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HWY-DS 2.3903

MAR 20 2007

TO: GENEVIEVE SALMONSON, DIRECTOR
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
DEPARTMENT OF HEALTH

FROM: BRENNON T. MORIOKA, Ph. D., P.E.
DEPUTY DIRECTOR-HIGHWAYS

SUBJECT: FINDING OF NO SIGNIFICANT IMPACT (FONSI)
KALANIANAOLE HIGHWAY IMPROVEMENTS
OLOMANA GOLF COURSE TO WAIMANALO BEACH PARK
FEDERAL-AID PROJECT NO. STP-072-1(44)

The State of Hawaii, Department of Transportation (HDOT), Highways Division has reviewed the comments received during the 30-day public comment period, which began on February 08, 2006, and extended to March 31, 2006. HDOT has determined that this project will not have significant environmental effects and has issued a FONSI. Please publish this notice in the next issue of the OEQC Environmental Notice.

We have enclosed a completed OEQC Publication Form, four copies of the Final Environmental Assessment, and the project summary in hard copy and disk.

If there are any questions, please contact Mr. Vincent Llorin at 692-7568, Technical Design Services Office, Design Branch, Highways Division.

Enclosures

c: Mountain Edge Environmental, Inc.
Jennifer Hernando (w/o enclosures)

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OFFICE OF ENVIRONMENTAL QUALITY CONTROL

FINAL
ENVIRONMENTAL ASSESSMENT / FINDING OF NO SIGNIFICANT IMPACT

KALANIANAOLE HIGHWAY IMPROVEMENTS
OLOMANA GOLF COURSE TO WAIMANALO BEACH PARK

(TAX MAP KEY: 4-1-03 through 09,12,13,15,16,18,19,20,21,22,28,33,34)

FEDERAL AID PROJECT NO. STP-072-1(44)

March 2007

FEDERAL HIGHWAY ADMINISTRATION
FINDING OF NO SIGNIFICANT IMPACT

For

Kalanianaole Highway Improvements
Olomana Golf Course to Waimanalo Beach Park
Waimānalo, Oahu, Hawaii

The FHWA has determined that the Kalanianaole Highway Improvements, Olomana Golf Course to Waimanalo Beach Park, project will have no significant impact on the human environment. This FONSI is based on the attached EA which has been independently evaluated by the FHWA and determined to adequately and accurately discuss the need, environmental issues, and impacts of the proposed project and appropriate mitigation measures. It provides sufficient evidence and analysis for determining that an EIS is not required. The FHWA takes full responsibility for the accuracy, scope, and content of the attached EA.

2/23/07
Date

For Mr. Abraham Wong
Hawaii Division Administrator

KALANIANAOLE HIGHWAY IMPROVEMENTS
Olomana Golf Course to Waimanalo Beach Park
Waimānalo, Oahu, Hawaii

Final Environmental Assessment / Finding of No Significant Impact

Submitted Pursuant to the
National Environmental Policy Act, 42 U.S.C. 4332 (2) (c)
and
Chapter 343, Hawaii Revised Statues

U.S. Department of Transportation
Federal Highway Administration
and
State of Hawaii Department of Transportation
Highways Division

MAR 1 2 2007

Date of Approval

Barry Fukunaga
Interim Director of Transportation
State of Hawaii Department of Transportation

FEB 2 2 2007

Date of Approval

Abraham Wong
Division Administrator
Federal Highway Administration
U.S. Department of Transportation

The following persons may be contacted for additional information concerning this document:

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This Final Environmental Assessment / Finding of No Significant Impact documents the environmental impact studies of a proposal to construct improvements on Kalanianaole Highway between Olomana Golf Course and Waimanalo Beach Park, approximately three miles, by improving traffic operations. The highway improvement is intended to make the highway operate more efficiently and increase safety for vehicles, bicycles, pedestrians, and equestrian riders.

S-1.0 PROJECT SUMMARY

S-1.1 Applicant and Project Summary

The State of Hawaii Department of Transportation (HDOT) and the Federal Highway Administration (FHWA) are proposing to improve traffic operations on Kalanianaole Highway between Olomana Golf Course and Waimanalo Beach Park, approximately three miles, by making specific lane changes and improvements to the highway shoulders. The highway improvement is intended to make the highway operate more efficiently, to increase safety for vehicles, bicycles, pedestrians, and equestrian riders, and to bring this portion of Kalanianaole Highway into compliance with current Americans with Disabilities Act (ADA) guidelines.

S-1.2 Purpose of the Environmental Assessment

The Proposed Project involves the use of both Federal and State funds and therefore an environment review process must be carried out. This Final Environmental Assessment (EA) has been prepared to comply with:

- The National Environmental Policy Act (NEPA);
- Chapter 343 of the Hawaii Revised Statutes (HRS),
- Title 11, Chapter 200 of the Hawaii Administrative Rules (HAR), and
- The Federal Highway Act and Federal Transit Administration Joint Regulations, Environmental Impact and Related Procedures 23 Code of Federal Regulations 771.

S-1.3 Alternatives

An alternative to the project includes No Action, which consists of no change to the existing conditions along the specified segment of road. Other alternatives that were considered but not analyzed in this Final EA are alternative alignments and a by-pass road. Alternative alignments were considered early in the project but not developed because the traffic needs did not materialize and because of the lack of community support. Widening the highway was initially considered to alleviate traffic congestion, but upon further analysis, it was determined that the issue was a diminished level of service issue caused by turning movements on Kalanianaole Highway, not a road capacity or sheer traffic volume issue. At one point there was an interest in adding to the right-of-way width by purchasing certain parcels adjacent to the highway; however, this proved impractical due to time and cost constraints since several parcels would require additional studies and permits. A by-pass road was another alternative brought up at community meetings; however, a by-pass road was not further considered because it did not address the loss in level of service caused by turning movements on Kalanianaole Highway. Furthermore, according to the Waimanalo Neighborhood Board, the proposed improvements are favored over widening or construction of a by-pass road.

S-1.4 Environmental Impacts

Table S-1 on the following page includes an outline of the resource areas evaluated and a brief summary of the potential impacts of the Proposed Project and the No Action alternative.

S-1.5 Determination

The FHWA has determined that the Proposed Project will have no significant impact on the human environment and has issued a Finding of No Significant Impact (FONSI).

Table S-1: Summary of Environmental Impacts

Resource Areas	Proposed Project	No Action
Land Use	The HDOT will be acquiring land at the Poalima Street intersection. The rest of the improvements will be located within the existing right-of-way. The proposed land acquisition complies with the existing planning documents for the project area.	No impacts.
Transportation	Temporary short-term impacts due to construction activities. Long-term beneficial impacts due to better organization of traffic and site improvements.	Adverse impacts as the current traffic situation does not meet current American Disability Act standards and impedes traffic flow.
Social and Economic	Temporary short-term beneficial impacts due to construction activities. Long-term beneficial impacts due to better organization of traffic and site improvements.	Adverse impacts as the current traffic situation does not meet current American Disability Act standards and impedes traffic flow.
Climate, Air and Water Quality, Noise	Temporary short-term impacts due to construction activities.	No impacts.
Biological	Minimal impacts due to construction activities. No naturally occurring endangered plants or animals within the easement.	No impacts.
Historic and Archaeological Resources	No impacts to known archaeological and cultural resources. Proposed Archaeological Monitoring Plan included in Appendix K should provide adequate protection of these resources.	No impacts.
Parkland/ Section 4(f), Visual Environment, Water Resources, Geographic Setting, and Utilities	Beneficial impacts due to better organization of traffic and site improvements.	No impacts.

