
**Final
Addendum to an
Archaeological Inventory Survey
of Approximately 1339-Acres of Castle and Cooke Lands
Waipi‘o and Waiawa Ahupua‘a,
‘Ewa District, O‘ahu Island**

**TMK: [1] 9-4-006:001 por., 002 por., 029 por.;
9-5-003: 001 por.; and 9-6-004:021 por.**

**Prepared for
Helber, Hastert, & Fee Planners, Inc.
and
Castle & Cooke Homes Hawai‘i, Inc.**

**Prepared by
Todd Tulchin, B.S.,
David W. Shideler, M.A.,
and
Hallett H. Hammatt, Ph.D.**

**Cultural Surveys Hawai‘i, Inc.
Kailua, Hawai‘i
(Job Code: WAPIO 9)**

September 2009

**O‘ahu Office
P.O. Box 1114
Kailua, Hawai‘i 96734
Ph.: (808) 262-9972
Fax: (808) 262-4950**

www.culturalsurveys.com

**Maui Office
1993 Main St.
Wailuku, Hawai‘i 96793
Ph: (808) 242-9882
Fax: (808) 244-1994**

Management Summary

Reference	Addendum to an Archaeological Inventory Survey of Approximately 1339-Acres of Castle and Cooke Lands Waipi'o and Waiawa Ahupua'a, 'Ewa District, O'ahu Island (TMK: [1] 9-4-006:001 por., 002 por., 029 por.; 9-5-003: 001 por.; and 9-6-004:021 por.) (Tulchin, Shideler, and Hammatt 2009)
Date	September 2009
Project Number (s)	Cultural Surveys Hawai'i (CSH) Job Code: WAIPIO 9
Investigation Permit Number	The fieldwork component of the archaeological inventory survey investigation was carried out under archaeological permit number 09-20, issued by the Hawai'i State Historic Preservation Division/Department of Land and Natural Resources (SHPD/DLNR), per Hawai'i Administrative Rules (HAR) Chapter 13-282.
Project Location	<p>The approximately 580-acre Koa Ridge Makai project area is located east of Mililani Town and north of the Waipi'o Business Park, and is primarily situated on tablelands bordered by Kīpapa Gulch to the north and west, and the H-2 Interstate Highway to the east. The approximately 190-acre Waiawa project area is located east of the H-2 Interstate Highway and south of the Mililani Memorial Park, and is primarily situated on tablelands bordered by Pānakauahi Gulch to the north and west.</p> <p>The current survey areas included four portions of the Koa Ridge Makai project area bordering Kīpapa Gulch (i.e. Survey Areas A-D) and three portions of the Waiawa project area bordering Pānakauahi Gulch (i.e. Survey Areas E-G). The Koa Ridge Makai and Waiawa project areas and the current survey areas are depicted on the U.S. Geological Survey 7.5-Minute Series Topographic Map, Waipahu Quadrangle (1998).</p>
Land Jurisdiction	Private, Castle & Cooke Homes Hawaii, Inc.
Agencies	State Historic Preservation Division / Department of Land and Natural Resources (SHPD/DLNR)
Project Description	The overall Koa Ridge Makai and Waiawa project involves development of a master planned, mixed-use residential community with commercial, light industrial, and health care components. Minimally, land disturbing activities would include major grading and excavations associated with subsurface utility installation, infrastructure construction, and building construction.
Project Acreage	Approximately 770 acres

Area of Potential Effect (APE) and Survey Acreage	The APE is defined as the entire approximately 770-acre Koa Ridge Makai and Waiawa project areas. The current survey areas included approximately 59 acres of the project areas.
Historic Preservation Regulatory Context	<p>In 1996, CSH conducted an archaeological inventory survey of Castle and Cooke lands in Waipi'o and Waiawa, which included tablelands portions of the Koa Ridge Makai and Waiawa project areas. The <i>Archaeological Inventory Survey of a 1339-Acre Parcel at Castle and Cooke Lands Within Portions of Waipi'o and Waiawa Ahupua'a, O'ahu (TMK 9-4-06:01, 03, & 10 port.; and 9-5-03:01 port., 04, & 07; and 9-6-04:21)</i> (Hammatt et al. 1996) was reviewed and accepted by the State Historic Preservation Division (SHPD) in 2002 (LOG NO: 29403, DOC NO: 0203EJ09) (see Appendix A).</p> <p>The current addendum archaeological inventory survey study was conducted on seven specific areas, primarily adjacent gulch lands, within the Koa Ridge Makai and Waiawa project areas that were not covered by the Hammatt et al. (1996) study.</p> <p>This addendum archaeological inventory survey study was prepared to support the planned project's historic preservation review under Hawai'i Revised Statutes (HRS) Chapter 6E-42 and Hawai'i Administrative Rules (HAR) Chapter 13-13-284. In consultation with the SHPD, the archaeological inventory survey investigation was designed to fulfill the State requirements for an archaeological inventory survey per HAR Chapter 13-13-276.</p>
Fieldwork Effort	The CSH field crew included Todd Tulchin, B.S.; Jeffrey Fong, M.A.; Trevor Yucha, B.S.; and Douglas Thurman, B.A.; under the general direction of principal investigator Hallett H. Hammatt, Ph.D. Fieldwork was conducted on June 12 and July 15-20, 2009 and required 13 person-days to complete.
Number of Historic Properties Identified	Two historic properties, State Inventory of Historic Properties (SIHP) #s 50-80-09-9530 and 50-80-09-7080, comprised of 6 archaeological features, were identified within the current survey areas.
Historic Properties Recommended Eligible to the Hawai'i Register of Historic Places (Hawai'i Register)	<p>SIHP # 50-80-09-9530, plantation-era ditch system, recommended Hawai'i Register-eligible under Criteria A, C, and D</p> <p>SIHP # 50-80-09-7080, historic clearing mound, recommended Hawai'i Register-eligible under Criterion D</p>
Historic Properties Recommended Ineligible to the Hawai'i Register	None

<p>Effect Recommendation</p>	<p>This archaeological inventory survey addendum study identified two historic properties within the current survey areas. SIHP #s 50-80-09-9530 and 50-80-09-7080 will potentially be affected by the proposed project.</p> <p>Due to the potential adverse effect on significant historic properties within the project's APE, CSH's project-specific effect recommendation is "effect, with proposed mitigation commitments." The recommended mitigation measures will reduce the project's potential adverse effect to significant historic properties.</p>
<p>Mitigation Recommendation</p>	<p>SIHP # 50-80-09-9530 plantation-era ditch system: Preservation (avoidance and protection) of Feature A irrigation ditch. No further work for Features B, H, I, and J.</p> <p>SIHP # 50-80-09-7080, historic clearing mound: No further work.</p> <p>Any proposed modifications for adaptive reuse of the Feature A irrigation ditch, including sediment removal or construction of rockfall barriers along the downslope berm of the ditch, will require consultation with and approval of the State Historic Preservation Division when the details of the proposed project become available. In addition, any potential burial of portions of the ditch associated with grading of the Koa Ridge Makai project area will require consultation with and approval of the State Historic Preservation Division when the details of the proposed project become available.</p> <p>If SIHP # 50-80-09-9530 Feature A will be impacted by the proposed project, it is recommended that a Preservation Plan be prepared for the proposed project, in accordance with Hawai'i Administrative Rules (HAR) 13-277-3, to address buffer zones and protective measures for SIHP # 50-80-09-9530 Feature A. This preservation plan should detail the short- and long-term preservation measures that will safeguard the historic property during project construction and subsequent use of the project area. The preservation plan should also address any breaches or potential burial of portions of the SIHP # 50-80-09-9530 Feature A irrigation ditch.</p>

Table of Contents

Management Summary	i
Section 1 Introduction	1
1.1 Project Background	1
1.2 Scope of Work	6
1.3 Environmental Setting	7
1.3.1 Natural Environment.....	7
1.3.2 Built Environment	7
Section 2 Methods	9
2.1 Field Methods	9
2.2 Laboratory Methods.....	9
2.3 Document Review	9
2.4 Consultation.....	10
Section 3 Results of Fieldwork.....	11
3.1 Survey Findings.....	11
3.1.1 Survey Area A	11
3.1.2 Survey Area B.....	16
3.1.3 Survey Area C.....	19
3.1.4 Survey Area D	19
3.1.5 Survey Area E.....	19
3.1.6 Survey Area F.....	19
3.1.7 Survey Area G	26
3.2 Historic Property Descriptions.....	26
3.2.1 SIHP #: 50-80-09-9530	26
3.2.2 SIHP #: 50-80-09-7080	47
3.3 Test Excavation Findings.....	50
3.3.1 SIHP # 50-80-09-7080 Test Unit 1	50
Section 4 Significance Assessments	53
Section 5 Project Effect and Mitigation Recommendations.....	54
5.1 Project Effect	54
5.2 Mitigation Recommendations.....	54
Section 6 References Cited	57
Appendix A SHPD Review of Hammatt et al. (1996)	A-1
Appendix B SHPD Review of Tulchin et al. (2009).....	B-1

List of Figures

Figure 1. U.S. Geological Survey 7.5-Minute Series Topographic Map, Waipahu Quadrangle (1998), showing the location of the current survey areas within the Koa Ridge Makai and Waiawa project areas.....	2
Figure 2. Tax Map Key Plat 9-4-06, showing the location of the current survey areas within the Koa Ridge Makai and Waiawa project areas.....	3
Figure 3. Tax Map Key Plat 9-6-04, showing the location of the current survey areas within the Waiawa project area	4
Figure 4. Aerial photograph (source: U.S. Geological Survey Orthoimagery 2005), showing the location of the current survey areas within the Koa Ridge Makai and Waiawa project areas.....	5
Figure 5. Overlay of the Soil Survey of Hawai‘i (Foote et al. 1972), indicating sediment types within the current survey areas.....	8
Figure 6. U.S. Geological Survey 7.5-Minute Series Topographic Map, Waipahu Quadrangle (1998), showing the locations of historic properties in Survey Area A	12
Figure 7. Aerial photograph (source: U.S. Geological Survey Orthoimagery 2005), showing the locations of historic properties in Survey Area A	13
Figure 8. SIHP # 50-80-09-9530 Feature A irrigation ditch, showing earthen berm recently constructed over the ditch (views to southeast, south).....	14
Figure 9. SIHP # 50-80-09-9530 Feature A irrigation ditch, showing recently constructed stone and mortar lining above the cut basalt block and mortar ditch lining (view to southwest).....	15
Figure 10. SIHP # 50-80-09-9530 Feature A irrigation ditch, showing recent modifications to the sluice gate and ditch outlet at the edge of Kīpapa Gulch (view to southwest).....	15
Figure 11. Recently constructed drainage ditch along the edge of the tablelands, upslope of the SIHP # 50-80-09-9530 Feature A irrigation ditch.....	16
Figure 12. U.S. Geological Survey 7.5-Minute Series Topographic Map, Waipahu Quadrangle (1998), showing the locations of historic properties in Survey Area B.....	17
Figure 13. Aerial photograph (source: U.S. Geological Survey Orthoimagery 2005), showing the locations of historic properties in Survey Area B.....	18
Figure 14. U.S. Geological Survey 7.5-Minute Series Topographic Map, Waipahu Quadrangle (1998), showing the locations of historic properties in Survey Areas C and D	20
Figure 15. Aerial photograph (source: U.S. Geological Survey Orthoimagery 2005), showing the locations of historic properties in Survey Areas C and D	21
Figure 16. U.S. Geological Survey 7.5-Minute Series Topographic Map, Waipahu Quadrangle (1998), showing the location of Survey Area E	22
Figure 17. Aerial photograph (source: U.S. Geological Survey Orthoimagery 2005), showing the location of Survey Area E	23
Figure 18. U.S. Geological Survey 7.5-Minute Series Topographic Map, Waipahu Quadrangle (1998), showing the location of Survey Area F.....	24
Figure 19. Aerial photograph (source: U.S. Geological Survey Orthoimagery 2005), showing the location of Survey Area F.....	25

Figure 20. U.S. Geological Survey 7.5-Minute Series Topographic Map, Waipahu
 Quadrangle (1998), showing the location of Survey Area G27

Figure 21. Aerial photograph (source: U.S. Geological Survey Orthoimagery 2005), showing
 the location of Survey Area G28

Figure 22. Plan-view diagram of SIHP # 50-80-09-9530 Feature A within Survey Area A.....30

Figure 23. SIHP # 50-80-09-9530 Feature A irrigation ditch, showing portion of the ditch
 where interior sediment has been recently removed (view to northeast).....31

Figure 24. SIHP # 50-80-09-9530 Feature A irrigation ditch, showing additional stacked-
 stone lining above the cut basalt block and mortar ditch lining (view to east)31

Figure 25. SIHP # 50-80-09-9530 Feature A irrigation ditch, showing sluice gate and ditch
 outlet at the edge of Kīpapa Gulch (view to northwest).....32

Figure 26. SIHP # 50-80-09-9530 Feature A irrigation ditch, showing ditch inlets adjacent to
 the upslope ditch wall (views to north)33

Figure 27. SIHP # 50-80-09-9530 Feature A irrigation ditch, showing portion of the ditch
 partially filled with sediment (view to southwest)35

Figure 28. SIHP # 50-80-09-9530 Feature A irrigation ditch, showing portions of the ditch
 damaged by flooding36

Figure 29. Plan-view diagram of SIHP # 50-80-09-9530 within Survey Area B.....37

Figure 30. Photograph (above, view to southwest) and profile diagram (below) of the SIHP #
 50-80-09-9530 Feature A ditch tunnel entrance.....38

Figure 31. Photograph of the interior of the SIHP # 50-80-09-9530 Feature A ditch tunnel.....39

Figure 32. Photograph of a collapsed portion of the SIHP # 50-80-09-9530 Feature A ditch
 tunnel39

Figure 33. Photograph (above, view to northeast) and profile diagram (below) of the SIHP #
 50-80-09-9530 Feature A ditch tunnel exit40

Figure 34. Photograph of SIHP # 50-80-09-9530 Feature B ditch, showing cut (“dressed”)
 stone and mortar construction transitioning to natural stone and mortar
 construction, view to southeast41

Figure 35. Photograph of SIHP # 50-80-09-9530 Feature B ditch, showing stacked-stone
 construction, view to south.....41

Figure 36. Photograph of SIHP # 50-80-09-9530 Feature B ditch, showing primarily earthen
 ditch construction with limited stacked-stone lining, view to south43

Figure 37. Photograph of SIHP # 50-80-09-9530 Feature H ditch, view to south43

Figure 38. Photograph (above, view to southeast) and profile diagram (below) of the SIHP #
 50-80-09-9530 Feature H footbridge44

Figure 39. Photograph of the origin of SIHP # 50-80-09-9530 Feature I ditch at the
 intersection with Feature H ditch, view to northwest.....45

Figure 40. Photograph (above, view to east) and profile diagram (below) of the SIHP # 50-
 80-09-9530 Feature J ditch tunnel exit.....46

Figure 41. Plan-view diagram of SIHP # 50-80-09-7080 mound.....48

Figure 42. Photograph of SIHP # 50-80-09-7080 mound, view to east48

Figure 43. Photograph of SIHP # 50-80-09-7080 mound, showing historic bottle wedged into
 crevice49

Figure 44. Photograph of historic bottle found on SIHP # 50-80-09-7080 mound49

Figure 45. Photograph of SIHP # 50-80-09-7080 Test Unit 1, pre-excavation, view to
northeast51

Figure 46. Photograph of SIHP # 50-80-09-7080 Test Unit 1, post-excavation, view to
northeast51

Figure 47. Photograph (above) and stratigraphic profile (below) of the south wall of SIHP #
50-80-09-7080 Test Unit 152

Section 1 Introduction

1.1 Project Background

At the request of Helber, Hastert, & Fee Planners, Inc. (HHF), Cultural Surveys Hawai'i, Inc. (CSH) completed this *Addendum to an Archaeological Inventory Survey of Approximately 1339-Acres of Castle and Cooke Lands Waipi'o and Waiawa Ahupua'a, 'Ewa District, O'ahu Island (TMK: [1] 9-4-006:001 por., 002 por., 029 por.; 9-5-003: 001 por.; and 9-6-004:021 por.)*. The approximately 580-acre Koa Ridge Makai project area is located east of Mililani Town and north of the Waipi'o Business Park, and is primarily situated on tablelands bordered by Kīpapa Gulch to the north and west, and the H-2 Interstate Highway to the east. The approximately 190-acre Waiawa project area is located east of the H-2 Interstate Highway and south of the Mililani Memorial Park, and is primarily situated on tablelands bordered by Pānakauahi Gulch to the north and west. The current survey areas included four portions of the Koa Ridge Makai project area bordering Kīpapa Gulch (i.e. Survey Areas A-D) and three portions of the Waiawa project area bordering Pānakauahi Gulch (i.e. Survey Areas E-G) (Figures 1-3). The Koa Ridge Makai and Waiawa project areas and the current survey areas are depicted on the U.S. Geological Survey 7.5-Minute Series Topographic Map, Waipahu Quadrangle (1998).

The overall Koa Ridge Makai and Waiawa Project involves development of a master planned, mixed-use residential community with commercial, light industrial, and health care components. Minimally, land disturbing activities would include major grading and excavations associated with subsurface utility installation, infrastructure construction, and building construction. The area of potential effect (APE) is defined as the entire approximately 770-acre Koa Ridge Makai and Waiawa project areas. The current survey areas included approximately 59 acres of the project lands.

In 1996, CSH conducted an archaeological inventory survey of Castle and Cooke lands in Waipi'o and Waiawa, which included tablelands portions of the Koa Ridge Makai and Waiawa project areas. The *Archaeological Inventory Survey of a 1339-Acre Parcel at Castle and Cooke Lands Within Portions of Waipi'o and Waiawa Ahupua'a, O'ahu (TMK 9-4-06:01, 03, & 10 port.; and 9-5-03:01 port., 04, & 07; and 9-6-04:21)* (Hammatt et al. 1996) was reviewed and accepted by the State Historic Preservation Division (SHPD) in 2002 (LOG NO: 29403, DOC NO: 0203EJ09) (see Appendix A). The current addendum archaeological inventory survey study was conducted on seven specific areas, primarily adjacent gulch lands, within the Koa Ridge Makai and Waiawa project areas that were not covered by the Hammatt et al. (1996) study.

This addendum archaeological inventory survey study was prepared to support the planned project's historic preservation review under Hawai'i Revised Statutes (HRS) Chapter 6E-42 and Hawai'i Administrative Rules (HAR) Chapter 13-13-284. In consultation with the SHPD, the archaeological inventory survey investigation was designed to fulfill the State requirements for an archaeological inventory survey per HAR Chapter 13-13-276.

