Communications tower
FEATURES: 1
DIMENSIONS: Approx. 3.0 m x 2.6 m
CONDITION: Fair
PROBABLE AGE: Historic
TAX MAP KEY: [4] 3-5-01: 102
UTM COORDINATES: NAD 83 UTM Zone 4 N
465713.18 mE 2428234.37

DESCRIPTION:

Site 50-30-11-2088 is a concrete foundation measuring 3.0 m northeast-southwest by 2.6 m northwest-southeast. A rusted metal plate with the remnants of metal bolts is present in the center of the foundation and measures 2.0 m northeast-southwest by 1.8 m northwest-southeast. A concrete wall is present on the southwestern edge of the foundation measuring 4.3 m long by 0.28 m thick. The wall varies in height between 0.54 m on the northwest end and 0.22 m on the southeast end. The wall appears broken at both ends; its original length and function is unknown. Cultural material observed on site includes corroded metal of unknown function, wire, and fragments of glass. Marine shell is also present and includes *Cypraea sp*, Turbinidae, *Cellana sp*, Neritidae, and Bivalvia. The foundation is likely the remains of a communication tower and is possibly the same as depicted on the 1910 U.S. Geological Survey topographic map (Figure 16). The site sits on a level plane approximately 15 m from the ocean, approximately 25 m southeast of the *makai* project alignment, and is surrounded by bedrock outcrop on the northwest and southwest sides (Figure 43 and Figure 44). Vegetation present in the area includes *naupaka*, and low lying ironwood trees.

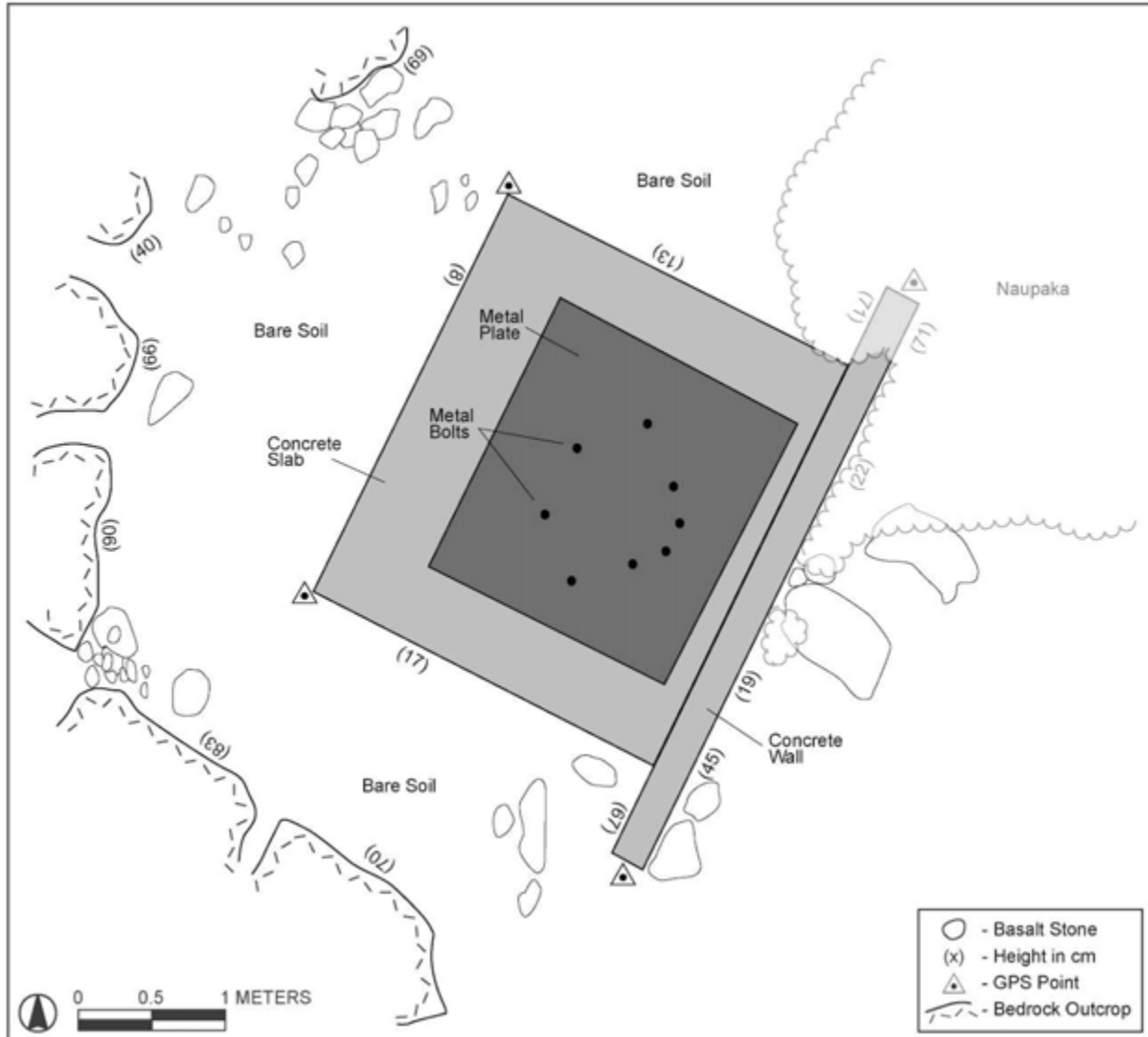


Figure 43. Plan view of Site 50-30-11-2088 (CSH 6)



Figure 44. Site 50-30-11-2088 (CSH 6), view east

4.2.6 Site 50-30-11-2089 (CSH 7)

SITE TYPE: Mounds
FUNCTION: Possible burial
FEATURES: 2
DIMENSIONS: Approx. 14.3 m x 5.7 m
CONDITION: Good
PROBABLE AGE: Historic
TAX MAP KEY: [4] 3-5-01: 102
UTM COORDINATES: NAD 83 UTM Zone 4 N
465750.09 mE 2428372.4 mN

DESCRIPTION:

Site 50-30-11-2089 consists of two mounds separated by a bulldozed push pile (Figure 45-Figure 47). The mounds are constructed of smaller basalt cobbles and are more tightly stacked, differentiating them from the push pile of other cobbles and boulders in the area. Mound A measures 2.0 m north-south by 2.3 m east-west and is constructed of small boulders and large cobbles stacked three-to-five courses high, with a maximum height of 0.51 m. The north end of the mound is faced, while other portion slopes gently south. The style of construction indicates Mound A is likely a burial, but because it's relatively small size, may be a pet burial or that of a small child.

Mound B is located 9.7 m east of Mound A and consists of an L-shaped mound measuring 5.4 m north-south by 1.4 m east-west. The north end of the mound is constructed on a large bedrock boulder. The mound itself is constructed of large cobbles and a few smaller boulders stacked two-to-six courses high to a maximum height of 0.81 m. The cobbles of Mound B are smaller than those observed in the push pile, but are not as tightly stacked as Mound A. This indicates the feature is likely a clearance mound. Site 50-30-11-2089 is located under a canopy of ironwood trees approximately 15 m west of the *makai* project alignment and 30 m east of the *mauka* project alignment, and is approximately 40 m from the ocean.



Figure 45. Plan view of Site 50-30-11-2089 (CSH 7)



Figure 46. Site 50-30-11-2089 (CSH 7), Mound A, view west



Figure 47. Site 50-30-11-2089 (CSH 7), Mound B, view northeast

4.2.7 Site 50-30-11-2090 (CSH 8)

SITE TYPE: Foundation
FUNCTION: gun emplacement
FEATURES: 3
DIMENSIONS: Approx. 14 m x 10 m
CONDITION: Good
PROBABLE AGE: Historic
TAX MAP KEY: [4] 3-5-01: 102
UTM COORDINATES: NAD 83 UTM Zone 4 N
465834.71 mE 2428532.68 mN

DESCRIPTION:

Site 50-30-11-2090 is an artillery gun emplacement likely related to World War II military infrastructure (Figure 48-Figure 50). The gun emplacement consists of three features: Feature A is a circular concrete base measuring 2.48 m in diameter by 0.84 m high. There is a smaller circular concrete base in the center of the larger base which measures 1.88 m in diameter by 0.11 m high. A modern fire pit is present on the southeastern side of Feature A. Features B and C are curved concrete walls of identical construction present on the northeast and southwest sides of Feature A. Feature B, located approximately 4 m northeast of Feature A, measures 4.15 m long by 0.93 m thick by 0.92 m high. Feature C, located approximately 3 m southwest of Feature A, measures 4.0 m long by 0.92 m thick by 1.22 m high. Both walls have a metal track embedded on top which is mostly eroded away. Features B and C may have originally been one complete structure, however, it appears the northwest part of the structure has been bulldozed and partially buried. Artifacts observed on site include rusty nails and miscellaneous pieces of corroded metal. Vegetation observed in the area includes *naupaka*, *milo*, ironwood trees, and wild spinach. Site 50-30-11-2090 is located approximately 12 m east of the *makai* project alignment.

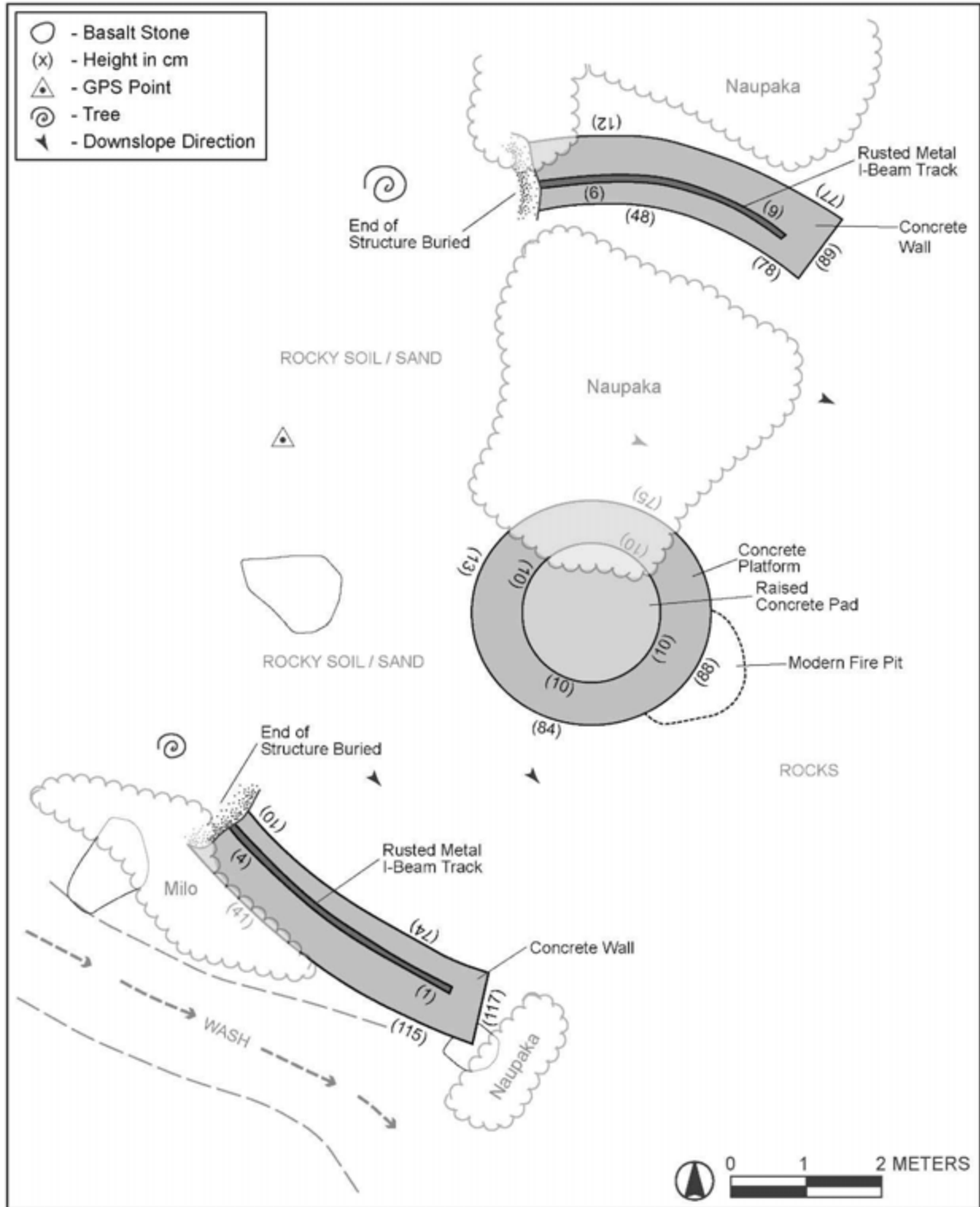


Figure 48. Plan view of Site 50-30-11-2090 (CSH 8)



Figure 49. Site 50-30-11-2090 (CSH 8), view northwest



Figure 50. Site 50-30-11-2090 (CSH 8), view northeast

4.2.8 Site 50-30-11-2091 (CSH 9)

SITE TYPE: Foundation
FUNCTION: Habitation
FEATURES: 2
DIMENSIONS: Approx. 6.3 m x 3.1 m
CONDITION: Fair
PROBABLE AGE: Historic
TAX MAP KEY: [4] 3-5-01: 102
UTM COORDINATES: NAD 83 UTM Zone 4 N
465796.31 mE 2428672.71 mN

DESCRIPTION:

Site 50-30-11-2091 is a concrete building foundation measuring 6.3 m east-west by 3.1 m north-south (Figure 51-Figure 53). The foundation appears to be the remains of a small, one-bedroom house. Partial walls are still present and consist of formed concrete. Rooms observed include a larger room with a drain pipe that was likely a living room/ kitchen combination, a smaller bedroom with closet, and a bathroom or smaller bedroom. A depression is present approximately 5 m southeast of the foundation and measures 2.9 m northeast-southwest by 2.4 m northwest-southeast. The depression is 0.77 m deep. Its depth and proximity to the structure indicate it is likely the remains of an outhouse. Marine midden, consisting of *Cellana sp.*, and roofing material were observed on site. Site 50-30-11-2091 is located in a level area surrounded by ironwood trees approximately 62 m west of the *makai* project alignment and 23 m east of the *mauka* project alignment.