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Appendix K Archaeological Monitoring Plan

ACRONYMS AND ABBREVIATIONS

ADA	Americans with Disabilities Act
ADT	Average Daily Traffic
BAFS	Bellows Air Force Station
BWS	Board of Water Supply
C&C	City and County of Honolulu
CZM	Coastal Zone Management
dBA	decibels
DLNR	State Department of Land and Natural Resources
DLU	Department of Land Utilization
DOH	State Department of Health
DOT	U.S. Department of Transportation
EA	Environmental Assessment
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
FY	Fiscal Year
HAR	Hawaii Administrative Rules
HDOT	State of Hawaii Department of Transportation
HRS	Hawaii Revised Statutes
HSTP	Hawaii Statewide Transportation Plan
LOS	Level of Service
mg/L Cl^-	milligram per liter Chloride
NAGPRA	National American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
OMPO	Oahu Metropolitan Planning Organization
ORTP	Oahu Regional Transportation Plan
PIM	Public Information Meeting
SHPD	State Historic Preservation Division
SHPO	State Historic Preservation Officer
SMA	Special Management Area
USFWS	U.S. Fish and Wildlife Service
vph	vehicles per hour

1.0 PURPOSE AND NEED FOR ACTION

This chapter presents the purpose of and need for the Proposed Project, the purpose of this Final Environmental Assessment (EA), and the history of the Proposed Project.

1.1 PURPOSE AND NEED FOR ACTION

The purpose of and need for the proposed Kalanianaole Highway improvements are to bring the highway up to current design and ADA guidelines, and to make the highway operate more efficiently. In addition, the proposed improvements will make the highway safer and friendlier to pedestrians and other highway users, and address drainage problems that currently exist along portions of the highway. Details of the proposed improvements are presented in Chapter 2.

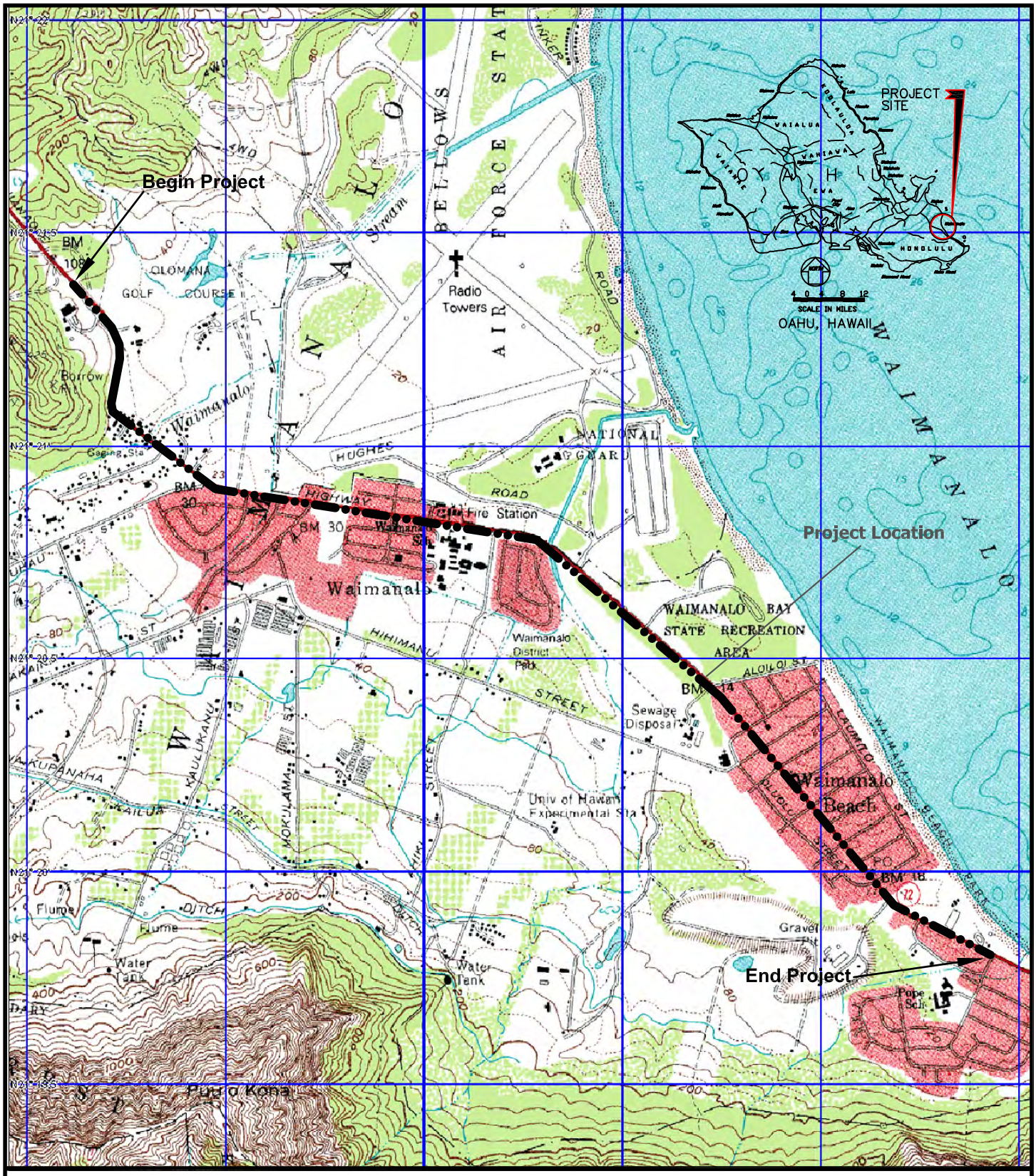
Kalanianaole Highway is a two-way, two-lane highway and the only route that leads into and out of the Waimānalo area. There is one signalized intersection near the center of Waimanalo Town at Kalanianaole Highway and Poalima Street. The other side streets within the project area are all two-lane, two-way roads that are stop-controlled at their intersections with Kalanianaole Highway. All cars making turns off of Kalanianaole Highway onto side streets must stop on the highway until oncoming traffic is clear, causing undesirable delays to through traffic, particularly during the morning and evening peak traffic hours. The side street intersections generally operate at an unsatisfactory to unacceptable level of service (LOS) due to the heavy through traffic on the highway. Long queues occur in both directions of the highway, during evening peak hour traffic. The existing traffic conditions are detailed in Section 3.2.2.

In addition to the unsatisfactory level of service, curb ramps and sidewalks along the highway are not up to ADA guidelines. There are several locations where the sidewalk is very narrow, and in some locations, there are no sidewalks at all. Likewise, most locations along the highway do not have a drainage system, which results in rainfall runoff making its way on the surface of the highway and shoulders to the crossing streams. Water also ponds in some areas along the highway.

1.2 PURPOSE OF THIS FINAL EA

The State of Hawaii Department of Transportation (HDOT) and the United States Department of Transportation, Federal Highway Administration (FHWA) are issuing this Final EA for the Proposed Kalanianaole Highway Improvements Project in Waimānalo, O‘ahu, Hawaii (see Figure 1-1). This proposed federal-aid project proposes to improve traffic operations on Kalanianaole Highway between Olomana Golf Course and Waimanalo Beach Park by making improvements within the described limits.

This Final EA has been prepared to comply with the National Environmental Policy Act (NEPA); Chapter 343 of the Hawaii Revised Statutes (HRS); Title 11, Chapter 200 of the Hawaii Administrative Rules (HAR); and FHWA and Federal Transit Administration Joint Regulations, Environmental Impact and Related Procedures [23 Code of Federal Regulations 771]. Compliance with federal laws is required because of the use of federal funds for construction.



Reference: 3-D TopoQuads, Delorme, 1999
Source Map: USGS Topographic Map (1983), Koko Head Quadrangle

0 2000 4000

Scale In Feet

Scale: 1"=2000' Approximately

N

Legend

Project Location
Kalanianaole Highway

Figure 1-1
Project Location Map

Draft Environmental Assessment
Kalanianaole Highway Improvements
Federal Aid Project No. STP-072-1(44)

This Final EA evaluates the social and environmental impacts that could result from the proposed highway improvements as described in Chapter 2. The potential impacts are assessed for the design year 2020. Construction-phase impacts are also assessed. Coordination with interested and affected parties is required and all coordination to date is documented in Chapter 7. Coordination included presentations with the Waimanalo Neighborhood Board, informational letters to public agencies, publication of the Draft EA, a 30-day public comment period which began on February 8, 2006 and was extended to March 31, 2006, review of comments from the public, and preparation of responses to comments. This Final EA incorporates the comments received from the public.