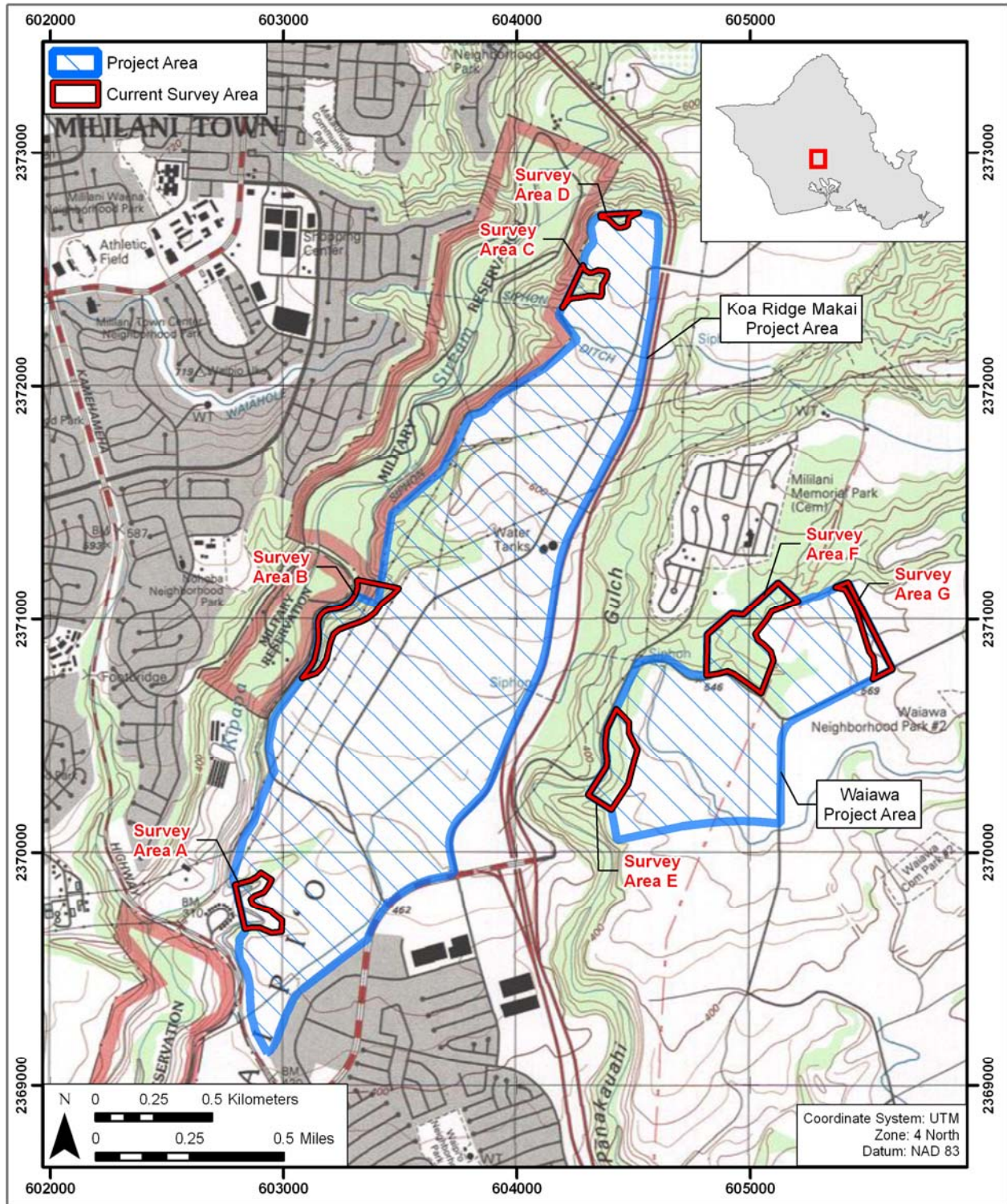


Figure 1. U.S. Geological Survey 7.5-Minute Series Topographic Map, Waipahu Quadrangle (1998), showing the location of the current survey areas within the Koa Ridge Makai and Waiawa project areas

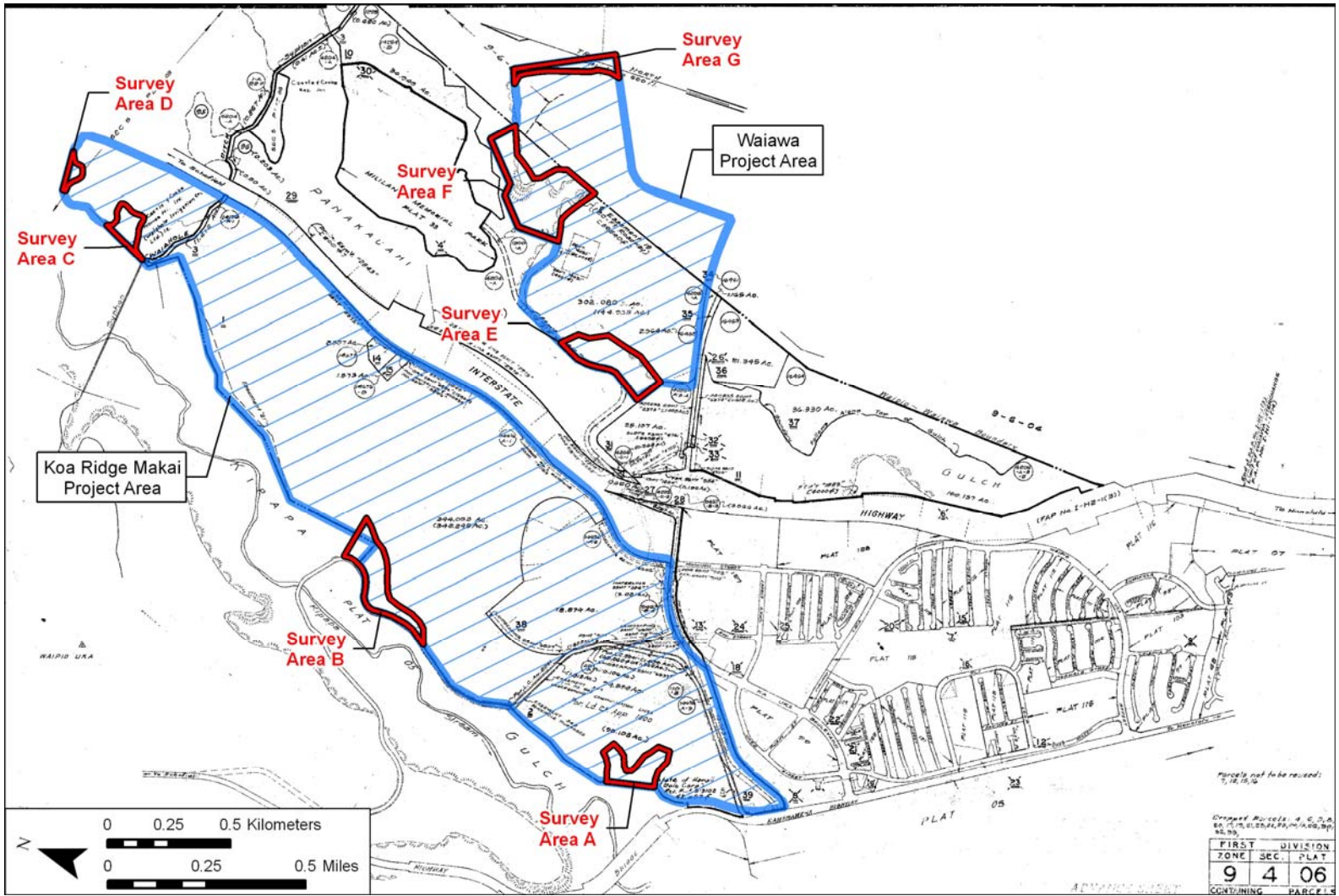


Figure 2. Tax Map Key Plat 9-4-06, showing the location of the current survey areas within the Koa Ridge Makai and Waiawa project areas

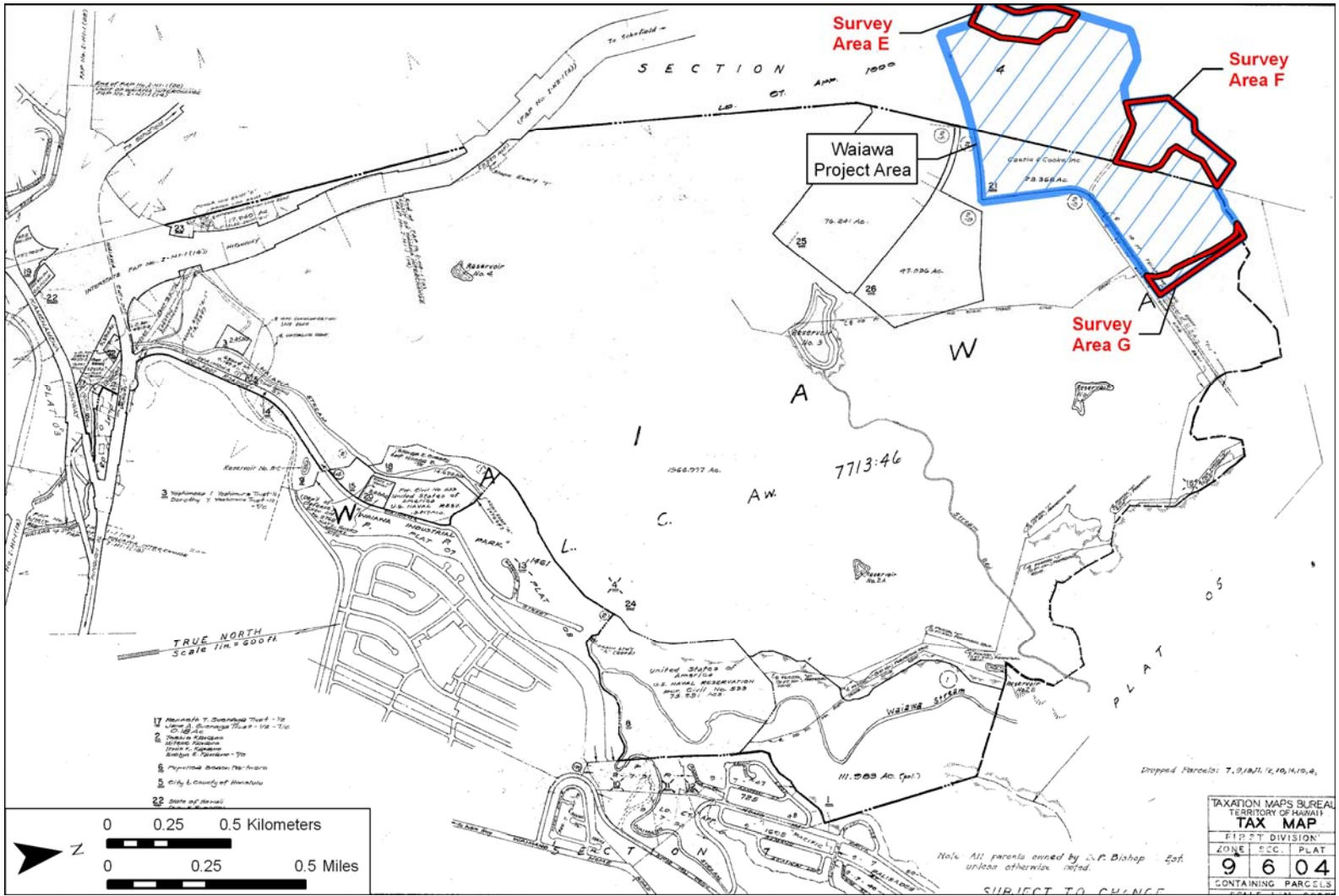


Figure 3. Tax Map Key Plat 9-6-04, showing the location of the current survey areas within the Waiawa project area

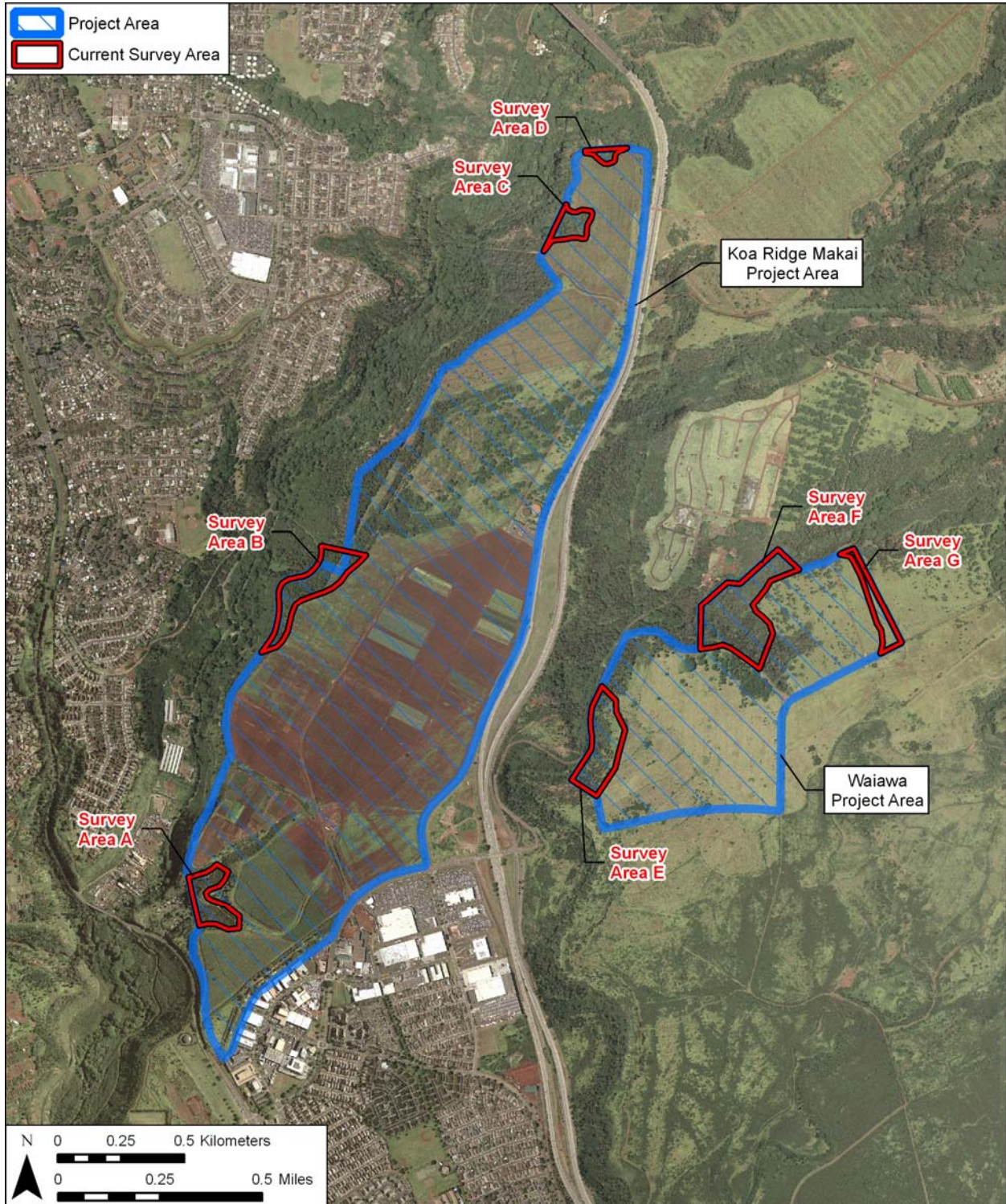


Figure 4. Aerial photograph (source: U.S. Geological Survey Orthoimagery 2005), showing the location of the current survey areas within the Koa Ridge Makai and Waiawa project areas

1.2 Scope of Work

This addendum archaeological inventory survey and its accompanying report documented all historic properties within the current survey areas. The following scope of work satisfies the State requirements for an archaeological inventory survey, per HAR Chapter 13-13-276:

1. A complete (100% coverage) systematic pedestrian inspection of the survey areas to identify any potential surface historic properties. Surface historic properties were recorded with an evaluation of age, function, interrelationships, and significance. Documentation included photographs, scale drawings, and, if warranted, limited controlled excavation of select sites and/or features, and location of historic properties with GPS survey equipment.
2. As appropriate, consultation with knowledgeable individuals regarding the project area's history, past land use, and the function and age of the historic properties documented within the project area.
3. As appropriate, laboratory work to process and gather relevant environmental and/or archaeological information from collected samples.
4. Preparation of this archaeological inventory survey report, including the following:
 - a) A project description;
 - b) A section of a U.S. Geological Survey topographic map showing the project area boundaries and the location of all recorded historic properties;
 - c) Descriptions of all historic properties, including selected photographs, scale drawings, and discussions of age, function, laboratory results, and significance, per the requirements of HAR 13-13-276. Each historic property was assigned a Hawai'i State Inventory of Historic Properties (SIHP) number;
 - d) If appropriate, a section concerning cultural consultations [per the requirements of HAR 13-276-5(g) and HAR 13-275].
 - e) A summary of historic property categories, integrity, and significance based upon the Hawai'i Register of Historic Places evaluation criteria;
 - f) A project effect recommendation;
 - g) Treatment recommendations to mitigate the project's potential adverse effect on historic properties identified in the project area that are recommended eligible to the Hawai'i Register of Historic Places.

This scope of work includes full coordination with the State Historic Preservation Division (SHPD), and county relating to archaeological matters. This coordination takes place after consent of the landowner or representatives.

1.3 Environmental Setting

1.3.1 Natural Environment

The current survey areas generally consist of moderate to steep sloping lands along the slopes of Kīpapa Gulch, Pānakauahi Gulch, or their tributaries. One of the current survey areas (i.e. Survey Area G) is located on the relatively level tablelands adjacent to Pānakauahi Gulch. No running water was observed in the tributary gullies within the current survey areas. However, evidence of periodic flooding during heavy rainfall was observed. Elevations within the current survey areas range from approximately 110-225 m (360-740 ft.) above mean sea level.

Soils within the current survey areas primarily consist of Helemano Silty Clay (HLMG), along the gulch slopes and Lahaina Silty Clay (LaC3), Manana Silty Clay (MpB, MpC, MpD), and Wahiawa Silty Clay (WaA, WaB) along the upslope tablelands (Figure 5). Soils of the Helemano Series are described as “well-drained soils on alluvial fans and colluvial slopes on the sides of gulches...developed in alluvium and colluvium derived from basic igneous rock” (Foote et al. 1972). Soils of the Lahaina Series are described as “well-drained soils on uplands...developed in material weathered from basic igneous rock” (Foote et al. 1972). Soils of the Manana Series are described as “well-drained soils on uplands...developed in material weathered from basic igneous rock” (Foote et al. 1972). Soils of the Wahiawa Series are described as “well-drained soils on uplands...developed in residuum and old alluvium derived from basic igneous rock” (Foote et al. 1972). The current survey areas receive approximately 900-1300 mm (35-50 in.) of annual rainfall (Giambelluca et al. 1986). Vegetation within the current survey areas includes white monkeypod (*Albizia sp.*), strawberry guava (*Psidium cattleianum*), Christmas berry (*Schinus terebinthifolius*), koa haole (*Leucaena leucocephala*), paperbark tree (*Melaleuca quinquenervia*), ironwood (*Casuarina equisetifolia*), Formosan koa (*Acacia confusa*), and various exotic weeds and grasses.

1.3.2 Built Environment

The Koa Ridge Makai and Waiawa project areas are generally undeveloped, with the exception of limited plantation-era irrigation infrastructure and modern farm infrastructure. Development within Kīpapa Gulch in the vicinity of the project area includes the Kīpapa Acres agricultural subdivision and Kīpapa Gulch Estates residential complex north of Kamehameha Highway, and the U.S. Army Upper and Lower Kīpapa Ammunition Storage Sites. Structures include single-family homes, commercial agricultural base-yard and warehouse facilities, and remnant military-related storage infrastructure. Lands in the vicinity of the project area west of Kīpapa Gulch consist primarily of residential components of the master-planned community of Mililani. Structures include single-family homes and condominium townhomes. Lands in the vicinity of the project area east of Kīpapa Gulch include the commercial, light industrial, and residential components of the master-planned community of Waipi'o Gentry, and the Patsy T. Mink Central O'ahu Regional Park. Structures include single-family homes, warehouses, multi-level commercial buildings, and city park infrastructure. Lands north of the Waiawa project area include the Mililani Memorial Park cemetery.