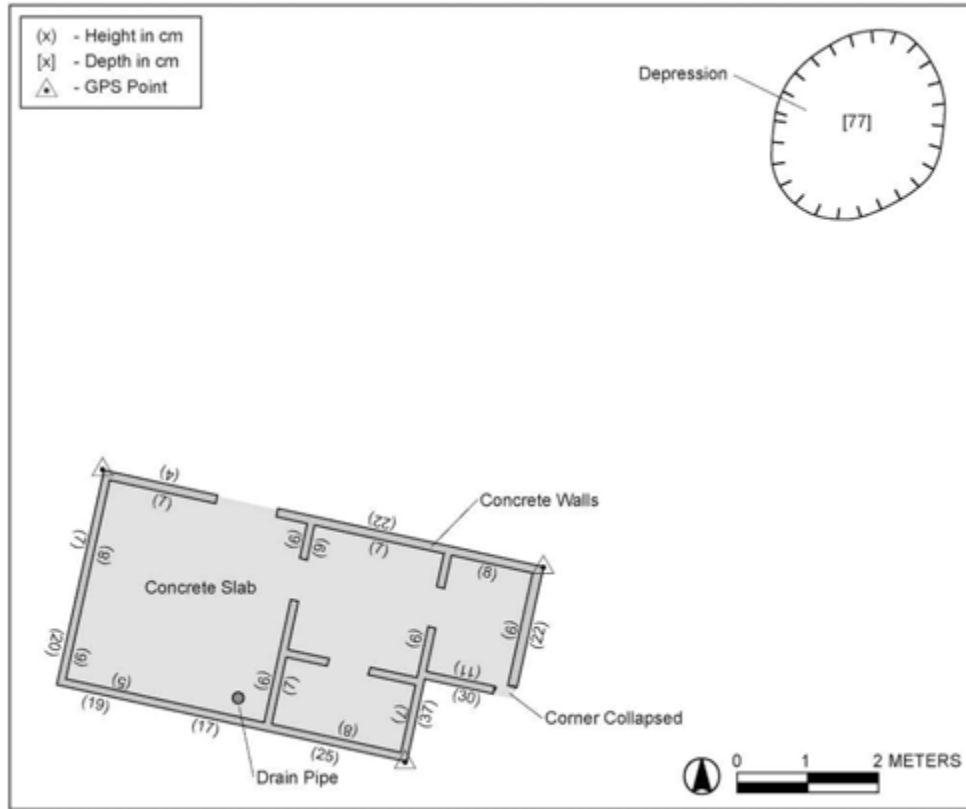


Figure 51. Plan view of Site 50-30-11-2091 (CSH 9)



Figure 52. Site 50-30-11-2091 (CSH 9), building foundation, view southeast.



Figure 53. Site 50-30-11-2091 (CSH 9), depression, view northeast

4.2.9 Site 50-30-11-2092 (CSH 10)

SITE TYPE: Foundation
FUNCTION: Outhouse and cesspool
FEATURES: 1
DIMENSIONS: Approx. 8.9 m x 4.1 m
CONDITION: Fair
PROBABLE AGE: Historic
TAX MAP KEY: [4] 3-5-01: 102
UTM COORDINATES: NAD 83 UTM Zone 4 N
465805.14 mE 2428741.17 mN

DESCRIPTION:

Site 50-30-11-2092 is the remains of an outhouse and cesspool connected by a shallow ditch (Figure 54-Figure 56). The cesspool is located at the northern end of the site and measures 4.0 m northwest-southeast by 3.1 m northeast-southwest by 2.2 m deep. A total of three large concrete slabs are present in the depression, which are likely collapsed walls of the original structure. A shallow ditch is present at the southwest end of the cesspool which measures 3.5 m long by 1.0 m wide and connects to the outhouse remains, which are approximately 3.5 m southeast of the cesspool. The ditch varies in depth between 0.41 m at its northwest end and 0.27 m at its southeast end. The outhouse remains consist of a smaller, rectangular-shaped depression measuring 1.5 m northwest-southeast by 1.7 m northeast-southwest by 0.42 m deep. Fragments of roofing material were observed on site, however no other artifacts or cultural materials were identified. The site is located in a leveled area under a canopy of ironwood trees approximately 50 m west of the *makai* project alignment and 23 m east of the *mauka* project alignment.

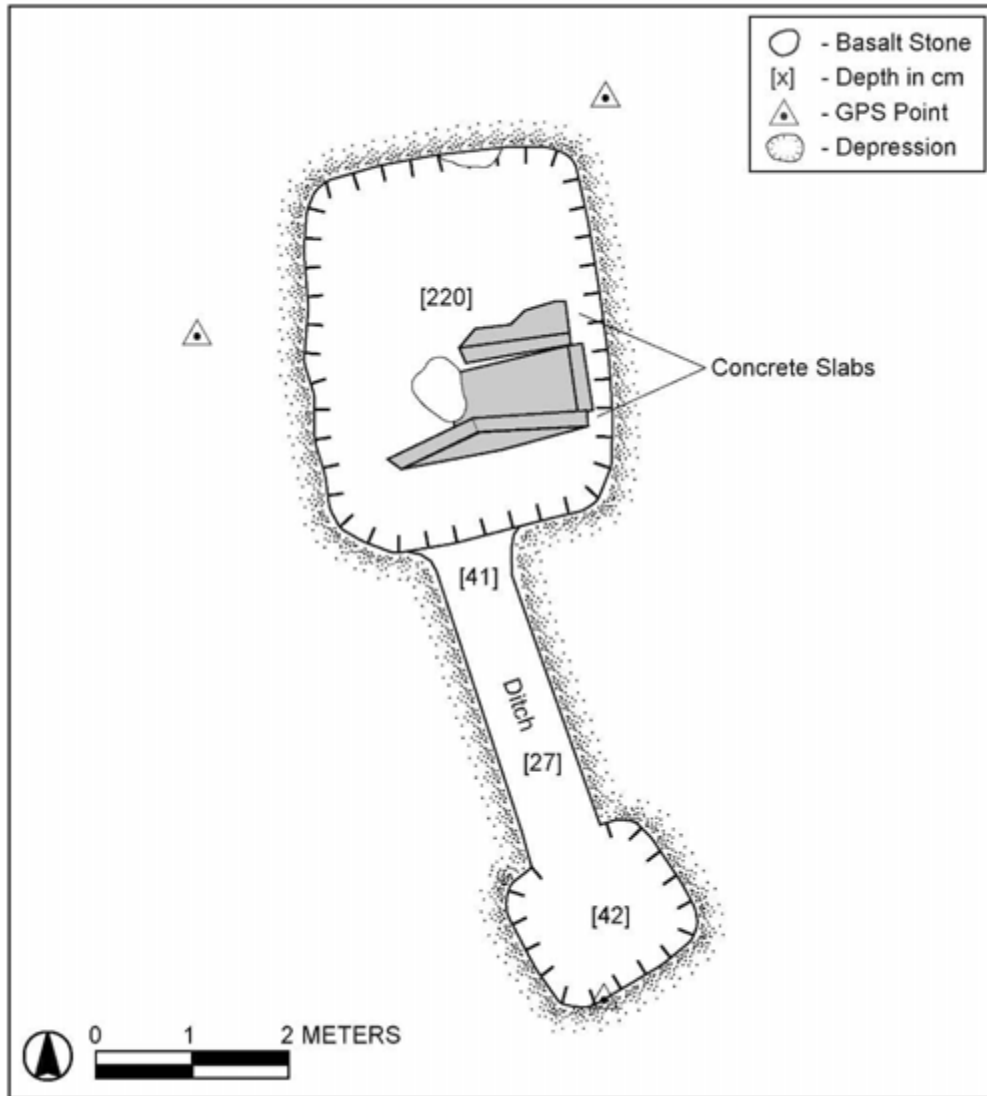


Figure 54. Plan view of Site 50-30-11-2092 (CSH 10)



Figure 55. Site 50-30-11-2092 (CSH 10), ditch and outhouse, view north



Figure 56. Site 50-30-11-2092 (CSH 10), cesspool, view east

4.2.10 Site 50-30-11-2093 (CSH 11)

SITE TYPE: Ditch
FUNCTION: Drainage
FEATURES: 1
DIMENSIONS: Approx. 61.7 m long
CONDITION: Good
PROBABLE AGE: Historic
TAX MAP KEY: [4] 3-5-01: 102
UTM COORDINATES: NAD 83 UTM Zone 4 N
465832.63 mE 2429233.00 mN

DESCRIPTION:

Site 50-30-11-2093 is a plantation-era, earthen drainage ditch measuring 61.7 m long and running roughly east-west (Figure 57 and Figure 58). This is likely a secondary ditch that may have originally connected to the main plantation ditch, which is present farther west, outside of the current project area. A portion of Site 50-30-11-2093 has been buried by a dirt road which allows for shore access, however, the ditch continues east, beyond the dirt road, and terminates approximately 15 m west of the ocean. The ditch width and depth vary from 0.60 m to 1.6 m wide and 0.48 to 0.60 m deep. Topography in the area is level-to-gently sloping and vegetation consists of *naupaka*, ironwood trees, *'ilima*, *pa'uohi'iaka*, and various types of grasses. The site is located approximately 46 m west of the *makai* project alignment and 22 m east of *mauka* project alignment



Figure 57. Site 50-30-11-2093 (CSH 11), view east



Figure 58. Site 50-30-11-2093 (CSH 11), view west

4.2.11 Site 50-30-11-2094 (CSH 12)

SITE TYPE: Terrace
FUNCTION: Habitation
FEATURES: 1
DIMENSIONS: Approx. 6.2 m x 5.0 m
CONDITION: Poor
PROBABLE AGE: Pre-contact
TAX MAP KEY: [4] 3-5-01: 102
UTM COORDINATES: NAD 83 UTM Zone 4 N
465840.71 mE 2429485.8 mN

DESCRIPTION:

Site 50-30-11-2094 is a pre-contact habitation site consisting of a terrace measuring 6.2 northeast-southwest by 5.0 m northwest-southeast (Figure 59-Figure 63). The terrace is constructed of basalt cobbles and boulders stacked one-to-two courses high to a maximum height of 0.35 m. The level interior surface of the terrace consists of soil with loose boulders and cobbles scattered throughout. A single *Cellana sp.* shell and a fragment of coral were observed in the northwestern portion of the interior surface, and a concentration of *Cellana sp.* marine shell was observed in the southern portion of the site, just south of the terrace. Modern trash and rusted metal were also observed on site. A modern firepit constructed of large basalt cobbles is present in the northeast portion of the site. Store bought charcoal was observed in the interior of the firepit. A total of 29 holes were also observed, drilled into the bedrock surrounding the site; their function is unknown. The topography in the area is level-to-gently sloping and vegetation consists of *naupaka*, ironwood trees, *'ilima*, *pa'uohi'iaka*, and various types of grasses.

Subsurface testing was conducted in the northwestern portion of the terrace to determine the extent of cultural material present. No significant cultural material was recovered. The style of construction, as well as the lack of significant cultural material present, indicates this site was likely used as a temporary habitation. Site 50-30-11-2094 is located approximately 5 m southeast of the *makai* project alignment.

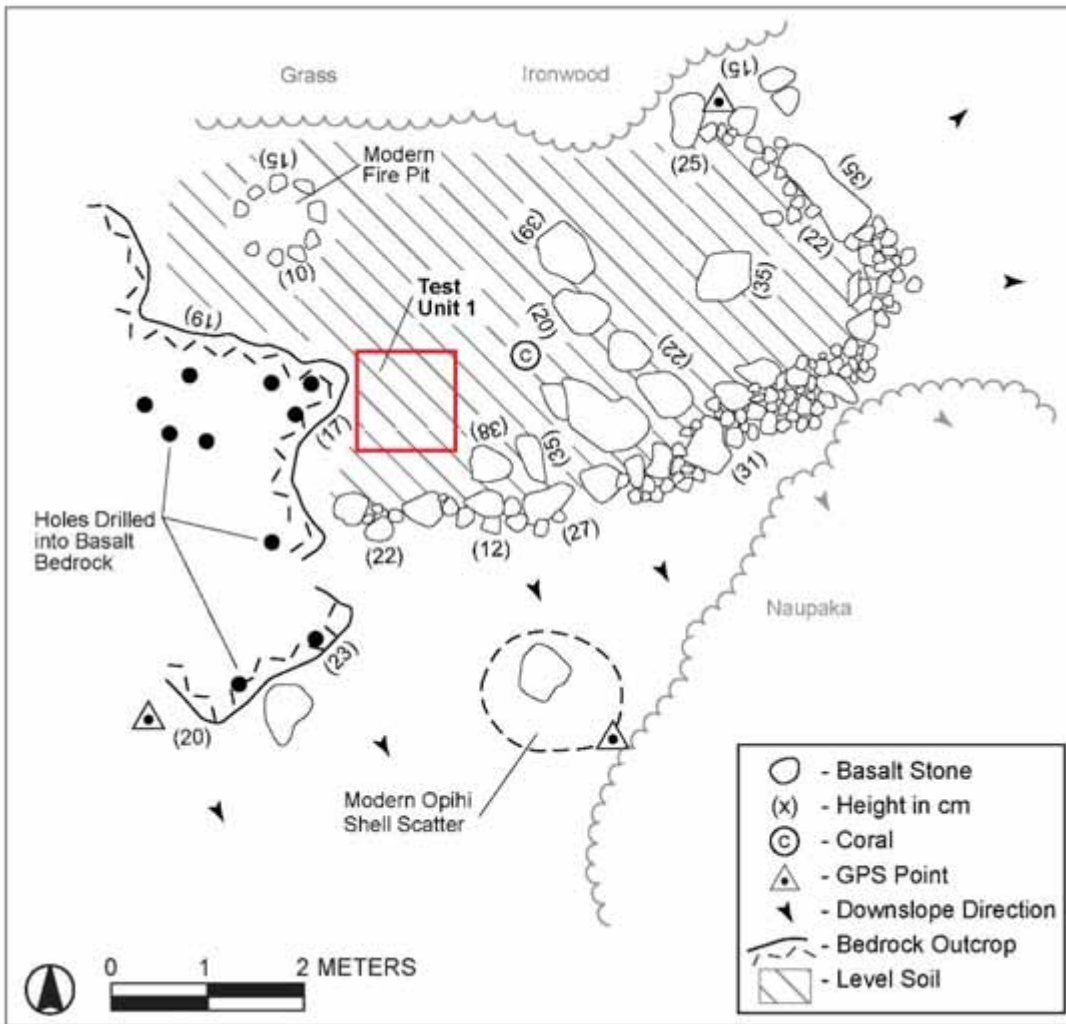


Figure 59. Plan view of Site 50-30-11-2094 (CSH 12)

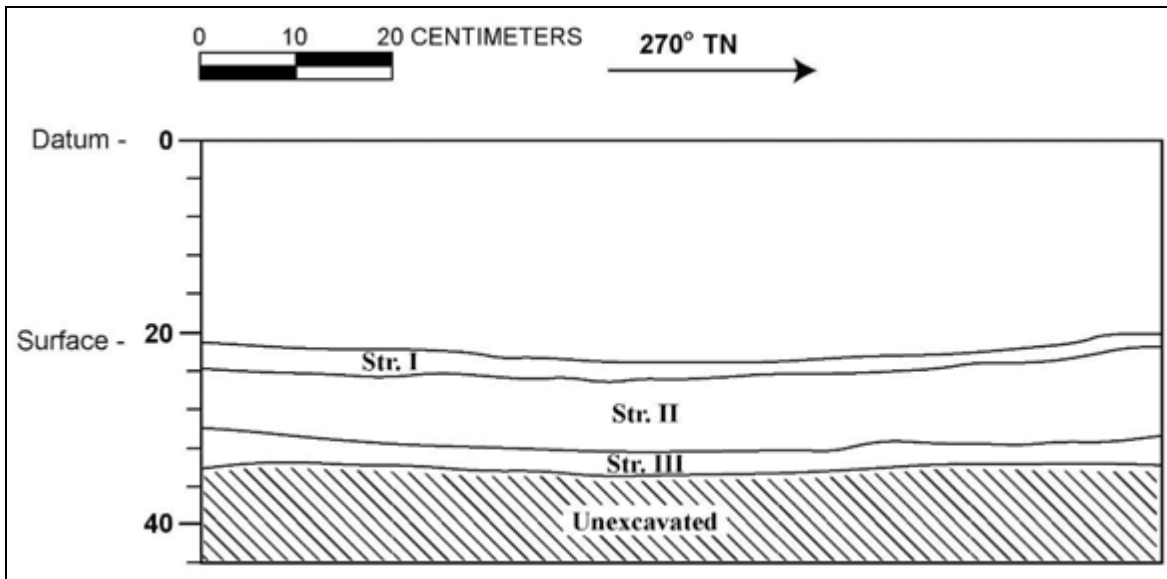


Figure 60. Profile of the south wall of Test Unit 1, Site 50-30-11-2094 (CSH 12)