After review of the comments received on the Draft EA, the FHWA has determined that the project will not have significant environmental effects and has issued a Finding of No Significant Impact (FONSI). This Final EA concludes the procedures required under HRS 343, HAR Chapter 200, and NEPA.

1.3 PROJECT HISTORY

In 1980, the HDOT identified the need for an improved highway to be constructed in the Waimānalo area to accommodate future traffic growth. Alternative highway alignments were examined and presented to interested community members and the Waimanalo Neighborhood Board in 1996 and 1997. As a result of these briefings, a Waimanalo Highway Improvement Task Force was formed. In a 1997 presentation to the community, residents did not support widening the existing highway from 2-lanes to 4-lanes because the residents believed private land would be condemned and it would lead to speeding and more traffic accidents.

At a public meeting in September 1998, the Waimanalo Neighborhood Board informed HDOT that the community favored improving the existing highway by providing accessible concrete sidewalks and left turning lanes in lieu of constructing a by-pass road and widening the entire highway.

In 1999, former Representative Goodenow solicited recommendations and comments related to highway improvements from the Waimānalo community. A prioritized tabulation of these comments was given to HDOT in 2000. These comments formed the basis of the Proposed Project. The majority of the comments related to enhancing highway operations by providing left turning lanes, providing bus pull-outs off the travel way, and improving the roadway shoulders and sidewalks to make it safer and accessible according to the Americans with Disabilities Act (ADA) guidelines.

On July 25, 2001 and August 29, 2001, Public Informational Meetings (PIMs) were held to present design concepts based on the community requested improvements compiled earlier. In these PIMs, the stakeholders provided more specific information on problem areas that HDOT incorporated into the conceptual plans.

Considerable discussion concerning equestrian paths and crossings occurred in the two PIMs. Consequently, HDOT conducted another public meeting specifically for stakeholders with equestrian interests on October 11, 2001. In this meeting, high equestrian traffic areas were identified and incorporated into the plan.

On June 25, 2002, the fourth PIM was conducted to show the semi-final conceptual plans and layouts. Since several stakeholders felt that the community was not adequately notified, HDOT conducted another PIM on July 9, 2002.

On November 26, 2002, the sixth PIM was conducted to update the community of the project status. Past comments and the latest conceptual plan and layout were reviewed. The community was updated on the upcoming schedule and was informed that the Environmental Assessment was about to begin.

The seventh and final PIM was held on June 30, 2004 at the Waimanalo Public and School Library. Six PIMs were supposed to be the maximum number of community meetings for this project, but due to the lack of community members at the meeting held on June 25, 2002, one extra PIM was held. Conceptual plans for the Proposed Project were presented and public comments were solicited at the final meeting. In addition, a letter was submitted to various government agencies soliciting pre-consultation comments. A flier was delivered door-to-door along the Proposed Project route, informing the recipients of the PIM and the Proposed Project. The information provided at the most recent PIM, the flier, the letter submitted to various government agencies, and the responses received are presented in Appendix A.

A Draft EA was submitted to OEQC for publication on February 8, 2006, and was submitted to various agencies as required by OEQC. The required 30-day comment period for the Draft EA was extended until March 31, 2006 to allow the public more time to comment. A supplemental meeting was held with elected officials and with community representatives on May 1, 2006 regarding the Draft EA. The letters submitted to FHWA and HDOT commenting on the Draft EA are presented in Appendix B along with the responses from HDOT. Appendix B also contains the letter inviting elected officials and community representatives to the May 1, 2006 meeting and the sign-in sheet for the meeting.

2.0 PROPOSED PROJECT AND ALTERNATIVES

This chapter describes the alternatives developed and evaluated to address the project purpose and need described in Chapter 1. A detailed description of the project area is presented in Chapter 3. A detailed analysis of the Proposed Project and alternatives is presented in Chapter 4.

2.1 PROPOSED PROJECT

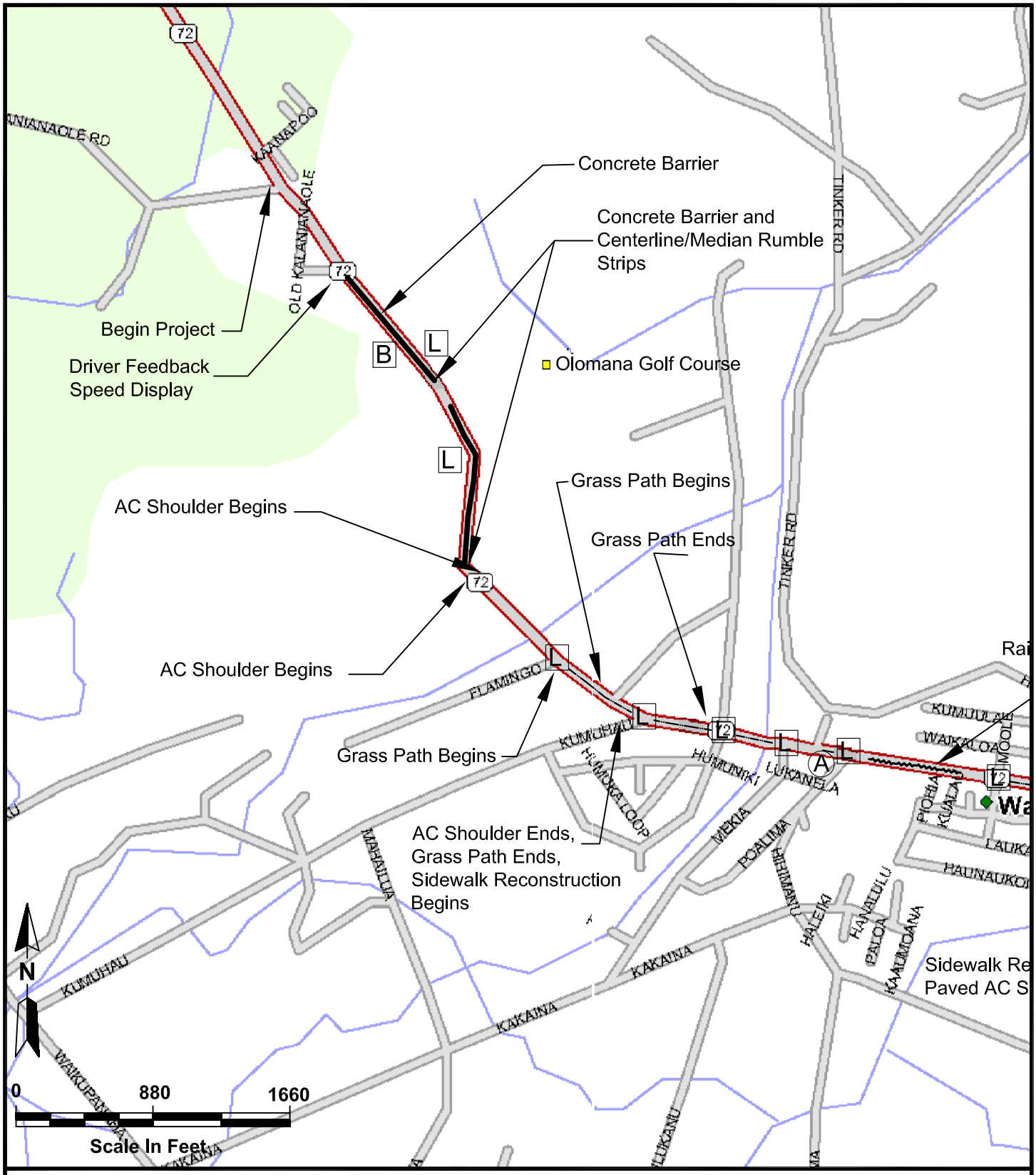
The Proposed Project consists of improvements to the Kalanianaole Highway in Waimānalo, O'ahu, Hawaii. The proposed improvements are graphically summarized in Figures 2-1 through 2-3, and schematic plans of the proposed improvements are contained in the planning report in Appendix C.