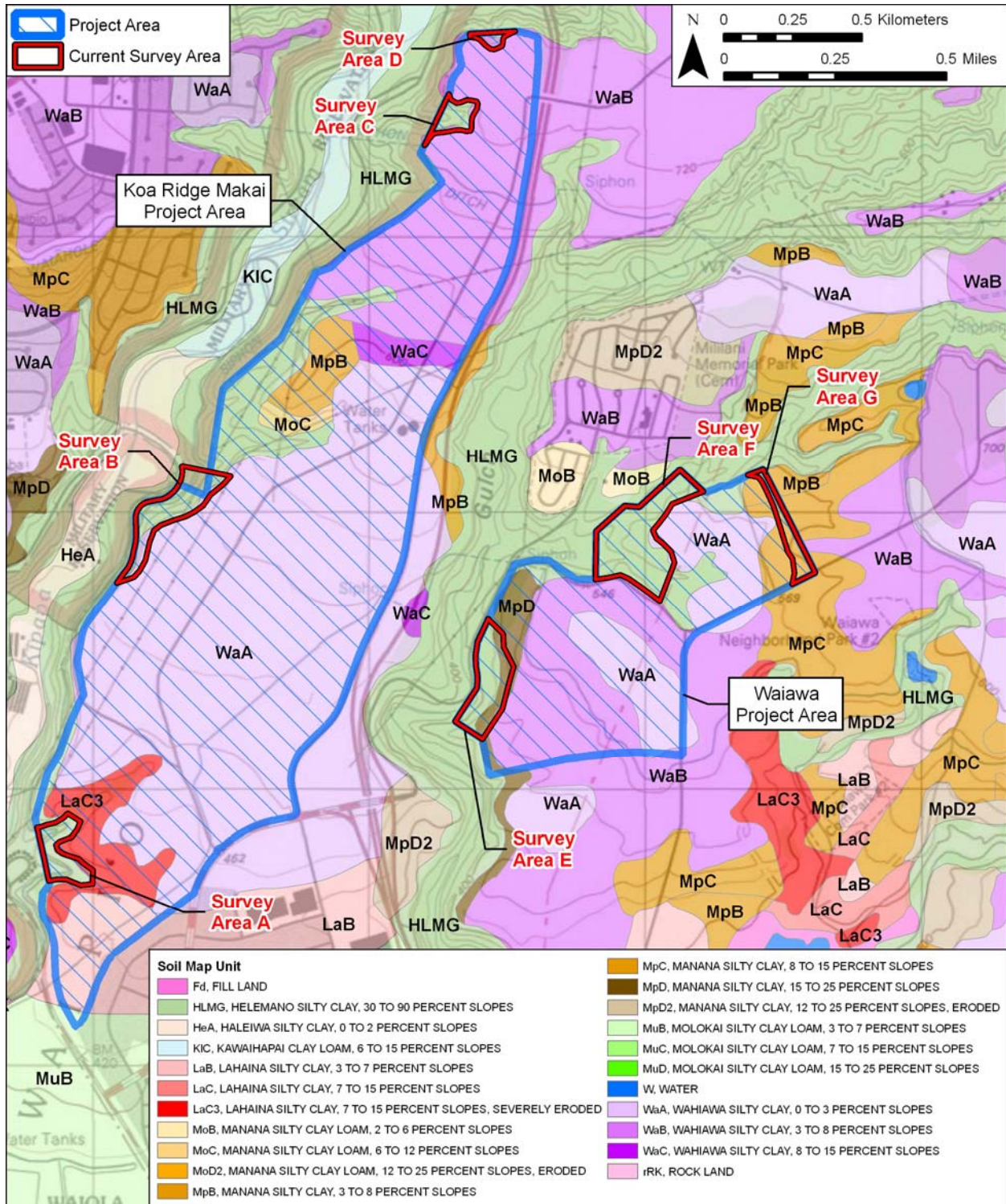


Figure 5. Overlay of the Soil Survey of Hawai'i (Foote et al. 1972), indicating sediment types within the current survey areas

Section 2 Methods

2.1 Field Methods

The fieldwork component of the archaeological inventory survey investigation was carried out under archaeological permit number 09-20, issued by the Hawai'i State Historic Preservation Division/Department of Land and Natural Resources (SHPD/DLNR), per Hawai'i Administrative Rules (HAR) Chapter 13-282. The CSH field crew included Todd Tulchin, B.S.; Jeffrey Fong, M.A.; Trevor Yucha, B.S.; and Douglas Thurman, B.A.; under the general direction of principal investigator Hallett H. Hammatt, Ph.D. Fieldwork was conducted on June 12 and July 15-20, 2009 and required 13 person-days to complete.

Fieldwork consisted of a 100% coverage pedestrian inspection of the approximately 59-acre current survey areas. The pedestrian inspection of the current survey areas was accomplished through systematic sweeps. The interval between the archaeologists was generally 5-10 m. All historic properties encountered were recorded and documented with a written field description, scale drawings, photographs, and each site was located using Trimble ProXH (sub-foot accuracy) GPS survey technology.

Subsurface testing consisted of the partial excavation, by hand, of a selected surface archaeological feature located during the pedestrian survey. The purpose of the subsurface testing was to aid in determining the function of a located surface site, as well as to possibly obtain datable materials for later radiocarbon dating. All excavated material was sifted through a 1/8 in. wire mesh screen to separate out the soil matrix, then all cultural material was collected for analysis in the lab. The test excavation was documented with a scale section profile, photographs, and sediment descriptions. Sediment description included characterization of Munsell color designation, compactness, texture, structure, inclusions, cultural material present, and boundary distinctness and topography. Following the test excavation, the excavated area was backfilled and reconstructed as closely as possible to its original state.

2.2 Laboratory Methods

Laboratory analysis of material recovered from limited subsurface testing within the project area included:

1. Identification and cataloguing of a historic artifact. The artifact was measured and classified by material type and artifact type. The historic bottle was analyzed based on manufacturing technique and information obtained from embossing on the bottle.

2.3 Document Review

The current archaeological inventory survey of portions of the Koa Ridge Makai and Waiawa project areas is being produced as an addendum to the original archaeological inventory survey report of Castle and Cooke's Waipi'o and Waiawa lands (Hammatt et al. 1996). Therefore, no additional background research was conducted as part of the current study. The reader is referred to the *Archaeological Inventory Survey of a 1339-Acre Parcel at Castle and Cooke Lands Within Portions of Waipi'o and Waiawa Ahupua'a, O'ahu* (Hammatt et al. 1996), as well as the

Archaeological Inventory Survey of Proposed Detention Basins, Associated Appurtenances, and an H-2 Freeway Interchange Associated with the Koa Ridge Makai Development Project, Waipi'o Ahupua'a, 'Ewa District, Island of O'ahu (Tulchin et al. 2009) for discussions on historical background and previous archaeological research relating to the Koa Ridge Makai and Waiawa project areas. The Tulchin et al. (2009) study was reviewed and accepted by the State Historic Preservation Division (SHPD) in 2009 (LOG NO: 2009.0605, DOC NO: 0902WT21) (see Appendix B).

2.4 Consultation

Two cultural impact studies have been completed by CSH in association with the proposed Koa Ridge Makai and Waiawa development projects. The reader is referred to the *Hawaiian Traditional Customs and Practices Impact Assessment for the Development of a 1339-Acre Parcel at Castle and Cooke Lands Within Portions of Waipi'o and Waiawa Ahupua'a, O'ahu* (Hammatt and Shideler 1996) and *A Supplement to the Hawaiian Traditional Customs and Practices Impact Assessment for the Development of 1339 Acres of Castle and Cooke Lands Within Portions of Waipi'o and Waiawa Ahupua'a, O'ahu* (Bushnell and Hammatt 2001) for information on community consultation and discussion of cultural impacts. These studies document certain gathering practices within the greater Kipapa Gulch, though none of these practices were specifically documented as occurring within the present study areas. No traditional cultural properties were documented in the present study area by the prior cultural studies or by the present archaeological study.

Section 3 Results of Fieldwork

3.1 Survey Findings

3.1.1 Survey Area A

Survey Area A, measuring approximately 7.4 acres, consists of moderate to steep sloping lands along the eastern slope of Kīpapa Gulch (Figure 6 and Figure 7). Included in the survey area are two unnamed tributary gullies that originate from the adjacent tablelands and empty into Kīpapa Gulch. No running water was observed in the tributary gullies. However, evidence of periodic flooding during heavy rainfall was observed. In general, the sloping lands and gully areas were heavily eroded and disturbed by land clearing and associated agricultural activities on the adjacent tablelands upslope of the survey area.

One historic property was identified in Survey Area A (Figure 6 and Figure 7). An approximately 330 m long portion of the SIHP # 50-80-09-9530 Feature A plantation-era dressed stone and mortar-lined irrigation ditch is constructed along the contour of the steep gulch slope, extending both north and south beyond the current survey area. The previously identified SIHP # 50-80-09-9530 Feature A ditch originates at Kīpapa Stream and progresses south along the eastern slope of Kīpapa Gulch for approximately 4.4 km. The ditch functioned in transporting irrigation water from Kīpapa Stream to plantation cane fields in the lower portions of Kīpapa Gulch and the tablelands of Waipi'o.

Portions of the Feature A ditch in the northern portion of Survey Area A, north of the northern natural drainage gully, have been recently modified in association with flood mitigation efforts. From the northern gully to the ditch outlet at the northern end of Survey Area A, the Feature A ditch has been modified to function as a drainage ditch (see Figure 22). In the area where the ditch crosses the northern drainage gully, a large earthen berm has been constructed over the ditch (Figure 8). The earthen berm, measuring approximately 2 m in height above the top of the Feature A ditch, is constructed adjacent to the south edge of the gully and functions in diverting storm water from the gully into the Feature A ditch. From the earthen berm north to the ditch outlet, all sediment from the interior of the Feature A ditch has been removed, allowing storm water to flow through the ditch and into Kīpapa Gulch. Other modifications to the ditch in this area include the addition of stone and mortar lining above the cut basalt block and mortar ditch lining (Figure 9) to reinforce a portion of the downslope ditch wall, and modification of the sluice gate and ditch outlet (Figure 10) to widen the outlet. In addition to the modifications to the Feature A ditch, a recently constructed earthen drainage ditch (Figure 11) runs along the top edge of the tablelands, upslope of the Feature A ditch, beginning at the southern natural drainage gully and terminating at the northern natural drainage gully. This drainage ditch, measuring approximately 2.5 m wide and 1.0 m deep, functions in diverting storm water from the southern drainage gully and areas upslope of the Feature A ditch between the gullies, into the northern gully and through the modified portions of the Feature A ditch.

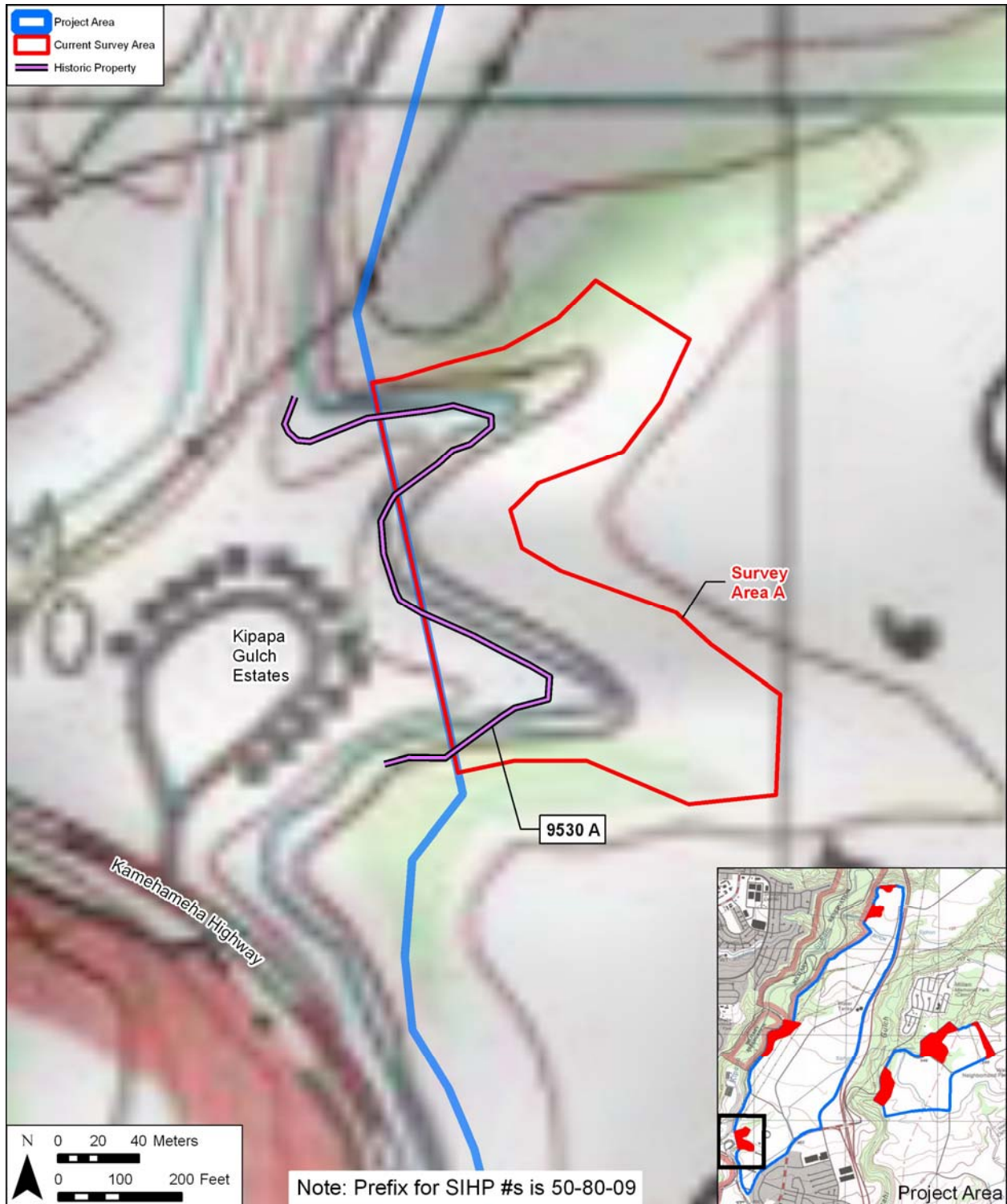


Figure 6. U.S. Geological Survey 7.5-Minute Series Topographic Map, Waipahu Quadrangle (1998), showing the locations of historic properties in Survey Area A

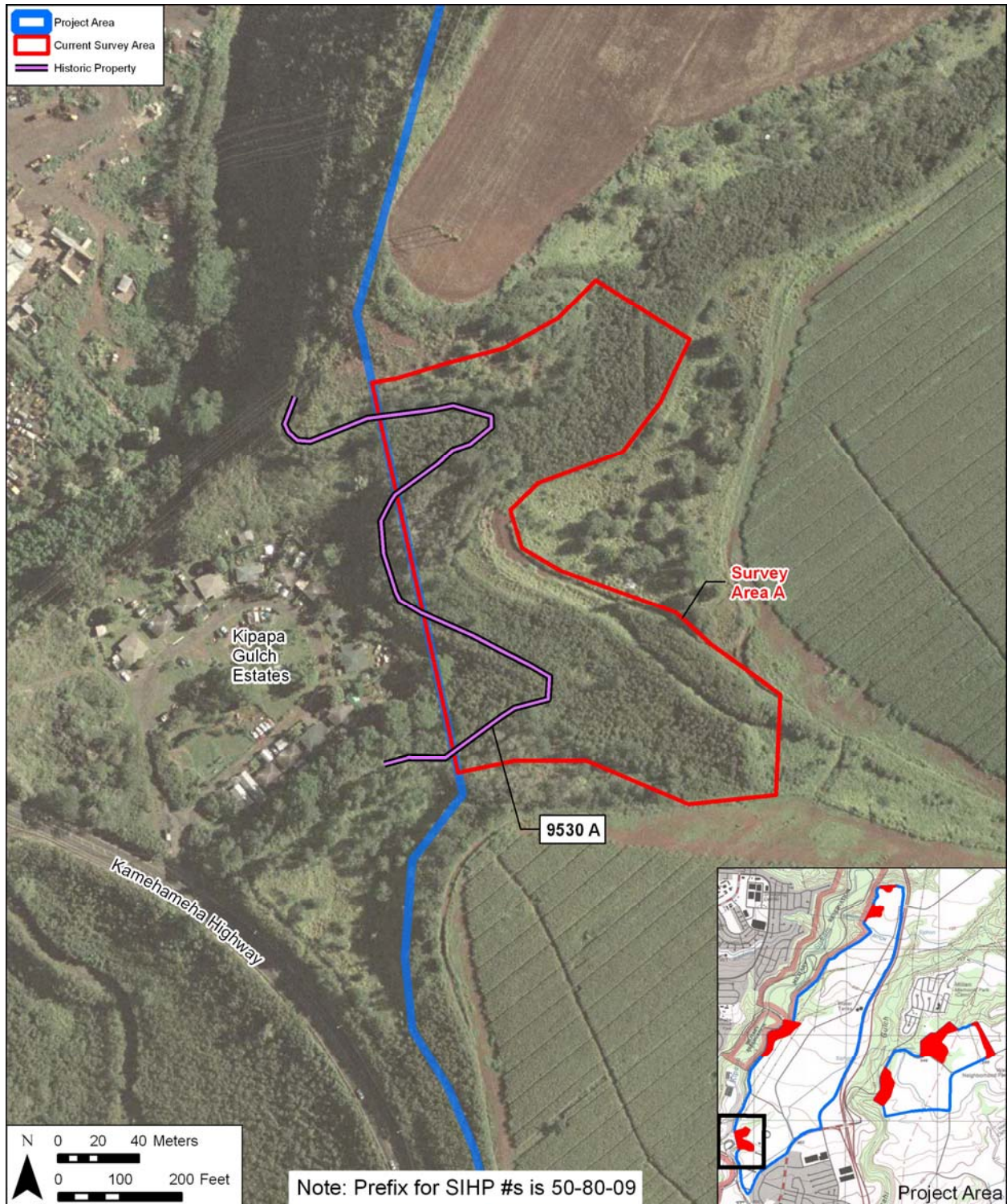


Figure 7. Aerial photograph (source: U.S. Geological Survey Orthoimagery 2005), showing the locations of historic properties in Survey Area A



Figure 8. SIHP # 50-80-09-9530 Feature A irrigation ditch, showing earthen berm recently constructed over the ditch (views to southeast, south)



Figure 9. SIHP # 50-80-09-9530 Feature A irrigation ditch, showing recently constructed stone and mortar lining above the cut basalt block and mortar ditch lining (view to southwest)



Figure 10. SIHP # 50-80-09-9530 Feature A irrigation ditch, showing recent modifications to the sluice gate and ditch outlet at the edge of Kīpapa Gulch (view to southwest)



Figure 11. Recently constructed drainage ditch along the edge of the tablelands, upslope of the SIHP # 50-80-09-9530 Feature A irrigation ditch

3.1.2 Survey Area B

Survey Area B, measuring approximately 10.9 acres, consists of moderate to steep sloping lands along the eastern slope of Kīpapa Gulch, extending from the Old Kamehameha Highway alignment (SIHP # 50-80-09-7053) to the edge of the upslope tablelands (Figure 12 and Figure 13). In general, the sloping lands were heavily eroded with the upslope portion of the survey area disturbed by land clearing and associated agricultural activities on the adjacent tablelands.