Figure 61. Site 50-30-11-2094 (CSH 12), Test Unit 1, post-excavation, view north



Figure 62. Site 50-30-11-2094 (CSH 12), Test Unit 1, south wall profile



Figure 63. Site 50-30-11-2094 (CSH 12), view northeast

4.2.12 Site 50-30-11-2095 (CSH 13)

SITE TYPE: Scatter
FUNCTION: Activity area
FEATURES: 1
DIMENSIONS: Approx. 5.1 m x 2.6 m
CONDITION: Good
PROBABLE AGE: Pre-contact
TAX MAP KEY: [4] 3-5-01: 102
UTM COORDINATES: NAD 83 UTM Zone 4 N
465804.75 mE 2429765.59 mN

DESCRIPTION:

Site 50-30-11-2095 is a scatter of cultural material measuring 5.1 m north-south by 2.6 m east-west (Figure 64-Figure 68). Cultural material observed on the surface includes marine shell midden consisting of Patellidae, Neritidae, Thaididae, Conidae, *Cellana sp.*, and *Cypraea sp.* Basalt cobbles and pebbles were also observed on the site surface. Subsurface testing was conducted to determine the extent of cultural material present. Approximately 18 kg of shell midden was systematically collected from the unit along with .7 kg of charcoal, which was recovered from Stratum IIb. Midden was present on the surface and extended through to a cultural layer (IIb) which was present from approximately 32 to 44 cmbs. The cultural layer contained a strong ash lens, along with a substantial amount of marine shell midden, however no defining firepit was identified. No other artifacts or features were observed on site.

The topography in the area is gently sloping and vegetation consists of *naupaka*, ironwood trees, *'ilima*, *pa'uohi'iaka*, and various types of grasses. Site 50-30-11-2095 is located approximately 7 m east of the *makai* project alignment.

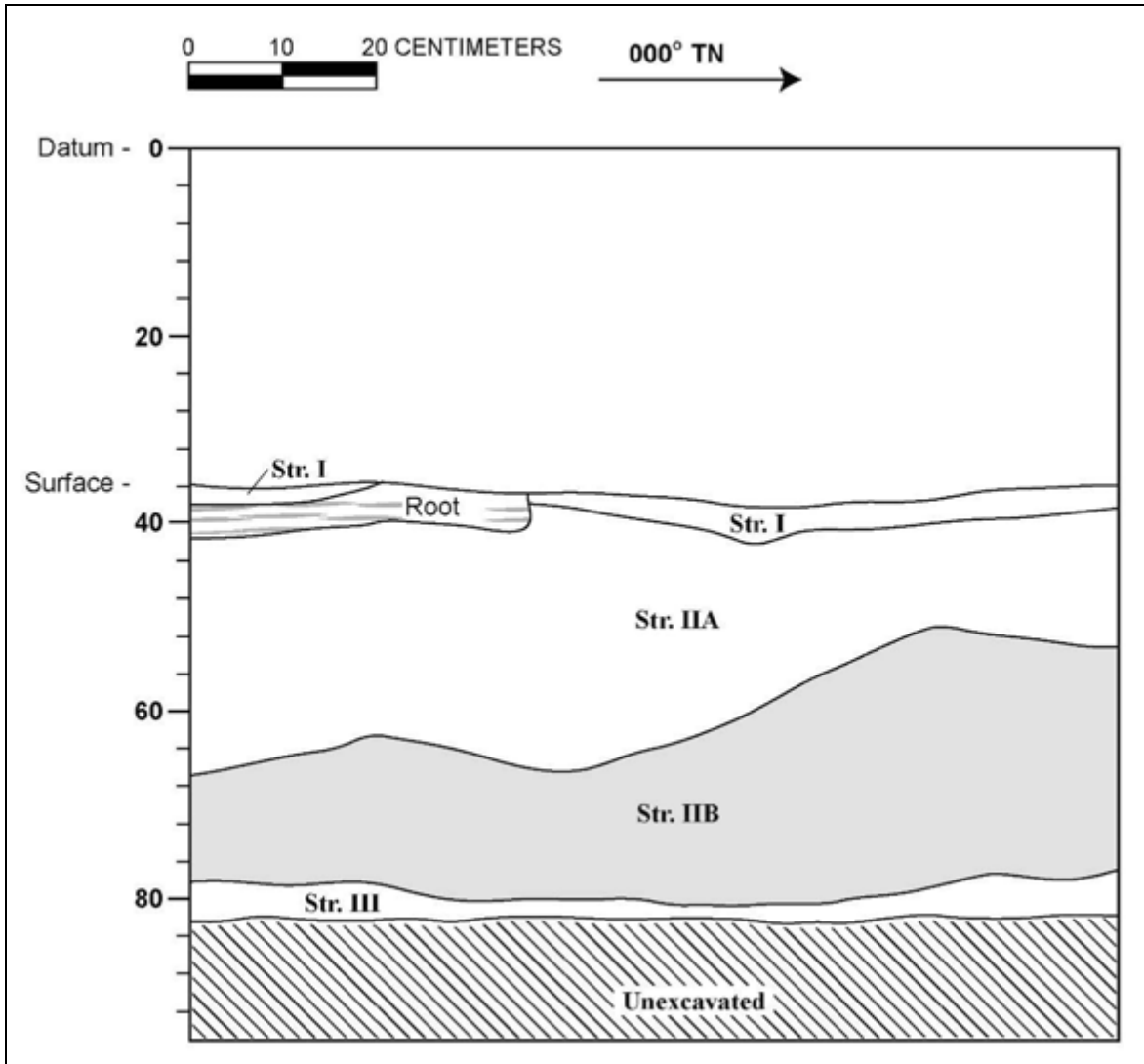


Figure 64. Profile of the west wall of Test Unit 1, Site 50-30-11-2095 (CSH 13)



Figure 65. Site 50-30-11-2095 (CSH 13), Test Unit 1 pre-excavation, view south



Figure 66. Site 50-30-11-2095 (CSH 13), Test Unit 1 post-excavation, view north



Figure 67. Site 50-30-11-2095 (CSH 13), Test Unit 1, profile of west wall



Figure 68. Site 50-30-11-2095 (CSH 13), view south

4.2.13 Site 50-30-11-2096 (CSH 14)

SITE TYPE: Ditch
FUNCTION: Drainage
FEATURES: 1
DIMENSIONS: Approx. 20.20 m x 0.38 m
CONDITION: Excellent
PROBABLE AGE: Historic
TAX MAP KEY: [4] 3-5-01: 8
UTM COORDINATES: NAD 83 UTM Zone 4 N
 465839.04 mE 2431788.97 mN

DESCRIPTION:

Site 50-30-11-2096 is a concrete ditch measuring 20.20 m long by 0.38 m wide and running in a northwest-southeast direction (Figure 69 and Figure 70). The concrete contains a large amount of gravel and small cobbles. No cultural material was observed, however a good amount of modern trash was present during recording. Because of its size and style of construction, the ditch is likely the remnant of a residential structure and may be related to the Ahukini Plantation Camp.

The ditch is located on level-to-gently sloping topography and is approximately 10 m west of the ocean and 10 m east of the *makai* project alignment. Vegetation observed includes *naupaka*, ironwood trees, *'ilima*, *pa'uohi'iaka*, and various types of grasses.

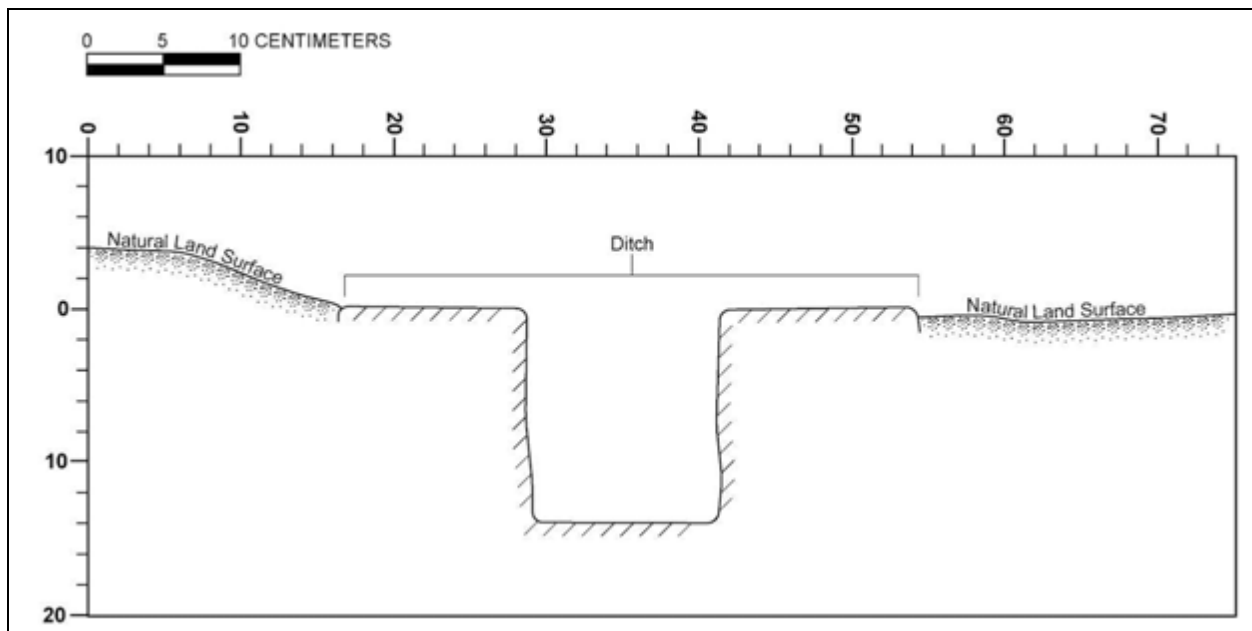


Figure 69. Plan view of Site 50-30-11-2096 (CSH 14)



Figure 70. Site 50-30-11-2096 (CSH 14), view east

4.2.14 Site 50-30-11-2097 (CSH 15)

SITE TYPE: Ditch
FUNCTION: Drainage
FEATURES: 1
DIMENSIONS: Approx. 15.10 m x 0.55 m
CONDITION: Excellent
PROBABLE AGE: Historic
TAX MAP KEY: [4] 3-5-01: 8
UTM COORDINATES: NAD 83 UTM Zone 4 N
 465863.95 mE 2431800.81 mN

DESCRIPTION:

Site 50-30-11-2097 is a concrete ditch measuring 15.10 m long by 0.55 m wide by 0.15 m deep and running in a northwest-southeast direction (Figure 71 and Figure 72). The concrete contains a large amount of gravel and small cobbles. A lip is present on the exterior of both sides of the ditch indicating a cover may have been present at one time. No cultural material was observed, however a good amount of modern trash was present during recording. Because of its size and style of construction, the ditch is likely the remnant of a residential structure and may be related to the Ahukini Plantation Camp.

The ditch is located on level-to-gently sloping topography and is approximately 10 m west of the ocean and 15 m east of the *makai* project alignment. Vegetation observed includes *naupaka*, ironwood trees, *'ilima*, *pa'uohi'iaka*, and various types of grasses.

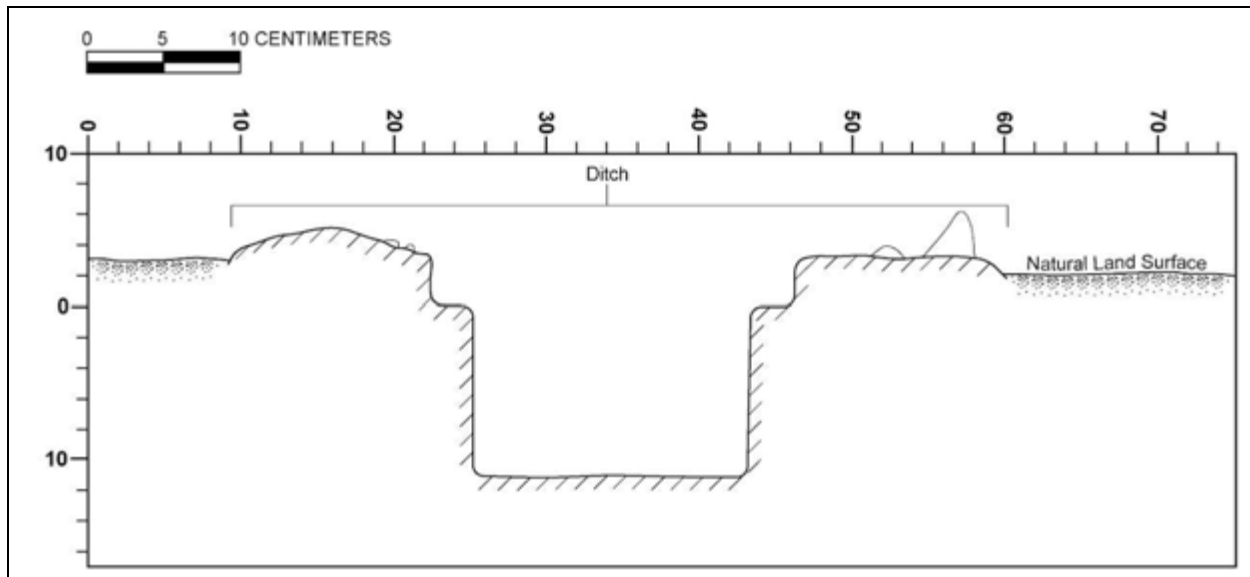


Figure 71. Plan view of Site 50-30-11-2097 (CSH 15)



Figure 72. Site 50-30-11-2097 (CSH 15), view east

4.2.15 Site 50-30-11-2103 (CSH 16)

SITE TYPE: Complex
FUNCTION: Transportation
FEATURES: 5
DIMENSIONS: Approx. 70 m N-S by 90 m E-W
CONDITION: Remnant
PROBABLE AGE: Historic
TAX MAP KEY: [4] 3-5-01: 159
UTM COORDINATES: NAD 83 UTM Zone 4 N
465628.34 mE 2431754.15 mN

DESCRIPTION:

Site 50-30-11-2103 consists of five features related to the historic industrial complex near Ahukini Landing (Figure 73). The complex was built to support Ahukini Landing and also housed Standard Oil, which supplied petroleum-based products to the eastern half of Kaua'i in the first part of the 20th century. The features present are in remnant condition and consist of concrete slabs and walls. Features A-D are present on the 1927 Sanborn fire Insurance map (Figure 74) and 1953 aerial photo (Figure 75), while Feature E is notably absent from the Sanborn Fire Insurance map, but appears in the 1953 aerial photo as two rectangular structures resembling warehouses.