The proposed improvements to the highway include the addition of left turn lanes at Flamingo Road, Kumuhau Street, Humuniki Street, Mekia Street, Moole Street (both directions), Inoaole Street, and Aloiloi Street. The left turn lanes will improve traffic flow along Kalanianaole Highway. Shelter lanes are proposed for left turning vehicles entering Kalanianaole Highway from side streets to make it easier for those drivers and to help improve traffic flow along Kalanianaole Highway. Where space is available, bus pullouts are proposed to alleviate queuing and improve traffic flow. The bus pullouts will also allow vehicles to pass by the bus instead of going around the bus and crossing the solid double yellow pavement markings. Raised medians with curbs and landscaping, in addition to striping improvements, such as solid yellow lines alerting motorists of no passing zones and centerline median rumble strips, are proposed where space is available along the highway.

Striping improvements are also proposed near the Old Kalanianaole Road. To promote a reduction in travel speed as vehicles approach Waimanalo from Kailua, a lane taper will begin (approximately 900 feet before the Old Kalanianaole Road) to reduce the travel lanes to one lane. A median barrier is also proposed at the Olomana Golf Course area to diminish the possibility of vehicles crossing into oncoming traffic. In addition, centerline median rumble strips will be incorporated where possible, along with a driver feedback speed display sign.

The proposed improvements also include reconstruction of the existing concrete sidewalk on the mauka-side of the highway from Kumuhau Street to Inoaole Street to comply with current ADA guidelines. The replacement will also include new ADA accessible driveways and curb ramps. This portion of the highway has been designated by the community as one of the primary routes used by school children traveling to and from the Waimanalo Elementary and Intermediate School. Remaining areas along Kalanianaole Highway that do not have concrete sidewalks will have a paved shoulder. Vehicles will be able to use the paved shoulder during emergencies. Pedestrians not wanting to use the adjacent grassed area will also be able to use the paved shoulder. In locations identified by the community, a shared-use grassed path is proposed to allow equestrian riders to traverse along Kalanianaole Highway to designated locations along the project.

Additional proposed improvements include pavement reconstruction due to the existing pavement having been resurfaced numerous times and drainage improvements to eliminate ponding, which occurs in several locations along the project limits during larger storm events. Existing wood utility poles and lines will also be relocated, or removed and placed underground, to provide adequate roadside clearance and ADA accessibility.



Legend

- L — Exclusive Left Turn Lane
- B — Bus Pullout
- Two-way Left Turn Lane
- A — Land Acquisition of 467 square feet to increase turn radius
- Concrete Barrier
- Raised Landscape Median

Scale: 1" = 880'
Source Map: Street Atlas USA Version 7.0, DeLorme, 1999.

Figure 2-1
Olomana Golf Course To Poalima Street
Location of Proposed Improvements

Draft Environmental Assessment
Kalanianaole Highway Improvements
Federal Aid Project No. STP-072-1(44)

Legend

- L Exclusive Left Turn Lane
- B Bus Pullout
- Raised Landscape Median
- Two-way Left Turn Lane
- Ⓐ Land Acquisition of 467 square feet to increase turn radius

Scale: 1" = 880'
Source Map: Street Atlas USA Version 7.0, DeLorme, 1999.

Figure 2-2
Poalima Street To Aloiloi Street
Location of Proposed Improvements

Draft Environmental Assessment
Kalanianaole Highway Improvements
Federal Aid Project No. STP-072-1(44)

Legend

L Exclusive Left Turn Lane

B Bus Pullout

Raised Landscape Median

Scale: 1" = 880'
Source Map: Street Atlas USA Version 7.0, DeLorme, 1999.

Figure 2-3
Aloiloi Street To Huli Street
Location of Proposed Improvements

Draft Environmental Assessment
Kalanianaole Highway Improvements
Federal Aid Project No. STP-072-1(44)

Due to the relocation or removal of the existing wood utility pole line system, the existing highway lighting system will be removed and replaced with new highway lighting metal standards, bracket arms and luminaries on concrete foundations. The proposed highway lighting system will provide adequate lighting for the entire length of the project to address the community's concern that the existing lighting is insufficient in some areas. In addition, the proposed lighting system will include shielded lighting to discourage the attraction of seabirds to the lights, which is a concern of the U.S. Fish and Wildlife Service (USFWS) in the Waimanalo area.

The proposed highway improvements will also include signs to accommodate bicyclists. The highway will be a shared roadway, with no designated bike lanes.

All of the proposed improvements are located within the existing easement of the highway except for the Poalima Street intersection. HDOT will need to acquire land at the southwest corner of the Poalima Street intersection to provide a larger turning radius for Makapuu-bound vehicles turning right onto Poalima Street. The property which HDOT will need to acquire is a former Chevron gas station which is currently a parking lot.

The source of funds for the proposed project is National Highway System funds. Project costs are estimated to range from $16.6 million to $51.5 million depending on whether or not the overhead utilities are placed underground. Appendix C provides detailed preliminary cost estimates for three different scenarios: Alternative 1 assumes that the existing utility poles will be relocated to provide adequate roadside clearance and ADA accessibility ($16.6 million); Alternative 2 assumes that the existing utility poles will be removed and all overhead utilities will be placed underground ($51.5 million); and Alternative 3 assumes the existing overhead utilities where the right-of-way is 50 feet will be placed underground so that the available space can be better utilized, and in areas where the right-of-way widens to more than 50 feet, the overhead utilities will be moved outwards to accommodate the proposed improvements and to meet clear zone requirements ($38.7 million). Project phasing and timing are summarized in Table 2-1.

Table 2-1: Project Phasing and Timing

Project Phase	Project Design	Construction
Median Improvements Vicinity of Olomana Golf Course	FY 2007	FY 2008
Olomana Golf Course to Poalima Street	FY 2007 – FY 2008	FY 2009 – FY 2010
Poalima Street to Aloiloi Street	FY 2009 – FY 2010	FY 2011 – FY 2012
Aloiloi Street to Waimanalo Beach Park	FY 2013	FY 2015

Note: FY = Fiscal Year

2.2 NO ACTION

The No Action alternative would maintain the status quo for Kalanianaole Highway. Current traffic conditions would remain unchanged at primarily undesirable to unacceptable levels of service (LOS E and F as described in Section 3.2.2), and sections of Kalanianaole Highway would not comply with current ADA guidelines. According to the traffic forecasts for 2022, the current traffic congestion will continue to increase as the existing roadways degrade.

2.3 ALTERNATIVES CONSIDERED BUT NOT ANALYZED

This section contains a description of the alternatives considered during the planning process but not analyzed in this document.

2.3.1. Alternative Alignments

Alternative alignments were considered early in the project but not developed because the traffic needs did not materialize and because of the lack of community support. Widening the highway was initially considered to alleviate traffic congestion, but it was determined the issue was a diminished level of service issue caused by turning movements, and not a road capacity or sheer traffic volume issue. At one point there was an interest in adding to the right-of-way width by purchasing certain parcels adjacent to the highway; however, this proved impractical due to time and cost constraints since several parcels would require additional studies and permits. Alternatives to the layout were studied by HDOT while developing the proposed improvements to traffic circulation and safety, and the most efficient pattern is presented in the Proposed Project. Therefore, alternative alignments are not analyzed in this document.

2.3.2. By-Pass Road

During discussions held at the PIM in 2002, several community members asked if a by-pass road similar to the Haleiwa By-Pass Road could be considered in addition to the proposed Kalanianaole Highway improvements. HDOT responded that a by-pass road would be considered a separate project. A by-pass road was not further considered as a project alternative because it did not meet the purpose and need of the project. The by-pass road did not address the loss in level of service caused by turning movements on Kalanianaole Highway. Furthermore, according to the Waimanalo Neighborhood Board, the proposed improvements are favored over widening or construction of a by-pass road. Therefore, the by-pass road alternative is not analyzed in this document.

3.0 AFFECTED ENVIRONMENT

This chapter describes the environment of the project area. Impacts of the Proposed Project on existing environmental conditions are presented in Chapter 4.