One historic property, including 5 features, was identified in Survey Area B (Figure 12 and Figure 13). An approximately 300 m long portion of the SIHP # 50-80-09-9530 Feature A plantation-era irrigation ditch is constructed along the contour of the steep gulch slope, extending both north and south beyond the current survey area. Within Survey Area B, the ditch also includes an approximately 135 m long tunnel. Four additional ditches (i.e. Features B, H, I, and J), components of the overall plantation ditch system, connect to the main Feature A ditch within Survey Area B. Features B and I are earthen ditches constructed roughly parallel to the Old Kamehameha Highway alignment. These ditches appear to primarily function as drainage ditches, collecting and transporting storm water draining from the gulch slope to prevent erosion of lands upslope of the Feature A ditch and the Old Kamehameha Highway alignment. Feature H is a dressed stone and mortar-lined ditch running *mauka-makai* (upslope-downslope) from the tablelands to the Feature A ditch. Feature H is an irrigation ditch that likely connected to the

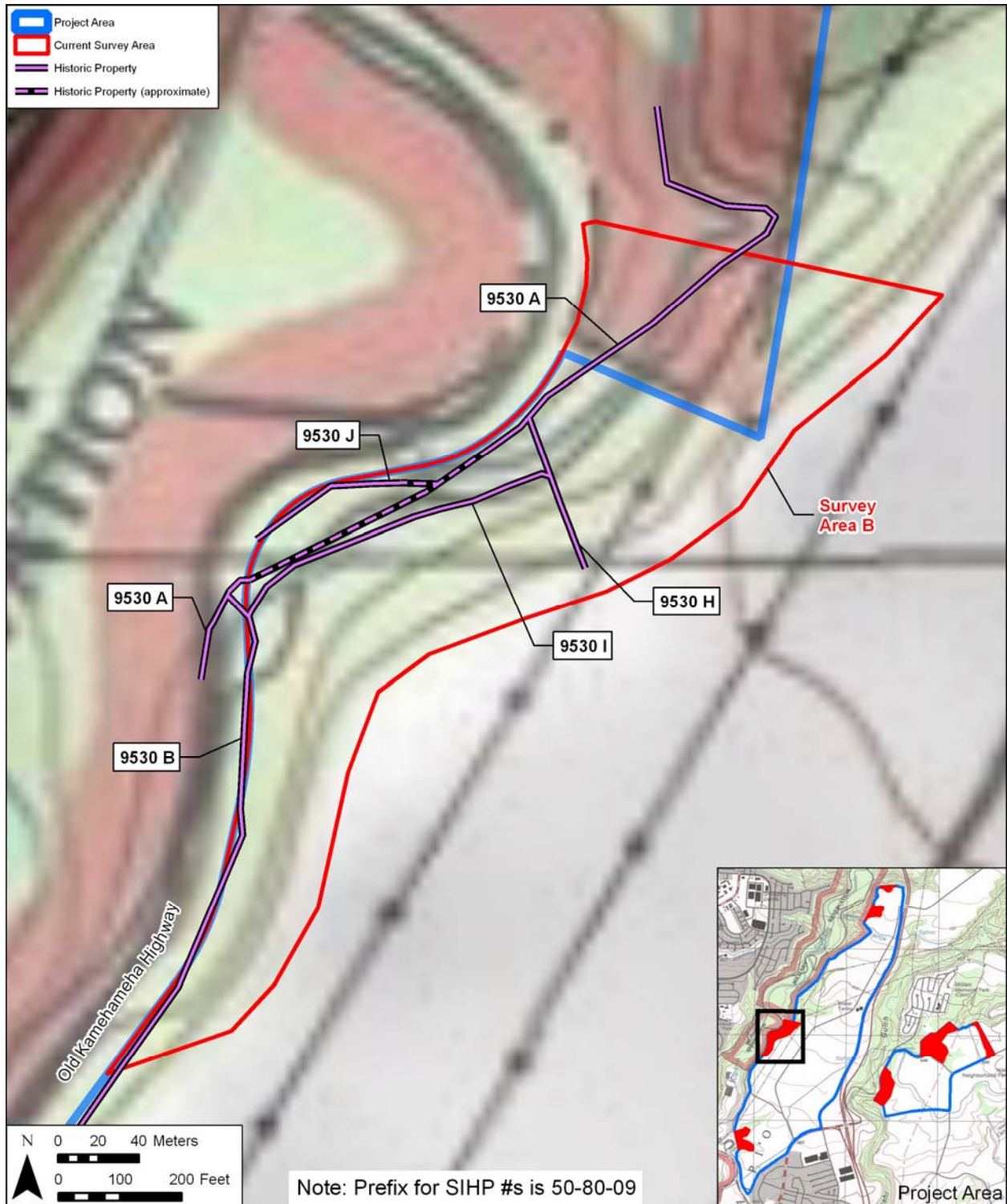


Figure 12. U.S. Geological Survey 7.5-Minute Series Topographic Map, Waipahu Quadrangle (1998), showing the locations of historic properties in Survey Area B

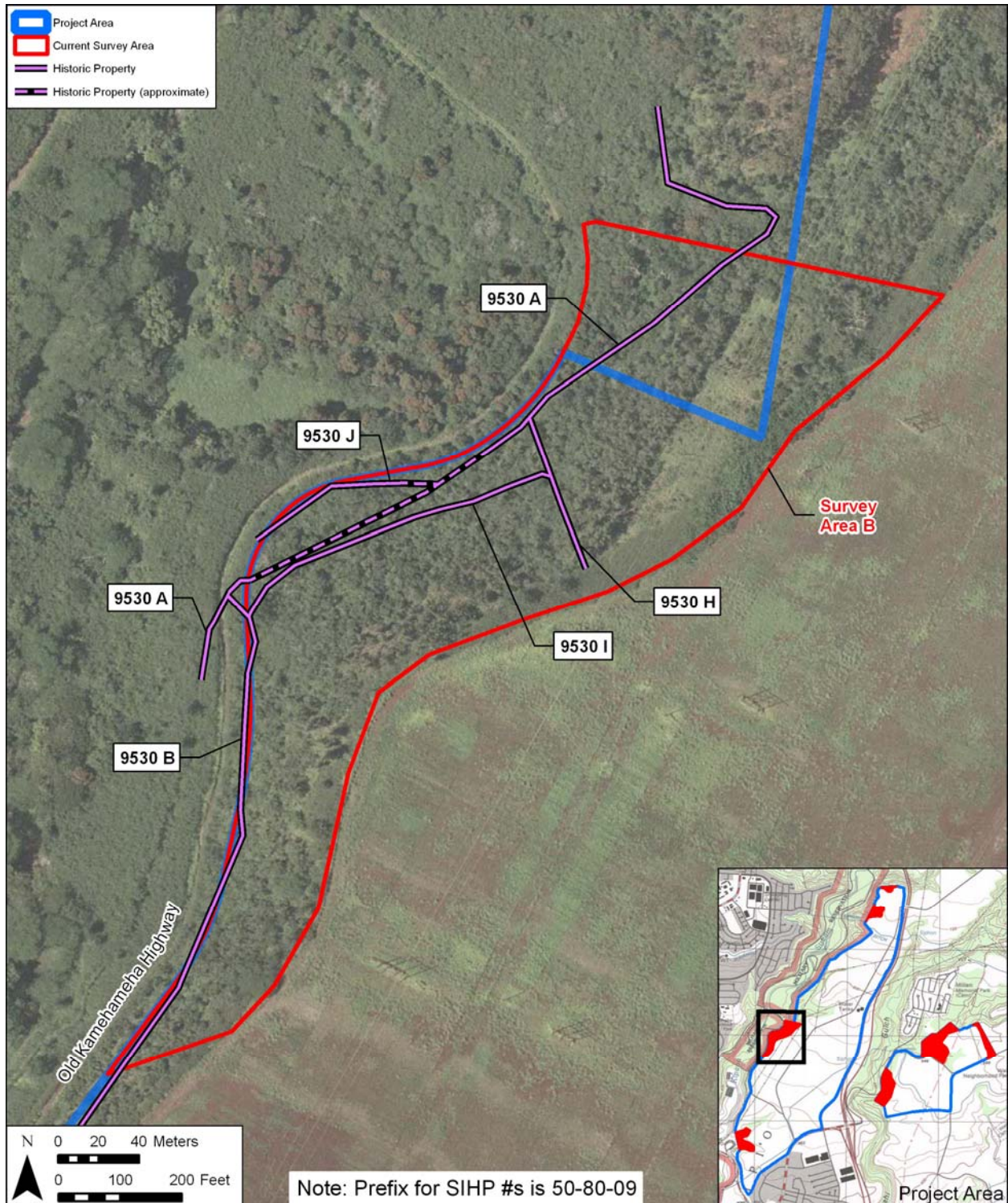


Figure 13. Aerial photograph (source: U.S. Geological Survey Orthoimagery 2005), showing the locations of historic properties in Survey Area B

plantation irrigation system along the tablelands upslope of Survey Area B, allowing excess irrigation water from the plantation fields to be recovered by the Feature A ditch and transported to fields further south. Feature J is a dressed stone and mortar-lined ditch downslope of and parallel to the Feature A ditch. Feature J is an irrigation ditch that connects to the Feature A ditch, allowing water to be released from the main ditch to fields at the base of Kīpapa Gulch.

3.1.3 Survey Area C

Survey Area C, measuring approximately 3.6 acres, consists of moderate to steep sloping lands within a tributary gully that originates from the adjacent tablelands and empties into Kīpapa Gulch (Figure 14 and Figure 15). No running water was observed in the tributary gully. However, evidence of periodic flooding during heavy rainfall was observed. In general, the gully consists of steep sloping valley walls, with a relatively wide and gently sloping base. The upslope portion of the gully slopes were heavily eroded and disturbed by land clearing and associated agricultural activities on the adjacent tablelands.

One historic property was identified within Survey Area C (Figure 14 and Figure 15). SIHP # 50-80-09-7080 is a rock mound located in the central portion of Survey Area C, at the base of the tributary gully. The base of the gully in the vicinity of the rock mound appeared to have been cleared of surface stones. SIHP # 50-80-09-7080 is likely a clearing mound, constructed during land clearing efforts associated with agricultural cultivation in the early 1900s.

3.1.4 Survey Area D

Survey Area D, measuring approximately 1.5 acres, consists of steep sloping lands along the southern slope of a tributary gulch of Kīpapa Gulch (Figure 14 and Figure 15). Lands within Survey Area D were heavily eroded, due in part to a natural landslide and associated erosion of the gulch slope. No historic properties were identified in Survey Area D.

3.1.5 Survey Area E

Survey Area E, measuring approximately 11.1 acres, consists of moderate to steep sloping lands along the eastern slope of Pānakauahi Gulch, extending from Waiawa Prison Road to the edge of the upslope tablelands (Figure 16 and Figure 17). The upslope half of the survey area exhibited evidence of former plantation pineapple cultivation, in the form of large mechanically graded earthen terraces along the sloping hillside. A portion of Pānakauahi Stream is located within Survey Area E. No running water was observed in the Pānakauahi Stream, though evidence of periodic flooding during heavy rainfall was observed. No historic properties were identified in Survey Area E.

3.1.6 Survey Area F

Survey Area F, measuring approximately 19.9 acres, consists of gently to steep sloping lands within two tributary gullies of Pānakauahi Gulch (Figure 18 and Figure 19). No running water was observed in the tributary gullies. However, evidence of periodic flooding during heavy rainfall was observed. In general, the gullies consist of steep sloping valley walls, with relatively wide and gently sloping bases. No historic properties were identified in Survey Area F.

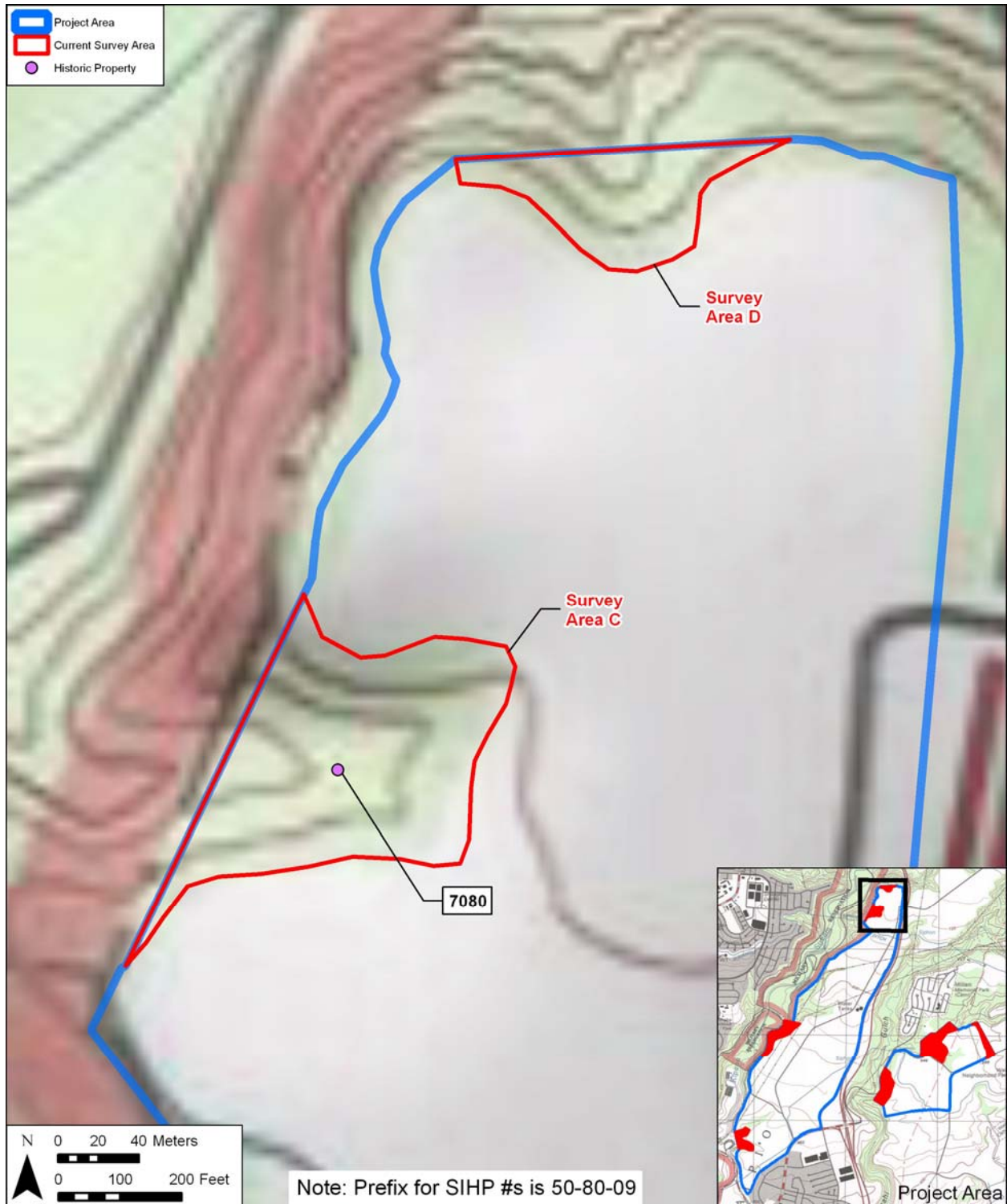


Figure 14. U.S. Geological Survey 7.5-Minute Series Topographic Map, Waipahu Quadrangle (1998), showing the locations of historic properties in Survey Areas C and D

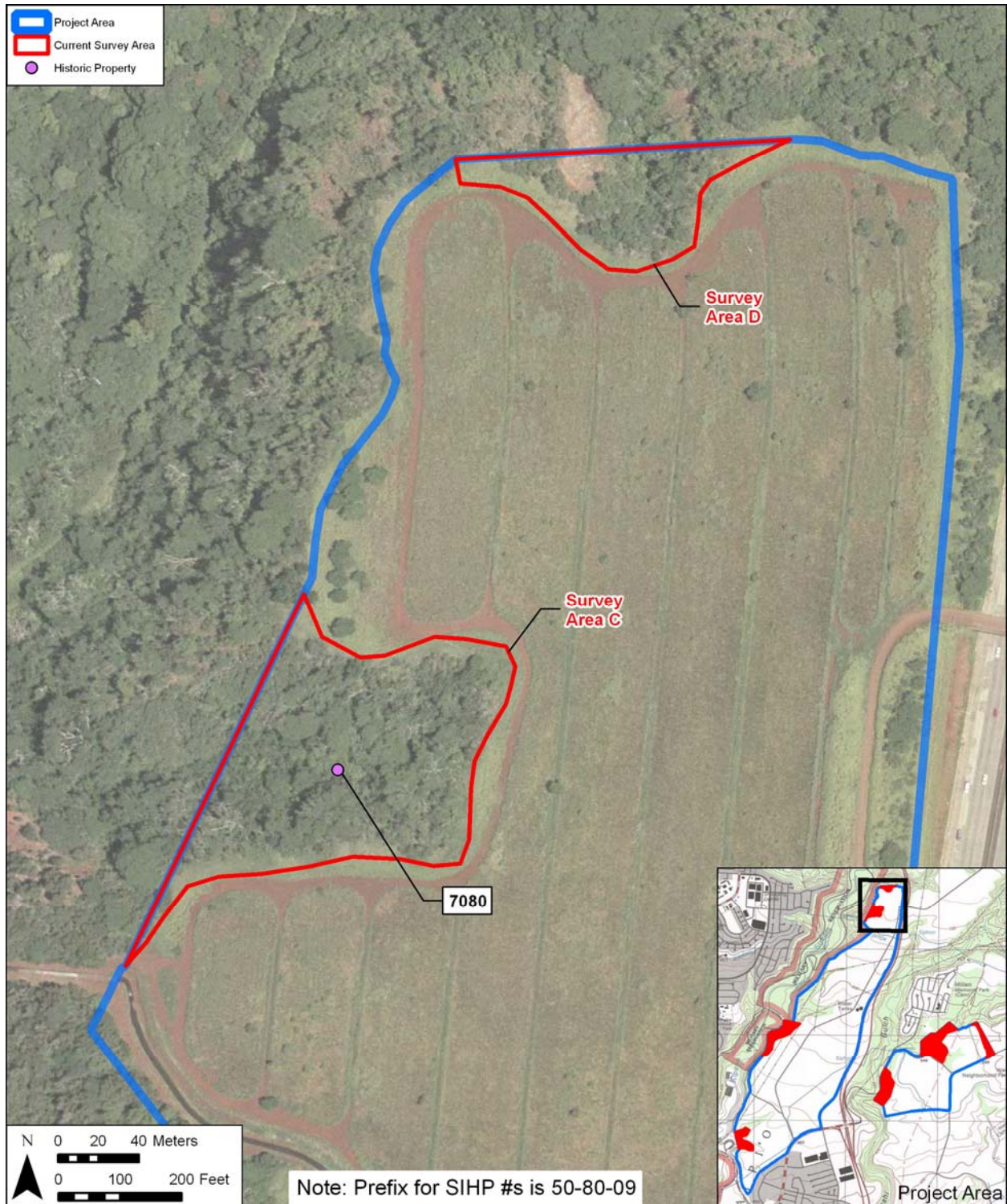


Figure 15. Aerial photograph (source: U.S. Geological Survey Orthoimagery 2005), showing the locations of historic properties in Survey Areas C and D

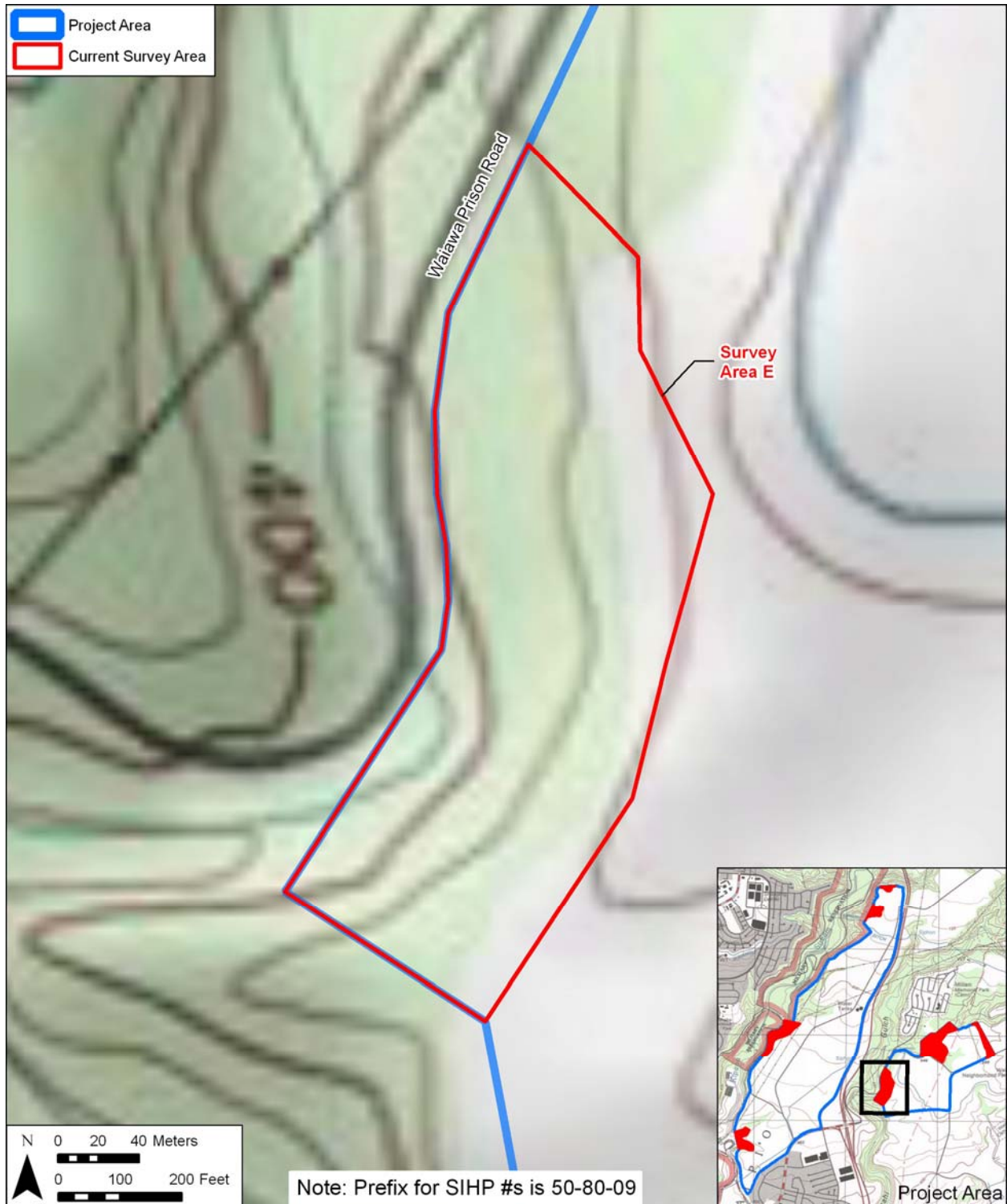


Figure 16. U.S. Geological Survey 7.5-Minute Series Topographic Map, Waipahu Quadrangle (1998), showing the location of Survey Area E