Figure 73. 2009 Google Earth aerial photo showing the location of SIHP # 50-30-11-2103

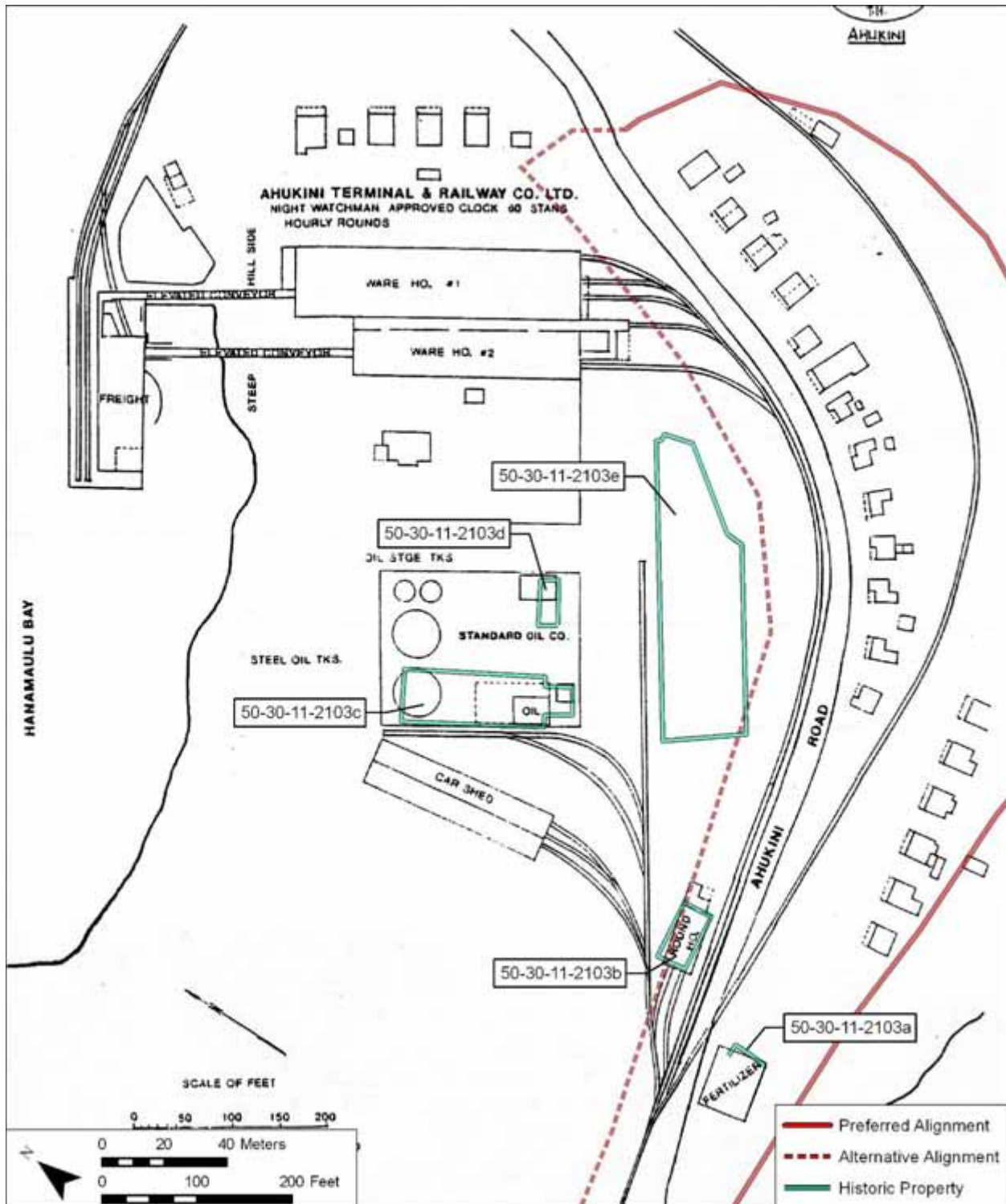


Figure 74. 1927 Sanborn Fire Insurance map with Site 50-30-11-2103 and current project area overlay

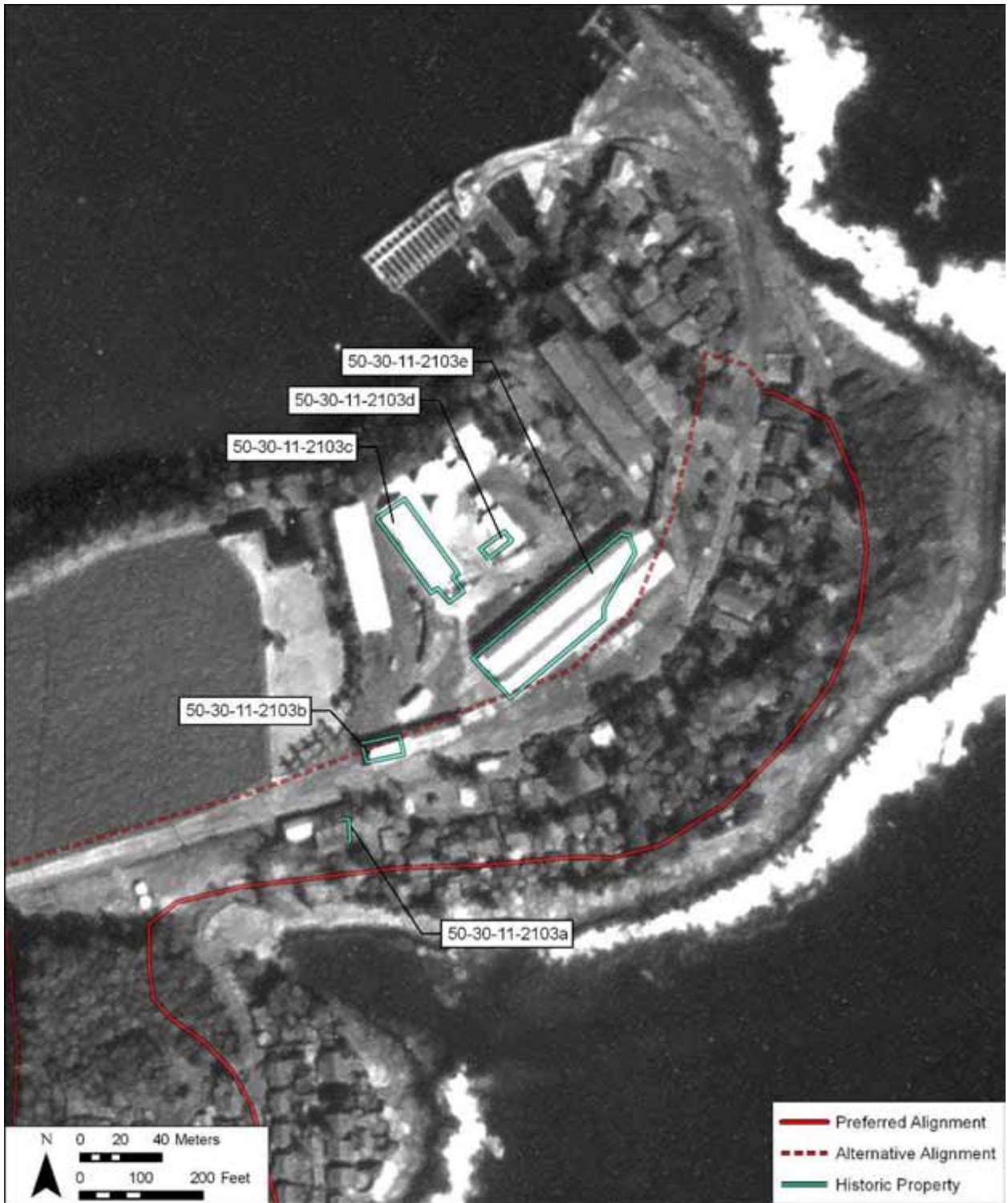


Figure 75. 1953 aerial photo of Site 50-30-11-2103 (R.M. Towill Corporation)

Feature A is the remnants of a fertilizer storage facility (see Figure 73 and Figure 74; Figure 76-Figure 78). Most of the structure was absent at the time of documentation. All that remained were portions of the north and east walls, and part of the platform. The platform and partial wall measured approximately 18.3 m long on the north side. The wall remnants were between 20 and 30 cm thick. No other defining characteristics were present. Feature A was overgrown by *haole koa*, vines, and exotic grasses at the time of documentation. The preferred project alignment passes just south of this foundation remnant.

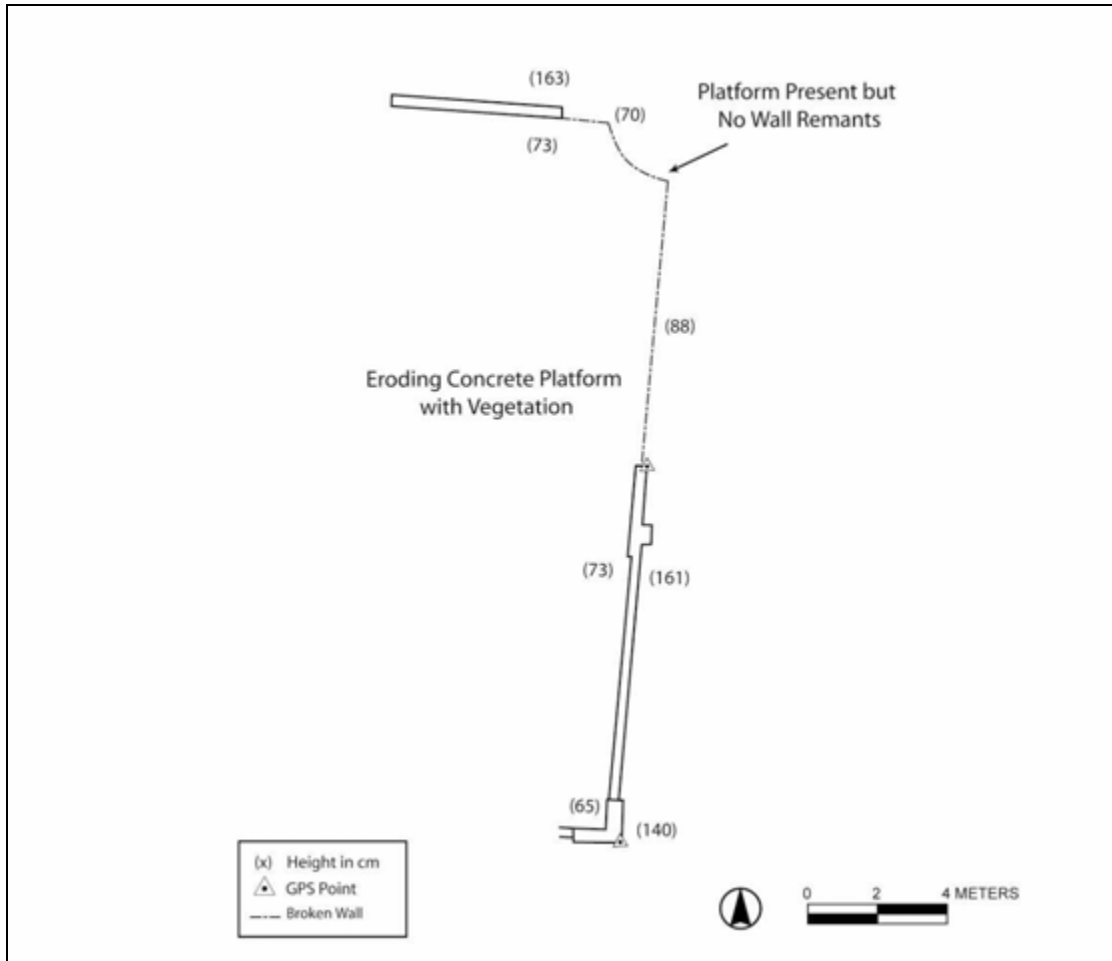


Figure 76. Site 50-30-11-2103 Feature A, remnants of fertilizer storage facility



Figure 77. Site 50-30-11-2103, Feature A, view southwest



Figure 78. Site 50-30-11-2103, Feature A, view north

Feature B is the remnants of a building foundation labeled a roundhouse on the 1927 Sanborn Fire Insurance map (see Figure 73 and Figure 74; Figure 79-Figure 81). The foundation footprint is intact and elevated above the current ground surface. A trough is present in the south-central portion of the foundation, and remnants of steps are also visible. Wooden blocks are bolted to the south-central portion of the foundation, between the trough and the south wall. They appear to be sections of railroad ties; however their original function is unknown. While Feature B is labeled a roundhouse on the Sanborn Fire Insurance map, no railroad tracks or other diagnostic features were observed during site documentation. The foundation was partially overgrown by vines and exotic grasses. The alternative project alignment passes through the northern side of the foundation remnant.