3.1 LAND USE

The project is located within the City and County of Honolulu's Koolaupoko district and the ahupua'a of Waimānalo on the windward side of the island of O'ahu, Hawai'i. The project begins at the intersection of the Olomana Golf Course and Kalanianaole Highway, and ends near the east entrance of Waimanalo Beach Park, a distance of approximately three miles.

3.1.1. Existing Communities and Land Uses

Land use along the project includes residential, business, educational, military, and community facilities. The dominant land uses include the Olomana Golf Course, Waimanalo Town Center, Waimanalo Elementary and Intermediate School, Bellows Air Force Station, the Honolulu Polo Club, Waimanalo Beach Park, and Waimanalo Bay Beach Park (Sherwood Forest). Figure 3-1 shows the State Land Use district boundaries.

In addition to private landowners, ownership within the project limits includes the State of Hawaii, the City & County of Honolulu, the State of Hawaii's Department of Education, the Department of Hawaiian Home Lands and the U.S. Air Force.

3.1.2. Development Trends and Proposed Land Uses

According to State of Hawaii and City and County of Honolulu plans and policies, development in the Koolaupoko region will not increase through the 2020 planning horizon. The Proposed Project will utilize land within the existing right-of-way except for the Poalima Street intersection; therefore, no change of land use is proposed except for the Poalima Street intersection. HDOT will acquire land at the Poalima Street intersection to improve the turning radius for Makapuu-bound vehicles turning right.

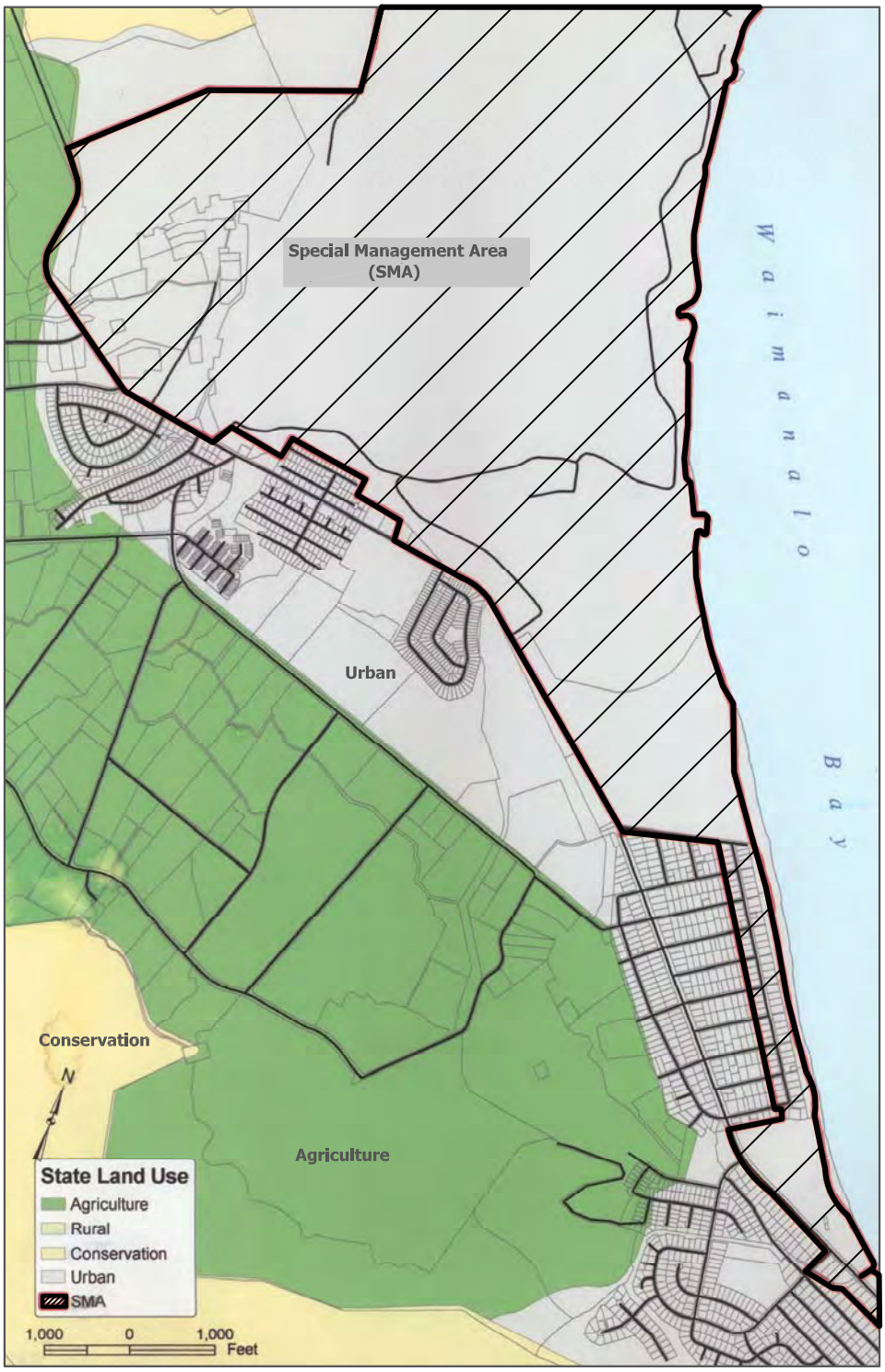
3.1.3. Government Plans, Policies and Controls

<u>The Hawaii State Plan</u>

The Hawaii State Plan, HRS Chapter 226-17 (State of Hawaii, 2005a), gives the State's objectives and policies for planning transportation systems. It reads:

(a) Planning for the State's facility systems with regard to transportation shall be directed towards the achievement of the following objectives:
  (1) An integrated multi-modal transportation system that services statewide needs and promotes the efficient, economical, safe, and convenient movement of people and goods.
  (2) A statewide transportation system that is consistent with and will accommodate planned growth objectives throughout the State.

The following thirteen State policies have been designed to achieve these transportation objectives:



Reference: State of Hawaii, Land Use Commission, Oahu
Source Map: State Land Use Map

0 2000 4000

Scale In Feet

Scale: 1"=2000' Approximately

N

Figure 3-1
State Land Use Map

Draft Environmental Assessment
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(1) Design, program, and develop a multi-modal system in conformance with desired growth and physical development as stated in this chapter;
(2) Coordinate state, county, federal, and private transportation activities and programs toward the achievement of statewide objectives;
(3) Encourage a reasonable distribution of financial responsibilities for transportation among participating governmental and private parties;
(4) Provide for accessibility to shipping, docking, and storage facilities;
(5) Promote a reasonable level and variety of mass transportation services that adequately meet statewide and community needs;
(6) Encourage transportation systems that serve to accommodate present and future development needs of communities;
(7) Encourage a variety of carriers to offer increased opportunities and advantages to interisland movement of people and goods;
(8) Increase the capacities of airport and harbor systems and support facilities to effectively accommodate transshipment and storage needs;
(9) Encourage the development of transportation systems and programs which would assist statewide economic grown and diversification;
(10) Encourage the design and development of transportation systems sensitive to the needs of affected communities and the quality of Hawaii's natural environment;
(11) Encourage safe and convenient use of low-cost, energy-efficient, non-polluting means of transportation;
(12) Coordinate intergovernmental land use and transportation planning activities to ensure the timely delivery of supporting transportation infrastructure in order to accommodate planned growth objectives; and
(13) Encourage diversification of transportation modes and infrastructure to promote alternate fuels and energy efficiency.

The policies most pertinent to the Proposed Project include numbers (1), (2), (6), (10), (11), (12), and (13).

Hawaii Statewide Transportation Plan

The Hawaii Statewide Transportation Plan (HSTP) provides guidelines to be used in planning Hawaii's roadways. In developing the HSTP, the needs of stakeholders, users, and providers were considered. A public outreach program was the focus of the HSTP's development. One of the most relevant missions of the HSTP, as it pertains to the Proposed Project, is to "provide for the safe, economic, efficient, and convenient movement of people and goods" (State of Hawaii, 2005b).