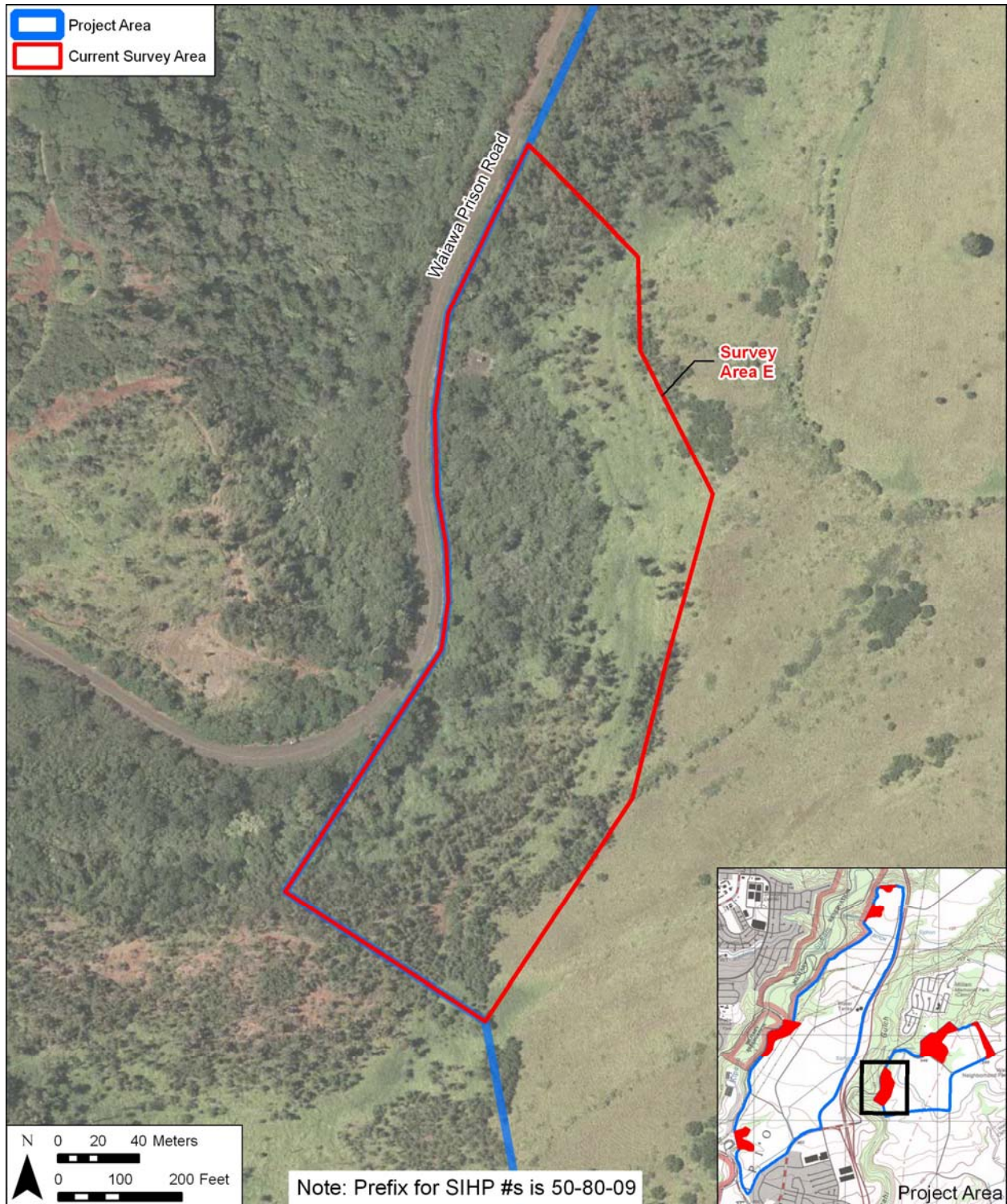


Figure 17. Aerial photograph (source: U.S. Geological Survey Orthoimagery 2005), showing the location of Survey Area E

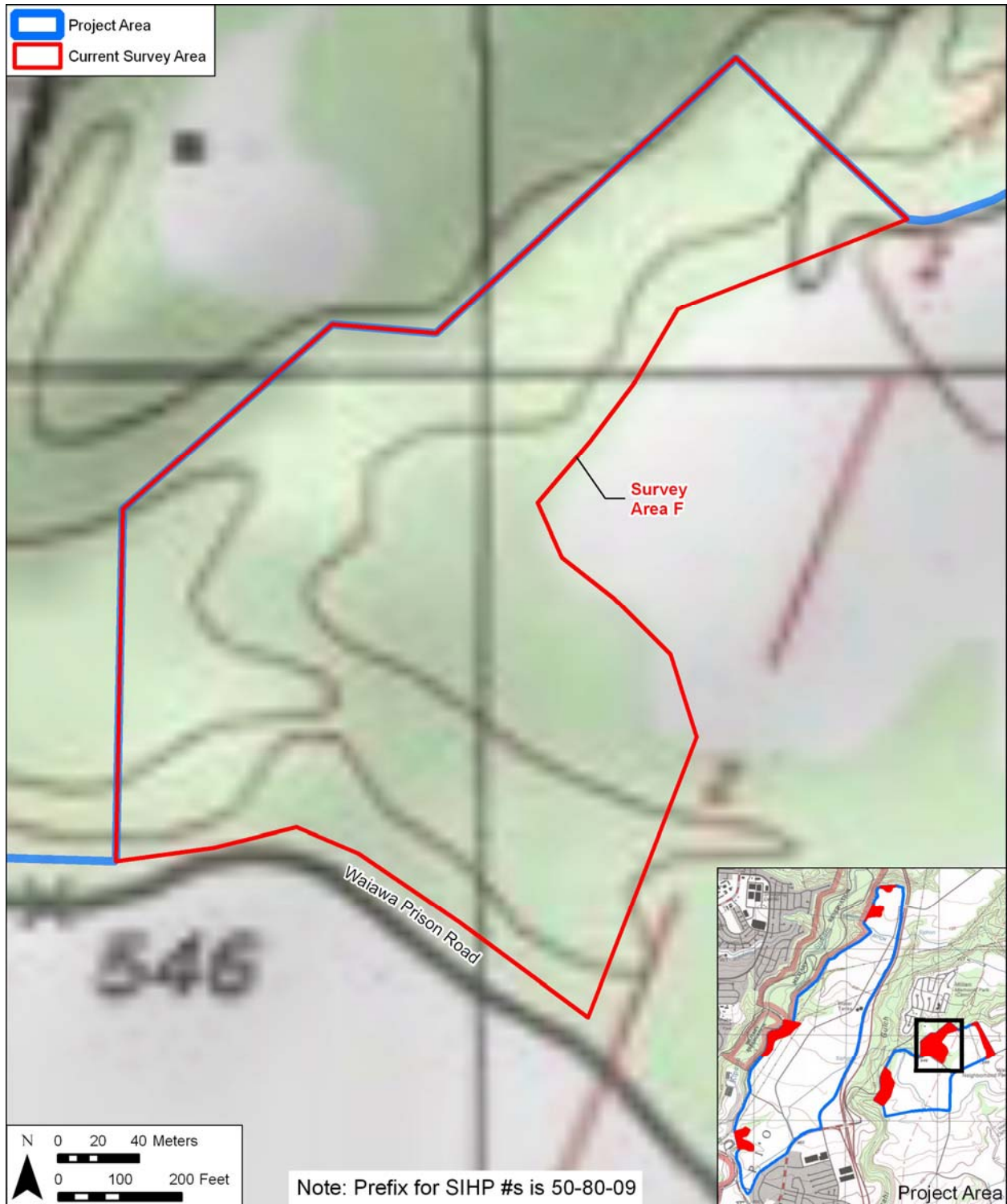


Figure 18. U.S. Geological Survey 7.5-Minute Series Topographic Map, Waipahu Quadrangle (1998), showing the location of Survey Area F

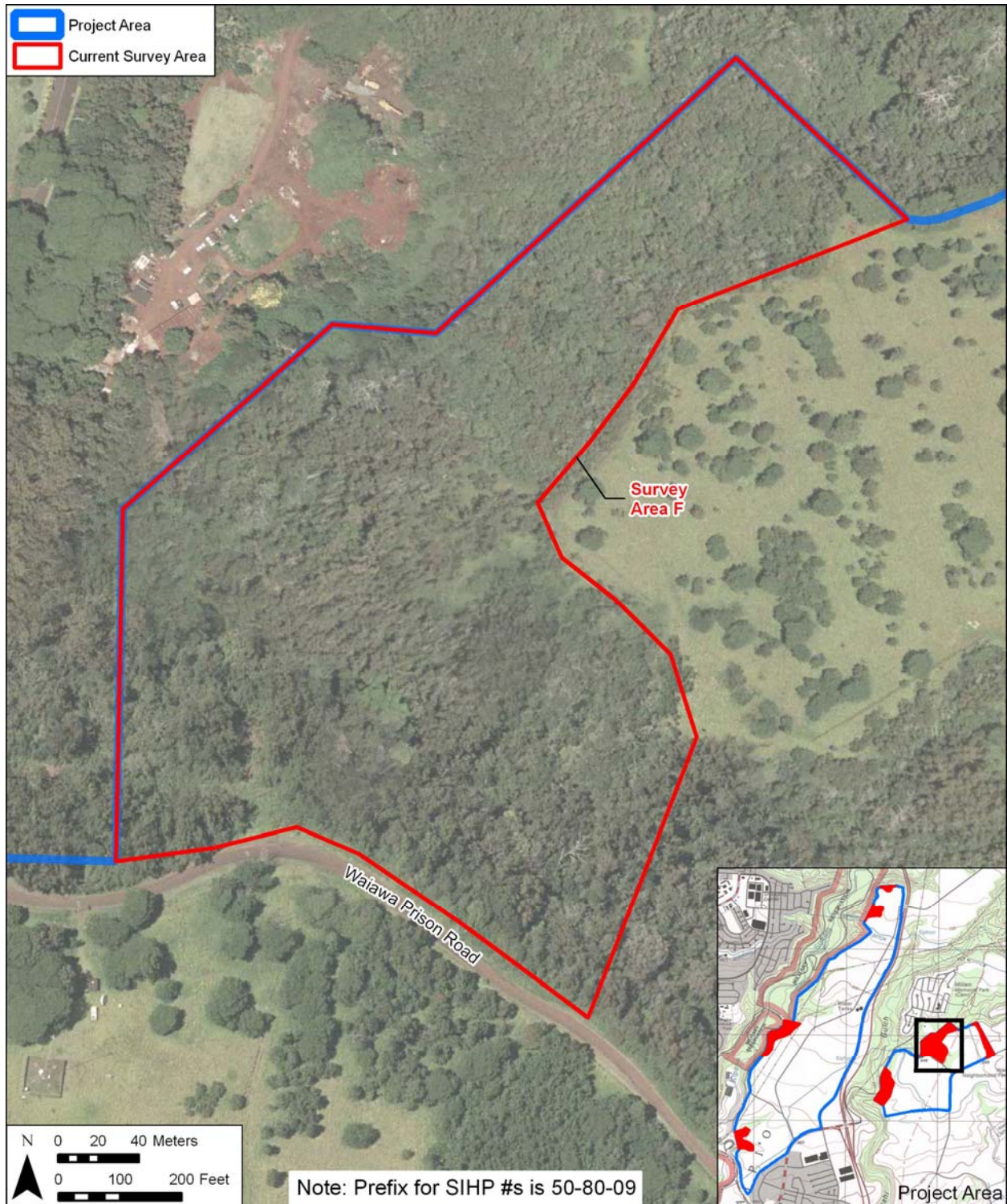


Figure 19. Aerial photograph (source: U.S. Geological Survey Orthoimagery 2005), showing the location of Survey Area F

3.1.7 Survey Area G

Survey Area G, measuring approximately 4.5 acres, consists of gently sloping tablelands bordering a tributary gully of Pānakauahi Gulch (Figure 20 and Figure 21). The entire survey area appeared to have been graded, associated with plantation agricultural activities. No historic properties were identified in Survey Area G.

3.2 Historic Property Descriptions

3.2.1 SIHP #: 50-80-09-9530

SITE TYPE: Plantation Ditch System

FUNCTION: Agricultural

FEATURES: 5

DIMENSIONS: Feature A: approximately 630 linear m within the current survey areas; Feature B: approximately 250 linear m within the current survey area; Feature H: 80 linear m; Feature I: 170 linear m; Feature J: 98 linear m

CONDITION: Good

PROBABLE AGE: Post-Contact

TAX MAP KEY: Feature A: [1] 9-4-006:001, 002, [1] 9-4-005:008, 052; Feature B: [1] 9-4-006:001; Feature H: [1] 9-4-006:001; Feature I: [1] 9-4-006:001; Feature J: [1] 9-4-006:001

DESCRIPTION:

Component features of the previously identified SIHP # 50-80-09-9530 plantation infrastructure complex were identified within Survey Area A (see Figure 6 and Figure 7) and Survey Area B (see Figure 12 and Figure 13). SIHP # 50-80-09-9530 was initially identified as “Kīpapa Platform and Terraces” during an inventory survey of lands owned by the U.S. Army by the Bishop Museum (Rosendahl 1977:2-21). In a subsequent archaeological study by Hammatt and Borthwick (1988), SIHP # 50-80-09-9530 was redefined to include features “related to activities of the Oahu Sugar Co.” (Hammatt and Borthwick 1988:42). These features included a stone-lined ditch, a cement dam, cement slabs, stone and mortar alignments, former roadways, and a railroad berm.

Hammatt et al. (1996) conducted an archaeological inventory survey of Castle and Cooke lands in Waipi‘o and Waiawa, which included the tablelands portion of the Koa Ridge Makai project area. The stone-lined ditch (i.e. a component of SIHP # 50-80-09-9530), named the “Kīpapa Ditch” in the report, was observed during the study but was believed to be located outside of the project area and was not formally documented. A brief description of the ditch was provided, as the ditch was noted to run adjacent to the Koa Ridge Makai project area for approximately 2.4 km. The authors noted:

Although at present the ditch only carries excess water during rains, along much of its length it is still in workable condition. It was observed to be a major work of engineering for its time. The use of quarried shaped basalt boulders along its entire length is particularly impressive. [Hammatt et al. 1996:53]

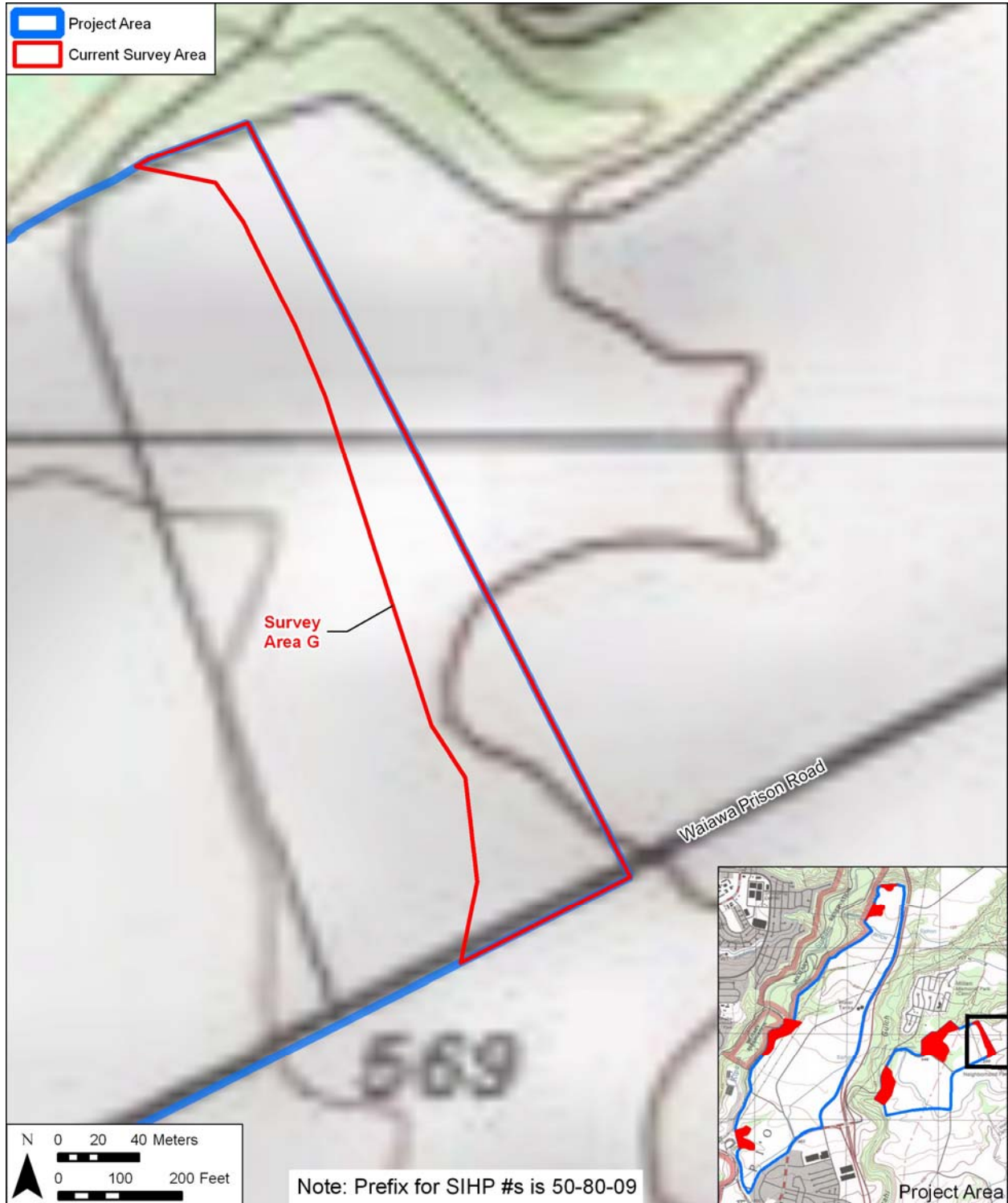


Figure 20. U.S. Geological Survey 7.5-Minute Series Topographic Map, Waipahu Quadrangle (1998), showing the location of Survey Area G

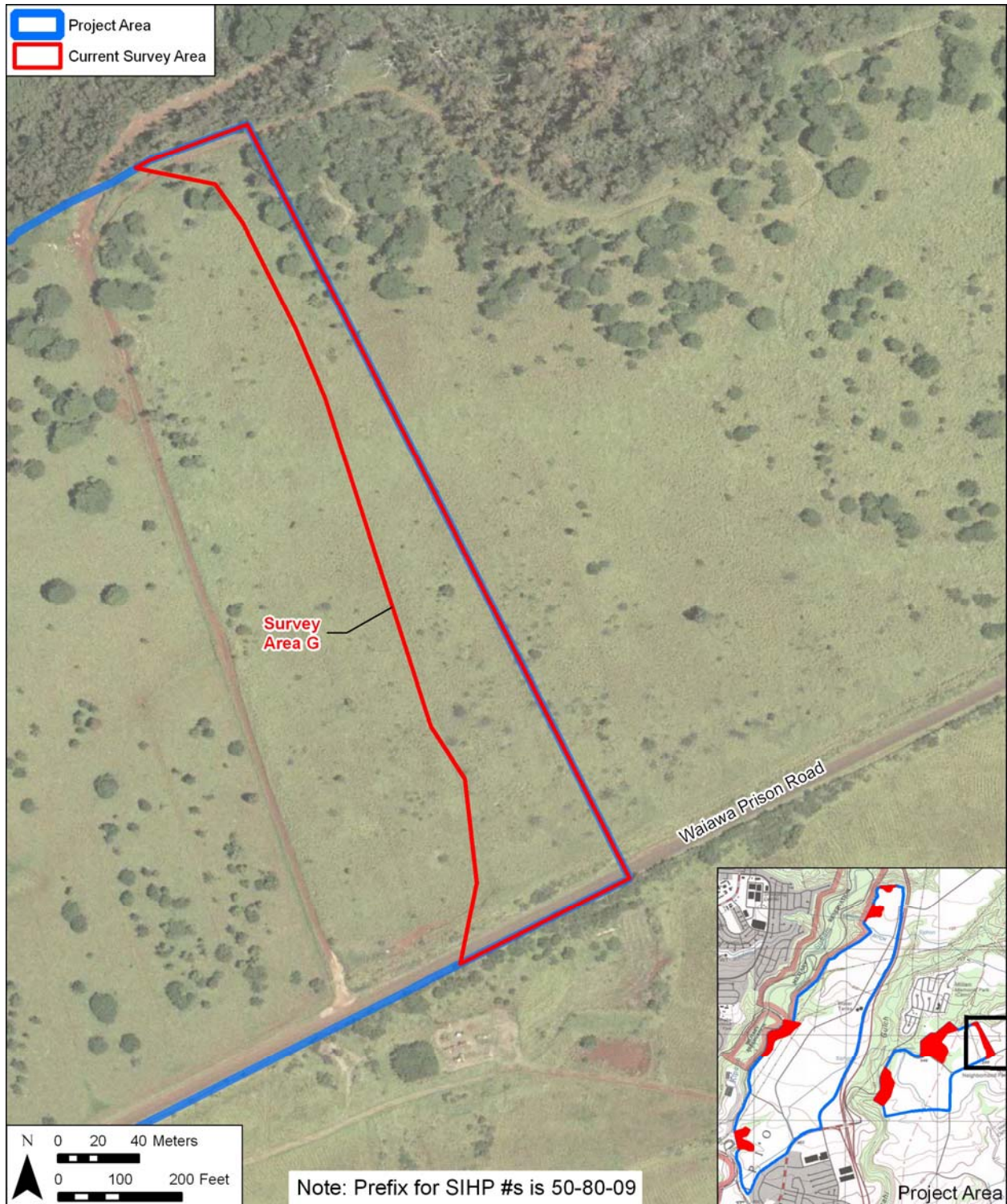


Figure 21. Aerial photograph (source: U.S. Geological Survey Orthoimagery 2005), showing the location of Survey Area G