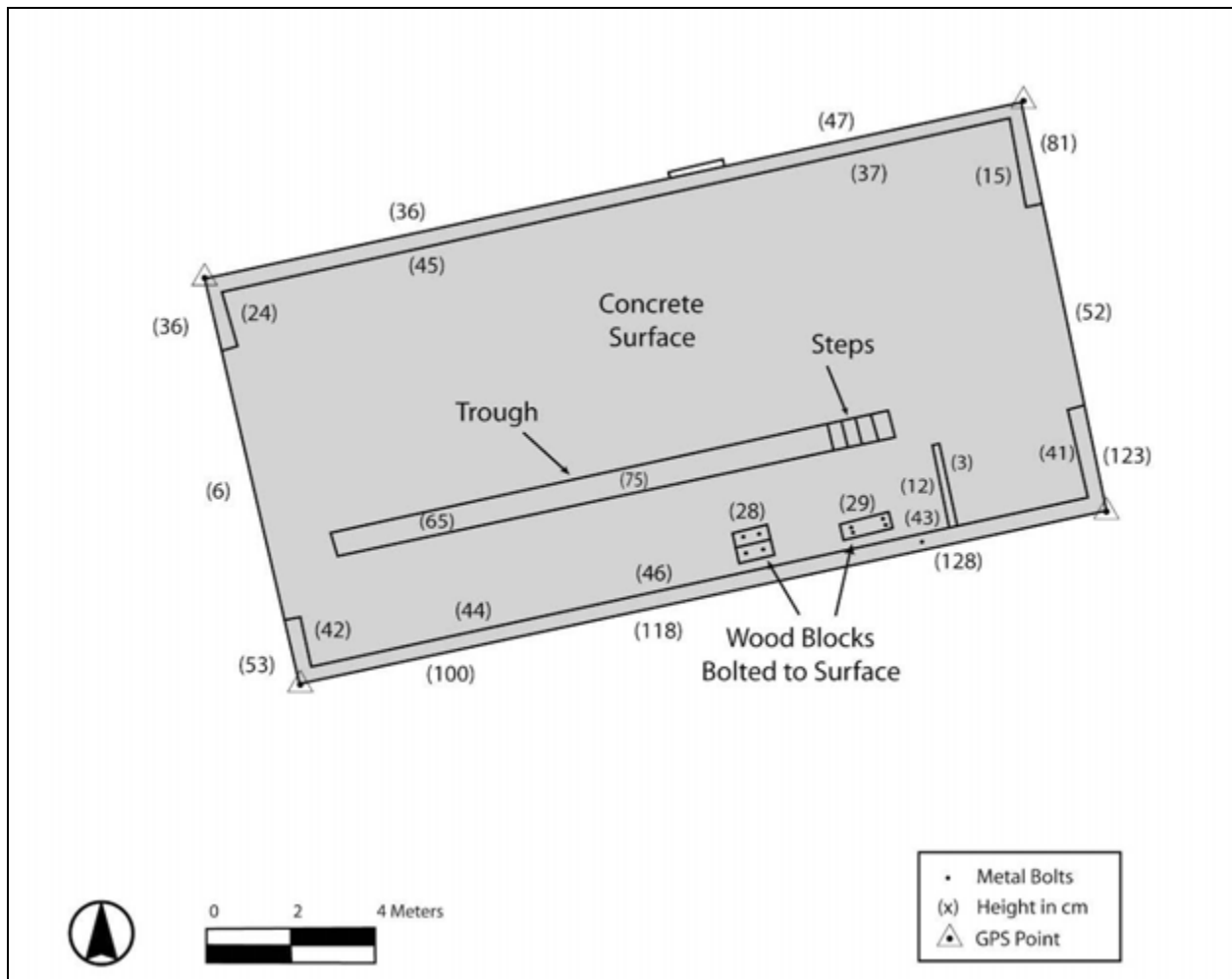


Figure 79. Site 50-30-11-2103, Figure B, roundhouse foundation



Figure 80. Site 50-30-11-2103 Feature B, roundhouse foundation remnant; view northwest



Figure 81. Site 50-30-11-2103 Feature B, trough; view east

Feature C is a remnant of the Standard Oil storage facility present on the 1927 Sanborn Fire Insurance map (see Figure 73 and Figure 74; Figure 82-Figure 84). The foundation consists of two concrete slabs. The northeastern slab is smaller and elevated approximately 12 cm higher than the southwestern slab. The northeastern slab measures approximately 2 m NE-SW by 6 m NW-SE. The adjacent southwestern slab is flush with current ground surface and measures approximately 11 m NE-SW by 6 m NW SE. There are no additional defining characteristics of this feature.

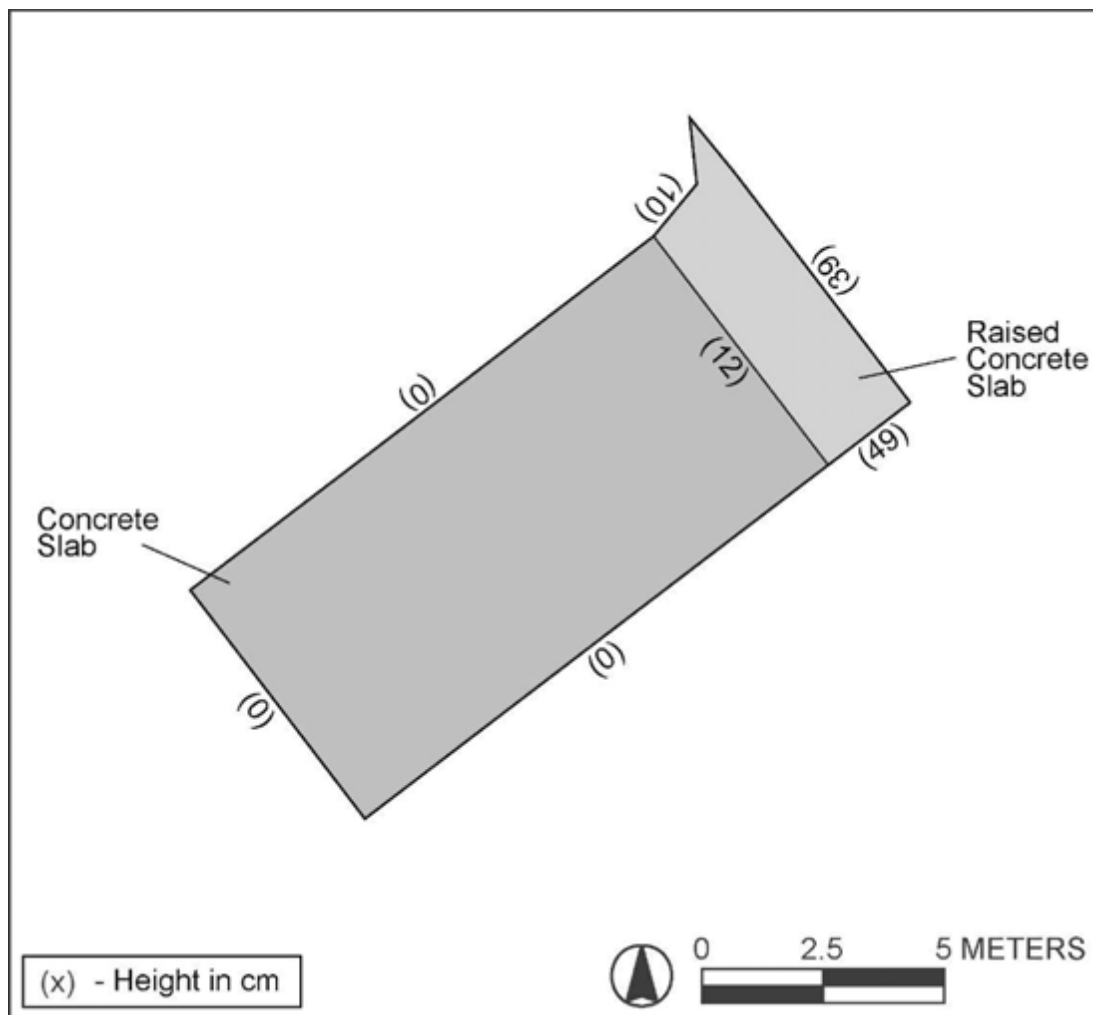


Figure 82. Site 50-30-11-2103, Feature C, remnant of Standard Oil storage facility



Figure 83. Site 50-30-11-2103, Feature C, view northeast



Figure 84. Site 50-30-11-2103, Feature C, view northwest

Feature D is also a remnant of the Standard Oil storage facility on the 1927 Sanborn Fire Insurance map (see Figure 73 and Figure 74; Figure 85-Figure 87). The foundation remnant consists of two adjacent concrete pads, is overgrown by low grasses, and appears to be eroding in some portions. Gravel and asphalt are present along the northeastern side of the larger concrete pad and there are two sections of embedded metal footing remnants on the southwestern side. Gravel and asphalt is also present on the northwestern side of the smaller concrete pad. The larger concrete pad of Feature D measures approximately 45.0 m NW-SE by 12.5 m NE-SW, while the smaller adjacent concrete pad measures approximately 8.5 M NW-SE by 7.0 m NE – SW. No other defining characteristics were observed.

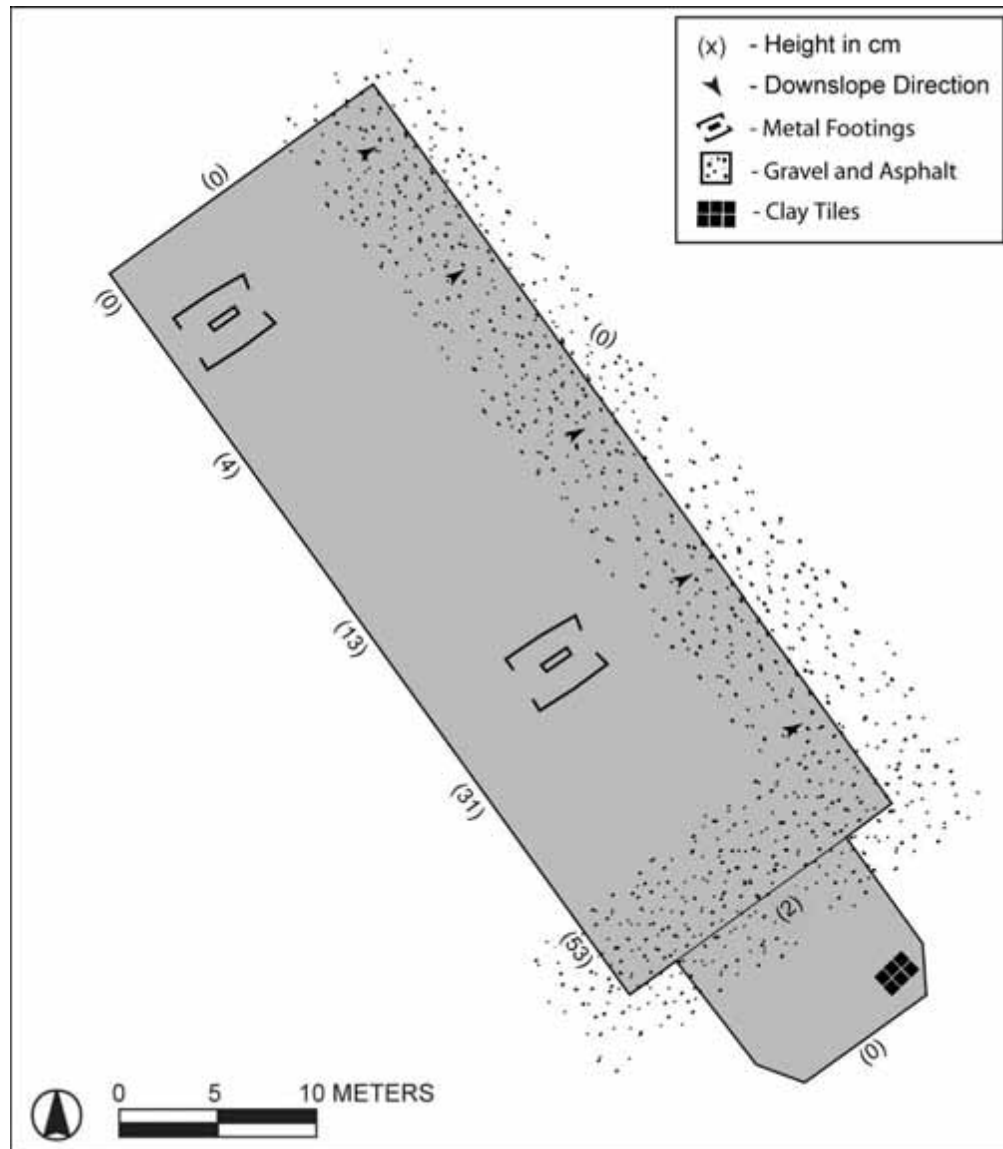


Figure 85. Site 50-30-11-2103, Feature D, remnant of Standard Oil storage facility



Figure 86. Site 50-30-11-2103, Feature D, view northwest



Figure 87. Site 50-30-11-2103, Feature D, raised concrete foundation; view northwest

Feature E is the remnants of three sets of narrow gauge tracks imbedded in a concrete slab that is flush with the current ground surface (see Figure 73; Figure 88-Figure 90). This feature appears in the 1953 aerial photo as two rectangular structures resembling warehouses (see Figure 75). The concrete slab is eroding away and appears to be sediment in some places. No berm or railroad ties are present. The track sets are placed approximately 84 cm apart and the tracks themselves are 12 cm thick. The slab measures approximately 95 m NE-SW by 27 m NW-SE. No other defining characteristics were observed. The alternative project alignment passes through the southeastern corner of the concrete slab.

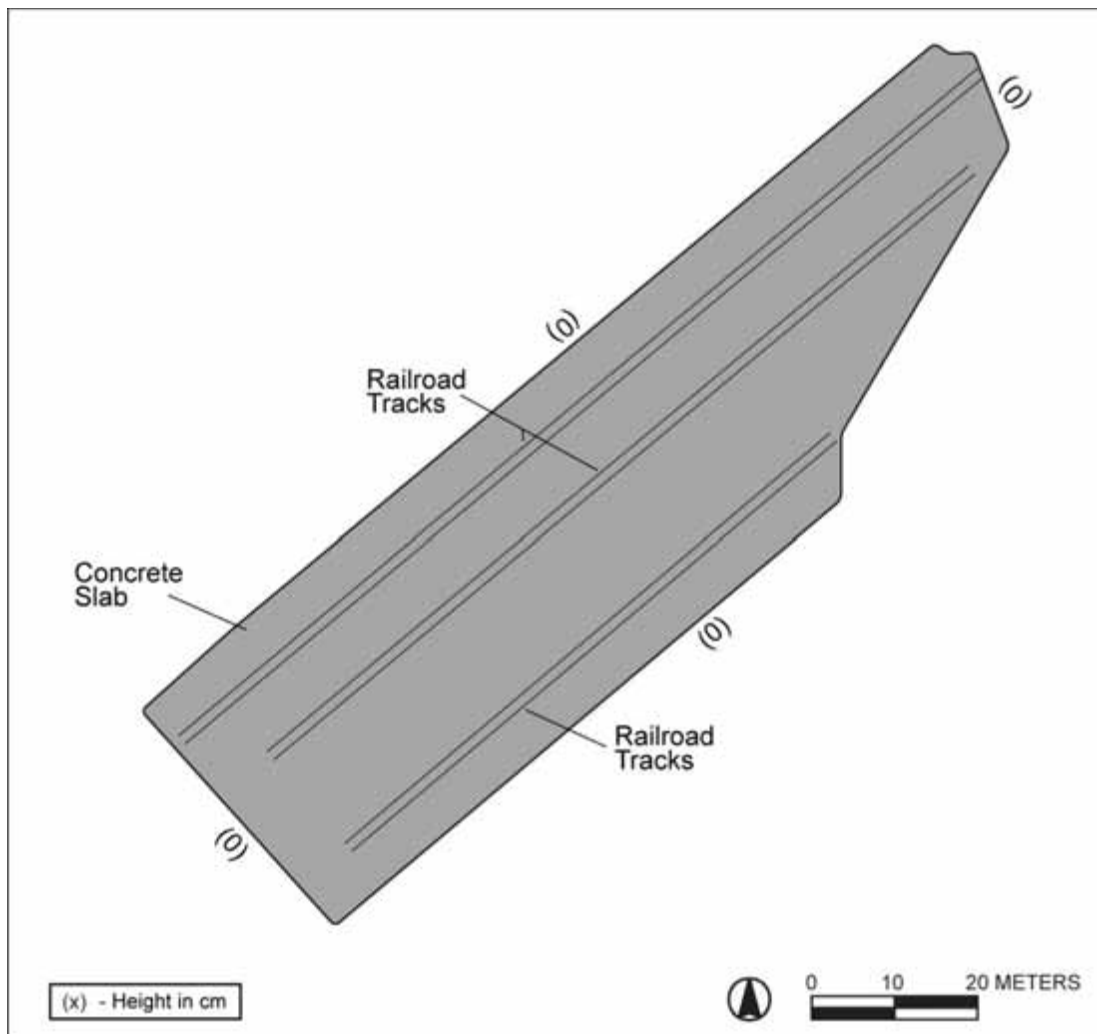


Figure 88. Site 50-30-11-2103, Feature E, railroad track remnants



Figure 89. Site 50-30-11-2103 Feature E, view northeast



Figure 90. Site 50-30-11-2103 Feature E, railroad tracks; view northeast

Section 5 Results of Laboratory Analysis

5.1 Site 50-30-11-2095 Shell Midden Analysis

The analysis of faunal and floral remains (midden) from archaeological sites may yield data on environment utilization, specialized economic activity, diet, and customs. The midden herein analyzed contained a range of marine invertebrate remains (including sea shells, sea urchins, mussels, and crabs), and the bones of a variety of fish, rodents, and chicken. Charcoal was present but not included in the midden analysis. The results of analysis on all midden recovered during testing is discussed below. Appendix B reports midden weights by taxonomic categories.