Hawaii State Land Use Controls

Lands within the State have been classified into four categories of land use districts: urban, rural, agricultural, and conservation (Chapter 205, HRS; Chapter 15-15, Hawaii Administrative Rules). The project lies primarily within the urban district, with a portion at the east end, near the golf course, abutting the agricultural district (see Figure 3-1). Lands within the urban district are regulated at the county level.

Hawaii State Coastal Zone Management

The Hawaii Coastal Zone Management (CZM) Program (Chapter 205A, HRS) was promulgated in 1977 in response to the Federal Coastal Zone Management Act of 1972. The mission of the

Hawaii CZM Program is to "balance marine and coastal resources protection and sustainable economic development, anticipating emerging issues and facilitating their resolution by coordinating among interests, developing and articulating appropriate management policies, and involving the public in resource management efforts" (State of Hawaii, 2005c). The program covers the following ten policy areas: 1) Recreational Resources, 2) Historic Resources, 3) Scenic and Open Space Resources, 4) Coastal Ecosystems, 5) Economic Uses, 6) Coastal Hazards, 7) Management Development, 8) Public Participation, 9) Beach Protection, and 10) Marine Resources.

Special Management Area

The Special Management Area (SMA) was developed by the State for more intensive management of coastal areas (State of Hawaii, 2005c). No development can occur in the SMA unless the county first issues a permit. Development is defined to include most uses, activities and operations on land and in the water. A large portion of the Proposed Project borders the Special Management Area, as shown in Figure 3-1.

Bike Plan Hawaii

The 2003 Bike Plan Hawaii (State of Hawaii, 2003) is a HDOT master plan to create a guide of enhancing the bicycle environment in Hawaii. This plan establishes a long-term strategy for bicycle facility improvements, enables better coordination between transportation and land-use planning, increases the ability to leverage funds for bicycle facilities, and provides a mechanism to achieve community consensus. The 2003 Bike Plan Hawaii does not cover recreational bikeways, such as mountain bike trails, and bicycle facilities on City and County roads in the Honolulu Primary Urban Center (Kahala to Pearl City). The 2003 Bike Plan Hawaii states that a bicycle facility project is currently underway within the project area. This project, which is the design phase of the proposed project, consists of 2.1 miles of a signed shared road on Kalanianaole Highway from Olomana Golf Course to Aloiloi Street.

Koolaupoko Sustainable Communities Plan

The Koolaupoko Sustainable Communities Plan (C&C, 2000) was prepared in accordance with the Charter-prescribed requirements for developmental plans. This plan is one of eight community-oriented plans intended to help guide public policy, investment, and decision making through the 2020 planning horizon. This plan states that the Koolaupoko region will experience no growth through the 2020 planning horizon. This plan also states that the vision for Koolaupoko's future is two-fold:

1. Protection of the communities' natural, scenic, cultural, historic and agricultural resources.
2. Address the need to improve and replace, as necessary, the region's aging infrastructure systems.

City and County of Honolulu, General Plan

The General Plan for the City and County of Honolulu (C&C, 2003) is a requirement of the City Charter. This plan is a two-fold written commitment by the City and County government to a desirable and attainable future for the Island of Oahu. The first part of the plan is a statement of long-range social, economic, environmental, and design objectives for the general welfare and

prosperity of the people of Oahu. The second part of the plan is a statement of the broad policies which facilitate the attainment of the objectives established in the first part of the plan.

The General Plan is a guide for all levels of government, private enterprises, neighborhood and citizen groups, organizations, and individual citizens in eleven areas of concern: 1) population, 2) economic activity, 3) the natural environment, 4) housing, 5) transportation and utilities, 6) energy, 7) physical development and urban design, 8) public safety, 9) health and education, 10) culture and recreation, and 11) government operations and fiscal management.

City and County of Honolulu, Zoning

The City and County of Honolulu is required to conform to Development Plan designations administered by the Department of Land Utilization (DLU). Current zoning as designated by the City and County of Honolulu in the Proposed Project vicinity is presented in Figure 3-2. The land along the designated section of Kalanianaole Highway is primarily zoned Residential and Agricultural. A small pocket of land in the center of Waimānalo is zoned Neighborhood Business. A segment on the west end of the project, within Bellows Air Force Station (BAFS), is zoned Military and Federal. At the extreme west end of the Proposed Project, the land between Kalanianaole Highway and the ocean is zoned P-2 General (C&C, 2005a). P-2 is a preservation designation.

3.2 TRANSPORTATION

3.2.1. Existing Highway Facility

According to the March 2007 Advance Planning Report for Kalanianaole Highway Improvements by Akinaka & Associates, Ltd. (Appendix C), Kalanianaole Highway is the only major transportation facility passing through Waimānalo and consequently is a heavily traveled route. Commuter traffic between Hawaii Kai and Kailua occurs on a regular basis. Acute traffic circulation problems usually develop during weekends and holidays due to the popular local beach areas. Concerns about the safety of children walking to and from the nearby schools were raised during the PIMs. Sections of existing sidewalk and narrow unimproved walkways are not in compliance with current ADA guidelines.

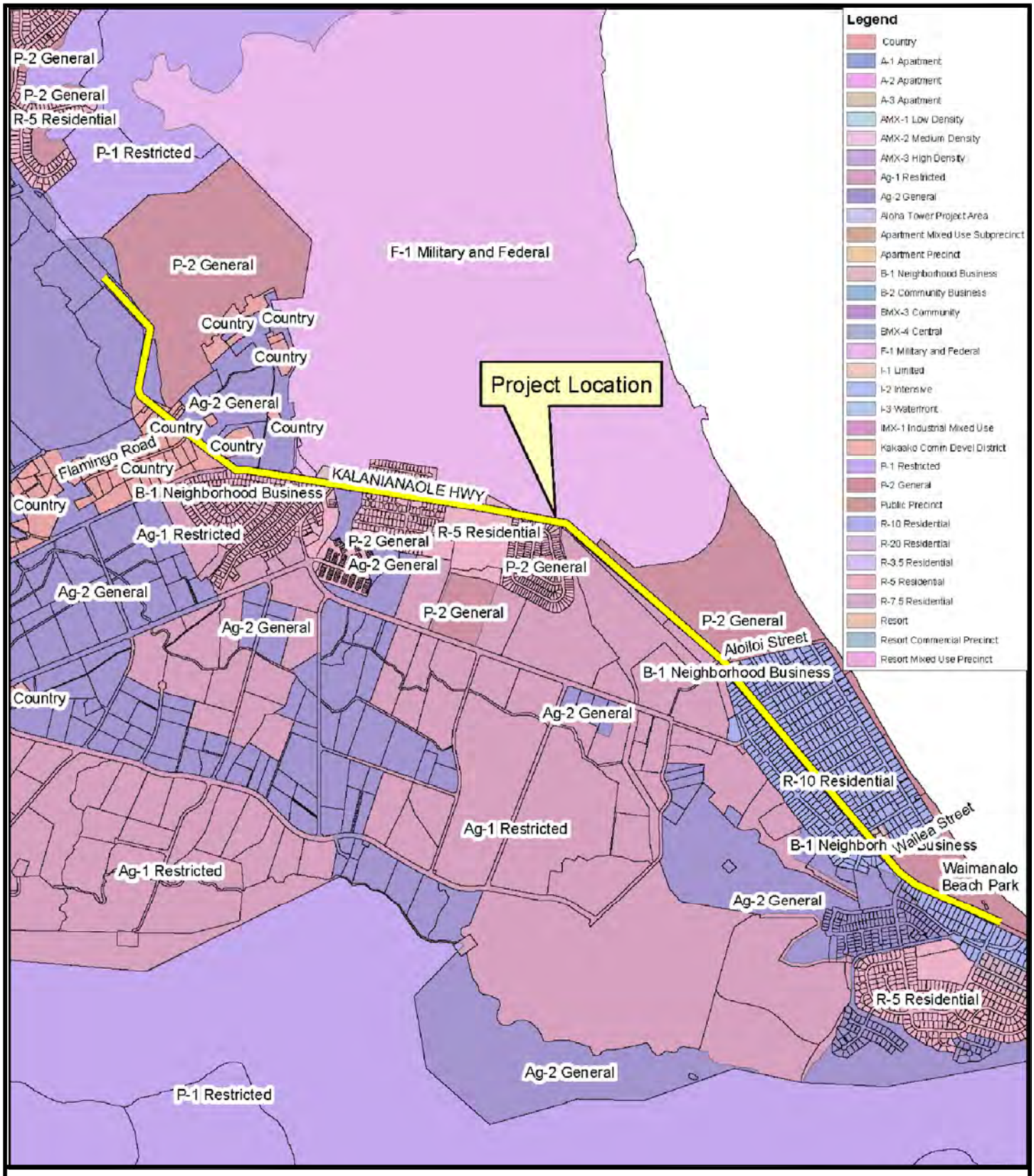
Current right-of-way widths along the project vary from 50-feet to 100-feet as shown in Table 3-1. The existing 50-foot right-of-way between Flamingo and Aloiloi Streets is fully utilized. The 80- and 100-foot widths are not fully utilized.