Tulchin et al. (2009) recently completed an archaeological inventory survey of Kīpapa Gulch lands in the vicinity of the current survey areas for planned off-site infrastructure improvements related to the Koa Ridge Makai project. An approximately 440 m portion of the stone-lined ditch, located immediately north of Survey Area B, was formally documented and designated Feature A of SIHP # 50-80-09-9530. The following general description of the SIHP # 50-80-09-9530 Feature A irrigation ditch was provided:

Feature A is a well-constructed irrigation ditch. The ditch, based on observations by Hammatt and Borthwick (1988) and Hammatt et al. (1996), originates at a dam within Kīpapa Stream, approximately 0.7 km north of the project area. From the intake at Kīpapa Stream, the ditch progresses south, situated along the eastern slope of Kīpapa Gulch. The ditch runs along the eastern slope of the gulch, through the project area, and continues to the south, beyond the project area. As the ditch progresses south, it gradually climbs the east slope of Kīpapa Gulch until reaching the top of the gulch slope and progressing along the tablelands of the *makai* portion of Waipi'o. [Tulchin et al. 2009:126]

3.2.1.1 SIHP # 50-80-09-9530 within Survey Area A

An approximately 330 m long portion of the SIHP # 50-80-09-9530 Feature A irrigation ditch was documented within Survey Area A (Figure 22). The Feature A ditch is constructed along the contour of the eastern slope of Kīpapa Gulch, and extends north and south beyond the survey area. The ditch is generally U-shaped, with a flat bottom and sloping side walls, measuring 1.2-1.8 m wide at the base and 2.2-2.8 m wide at the top surface, with depths of 1.3-1.6 m. The interior of the ditch is lined with cut (“dressed”) and mortared basalt blocks, each measuring approximately 30 by 30 cm, 4-5 courses high along the side walls of the ditch (Figure 23). The base of the ditch is lined with cement. Portions of the ditch walls are reinforced with the addition of stacked basalt boulder and cobble retaining walls, 2-4 courses high, constructed above the top of the mortared basalt blocks (Figure 24). The additional stacked-stone retaining walls are generally located along the upslope wall of the ditch in areas where the ditch is heavily cut into the hillside, and along the downslope wall in areas where the ditch makes sharp curves.

Near the northern end of Survey Area A, a sluice gate (Figure 25) is constructed within the western (downslope) edge of the Feature A ditch, allowing irrigation water from the ditch to be released to secondary ditches or fields down slope, within Kīpapa Gulch. In the central portion of Survey Area A, two ditch inlets are constructed adjacent to the eastern (upslope) edge of the Feature A ditch (Figure 26). The ditch inlets are of similar construction as the main Feature A ditch, with cut and mortared basalt block side walls and cement base, measuring 0.9 m wide and 0.4 m deep. The improved portions of the ditch inlets measure approximately 2-4 m in length, with remnant earthen ditches continuing upslope. Due to heavy erosion of the sloping hillside, the full extent and origin of the earthen ditches could not be discerned. The ditch inlets likely connected to the plantation irrigation system along the tablelands upslope of the Feature A ditch, allowing excess irrigation water from the plantation fields to be recovered by the Feature A ditch and transported to fields further south.

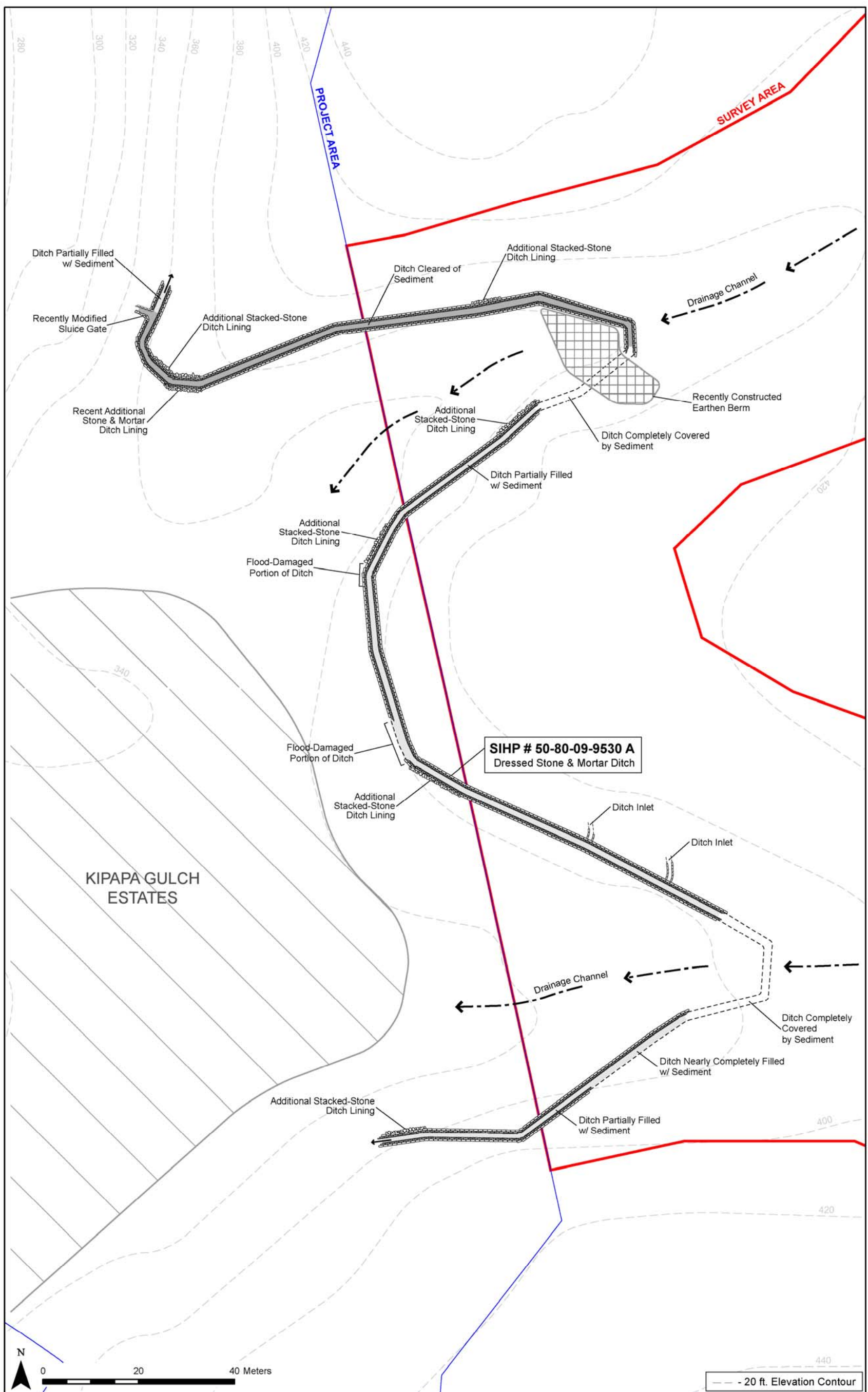


Figure 22. Plan-view diagram of SIHP # 50-80-09-9530 Feature A within Survey Area A



Figure 23. SIHP # 50-80-09-9530 Feature A irrigation ditch, showing portion of the ditch where interior sediment has been recently removed (view to northeast)



Figure 24. SIHP # 50-80-09-9530 Feature A irrigation ditch, showing additional stacked-stone lining above the cut basalt block and mortar ditch lining (view to east)



Figure 25. SIHP # 50-80-09-9530 Feature A irrigation ditch, showing sluice gate and ditch outlet at the edge of Kīpapa Gulch (view to northwest)



Figure 26. SIHP # 50-80-09-9530 Feature A irrigation ditch, showing ditch inlets adjacent to the upslope ditch wall (views to north)

Much of the Feature A ditch is partially filled with sediment eroding from upslope areas (Figure 27). Portions of the ditch, where the ditch crosses natural drainage gullies, are completely covered by erosional sediment. Two portions of the downslope wall of the ditch have been damaged by flooding (Figure 28). The Feature A ditch apparently collects storm water draining from upslope areas and the two natural gullies within Survey Area A, and was breached in these two locations during periods of particularly heavy rainfall. The flood damaged portions of the ditch are located immediately upslope of the Kīpapa Gulch Estates residential complex.

3.2.1.2 SIHP # 50-80-09-9530 within Survey Area B

Five component features of SIHP # 50-80-09-9530 were identified within Survey Area B (Figure 29). An approximately 300 m long portion of the Feature A irrigation ditch is constructed along the contour of the steep gulch slope. Portions of the Feature A ditch immediately north and south of Survey Area B were documented in detail by Tulchin et al. (2009). Within Survey Area B, much of the Feature A ditch is partially or completely filled with sediment eroding from upslope areas. Based on observations of the exposed portions of the ditch, the general construction of the ditch appears to be fairly uniform throughout its length, with dimensions equivalent to those observed in the recently excavated portions of the Feature A ditch in Survey Area A.

In the central portion of Survey Area B, the Feature A ditch enters an approximately 135 m long ditch tunnel. Prior to entering the tunnel, the Feature A ditch narrows from 3.1 to 1.7 m in width. The ditch tunnel entrance is constructed of cut (“dressed”) and mortared basalt blocks, measuring 3.0 m wide and 1.5 m high above the sidewall of ditch (Figure 30). The ceiling of the ditch tunnel is arched, with a height of 65 cm above the ditch sidewall (Figure 31). A portion of the ditch tunnel has collapsed, revealing the tunnel construction (Figure 32). The tunnel was apparently excavated through loose soil as well as solid rock, with the ceiling of the tunnel reinforced with an approximately 15 cm thick cement lining. The Feature A ditch exits the tunnel near the western boundary of Survey Area B. The ditch tunnel exit is of similar construction as the ditch entrance, measuring 3.3 m wide and 1.6 m high above the sidewall of ditch (Figure 33). A date plaque of “1931” is carved into the basalt block above the tunnel arch. The Feature A ditch continues south, beyond Survey Area B, where it crosses beneath the Old Kamehameha Highway alignment (SIHP # 50-80-09-7053) via a culvert. The ditch culvert was documented in detail by Tulchin et al. (2009).

Feature B is ditch that extends along the eastern slope of Kīpapa Gulch, upslope from and generally parallel to the Old Kamehameha Highway alignment, and connects to the Feature A ditch near the western boundary of Survey Area B. Near the intersection of Features A and B, the Feature B ditch is of similar construction as Feature A, including a lining of mortared basalt blocks, measuring 1.2-1.6 m wide and 0.4-1.2 m deep (Figure 34). The Feature B ditch progresses upslope from the Feature A ditch, transitioning from cut (“dressed”) stone and mortar construction to natural stone and mortar construction, then to stacked-stone construction (Figure 35). The ditch then curves to the south and extends cross-slope for approximately 230 m within the survey area at a slight upslope angle. The cross-slope portion of Feature B is an earthen ditch,



Figure 27. SIHP # 50-80-09-9530 Feature A irrigation ditch, showing portion of the ditch partially filled with sediment (view to southwest)



Figure 28. SIHP # 50-80-09-9530 Feature A irrigation ditch, showing portions of the ditch damaged by flooding

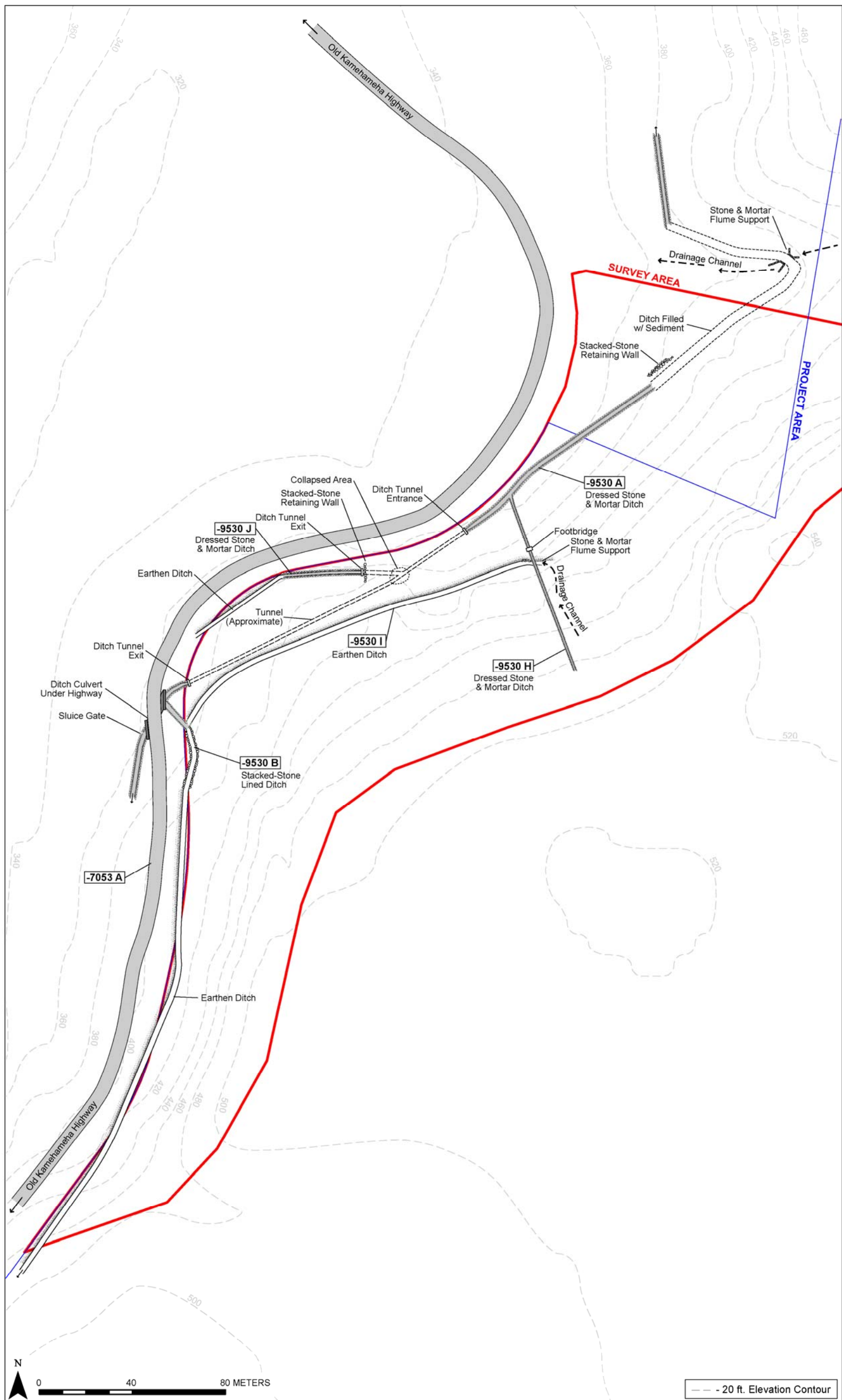


Figure 29. Plan-view diagram of SIHP # 50-80-09-9530 within Survey Area B

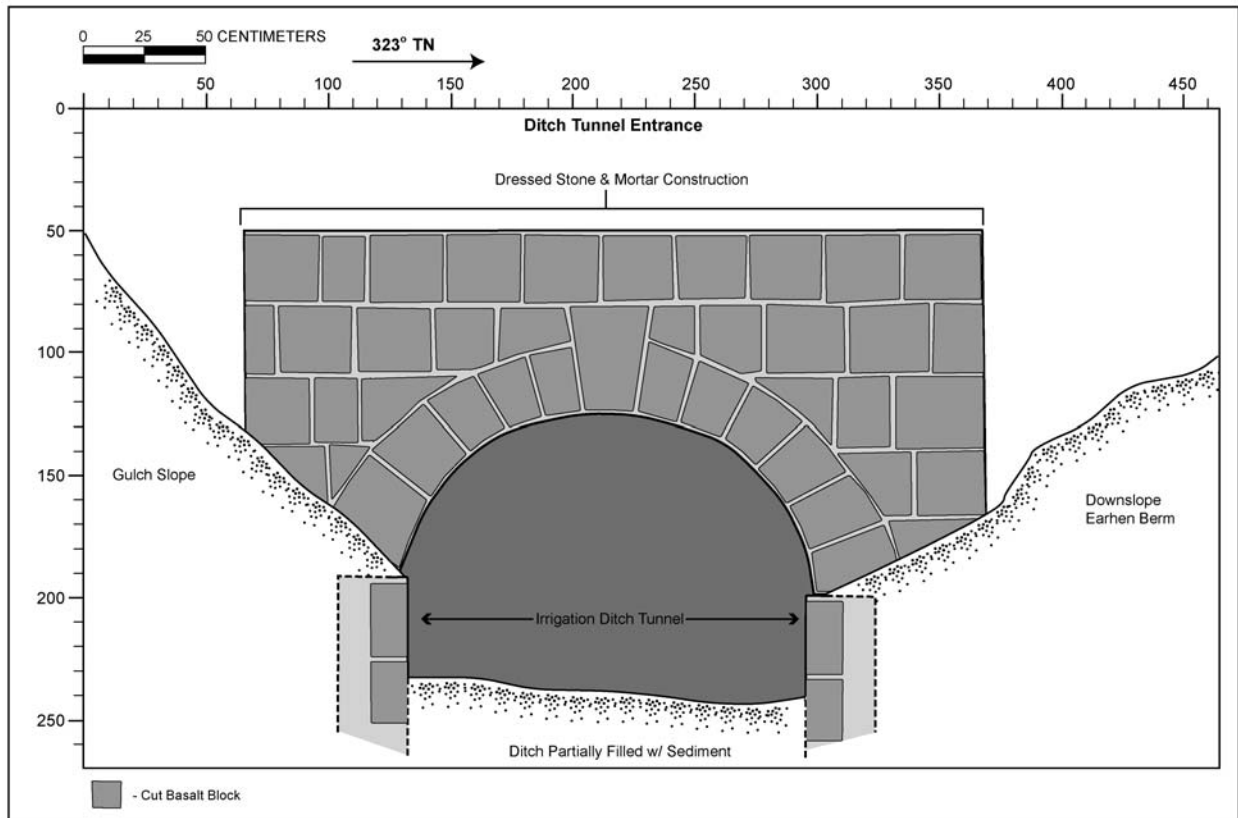


Figure 30. Photograph (above, view to southwest) and profile diagram (below) of the SIHP # 50-80-09-9530 Feature A ditch tunnel entrance



Figure 31. Photograph of the interior of the SIHP # # 50-80-09-9530 Feature A ditch tunnel



Figure 32. Photograph of a collapsed portion of the SIHP # # 50-80-09-9530 Feature A ditch tunnel