All excavated sediments from culture-bearing strata of Site 50-30-11-2095 were sifted through 1/4" screens. Midden was collected by 10 cm depth increments and stratum. The sheer abundance of midden collected from the unit required special procedures for laboratory analysis. A total of 13855.2 grams (30.5 lbs.) of midden was retained and was more than enough to characterize the marine exploitation strategies and the concentration of midden present at this site.

It was decided after a perusal of the material that little would be learned from sorting and identifying all of the midden. Midden was divided by quadrant and depth. The northwest and southwest quadrants were sorted completely. All midden from these two quadrants was classified and weighed by 10 cm depth increments. For the northeast and southeast quadrants, midden was sifted and examined for any taxonomic category not already represented in the assemblage, as well as artifacts. The midden from these quadrants was then weighed by 10 cm depth increments. All results are presented in Appendix B. In addition, note was made of any unusual or potentially significant species present.

Invertebrate midden represents 99.4% of the assemblage. The most common three types of marine shellfish present by weight are *Nerita picea*, *cypraea sp.*, and *drupa sp.* Other types of shellfish prominent in the assemblage include *cellana sp.*, *littorina sp.*, *conus sp.*, and Echinodermata (sea urchin). These seven types of shellfish account for approximately 90% of the assemblage. All are typically found on rocky shores in less than 4 ft (1.3 m.) of water. Shellfish types which favor sandy areas (bivalvia, *Isognomindae*) or deeper water (*Cassis cornuta* and *Charonia tritonis*) were uncommon. Thus, the shellfish species present generally indicated the traditional Hawaiian subsistence pattern of localized inshore collection. This collection was historically a function of the women and children (Handy and Pukui 1972). Particular attention was paid to the distribution of crab and other crustacean remains as these are documented (Handy and Pukui 1977:81; Valeri 1985:399) as used in ritual activity and thought to have possible status associations. Crab is present in small quantities at all depths and quadrants.

The vertebrate assemblage of Site 50-30-11-2095 was sparse and represented only .06% or 7.7 grams of the assemblage. Species of fish, rodent, and chicken were represented, however the remains were sparse and consisted of only a few scales, teeth, and bones. Of interest is one spine of a Fan Tail File Fish (*Pervagor spiloma*) present in the top layer of the western quadrant (53-63 cmbd). Faunal bone was more prevalent in the top 10 cm layer of the test unit, however it was present at all depths of the unit.

Several pieces of basalt were observed during laboratory analysis. Of these pieces only one was culturally significant and consisted of a tertiary flake with the bulb of percussion evident on the ventral side. No evidence of use or other function was observed. No other artifacts were recovered from this test unit.

Approximately 700 grams of charcoal was recovered from the test excavation. Charcoal was present at all depths in all quadrants and consisted of burned sea shell, wood, and sediment. Results of radio carbon analysis conducted from charcoal collected from this test excavation are summarized in Section 5.2.

Shell species recovered from Site 50-30-11-2095 indicate a variety of shallow water and intertidal invertebrates were collected. Because there is no other evidence indicating habitation or ritual use of the site, it was likely an activity area for shallow water marine resource exploitation. The abundance of midden and charcoal present in the test unit indicates the site was likely used repeatedly over time.

5.2 Radiocarbon Analysis

One sample from Site 50-30-11-2095 (CSH 13), Test Unit 1, Stratum II, 73-83 cmbd was submitted to Beta Analytic, Inc for radiocarbon dating analysis. The standard radiometric method was used to establish dates of use for the shell midden encountered during the test excavation. The sample (Beta-262604) yielded a date range, with a calibrated 2-sigma date of 1390 AD to 1440 AD (95%). These dates place site use firmly in the pre-contact period of Hawaiian prehistory.

Table 5. Results of radiocarbon analysis of organic material collected from Stratum II of Test Unit 1.

Trench/ Stratum	Beta Analytic ID #	Sample Material / Analytic Technique	Provenience	Conventional Radiocarbon Age	C13/C12 Ratio	Oxcal Calibrated Calendar Age (2 sigma)
Test Unit 1, Stratum II	Beta- 262604	Sediment and charcoal / Radiometric	Stratum II, 73-83 cmbd	530 +/- 40 BP	-24.8 o/oo	1390 AD-1440 AD (95%)

Section 6 Summary and Interpretation

The current archaeological inventory survey investigation identified 15 historic properties within the project area (Table 6). Pre-contact cultural resources identified include two habitation terraces, an activity area, and a possible burial mound. Historic cultural resources documented during the inventory survey include Nāwiliwili Harbor Light and associated remnants of its caretaker's structures, a World War II era military gun emplacement, two concrete ditches, one plantation era earthen ditch, two plantation era agricultural field dividers, a communications tower, two sites consisting of infrastructure related to residences, and one industrial complex .

Background research indicated the presence of five previously identified sites within the project area. Only two of these sites were relocated during the current project. Of the previously identified sites, Site 50-30-11-100, Ninini Heiau, was documented as destroyed by Thrum in the early 1900s. It is possible that some remnants of the heiau were used in the construction of walls associated with the Nāwiliwili Harbor Light complex, and this is what was documented during Hammatt's survey of 1990. The other two sites not relocated during the current inventory survey were likely destroyed by erosional processes and Hurricane 'Iniki in 1993. Both sites were pre-contact in origin and were in fair condition at the time of original documentation.

Shell midden and radio carbon analysis of Site 50-30-11-2095 indicate traditional Hawaiian subsistence practices at a very early period of 1390-1440 AD. Shell species recovered from this site indicate a variety of shallow water and intertidal marine invertebrates were exploited. The abundance of midden and charcoal present in the test unit indicates the site was likely used repeatedly over time.

The historic properties identified as part of the current inventory survey relate to pre-contact habitation and activity areas, historic agriculture, residential and commercial infrastructure, well as World War II era military infrastructure. The findings of this archaeological inventory survey support the predictive model based on background research. Extensive land alteration by historic agricultural activities has likely destroyed any previously existing pre-contact structures in the *mauka* portions of the project area. In the areas that were not heavily utilized or disturbed during historic agricultural pursuits, pre-contact cultural resources were encountered.

Section 7 Significance Assessments

Each historic property identified by the current study was evaluated for significance according to the broad criteria established for the Hawai'i Register of Historic Places (see discussion below and Table 3). The five criteria are:

- A Associated with events that have made an important contribution to the broad patterns of our history;
- B Associated with the lives of persons important in our past;
- C Embodies the distinctive characteristics of a type, period, or method of construction, represents the work of a master, or possesses high artistic value;
- D Have yielded, or is likely to yield information important for research on prehistory or history;
- E Have an important value to the native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property, or due to associations with traditional beliefs, events or oral history accounts – these associations being important to the group's history and cultural identity.

Site 50-30-11-2086 (CSH 3) is the remnants of two terraces interpreted as associated with pre-contact habitation. Site 50-30-11-2086 is assessed as significant under Criterion D (have yielded, or may be likely to yield information important in prehistory or history) and Criterion E (value to the native Hawaiian people due to associations with cultural practices) of the Hawai'i Register of Historic Places evaluation criteria.

Site 50-30-11-2087 (CSH 5) is a series of features interpreted as being associated with Nāwiliwili Harbor Light. Site 50-30-11-2087 is assessed as significant under Criterion C (embodies the distinctive characteristics of a type, period, or method of construction, represents the work of a master, or possesses high artistic value) and Criterion D (have yielded, or may be likely to yield information important in prehistory or history) of the Hawai'i Register of Historic Places evaluation criteria.

Site 50-30-11-2088 (CSH 6) is the foundation of a historic communications tower present on the 1910 U.S. Geological Survey map. Site 50-30-11-2088 is interpreted as associated with historic communications practices and is assessed as significant under Criterion D (have yielded, or may be likely to yield information important in prehistory or history) of the Hawai'i Register of Historic Places evaluation criteria.

Site 50-30-11-2089 (CSH 7) is a possible burial mound and is interpreted as associated with historical burial practices. Site 50-30-11-2089 is assessed as significant under Criterion D (have yielded, or may be likely to yield information important in prehistory or history) and Criterion E (value to the native Hawaiian people due to associations with cultural practices) of the Hawai'i Register of Historic Places evaluation criteria.

Site 50-30-11-2090 (CSH 8) is an artillery gun emplacement and is interpreted as associated with historic military operations. Site 50-30-11-2090 is assessed as significant under Criterion D

(have yielded, or may be likely to yield information important in prehistory or history) of the Hawai'i Register of Historic Places evaluation criteria.

Site 50-30-11-2092 (CSH 10) is an outhouse and cesspool interpreted as associated with historical residential housing. Site 50-30-11-2092 is assessed as significant under Criterion D (have yielded, or may be likely to yield information important in prehistory or history) of the Hawai'i Register of Historic Places evaluation criteria.

Site 50-30-11-2094 (CSH 12) is the remnants of a terrace interpreted as associated with pre-contact habitation. Site 50-30-11-2094 is assessed as significant under Criterion D (have yielded, or may be likely to yield information important in prehistory or history) and Criterion E (value to the native Hawaiian people due to associations with cultural practices) of the Hawai'i Register of Historic Places evaluation criteria

Site 50-30-11-2095 (CSH 13) is a scatter of shell midden with a subsurface cultural layer. CSH 13 is interpreted as a pre-contact activity area and is assessed as significant under Criterion D (have yielded, or may be likely to yield information important in prehistory or history) and Criterion E (value to the native Hawaiian people due to associations with cultural practices) of the Hawai'i Register of Historic Places evaluation criteria.

Site 50-30-11-2103 (CSH 16) is the remnants of five foundations associated with a historic industrial complex present near Ahukini Landing. It is assessed as significant under Criterion D (have yielded, or may be likely to yield information important in prehistory or history) of the Hawai'i Register of Historic Places evaluation criteria.

Table 6. Summary of Sites with Significance Assessments and Recommendations

CSH Site Number	SHPD Site Numbers	Age	Type	Function	Significance	Recommendations
CSH 1	50-30-11-422	Plantation era	Wall	Field divider	Non-significant	No further work, previously recorded and site updated
CSH 2	50-30-11-423	Plantation era	Wall	Field divider	Non-significant	No further work, previously recorded and site updated
CSH 3	50-30-11-2086	Pre-contact	Terrace	Habitation	D, E	Preservation, avoid with a 20-ft buffer
CSH 5	50-30-11-2087	Historic	Lighthouse and associated habitation remnants	Harbor light and caretaker's residence	C, D	Preservation of remaining structure; adaptive re-use
CSH 6	50-30-11-2088	Military	Concrete slab	The base of a communications tower; see 1910 U.S. Geological Survey map	D	No further work
CSH 7	50-30-11-2089	Historic	Mounds	Possible burial	D, E	Preservation in place; avoid with 50-ft buffer; data recovery program to be implemented before construction begins
CSH 8	50-30-11-2090	Military	Structural foundation	Gun emplacement	D	Preservation, avoid with a 20-ft buffer
CSH 9	50-30-11-2091	Historic	Foundation	Habitation	Non-significant	No further work
CSH 10	50-30-11-2092	Historic	Septic	Outhouse and cesspool	D	No further work
CSH 11	50-30-11-2093	Plantation era	Ditch	Drainage	Non-significant	No further work

CSH Site Number	SHPD Site Numbers	Age	Type	Function	Significance	Recommendations
CSH 12	50-30-11-2094	Pre-contact/historic	Terrace	Habitation	D, E	Preservation, avoid with a 20-ft buffer
CSH 13	50-30-11-2095	Pre-contact	Scatter	Activity area	D,E	No further work
CSH 14	50-30-11-2096	Historic	Ditch	Drainage	Non-significant	No further work
CSH 15	50-30-11-2097	Historic	Ditch	Drainage	Non-significant	No further work
CSH 16	50-30-11-2103	Historic	Structural foundations	Industrial complex	D	Educational signage

Section 8 Project Effect and Mitigation Recommendations

8.1 Project Effect

The following project effect determination and cultural resource management recommendations are intended to facilitate project planning and support the proposed project's required historic preservation consultation. This determination is based on the results of this archaeological inventory survey investigation.

8.2 Mitigation Recommendations

The proposed project will potentially affect historic properties recommended eligible to the Hawai'i Register. To reduce the proposed project's potential adverse effect on significant historic properties, the following mitigation measures are recommended (summarized in Table 3 above, also see Figure 23-Figure 25). The mitigation measures should be completed prior to commencement of ground disturbing activities within the project area.

1. Site 50-30-11-2086 (CSH 3), a pre-contact habitation terrace, was documented with a detailed written description, photographs, and accurately located with GPS survey equipment. The proposed project may have an adverse effect on the remaining structure. Preservation, in the form of avoidance by a 20 ft buffer and educational signage, is recommended for Site 50-30-11-2086.
2. Site 50-30-11-2087 (CSH 5), Nāwiliwili Harbor Light and associated features, was documented with a detailed written description, photographs, and accurately located with GPS survey equipment. The proposed project may have an adverse effect on these remnants. Adaptive re-use of the site using traditional Hawaiian methods and construction, and educational signage discussing the long history of Ninini Point is recommended for Site 50-30-11-2087. Consultation with SHPD/DLNR should take place to determine appropriate historic replication of structures.
3. Site 50-30-11-2088 (CSH 6), a possible communications tower foundation, was documented with a detailed written description, photographs, scale drawings, and accurately located with GPS survey equipment. The proposed project may have an adverse effect on the foundation. No further work is recommended for Site 50-30-11-2088. Sufficient information regarding the location, function, age, and construction methods of the foundation has been generated by the current inventory survey investigation to mitigate any adverse effect caused by proposed development activities.
4. Site 50-30-2089 (CSH 7), a possible burial mound, was documented with a detailed written description, photographs, and accurately located with GPS survey equipment. The proposed project may have an adverse effect on the mound. Preservation, in the form of avoidance and protection, is recommended for Site 50-30-2089. A buffer of 50 ft is recommended and would ensure public avoidance of the site. An archaeological data recovery program is also recommended for this site prior to commencement of construction activities.