Table 3-1: Right-of-Way Widths

Location	Right-Of-Way Width
Flamingo Road to Aloiloi Street	50-feet
Aloiloi Street to Wailea Street	100-feet
Wailea Street to Waimanalo Beach Park	80-feet

3.2.2. Existing Traffic Conditions

The Traffic Management Consultant prepared two reports (contained in Appendix C) analyzing the existing conditions at intersections within the project area. Information presented in this section is from these two reports.



Source Map: Advanced Planning report for Kalanianaole Highway Improvements for the Proposed Kalanianaole, Federal Aid Project No. STP-072-1(44), Tax Map Key: 4-1-03 through 09,12,13,15,16,18,19,20,21,22,28,33,34, Akinaka & Associates, Ltd., August 2005

0 2000 4000

Scale In Feet

Scale: 1"=2000' Approximately

N

Figure 3-2
City and County of Honolulu Zoning Map

Draft Environmental Assessment
Kalanianaole Highway Improvements
Federal Aid Project No. STP-072-1(44)

Existing Traffic Circulation

Kalanianaole Highway is a two-way, two-lane highway within the Waimānalo area. It is the only route that leads into and out of the Waimānalo area. The one signalized intersection is at Kalanianaole Highway and Poalima Street, which is near the center of Waimanalo Town.

The other side streets within the project area are all two-lane, two-way roads. Side streets are stop-controlled at their intersections with Kalanianaole Highway. All cars making turns off of Kalanianaole Highway onto side streets must stop on the highway until oncoming traffic is clear, causing undesirable delays to through traffic, particularly during the morning and evening peak traffic hours. Figures 3-3 and 3-4 show the existing AM and PM peak traffic, respectively.

Existing Traffic Volumes

The October 2003 Final Traffic Engineering Report by The Traffic Management Consultant (contained in Appendix C) included an analysis for Kalanianaole Highway from Flamingo Road to Aloiloi Street. This report concluded that peak hour morning traffic occurs between 7:15 AM and 8:15 AM. Kalanianaole Highway carries between 1,300 vehicles per hour (vph) and 1,900 vph, total for both directions. Evening peak hour traffic occurs between 3:45 PM and 4:45 PM. During this hour, Kalanianaole Highway carries between 1,400 vph and 2,000 vph, total for both directions.

The March 2005 Traffic Engineering Report Addendum by the Traffic Management Consultant (Appendix C) included an analysis of Kalanianaole Highway at the intersections of the Olomana Golf Course driveway, Kumuhau Street and Moole Street intersections. This report concluded that the peak hour morning traffic occurs between 7:00 AM and 8:00 AM at the intersection of the Olomana Golf Course Driveway and Kalanianaole Highway. Kalanianaole Highway carries 1,900 vph, total for both directions at this intersection. Evening peak hour traffic occurs between 3:45 PM and 4:45 PM at the intersection of the Olomana Golf Course Driveway and Kalanianaole Highway. During this hour Kalanianaole Highway carries over 2,000 vph, total for both directions at this intersection.

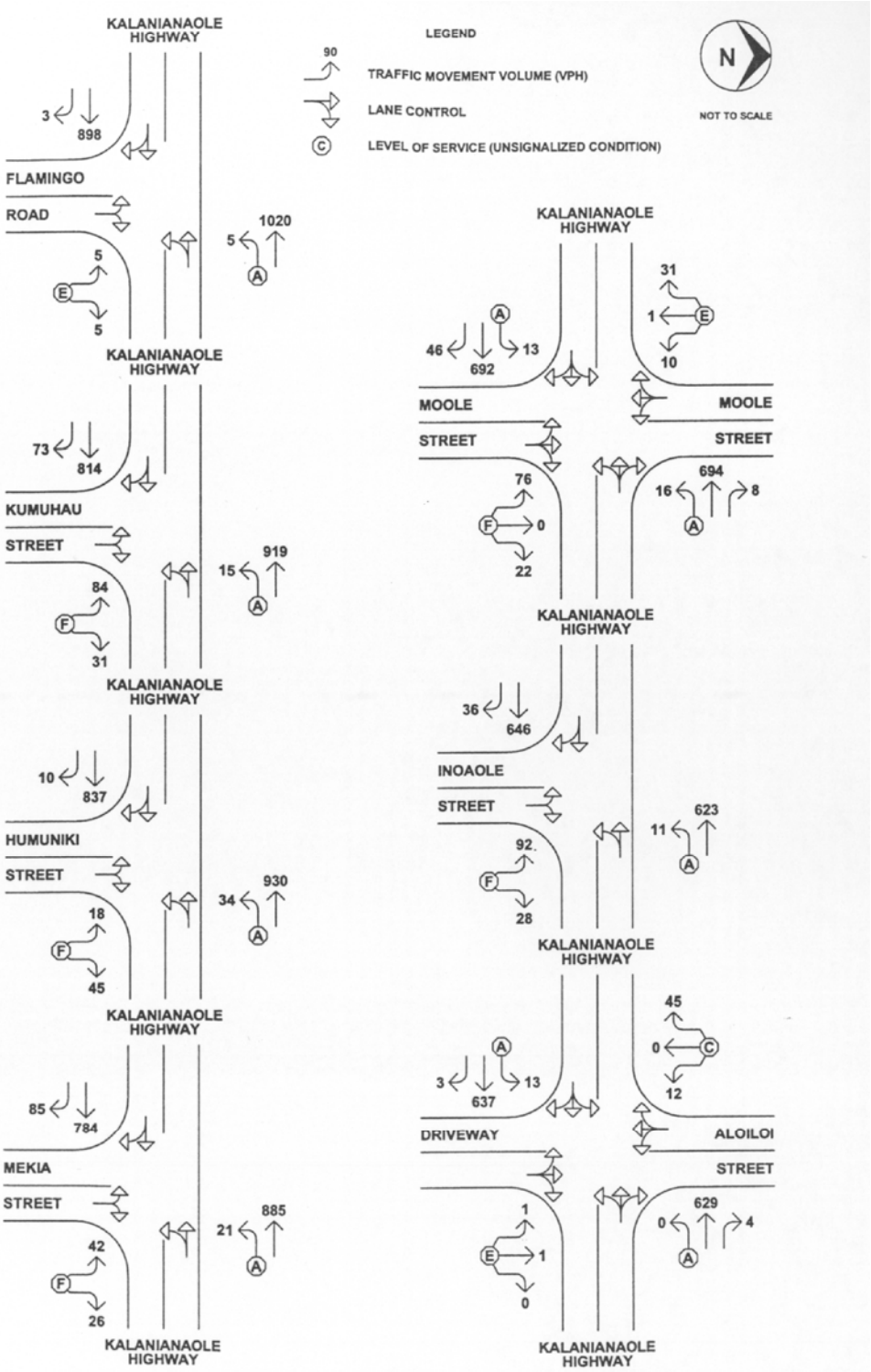
Capacity Analysis Methodology

The highway capacity analysis presented in Appendix C is based upon procedures presented in the “Highway Capacity Manual,” Special Report 209, Transportation Research Board, and the “Highway Capacity Software,” Federal Highways Administration.