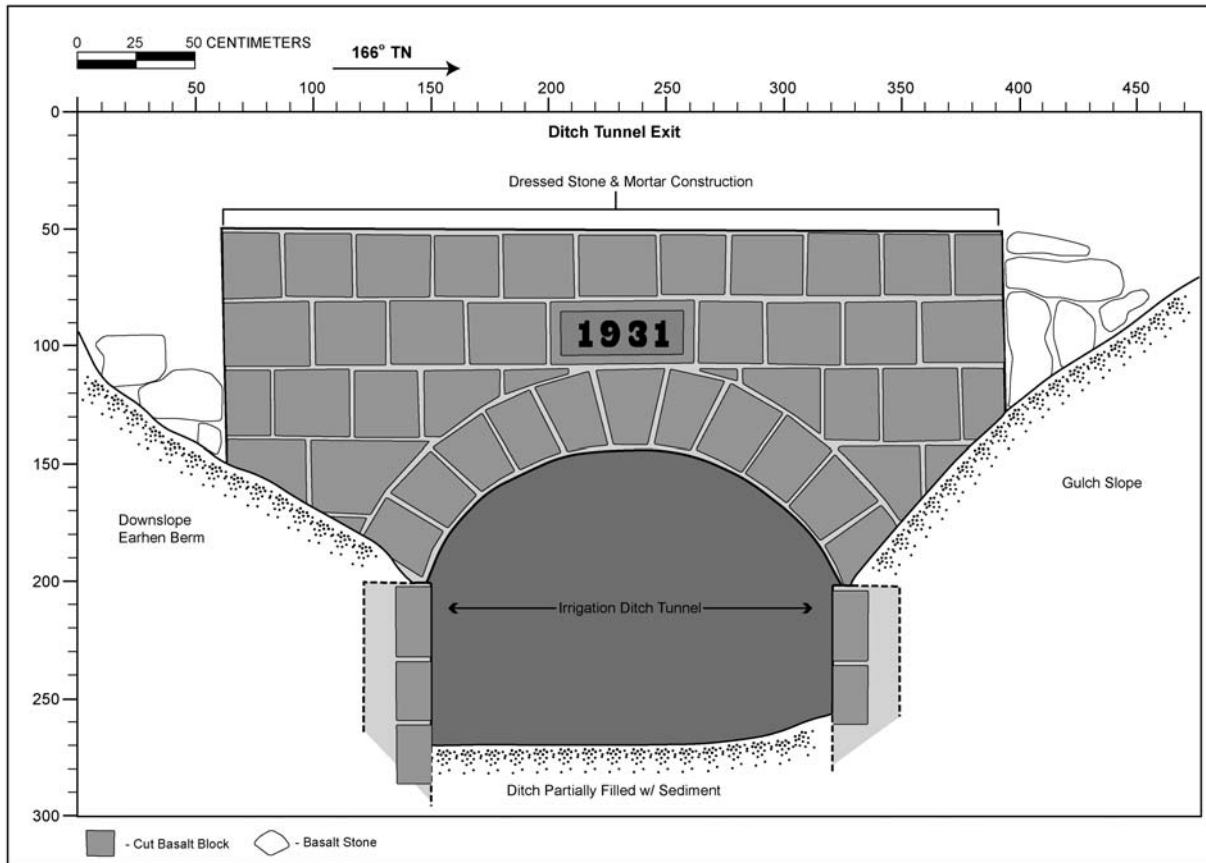


Figure 33. Photograph (above, view to northeast) and profile diagram (below) of the SIHP # 50-80-09-9530 Feature A ditch tunnel exit



Figure 34. Photograph of SIHP # 50-80-09-9530 Feature B ditch, showing cut (“dressed”) stone and mortar construction transitioning to natural stone and mortar construction, view to southeast



Figure 35. Photograph of SIHP # 50-80-09-9530 Feature B ditch, showing stacked-stone construction, view to south

measuring 1.5-2.5 m wide and 0.5-1.5 m deep, with an earthen berm along the downslope edge (Figure 36). Feature B continues to parallel the Old Kamehameha Highway alignment to the south, beyond Survey Area B. Feature B likely functioned as a water diversion / drainage feature. The ditch collects storm water draining from the eastern gulch slope, upslope of the Old Kamehameha Highway alignment. The water is collected along the length of the Feature B ditch and is then directed into the Feature A irrigation ditch and beneath the highway via the aforementioned ditch culvert, thereby preventing flooding of the Old Kamehameha Highway alignment.

Feature H is an irrigation ditch that connects to the Feature A ditch approximately 20 m north of the ditch tunnel entrance. The Feature H ditch is of similar construction as Feature A, including a lining of mortared basalt blocks, and measures 0.8 m wide and 0.3 m deep (Figure 37). The Feature H ditch is oriented *mauka-makai* (upslope-downslope), extending upslope from the Feature A ditch to the edge of the tablelands, where it has been disturbed by modern agricultural activities. The Feature H ditch likely connected to the plantation irrigation system along the tablelands upslope of Survey Area B, allowing excess irrigation water from the plantation fields to be recovered by the Feature A ditch and transported to fields further south. Approximately 20 m upslope of the intersection with the Feature A ditch, is a well-constructed bridge over the Feature H ditch (Figure 38). The bridge measures 2.0 by 1.2 m wide, with a height of 1.3 m above the sidewall of the ditch. The bridge rests on a mortared basalt block foundation, with the bridge constructed from a base layer of iron railroad tracks, followed by a layer of sheet metal, 3 courses of stacked basalt boulders and cobbles, and a top layer of sheet-metal. The bridge appears to function as a footbridge, likely associated with maintenance of the plantation ditch system.

Feature I is a ditch that extends along the eastern slope of Kīpapa Gulch, upslope from and generally parallel to the Feature A ditch. The Feature I ditch originates at an intersection of a natural drainage channel with the Feature H ditch. At the intersection, an earthen berm lined with stone and mortar wall segments diverts the water flow from the natural drainage over the Feature H ditch and into the Feature I ditch (Figure 39). The stone and mortar walls have notches that likely functioned as the foundation for a wooden or metal flume over the Feature H ditch. The Feature I ditch is primarily an earthen ditch, measuring 1.5-2.5 m wide and 0.5-1.0 m deep, with an earthen berm along the downslope edge. The downslope wall of the ditch is lined with stacked stones near intersection with the Feature H ditch. The Feature I ditch progresses cross-slope for approximately 170 m, upslope of the Feature A ditch tunnel, until connecting with the Feature B ditch. Feature I likely functioned as a water diversion / drainage feature. The ditch collects storm water from a natural drainage channel, as well as water draining from the eastern gulch slope, upslope of the Feature A ditch tunnel. The water is collected along the length of the Feature I ditch, directed into the Feature B ditch, and then into the Feature A ditch, beyond the ditch tunnel. The Feature I ditch thereby prevents flooding of the Feature A ditch tunnel and erosion of land above the ditch tunnel. A portion of the Feature I ditch has been breached by flood waters, allowing storm water to now flow over the Feature A ditch tunnel. Erosion caused by the flood waters likely caused the aforementioned collapse of a portion of the Feature A ditch tunnel.



Figure 36. Photograph of SIHP # 50-80-09-9530 Feature B ditch, showing primarily earthen ditch construction with limited stacked-stone lining, view to south



Figure 37. Photograph of SIHP # 50-80-09-9530 Feature H ditch, view to south

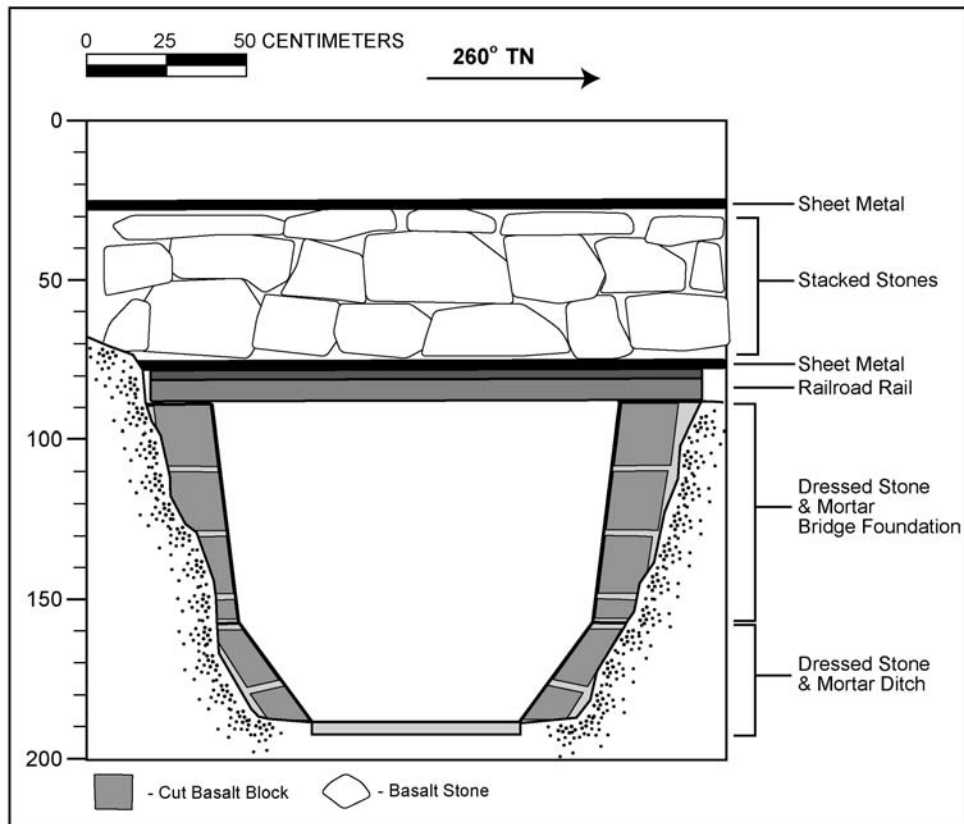


Figure 38. Photograph (above, view to southeast) and profile diagram (below) of the SIHP # 50-80-09-9530 Feature H footbridge



Figure 39. Photograph of the origin of SIHP # 50-80-09-9530 Feature I ditch at the intersection with Feature H ditch, view to northwest

Feature J is an irrigation ditch that originates at a tunnel exit, approximately 18 m west of the Feature A ditch tunnel. The ditch tunnel exit is of similar construction as the Feature A ditch tunnel exit, and measures 3.0 m wide (Figure 40). Stacked stone retaining walls are constructed adjacent to the sides of the tunnel exit. A stacked stone retaining wall, 3-4 courses high, is also constructed immediately upslope of the tunnel exit. At present, the tunnel exit is almost completely covered by erosional sediment. The Feature J tunnel appears to connect to the Feature A tunnel at the presently collapsed portion of the tunnel. The intersection of the two tunnels may have been a weaker portion of the tunnel structure, making it more susceptible to collapse. The Feature J ditch progresses approximately 80 m to the west, along the contour of the slope, and terminates at a disturbed area adjacent to the Old Kamehameha Highway alignment. The Feature J ditch is of similar construction as the Feature A ditch, lined with cut (“dressed”) and mortared basalt blocks. The Feature J ditch is in poor condition with many collapsed areas. Feature J appears to function as an outlet allowing water to be released from the main Feature A ditch to fields at the base of Kīpapa Gulch.

SIHP # 50-80-09-9530 Features A, B, H, I, and J are components of a plantation-era ditch system, attributable to the Oahu Sugar Company. Background research indicated the Kīpapa Gulch ditch system was constructed *circa* the early 1930s and functioned in transporting irrigation water from Kīpapa Stream to plantation fields along the tablelands to the south. SIHP #

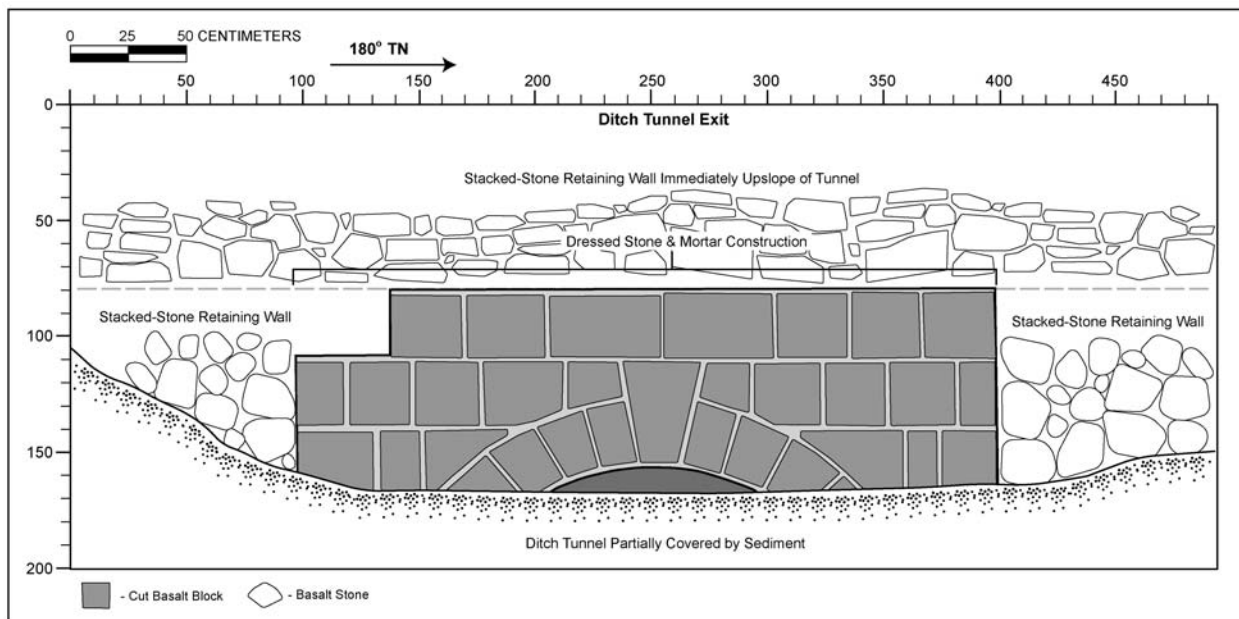


Figure 40. Photograph (above, view to east) and profile diagram (below) of the SIHP # 50-80-09-9530 Feature J ditch tunnel exit

50-80-09-9530 Features A, B, H, and I are in good condition. Feature J is in poor condition. Portions of the SIHP # 50-80-09-9530 ditch system have been disturbed by erosion and flooding. Portions of the Feature A ditch have also been modified for adaptive reuse of the feature as a drainage ditch. SIHP # 50-80-09-9530 was previously assessed by Tulchin et al. (2009) as significant under Criterion A (associated with events that have made an important contribution to the broad patterns of our history), Criterion C (embody the distinctive characteristics of a type period or method of construction), and Criterion D (have yielded, or may be likely to yield information important in prehistory or history) of the Hawai'i Registers of Historic Places evaluation criteria.

3.2.2 SIHP #: 50-80-09-7080

SITE TYPE: Mound
FUNCTION: Agricultural
FEATURES: 1
DIMENSIONS: 4.2 m E/W by 3.9 m N/S
CONDITION: Good
PROBABLE AGE: Post-Contact
TAX MAP KEY: [1] 9-5-003:001
DESCRIPTION:

SIHP # 50-80-09-7080 is a rock mound located in the central portion of Survey Area C (see Figure 14 and Figure 15). The mound is situated on the relatively wide and gently sloping base of a tributary gully, near the base of the southern gully slope. The mound is oval-shaped, measuring 4.2 m by 3.9 m in diameter, with a maximum height of 1.0 m (Figure 41). The mound is constructed of loosely piled basalt boulders and cobbles, 1-3 courses high, with large gaps between the stones (Figure 42). The perimeter of the mound is not faced, and the top surface of the mound is sloping and uneven. A particularly large boulder is located at the east edge of the mound. The base of the gully in the vicinity of the mound appears to have been cleared of surface stones.

A 1 m by 1 m test excavation was made within the central portion of the SIHP # 50-80-09-7080 mound to better determine the function, age, and method of construction of the feature (see Section 3.3: Test Excavation Findings). No cultural material was observed through the test excavation. A single historic bottle was observed to be wedged into a crevice within the southern portion of the mound structure (Figure 43). The bottle is light green in color, measuring 30.1 cm in length, 7.5 cm in diameter, with a round base (Figure 44). The bottle is of a two-piece mold manufacturing technique with a tooled lip. The body of the bottle is embossed "HONOLULU BREWING CO. HONOLULU, H. T.". Manufacturing characteristics and embossing indicate that it is a beer bottle manufactured circa 1908-1911 (Elliott and Gould 1988:188).

SIHP # 50-80-09-7080 is likely a clearing mound, constructed during land clearing efforts associated with agricultural cultivation in the early 1900s. SIHP # 50-80-09-7080 is in good condition, with limited disturbance due to erosion and vegetation growth. SIHP # 50-80-09-7080 is assessed as significant under Criterion D (have yielded, or may be likely to yield information important in prehistory or history) of the National and Hawai'i Registers of Historic Places evaluation criteria.

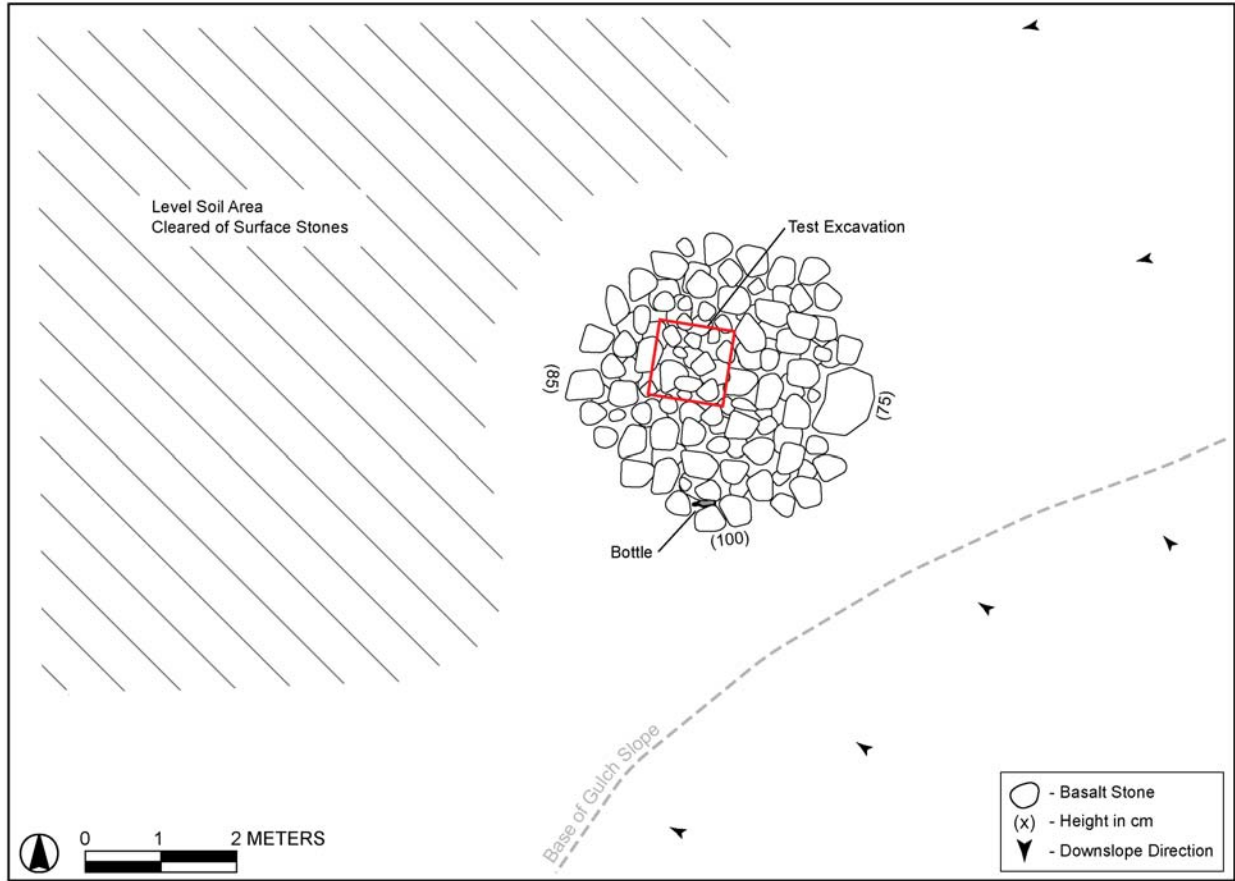


Figure 41. Plan-view diagram of SIHP # 50-80-09-7080 mound



Figure 42. Photograph of SIHP # 50-80-09-7080 mound, view to east



Figure 43. Photograph of SIHP # 50-80-09-7080 mound, showing historic bottle wedged into crevice



Figure 44. Photograph of historic bottle found on SIHP # 50-80-09-7080 mound

3.3 Test Excavation Findings

3.3.1 SIHP # 50-80-09-7080 Test Unit 1

A 1 m by 1 m test excavation was made within the central portion of the SIHP # 50-80-09-7080 mound (see Figure 41) to better determine the function, age, and method of construction of the feature. The test excavation was located in a relatively well-constructed portion of the mound, thought to have the highest likelihood of encountering intact cultural material. The uneven surface of the test excavation consisted of piled basalt boulders and cobbles, covered with a layer of leaf litter and humus (Figure 45). Excavation of the mound revealed that the stones were loosely piled with an accumulation of soil amongst the stone matrix extending to the base of excavation (Figure 46). The stones comprising the mound structure were unsorted, with cobbles and boulders distributed throughout the construction. Several massive boulders were also incorporated into the mound construction.