5. Site 50-30-11-2090 (CSH 8), a World War II era military gun emplacement related to the defense of Kaua'i Island, was documented with a detailed written description, photographs, and accurately located with GPS survey equipment. The proposed project may have an adverse effect on the remaining structure. Preservation, in the form of avoidance by a 20 ft buffer and educational signage, is recommended for Site 50-30-11-2090.
6. Site 50-30-11-2092 (CSH 10), a historic outhouse and cesspool, was documented with a detailed written description, photographs, scale drawings, and accurately located with GPS survey equipment. The proposed project may have an adverse effect on these remnants. No further work is recommended for Site 50-30-11-2092. Sufficient information regarding the location, function, age, and construction methods of the the outhouse and cesspool has been generated by the current inventory survey investigation to mitigate any adverse effect caused by proposed development activities.
7. Site 50-30-11-2094 (CSH 12), a pre-contact habitation terrace, was documented with a detailed written description, photographs, and accurately located with GPS survey equipment. The proposed project may have an adverse effect on the remaining structure. Preservation, in the form of avoidance by a 20 ft buffer and educational signage, is recommended for Site 50-30-11-2094.
8. Site 50-30-11-2095 (CSH 13), a pre-contact activity area, was documented with a detailed written description, photographs, scale drawings, and accurately located with GPS survey equipment. A test unit was also excavated to determine the extent of subsurface cultural material, and all cultural material within the test unit was collected. The proposed project may have an adverse effect on these remnants. No further work is recommended for Site 50-30-11-2095. Sufficient information regarding the location, function, age, and construction methods of the terrace has been generated by the current inventory survey investigation to mitigate any adverse effect caused by proposed development activities.
9. Site 50-30-11-2103 (CSH 16), a historic industrial complex, was documented with a detailed written description, photographs, scale drawings, and accurately located with GPS survey equipment. The proposed project may have an adverse effect on these remnants. Sufficient information regarding the location, function, age, and construction methods of the industrial complex has been generated by the current inventory survey investigation to mitigate any adverse effect caused by proposed development activities; however preservation in the form of educational signage is recommended for Site 50-30-11-2103.

In summary, of the nine sites recommended eligible to the Hawai'i Register of Historic Places, six are recommended for preservation, and no further work is recommended for the remaining three sites. Site 50-30-2089 will be addressed by a Data Recovery Program, in compliance with HAR 13-13-278, prior to commencement of construction activities. This program will consist of a Data Recovery Plan, appropriate fieldwork, and a Data Recovery Report. Should human remains be identified, they will be considered previously identified and SHPD and the Kaua'i Island Burial Council will be consulted for the appropriate treatment, per

HRS 13-300-31. A Preservation Plan is recommended to address the remaining four sites that are recommended for preservation, in compliance with HAR 13-13-277.

8.3 Disposition of Materials

The artifacts associated with this archaeological inventory survey were collected from private and public lands; accordingly, this material belongs to the landowner. The collection is comprised of approximately 38 kg of shell midden and charcoal that was systematically collected from Test Unit 1 of Site 50-30-11-2095 in the project area. The shell midden will be temporarily housed at the CSH storage facility. CSH will make arrangements with the landowner regarding the disposition of the project's collection. Should the landowner request different archiving of material, then the archive location should be determined in consultation with SHPD.

Section 9 References Cited

Baptiste, Lucinda

- 1993a "Ahukini memories: The glory days." *The Garden Island*, November 24.
 1993b "Bustling Ahukini fades into fond memories." *The Garden Island*,
 November 26.

Bell, Matthew, Constance R. O'Hare, Matt McDermott, and Shawn Barnes

- 2006 Archaeological Inventory Survey of the Proposed Līhu'e Airport
 Improvements, Hanamā'ulu and Kalapakī Ahupua'a, Līhu'e District (Puna
 Moku), Island of Kaua'i, TMK [4] 3-5-001: Por.005, 008, 102, 160, and 3-
 7-002: Por. 001. Cultural Surveys Hawai'i, Inc. Kailua, Hawai'i.

Bennett, John D.

- 2003 The Coast Defenses of Kauai, T.H., 1942-1944, *The Coast Defense
 Journal*, Volume 17, Issue 2, pp 66-77.

Bennett, Wendell C.

- 1931 *The Archaeology of Kaua'i*. Bernice P. Bishop Museum, Bishop Museum
 Bulletin 80, Honolulu, Hawai'i.

Bishop Museum

- 1924 Photo of Nāwiliwili Bay. 4th Photo Service 8-2420. Copies Available from
 the Bishop Museum Archive, Honolulu, HI.
 1930 Photo of Nāwiliwili Harbor Under Construction. Unknown photographer.
 Copies Available from the Bishop Museum Archive, Honolulu, HI.

Chinen, Jon J.

- The Great Māhele, Hawaii's Land Division of 1848. University of Hawaii Press,
 Honolulu, Hawai'i.
 1971 *Original Land Titles in Hawai'i*, University of Hawaii Press, Honolulu,
 Hawai'i.

Ching, Francis K.W., Griffin, P. Bion, Kikuchi, William K., Albrecht, William H., Belshe, John C. and Catherine Stauder

- 1973 Hawaiian Archaeological Journal 73-1. The Archaeology of Puna,
 Kaua'i, Niūmalu Ahupua'a; Loko Kuapa o Alekoko, Archaeological
 Research Associates, Honolulu, HI

Condé, Jesse C., and Gerald M. Best

- 1973 *Sugar Trains, Narrow Gauge Rails of Hawai'i*. Glenwood Publishers,
 Felton, California.

Coulter, John W.

- 1931 *Population and Utilization of Land and Sea in Hawaii*, 1853. B.P. Bishop
 Museum Press, Honolulu, Hawai'i.

- Creed, Victoria S., Loren Zulick, Gerald K. Ida, D.W. Shideler, and H.H. Hammatt**
 1999 Archaeological Assessment of the Proposed Līhu'e Airport Expansion Area, Hanamā'ulu and Kalapakī Ahupua'a, Līhu'e District, Island of Kaua'i (TMK 3-5-01: 5, 6, 8, 9, 109, 111, and 158 and 3-7-02: Por. 1). Cultural Surveys Hawai'i, Kailua, Hawai'i.
- Damon, Ethel M.**
 1931 *Koamalu*. Privately printed at the Honolulu Star-Bulletin Press, Honolulu, (2 Volumes).
- Dean, Love**
 1991 *The Lighthouses of Hawai'i*, University of Hawaii Press, Honolulu, HI.
- Dickey, Lyle**
 1917 "Stories of Wailua," in six consecutive installments of *The Garden Island* newspaper, Līhu'e, Kaua'i.
- Donohugh, Donald**
 2001 *The Story of Kōloa, A Kauai Plantation Town*. Mutual Publishing, Honolulu, Hawai'i.
- Dorrance, William H.**
 1998 "The U. S. Army on Kaua'i 1909 - 1942" in *The Hawaiian Journal of History*, Volume 32:155 - 170, The Hawaiian Historical Society, Honolulu, HI., Hawaiian Historical Society, Honolulu, HI
- Dorrance, William H. and Francis S. Morgan**
 2000 *The 165-Year Story of Sugar in Hawai'i*. Mutual Publishing, Honolulu, Hawai'i.
- Folk, William H., and Hallett H. Hammatt**
 1991 Archaeological Survey and Subsurface Testing at Kanoa Estate Lands, Niūmalu, Kaua'i. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i
- Foote, Donald E., E.L. Hill, S. Nakamura, and F. Stephens**
 1972 *Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai and Lanai*. State of Hawaii, U.S. Department of Agriculture, U.S. Government Printing Office, Washington, D.C.
- Franklin, Leta J., and Alan T. Walker**
 1994 Additional Archaeological Inventory Survey, Molokoa Lands Project Area, Lands of Hanama'ulu and Kalapakī, Līhu'e District, Island of Kauai. PHRI, Inc, Hilo, Hawai'i.
- Garden Island Newspaper**
- Giambelluca, Thomas W., Nullett, Michael A. and Thomas A. Schroeder**
 1986 *Rainfall Atlas of Hawai'i*, Department of Land and Natural Resources, SHPD/DLNR, State of Hawai'i, Honolulu, HI.
- Google Earth**
 2009 Aerial imagery of Kapa'a and Līhu'e Quadrangles, 7.5 Minute Series Maps, USGS.

Hammatt, Hallett, H.

Archaeological Reconnaissance Survey of 150 acres of Coastal Land, Kalapakī, Kauai Island [Kauai Lagoon's Resort]. Cultural Surveys Hawai'i, Kailua, Hawai'i.

1990 Archaeological Assessment of Phase III, IV, V Kaua'i Lagoons Resort, Kalapaki, Kaua'i, TMK 4-3-5-001:102. Cultural Surveys Hawai'i, Kailua, Hawai'i.

Hammatt, Hallett H., and Victoria S. Creed

1993 Archaeological Inventory Survey of 61.6 Acres in Nawiliwili, Kauai. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Hammatt, Hallett H., and William H. Folk (eds)

1995 Nāwiliwili Cemetery Burial Treatment: An Archaeological and Osteological Study. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Hammatt, Hallett H., Gerald K. Ida, and Rodney Chiogioji

1994 Archaeological Document Review and Assessment of Three Alternative Widening and Bypass Options for the Kūhiō Highway Within the Ahupua'a of Hanamā'ulu, Wailua, South Olohena, North Olohena, Waipouli & Kapa'a, Līhu'e and Kawaihau Districts, Island of Kaua'i. Cultural Surveys Hawai'i, Kailua, Hawai'i.

Hammatt, Hallett H., and David W. Shideler

2003 Archaeological Assessment for the Kuhio Highway Improvements, Kapa'a to Hanama'ulu (Kapa'a Relief Route) Project within the Ahupua'a of Kapa'a, Waipouli, North Olohena, South Olohena, Wailua, and Hanama'ulu, Island of Kaua'i (TMK 4-3-7; 4-3-9; 4-4-1; 4-4-3; 4-4-5; 4-4-6). Cultural Surveys Hawai'i, Kailua, Hawai'i.

Hammatt, Hallett H., David W. Shideler, and William H. Folk

2002 Archaeological Study in Support of Proposed Kūhiō highway Improvements (Kapa'a By-Pass). Hanamā'ulu to Kapa'a Ahupua'a, Kaua'i. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Handy, E.S. Craighill

1940 *The Hawaiian Planter, Volume 1*. Bishop Museum Bulletin No. 161, Bernice P. Bishop Museum, Honolulu.

Handy, E.S. Craighill and Mary Kawena Pukui

1972 *The Polynesian Family System in Ka'u, Hawai'i*, Charles E. Tuttle Co., Rutland, Vermont & Tokyo, Japan

1977 *The Polynesian Family System in Ka'u, Hawaii*, Hawaiian Polynesian Society, Inc., Fourth Printing, Japan.

Hawai'i TMK Service

N. D. Hawai'i TMK Service, 222 Vineyard St Ste 401, Honolulu, Hawai'i. Tax Map Key [4] 3-5-01:4, 8, 60, 85, 102, 128, 159, and 160 por.

Iao, Joseph

- 1936 County of Kauai, Territory of Hawaii, Showing Sixth Representative District and Precinct Boundaries. Copies available at the Cultural Surveys Hawai'i Library, Waimanālo, HI.

Jackson, Lt. George G.

- 1881 Map of Nāwiliwili Harbor, Kalapaki. Registered Map 902. Copies available from the Hawai'i State Archive, Honolulu, HI.

Juvik, James O., and Sonia P. Juvik

- 1998 *Atlas of Hawai'i*, 3rd Edition. University of Hawai'i Press, Honolulu.

Kalima, Lehua, and Helen Wong-Smith

- 1991 Appendix B: Historical Documentary Research, IN, Archaeological Inventory Survey, Hanamā'ulu Affordable Housing Project Area, Land of Hanamā'ulu, Lihue District, Island of Kauai (TMK: 3-7-03:Por. 20), by Alan T. Walker, and Paul H. Rosendahl. Paul H. Rosendahl, Ph.D., Inc, Hilo, Hawai'i.

Kaua'i Community College

- 1973 Archaeology on Kaua'i: A Collection of Newsletters. (AOK), *Kaua'i Community College Newsletter*. Līhu'e, Kaua'i.

Kaua'i Historical Society

- 1991 The Kaua'i Papers, A Kaua'i Historical Society Publication, Lihue, Kauai, HI.

Kaua'i Museum

- n.d. Photo of Kalapakī Bay. Copies available from the Kaua'i Museum, Līhu'e, Kaua'i. Photo adapted from <http://www.hawaii.edu/environment/ainakumuwai/html/ainakumuwaitour3.htm>
- 1824 Map of Kaua'i. Copies available from the Kaua'i Museum, Līhu'e, Kaua'i.

Kelsey, Theodore

- n.d. "Kauai' Place Names." Unpublished manuscript, Kelsey Collection, Hawai'i State Archives.

Kikuchi, William K.

- 1992 Use Permit for J.C. Sandblasting, Hanama'ulu, Lihu'e, Kaua'i. ARCHAIOS.

Kikuchi, William K., and Susan Remoaldo

- 1992 *Cemeteries of Kaua'i* (vol.1). Kaua'i Community College and the University of Hawai'i, Committee for the Preservation of Hawaiian Language, Art and Culture, Puhi, Kaua'i.

Kirch, Patrick V.

- 1985 *Feathered Gods and Fishhooks*, University of Hawaii, Honolulu, HI

McMahon, Nancy

- 1990 Archaeological Fieldcheck of Three Parcels in Lihue Judiciary District: Possible Locations for a New Kaua'i Judiciary Building, Nawiliwili, Kalapakī, and Hanamā'ulu, Kaua'i. State Historic Preservation Division, State of Hawai'i.

Monahan, Chris and Hallett H. Hammatt

- 2008 Archaeological Literature Review and Field Inspection Report for the Nāwiliwili-Ahukini Bike Path Project, Nāwiliwili, Kalapakī and Hanamā'ulu Ahupua'a, Lihue District, Kaua'i Island, TMK: (4) 3-2-004; 3-5-001, 002 & 3-6-002, 019, 020, and various rights-of-way between various plats, Cultural Surveys Hawaii, inc. Kailua, Hawaii

Nogelmeier, M. Puakea

- 2006 *The Epic Tale of Hi'iakaikapoliopole*. Awaiaulu Press, Honolulu.

Pukui, Mary K.

- 1983 *'Ōlelo No'eau: Hawaiian Proverbs and Poetical Sayings*. Bishop Museum Special Publication No.71, Bernice P. Bishop Museum Press, Honolulu, Hawai'i.

Pukui, Mary K., Samuel H. Elbert, and Esther Mookini

- 1974 *Place Names of Hawai'i*. University of Hawai'i Press, Honolulu, Hawai'i.

Pukui, Mary K., and Samuel H. Elbert

- 1986 *Hawaiian Dictionary*. University of Hawai'i Press, Honolulu, Hawai'i.

Rice, Mary A.

- 1914 "History of Lihue." Typescript of a talk presented on December 17, 1914 to the Kauai' Historical Society. Reprinted in *The Kauai Papers*, pp. 46-67. Kauai Historical Society, Līhu'e, Kaua'i.

Rice, William H.

- 1977 *Hawaiian Legends*. Originally published in 1923. Bernice P. Bishop Museum, Honolulu, Hawai'i.

R.M. Towill Corporation

- 1953 Aerial photo of Ahukini Landing, Kaua'i. On file at R.M. Towill Corporation, Honolulu, HI.

Rosendahl, Paul H.

- 1990 Archaeological Field Inspection and Limited Subsurface Testing Kalepa Radio Station and Kalepa Road Improvement Project Areas, Land of Hanamāulu, Lihue District, Island of Kauai, 4-3-8-002:005. PHRI, Inc., Hilo, Hawai'i.
- 1991 Burial Treatment Plan, Kalepa Radio Station Project Area, Land of Hanamāulu, Lihue District, Island of Kauai. PHRI, Inc., Hilo, Hawai'i.

Sanborn Fire Insurance

- 1927 Fire Insurance Map for Ahukini Landing. Sanborn Map Company, 11 Broadway, New York. Available at the Hamilton Library, University of Hawai'i at Mānoa, Honolulu, Hawai'i.

Spearing, Mishalla, Chris Monahan, and Hallett H. Hammatt

- 2008 Cultural Impact Evaluation (CIE) for Nāwiliwili-Ahukini Bike/Pedestrian Path Project, Nāwiliwili, Kalapakī and Hanamā'ulu Ahupua'a, Līhu'e District (Puna Moku), Island of Kaua'i, TMK: (4) 3-2-004; 3-5-001, 002 & 3-6-002, 019, 020, and various rights-of-way between various plats. Cultural Surveys Hawai'i, Kailua, HI.

Thrum, Thomas G.

- 1907 "Heiaus and Heiau Sites Throughout the Hawaiian Islands," *Hawaiian Annual 1906*. Honolulu, Hawai'i.

U.S. Department of Agriculture

- 2001 Soils Survey Geographic Database (SSUGRO).

U.S. Geological Survey

- 1910 Map of Kaua'i, USGS.
1996 Kapa'a Quadrangle 7.5 Minute Series Map, USGS
1996 Līhu'e Quadrangle 7.5 Minute Series Map, USGS

State of Hawai'i, Department of Transportation, Airports Division

- 2007 <http://hawaii.gov/lih/airport-information/airport-history>. Accessed 9/1/2009

Van Hoften, Ellen

- 1970 History of the Honolulu Engineer District, 1905-1965, U.S. Army Engineer District, Unknown publisher.

Valeri, Valerio

- 1985 Kingship and Sacrifice: Ritual and Society in Ancient Hawaii, University of Chicago Press, Chicago, IL.

Waihona 'Aina

- 2000 *The Māhele Database*. Electronic document, <http://waihona.com>, Accessed 3/17/2008.

Walker, Alan T., and Paul M. Rosendahl

- 1990 Archaeological Inventory Survey, Hanamā'ulu Affordable Housing Project Area, Land of Hanamā'ulu, Lihue District, Island of Kauai (TMK: 3-7-03:Por. 20). PHRI, Inc., Hilo, Hawai'i.
1991 Archaeological Inventory Survey, Kalapaki Point Development Project Area. Land of Nawiliwili, Lihue District, Island of Kauai. PHRI, Inc., Hilo, Hawai'i.

Walker, Alan T., L. Kalima, and Susan T. Goodfellow

- 1991 Archaeological Inventory Survey Lihue/Puhi/ Hanamaulu Master Plan, Lands of Hanamaulu, Kalapaki, Nawiliwili, and Wailua, Lihue District, Island of Kauai (TMK 4-3-2-; 4-3-3-; 4-3-9-). PHRI, Inc., Hilo, Hawai'i.

Wilcox, Carol

- Sugar Water*. University of Hawai'i Press, Honolulu, Hawai'i.

Wilkes, Charles

1845 Narrative of the United States Exploring Expedition, Volume 4. Lea and Blanchard, Philadelphia, Pennsylvania.

Appendix A Radio Carbon Analysis Results



Consistent Accuracy . . .
... Delivered On-time

Beta Analytic Inc.
4985 SW 74 Court
Miami, Florida 33155 USA
Tel: 305 667 5167
Fax: 305 663 0964
Beta@radiocarbon.com
www.radiocarbon.com

Darden Hood
President

Ronald Hatfield
Christopher Patrick
Deputy Directors

August 18, 2009

Dr. Hallett H. Hammatt/Kendy Altizer
Cultural Surveys Hawaii
P.O. Box 1114
Kailua, HI 96734
USA

RE: Radiocarbon Dating Result For Sample NAW4.TU13

Dear Hallett and Kendy:

Enclosed is the radiocarbon dating result for one sample recently sent to us. It provided plenty of carbon for an accurate measurement and the analysis proceeded normally. As usual, the method of analysis is listed on the report sheet and calibration data is provided where applicable.

As always, no students or intern researchers who would necessarily be distracted with other obligations and priorities were used in the analysis. It was analyzed with the combined attention of our entire professional staff.

If you have specific questions about the analyses, please contact us. We are always available to answer your questions.

Thank you for prepaying the analysis. As always, if you have any questions or would like to discuss the results, don't hesitate to contact me.

Sincerely,

Digital signature on file



BETA ANALYTIC INC.
 DR. M.A. TAMERS and MR. D.G. HOOD

4985 S.W. 74 COURT
 MIAMI, FLORIDA, USA 33155
 PH: 305-667-5167 FAX:305-663-0964
 beta@radiocarbon.com

REPORT OF RADIOCARBON DATING ANALYSES

Dr. Hallett H. Hammatt/Kendy Altizer

Report Date: 8/18/2009

Cultural Surveys Hawaii

Material Received: 8/4/2009

Sample Data	Measured Radiocarbon Age	¹³ C/ ¹² C Ratio	Conventional Radiocarbon Age(*)
Beta - 262604 SAMPLE : NAW4.TU13 ANALYSIS : Radiometric-Standard delivery MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid 2 SIGMA CALIBRATION : Cal AD 1320 to 1350 (Cal BP 630 to 600) AND Cal AD 1390 to 1440 (Cal BP 560 to 510)	530 +/- 40 BP	-24.8 ‰	530 +/- 40 BP

Dates are reported as RCYBP (radiocarbon years before present, "present" = AD 1950). By international convention, the modern reference standard was 95% the ¹⁴C activity of the National Institute of Standards and Technology (NIST) Oxalic Acid (SRM 4990C) and calculated using the Libby ¹⁴C half-life (5568 years). Quoted errors represent 1 relative standard deviation statistics (68% probability) counting errors based on the combined measurements of the sample, background, and modern reference standards. Measured ¹³C/¹²C ratios (delta ¹³C) were calculated relative to the PDB-1 standard.

The Conventional Radiocarbon Age represents the Measured Radiocarbon Age corrected for isotopic fractionation, calculated using the delta ¹³C. On rare occasion where the Conventional Radiocarbon Age was calculated using an assumed delta ¹³C, the ratio and the Conventional Radiocarbon Age will be followed by "****". The Conventional Radiocarbon Age is not calendar calibrated. When available, the Calendar Calibrated result is calculated from the Conventional Radiocarbon Age and is listed as the "Two Sigma Calibrated Result" for each sample.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-24.8:lab. mult=1)

Laboratory number: Beta-262604

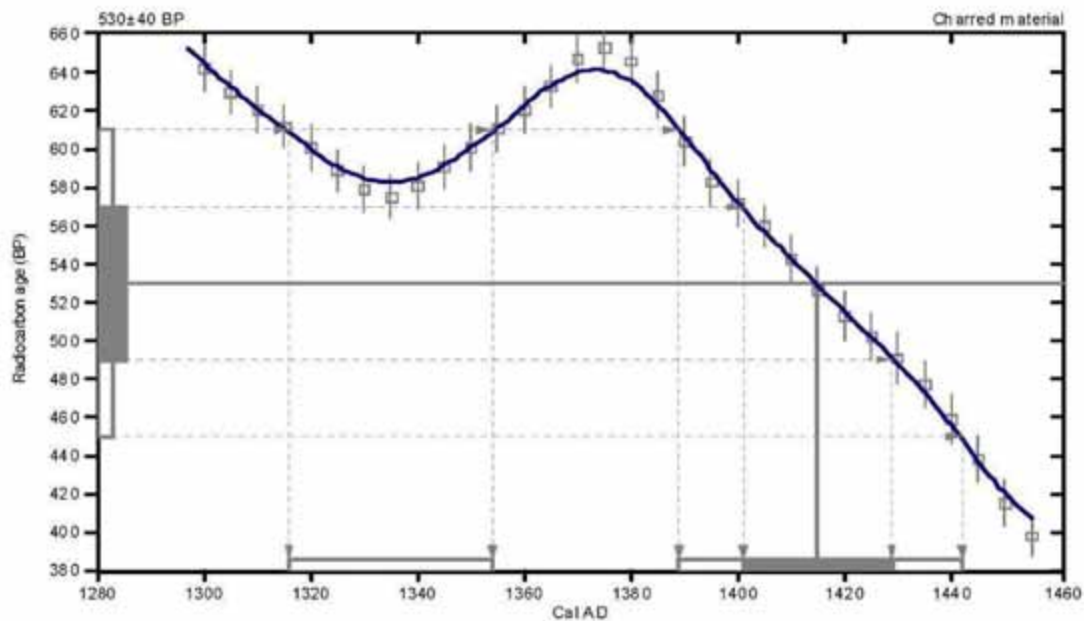
Conventional radiocarbon age: 530±40 BP

2 Sigma calibrated results: Cal AD 1320 to 1350 (Cal BP 630 to 600) and
(95% probability) Cal AD 1390 to 1440 (Cal BP 560 to 510)

Intercept data

Intercept of radiocarbon age
with calibration curve: Cal AD 1420 (Cal BP 540)

1 Sigma calibrated result: Cal AD 1400 to 1430 (Cal BP 550 to 520)
(68% probability)



References:

Database used

INTCAL04

Calibration Database

INTCAL04 Radiocarbon Age Calibration

IntCal04: Calibration Issue of Radiocarbon (Volume 46, nr 3, 2004).

Mathematics

A Simplified Approach to Calibrating C14 Dates

Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

Beta Analytic Radiocarbon Dating Laboratory

4955 S.W. 74th Court, Miami, Florida 33155 • Tel: (305)667-5167 • Fax: (305)663-0964 • E-Mail: beta@radiocarbon.com

Appendix B Site 50-30-11-2095 (CSH 13) Shell Midden Analysis

Quadrant	Level	General	Phylum	Class	Family	Genus	Species	Weight (Grams)
W	53-63		Mollusca	Gastropoda	Patellidae	<i>Cellana sp.</i>		37.2
W	53-63		Mollusca	Gastropoda	Neritidae	<i>Nerita</i>	<i>picea</i>	255.6
W	53-63		Mollusca	Gastropoda	Cypraeidae	<i>Cypraea sp.</i>		112.9
W	53-63		Mollusca	Gastropoda	Cypraeidae	<i>Large Cypraea sp.</i>		11.6
W	53-63		Mollusca	Gastropoda	Nassariidae	<i>Drupa sp</i>		81.4
W	53-63		Mollusca	Gastropoda	Trochidae	<i>Trochus</i>	<i>intextus</i>	2.8
W	53-63		Mollusca	Gastropoda	Conidae	<i>Conus sp.</i>		30.5
W	53-63		Mollusca	Gastropoda	Littorinidae	<i>Littorina sp</i>		5.7
W	53-63			Actinopterygii	Monacanthidae	<i>Pervagor</i>	<i>spiloma</i>	1.1
W	53-63		Mollusca	Misc Gastropoda				105.7
W	53-63		Echinodermata					22
W	53-63	Faunal Bone						2.4
W	53-63	crab						2.2
W	63-73		Mollusca	Gastropoda	Patellidae	<i>Cellana sp.</i>		187.6
W	63-73		Mollusca	Gastropoda	Neritidae	<i>Nerita</i>	<i>picea</i>	996.9
W	63-73		Mollusca	Misc Gastropoda				51.2
W	63-73		Mollusca	Gastropoda	Cypraeidae	<i>Cypraea sp.</i>		436.7
W	63-73		Mollusca	Gastropoda	Cypraeidae	<i>Large Cypraea sp.</i>		116.7
W	63-73		Mollusca	Gastropoda	Nassariidae	<i>Drupa sp</i>		333.3
W	63-73		Mollusca	Gastropoda	Trochidae	<i>Trochus</i>	<i>intextus</i>	7.4

Quadrant	Level	General	Phylum	Class	Family	Genus	Species	Weight (Grams)
W	63-73		Mollusca	Gastropoda	Conidae	<i>Conus sp.</i>		26.7
W	63-73		Mollusca	Gastropoda	Littorinidae	<i>Littorina sp</i>		25.4
W	63-73		Mollusca	Gastropoda	Turbinidae	<i>Turbo</i>		3.6
W	63-73		Mollusca	Gastropoda	Naticadae	<i>Nitaca sp</i>		4.8
W	63-73		Mollusca	Bivalvia	Isognomonidae			8.6
W	63-73		Echinodermata					52.4
W	63-73	Faunal Bone						1.7
W	63-73	crab						6.2
W	63-73	mussel						3.3
W	63-73	marine teeth						2.3
W	63-73	fish scales						0.7
W	73-83		Mollusca	Gastropoda	Patellidae	<i>Cellana sp.</i>		62.8
W	73-83		Mollusca	Gastropoda	Neritidae	<i>Nerita</i>	<i>picea</i>	579
W	73-83		Mollusca	Misc Gastropoda				39.7
W	73-83		Mollusca	Gastropoda	Cypraeidae	<i>Cypraea sp.</i>		169.5
W	73-83		Mollusca	Gastropoda	Nassariidae	<i>Drupa sp</i>		260.1
W	73-83		Mollusca	Gastropoda	Trochidae	<i>Trochus</i>	<i>intextus</i>	2.3
W	73-83		Mollusca	Gastropoda	Conidae	<i>Conus sp.</i>		7.8
W	73-83		Mollusca	Gastropoda	Littorinidae	<i>Littorina sp</i>		24.5
W	73-83		Mollusca	Gastropoda	Turbinidae	<i>Turbo</i>		2.5
W	73-83		Mollusca	Gastropoda	Thaididae	<i>Neothais</i>	<i>herpa</i>	2.4
W	73-83			Cirrapedia				12.6
W	73-83		Mollusca	Gastropoda	Naticadae	<i>Nitaca sp</i>		2

Quadrant	Level	General	Phylum	Class	Family	Genus	Species	Weight (Grams)
W	73-83		Echinodermata					86.8
W	73-83	Faunal Bone						3.6
W	73-83	crab						4.1
W	73-83	fish scales						2
E	53-63							606.9
E	63-73							1150
E	73-83							6150
E	83-93							1750
Total								13855.2