One sediment stratum was observed through the excavation of Test Unit 1 (Figure 47). Stratum I consisted of a dark reddish brown clay loam sediment, representing developing top soil and erosional sediment within the stone matrix of the mound structure. The test excavation was terminated at 86 cmbd, at a point of heavy rock density and clearly sterile sediments. No cultural material was observed through the excavation of Test Unit 1. Following the test excavation, the excavated area was reconstructed as closely as possible to its original state. Detailed sediment description is as follows:

<u>Strata</u>	<u>Depth (cmbd)</u>	<u>Description</u>
Stratum I	60-BOE	5YR 3/3 dark reddish brown clay loam; moderate, medium blocky structure; moist, friable consistency; slightly plastic; no cementation; terrestrial origin; includes leaf litter, abundant roots and rootlets; no cultural material observed; Lower Boundary (LB) is below base of excavation.



Figure 45. Photograph of SIHP # 50-80-09-7080 Test Unit 1, pre-excitation, view to northeast



Figure 46. Photograph of SIHP # 50-80-09-7080 Test Unit 1, post-excitation, view to northeast

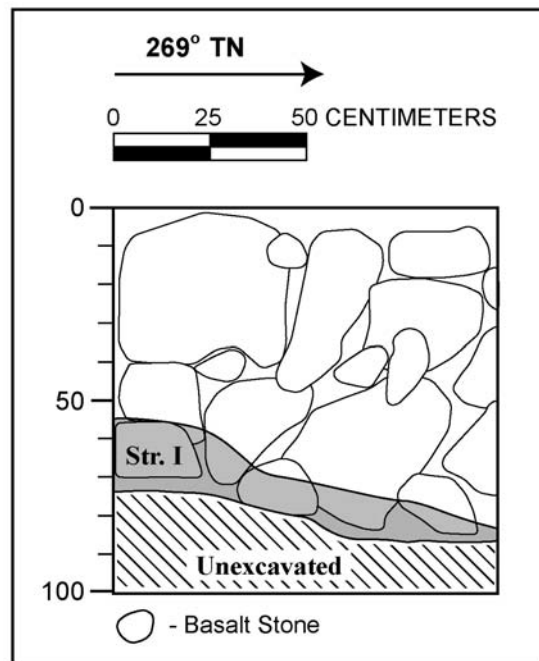


Figure 47. Photograph (above) and stratigraphic profile (below) of the south wall of SIHP # 50-80-09-7080 Test Unit 1

Section 4 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. 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.

SIHP # 50-80-09-9530 Features A, B, H, I, and J are components of a plantation-era ditch system, attributable to the Oahu Sugar Company. Background research indicated the Kīpapa Gulch ditch system was constructed *circa* the early 1930s and functioned in transporting irrigation water from Kīpapa Stream to plantation fields along the tablelands to the south. SIHP # 50-80-09-9530 Features A, B, H, and I are in good condition. Feature J is in poor condition. Portions of the ditch system SIHP # 50-80-09-9530 have been disturbed by erosion and flooding. Portions of the Feature A ditch have also been modified for adaptive reuse of the feature as a drainage ditch. SIHP # 50-80-09-9530 was previously assessed by Tulchin et al. (2009) as significant under Criteria A, C, and D of the Hawai'i Register of Historic Places evaluation criteria.

SIHP # 50-80-09-7080 is likely a clearing mound, constructed during land clearing efforts associated with agricultural cultivation in the early 1900s. SIHP # 50-80-09-7080 is in good condition, with limited disturbance due to erosion and vegetation growth. SIHP # 50-80-09-7080 is assessed as significant under Criterion D of the Hawai'i Registers of Historic Places evaluation criteria.

Section 5 Project Effect and Mitigation Recommendations

The following project effect discussion and cultural resource management recommendations are intended to facilitate project planning and support the proposed project's required historic preservation consultation. This discussion is based on the results of this archaeological inventory survey investigation and CSH's communication with agents for the project proponents regarding the project's potential impacts to the historic properties described in the Results of Fieldwork section, above.

5.1 Project Effect

The overall Koa Ridge Makai and Waiawa Project involves development of a master planned, mixed-use residential community with commercial, light industrial, and health care components. Minimally, land disturbing activities would include major grading and excavations associated with subsurface utility installation, infrastructure construction, and building construction. The area of potential effect (APE) is defined as the entire approximately 770-acre Koa Ridge Makai and Waiawa project area. The current survey areas included approximately 59 acres of the project area.

This archaeological inventory survey addendum study identified the following historic properties within the survey area. These historic properties will potentially be affected by the proposed project:

1. SIHP # 50-80-09-9530 Features A, B, H, I, and J, plantation-era ditch system, evaluated as significant under Criteria A, C, and D of the Hawai'i Register of Historic Places evaluation criteria. The proposed development project may have an adverse effect on multiple features of the ditch system.
2. SIHP # 50-80-09-7080 clearing mound, evaluated as significant under Criterion D of the Hawai'i Register of Historic Places evaluation criteria. The proposed development project may have an adverse effect on the mound.

Due to the potential adverse effect on significant historic properties within the project's APE, CSH's project-specific effect recommendation is "effect, with proposed mitigation commitments." The recommended mitigation measures will reduce the project's potential adverse effect to significant historic properties.

5.2 Mitigation Recommendations

To reduce the proposed project's potential adverse effect on significant historic properties, the following mitigation measures are recommended. The mitigation measures should be completed prior to any land disturbing activities in the vicinity of Survey Areas A, B, and C.

1. SIHP # 50-80-09-9530 Features A, B, H, I, and J, plantation-era ditch system, were documented with a detailed written descriptions, photographs, scale drawings of selected features, and accurately located with GPS survey equipment. Feature A is an excellent example of a dressed basalt block lined irrigation ditch. Preservation, in the form of avoidance and protection, is recommended for SIHP # 50-80-09-9530 Feature

A. Preservation of this irrigation ditch was also recommended by Hammatt and Borthwick (1988) and Tulchin et al. (2009).

Prior to the current addendum archaeological inventory survey, a portion of the SIHP # 50-80-09-9530 Feature A irrigation ditch was recently modified for adaptive reuse as a flood-control drainage ditch. Built-up sediment within the ditch was removed, minor modifications to portions of the ditch were made, and a portion of the ditch was covered by a large earthen berm. The flood control measures were implemented to prevent flooding of the Kīpapa Gulch Estates residential complex immediately downslope of the Feature A ditch. Prior to the modifications, flood waters were apparently collecting in the ditch and had breached the ditch at two locations, resulting in flooding of downslope areas. The modifications to the Feature A ditch were observed to be minor and do not significantly detract from the integrity of the feature. The flood control measures also divert storm water away from the flood damaged portions of the ditch, thereby decreasing the ongoing environmental degradation of the ditch.

Based on the findings of a preliminary rockfall assessment conducted for the Koa Ridge Makai project, the SIHP # 50-80-09-9530 Feature A irrigation ditch is currently functioning in-part as a “drop zone for the boulders and hinders them from travelling down the slopes” (Shimamoto 2009:6). A potential rockfall mitigation measure presented in the assessment is the construction of a rockfall boulder barrier along the downslope edge of the Feature A ditch. Removal of sediment from the ditch construction of a boulder barrier downslope of the ditch may occur without significantly detracting from the integrity of the Feature A ditch. Maintenance and possible stabilization of the damaged portions of the ditch for adaptive reuse would also decrease the ongoing environmental degradation of the ditch.

Any proposed modifications for adaptive reuse of the Feature A irrigation ditch, including sediment removal or construction of rockfall barriers along the downslope berm of the ditch, will require consultation with and approval of the State Historic Preservation Division when the details of the proposed project become available. In addition, any potential burial of portions of the ditch associated with grading of the Koa Ridge Makai project area will require consultation with and approval of the State Historic Preservation Division when the details of the proposed project become available.

No further work is recommended for SIHP # 50-80-09-9530 Features B, H, I, and J. Sufficient information regarding the location, function, age, and construction methods of the features has been generated by the current inventory survey investigation to mitigate any adverse effect caused by proposed development activities.

2. SIHP # 50-80-09-7080 clearing mound, was documented with a detailed written description, photographs, scale drawing, test excavation, and accurately located with GPS survey equipment. No further work is recommended for SIHP # 50-80-09-7080. Sufficient information regarding the location, function, age, and construction methods of Features A and B terraces has been generated by the current inventory survey

investigation to mitigate any adverse effect caused by proposed development activities.

If SIHP # 50-80-09-9530 Feature A will be impacted by the proposed project, it is recommended that a Preservation Plan be prepared for the project, in accordance with Hawai'i Administrative Rules (HAR) 13-277-3, to address buffer zones and protective measures for SIHP # 50-80-09-9530 Feature A. This preservation plan should detail the short- and long-term preservation measures that will safeguard the historic property during project construction and subsequent use of the project area. The preservation plan should also address any breaches or potential burial of portions of the SIHP # 50-80-09-9530 Feature A irrigation ditch.

If, in the unlikely event that subsurface cultural deposits are encountered during the course of development activities, all work in the immediate area should stop and the State Historic Preservation Division should be promptly notified.

Section 6 References Cited

Bushnell, Kristina W. and Hallett H. Hammatt

- 2001 *A Supplement to the Hawaiian Traditional Customs and Practices Impact Assessment for the Development of 1339 Acres of Castle and Cooke Lands Within Portions of Waipi'o and Waiawa Ahupua'a, O'ahu (TMK 9-4-06:01,03 & 10)*, Cultural Surveys Hawaii, Kailua, HI

Elliott, Rex. R. and Stephen C. Gould

- 1988 *Hawaiian Bottles of Long Ago: A Little of Hawai'i's Past*. Hawaiian Service, Inc. Honolulu, HI

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 Hawai'i*, U.S. Dept. of Agriculture, U.S. Government Printing Office, Washington, D.C.

Giambelluca, Thomas W., Michael A. Nuller and Thomas A. Schroeder

- 1986 *Rainfall Atlas of Hawai'i*. Department of Land and Natural Resources, State of Hawai'i.

Hammatt, Hallett H. and Douglas Borthwick

- 1988 *Archaeological Reconnaissance and Subsurface Testing in Upper and Lower Kīpapa Gulch, Waipi'o, O'ahu*. Cultural Surveys Hawai'i, Inc. Kailua, HI.

Hammatt, Hallett H., Leilani Pyle, Victoria Creed, Thomas Devereaux and Rodney Chiogioji

- 1996 *Archaeological Inventory Survey of a 1339-Acre Parcel at Castle and Cooke Lands Within Portions of Waipi'o and Wai'awa Ahupua'a O'ahu (TMK 9-4-06:01, 03 & 10 por.; and 9-5-03:01 por., 04 & 07; and 9-6-04:21)*. Cultural Surveys Hawai'i, Inc., Kailua, HI.

Hammatt, Hallett H. and David W. Shideler

- 1996 *Hawaiian Traditional Customs and Practices Impact Assessment for the Development of a 1339-Acre Parcel at Castle and Cooke Lands Within Portions of Waipi'o and Waiawa Ahupua'a, O'ahu (TMK 9-4-06:01, 03 & 10 port. and 9-5-06:01 port., 04 & 07 and 9-6-04:21)*, Cultural Surveys Hawaii, Kailua, HI

Rosendahl, Paul H.

- 1977 *Archaeological Inventory and Evaluation Report for Installations of Environmental Impact Statement for U.S. Army Support Command, Hawai'i*. Bernice P. Bishop Museum, Dept. of Anthropology, Honolulu, HI.


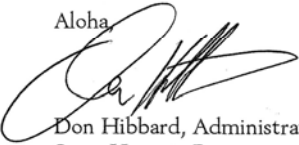
Shimamoto, Alan J.

- 2009 *Preliminary Rockfall Assessment, West Facing Slopes Above Existing Development and Kamehameha Highway, Koa Ridge Development, Waipi'o, O'ahu, Hawai'i*. Fewell Geotechnical Engineering, Ltd. Pearl City, HI.



Tulchin, Todd, Trevor Yucha, David W. Shideler, and Hallett H. Hammatt

- 2009 *Archaeological Inventory Survey of Proposed Detention Basins, Associated Appurtenances, and an H-2 Freeway Interchange Associated with the Koa Ridge Makai Development Project, Waipi'o Ahupua'a, 'Ewa District, Island of O'ahu (TMK: [1] 9-4-005: 006 por., 008 por.; 9-4-006:001 por., 029 por. ; 9-5-003:001 por., 002, 011 por. 014 por.)*. Cultural Surveys Hawai'i, Inc., Kailua, HI.

Appendix A SHPD Review of Hammatt et al. (1996)

BENJAMIN J. CAYETANO GOVERNOR OF HAWAII		GILBERT S. COLOMA-AGARAN, CHAIRPERSON BOARD OF LAND AND NATURAL RESOURCES COMMISSION ON WATER RESOURCES MANAGEMENT
STATE OF HAWAII		DEPUTIES ERIC T. HIRANO LINNEL NISHIOKA
DEPARTMENT OF LAND AND NATURAL RESOURCES		
HISTORIC PRESERVATION DIVISION KAKUHIHEWA BUILDING, ROOM 555 801 KAMOKILA BOULEVARD KAPOLEI, HAWAII 96707		
March 18, 2002	AQUATIC RESOURCES BOATING AND OCEAN RECREATION COMMISSION ON WATER RESOURCE MANAGEMENT CONSERVATION AND RESOURCES ENFORCEMENT CONVEYANCES FORESTRY AND WILDLIFE HISTORIC PRESERVATION LAND STATE PARKS	
David Shideler O`ahu Office Manger Cultural Surveys Hawaii 733 N. Kalaheo Ave. Kailua, Hawaii 96734	LOG NO: 29403 DOC NO: 0203EJ09	
Dear Mr. Shideler:		
SUBJECT: Archaeological Inventory Survey of a 1339-Acre Parcel at Castle and Cooke Lands within Portions of Waipi`o and Waiawa Ahupua`a, O`ahu Waipi`o and Waiawa, `Ewa, O`ahu <u>TMK: 9-4-006:001, 003, 010por.; 9-5-003:001por. 004, 007 and 9-6-004:021</u>		
Thank you for the submission of a report on an archaeological inventory survey of Castle and Cooke Lands in Waipi`o and Waiawa, O`ahu [<i>Archaeological Inventory Survey of a 1339-Acre Parcel at Castle and Cooke Lands within Portions of Waipi`o and Waiawa Ahupua`a, O`ahu</i> (Hammatt et al, June 1996)]. We received the report in June 2001.		
We believe that the survey was performed acceptably, finding one site, portions of Waiahole Ditch (State Site No. 50-80-09-2268) within the subject parcels. One other site, portions of Kipapa ditch (State Site No. 50-80-09-9529), were identified outside of the project area. The Waiahole Ditch is clearly likely to be significant under multiple criteria of the Hawaii Register of Historic Places, as it played a significant role in the early 1900s agricultural history of O`ahu. We agree that appropriate mitigative measures will need to be agreed upon should future development have the potential to have an adverse effect on this site.		
We have placed the CSH report in the SHPD library where it will be available for the public's use and benefit.		
Should you have any questions, please feel free to call Sara Collins at 692-8026 or Elaine Jourdane at 692-8027.		
Aloha  Don Hibbard, Administrator State Historic Preservation Division		
EJ:jk		

Appendix B SHPD Review of Tulchin et al. (2009)

<p>LINDA LINGLE GOVERNOR OF HAWAII</p> 		<p>LAURA H. THIELER CHAIRPERSON BOARD OF LAND AND NATURAL RESOURCES COMMISSION ON WATER RESOURCE MANAGEMENT</p> <p>RUSSELL V. TSUJI FIRST DEPUTY</p> <p>KEN C. KAWAHARA DEPUTY DIRECTOR - WATER</p> <p>AQUATIC RESOURCES BOATING AND OCEAN RECREATION BUREAU OF CONVEYANCES COMMISSION ON WATER RESOURCE MANAGEMENT CONSERVATION AND COASTAL LANDS CONSERVATION AND RESOURCES ENFORCEMENT ENGINEERING FORESTRY AND WILDLIFE HISTORIC PRESERVATION KAHOOLAWE ISLAND RESERVE COMMISSION LAND STATE PARKS</p>
<p>STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES STATE HISTORIC PRESERVATION DIVISION 601 KAMOKILA BOULEVARD, ROOM 555 KAPOLEI, HAWAII 96707</p>		
<p>February 10, 2009</p>		
<p>Mr. David Shideler Cultural Surveys Hawai'i P. O. Box 1114 Kailua, Hawai'i 96734</p>	<p>LOG NO: 2009.0605 DOC NO: 0902WT21 Archaeology</p>	
<p>Dear Mr. Shideler:</p>		
<p>SUBJECT: 6E-42 Historic Preservation Review-- DRAFT Archaeological Inventory Survey (AIS)-- of Proposed Detention Basins, Associated Appurtenances and an H-2 Freeway Interchange Associated with the Koa Ridge Makai Development Project, Waipi'o Ahupua'a, 'Ewa District, Island of O'ahu, Hawai'i TMK: (1) 9-4-005: 006 por., 008 por.; 9-4-006: 001 por., 029 por.; 9-5-003: 001 por., 002, 011 por., 014 por.</p>		
<p>Thank you for the opportunity to review this DRAFT AIS (<i>DRAFT Archaeological Inventory Survey of Proposed Detention Basins, Associated Appurtenances and an H-2 Freeway Interchange Associated with the Koa Ridge Makai Development Project, Waipi'o Ahupua'a, 'Ewa District, Island of O'ahu, Hawai'i, TMK: (1) 9-4-005: 006 por., 008 por.; 9-4-006: 001 por., 029 por.; 9-5-003: 001 por., 002, 011 por., 014 por. [Tulchin, Yucha, Shideler and Hammatt PhD, January 2009]</i>). The survey area is 123 acres primarily on gulch bottoms. The proposed project involves construction of a storm drain line, four storm water detention basins, access roads, and construction staging areas. Thirteen historic properties were recorded during this survey, and all were interpreted to be from historic military, agricultural and transportation activities in the gulch.</p>		
<p>This report includes recommendations for historic properties identified during the survey to mitigate adverse impacts to these properties. First, it is recommended that a Preservation Plan (PP) be prepared for the historic properties recommended for preservation. Second, SIHP #50-80-09-7047, six historic period agricultural terraces and an excavated pit, will be impacted during construction, and it is recommended that a Data Recovery Plan (DRP) be prepared to mitigate adverse effects to this historic property.</p>		
<p>This report is accepted and it meets the minimum requirements for compliance with 6E-42 and Hawaii Administrative Rules (HAR) §13-13-276 <i>Rules Governing Standards for Archaeological Inventory Studies and Reports</i>.</p>		
<p>The complete, finalized report should be free of errors, contain good quality color photographs, color maps and assigned State site numbers. Once this subject archaeological inventory survey report has received final acceptance pursuant to HAR §13-276, please send one hardcopy of the document, clearly marked FINAL, along with a copy of this review letter and a text-searchable PDF version on CD to the attention of Wendy Tolleson "SHPD Library" at the Kapolei SHPD office.</p>		

Mr. David Shideler
Page 2

Please call Wendy Tolleson at (808) 692-8024 if there are any questions or concerns regarding this letter.

Aloha,

A handwritten signature in cursive script that reads "Nancy A. McMahon".

Nancy A. McMahon (Deputy SHPO)
State Historic Preservation Officer