Level of Service (LOS) is defined as “a qualitative measure describing operational conditions within a traffic stream”. Several factors are included in determining LOS such as: speed, delay, vehicle density, freedom to maneuver, traffic interruptions, driver comfort, and safety. LOS “A”, “B”, and “C” are considered satisfactory levels of service. LOS “D” is generally considered a “desirable minimum” operating level of service. LOS “E” is an undesirable condition and LOS “F” is an unacceptable condition.

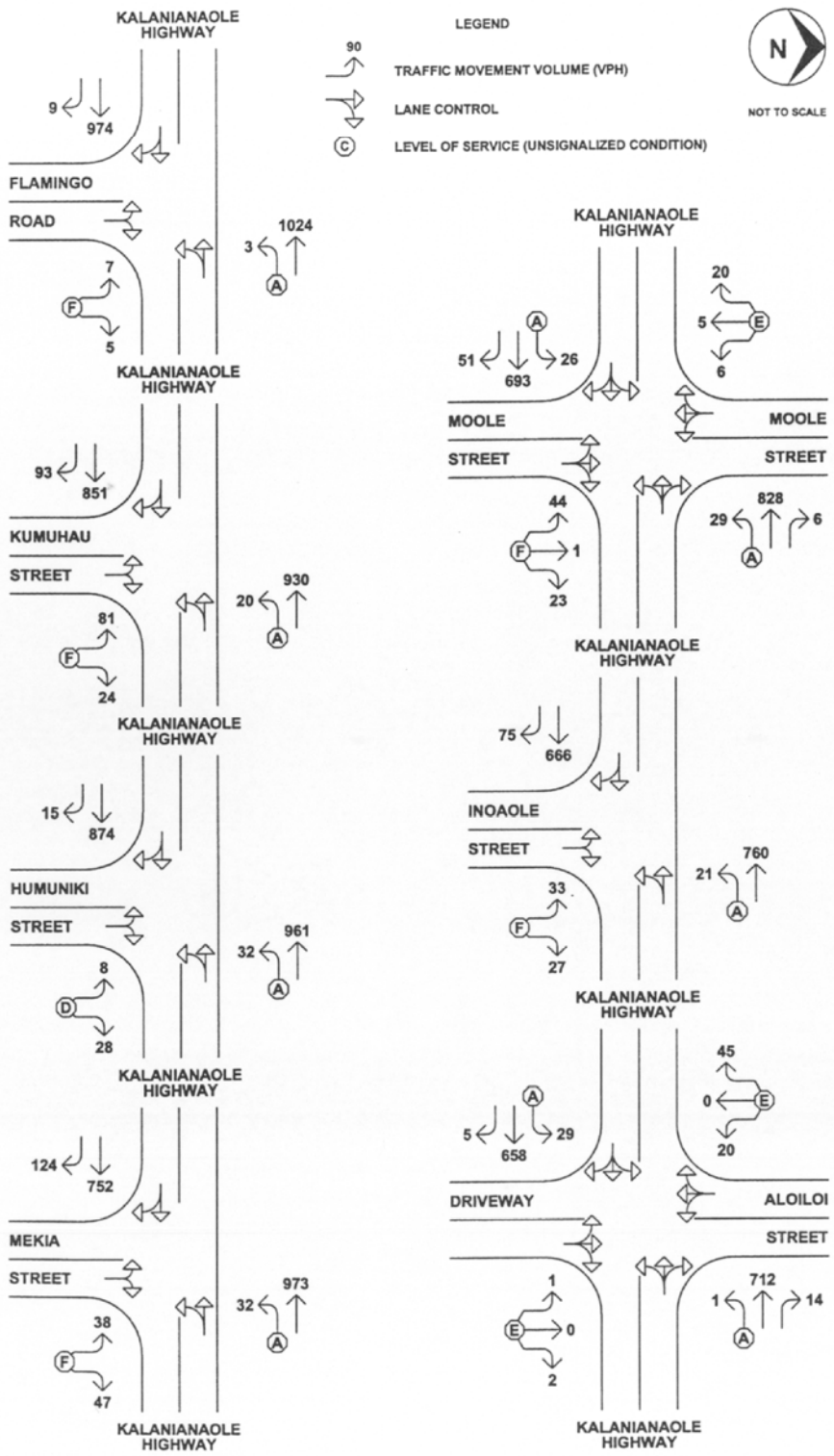
Intersection Level of Service and Summary of Results

Figure 3-3 and 3-4 summarize the existing levels of service for the intersections within the study area. Table 3-2 provides a tabular summary of the results.



Source Map: Final Traffic Engineering Report for the Proposed Kalanianaole Highway Improvements Flamingo Road to Aloiloi Street, The Traffic Management Consultant, October 15, 2003.

Figure 3-3
Existing AM Peak Hour Traffic



Source Map: Final Traffic Engineering Report for the Proposed Kalanianaole Highway Improvements Flamingo Road to Aloiloi Street, The Traffic Management Consultant, October 15, 2003.

Figure 3-4
Existing PM Peak Hour Traffic

Table 3-2: Existing Condition Level of Service Summary

Kalanianaole Highway Side Street Intersections	Turning onto Kalanianaole Highway		Turning off of Kalanianaole Highway	
	AM	PM	AM	PM
Flamingo Road	E	F	A	A
Kumuhau Street	F	F	A	A
Humuniki Street	F	D	A	A
Mekia Street	F	F	A	A
Moole Street				
Northbound/Eastbound	F	F	A	A
Southbound/Westbound	E	E	A	A
Inoaole Street	F	F	A	A
Aloiloi Street				
Northbound/Eastbound	E	E	A	A
Southbound/Westbound	C	E	A	A
Olomana Golf Course Driveway	F	E	A	A

When turning onto Kalanianaole Highway, the side street intersections generally operate at an unsatisfactory LOS due to the heavy through traffic on the highway. Long queues occur in both directions of the highway, during PM peak hour traffic, because of the traffic signal at the intersection of Kalanianaole Highway and Poalima Street.

3.2.3. Public Transit

The City and County of Honolulu operates an island-wide public bus transit system called TheBus. TheBus has 93 routes and approximately 4,200 bus stops that serve the entire island of Oahu. TheBus has a fleet of 525 buses and travels approximately 21.5 million miles a year. The project area is currently served by three bus routes, as described below:

- Route 57/57A – This route travels from Ala Moana to Nimitz Highway, Nimitz Highway to Bishop Street, Bishop Street to Pali Highway, Pali Highway to Kailua Road, Kailua Road to Keolu Drive, Keolu Drive to Kalanianaole Highway, and along Kalanianaole Highway to Sea Life Park.
- Route 77 – This route travels within Kaneohe and the Windward Community College, along Kalanianaole Highway between Kaneohe and Waimānalo, and along major streets within Waimānalo (Nalu to Nakini to Poliala to Huli to Nakini) (C&C, 2005b).
- Route 89 – This route is a weekday only express route that travels along major streets within Waimānalo (Nalu to Poliala to Huli), through Waimanalo on Kalanianaole Highway, Kalanianaole Highway to Pali Highway, and Pali Highway to Downtown Honolulu in the morning and in the opposite direction in the afternoon (C&C, 2006).

3.2.4. Oahu Regional Transportation Plan

The Oahu Regional Transportation Plan (ORTP) is revised every five years by the Oahu Metropolitan Planning Organization (OMPO). The plan was last adopted by OMPO in April 2001 and the development of the next ORTP is currently underway (OMPO, 2005).

The ORTP is the official guide for the development of major surface transportation facilities and programs to be implemented on Oahu. The plan outlines transportation goals, objectives, and policies for Oahu. It identifies “short-range and long-range strategies and actions that are

designed to promote the development of an integrated intermodal transportation system that facilitates the safe, efficient, and economic movement of people and goods" (OMPO, 2005).

3.3 SOCIAL AND ECONOMIC

The demographic characteristics of Waimānalo are best represented using the City and County of Honolulu's Neighborhood Board Area 32, which represents only the Waimānalo area. In 2000, the population of Waimānalo was 10,919. Between 1990 and 2000, the population in the Waimānalo area increased by 12 percent. The County of Honolulu experienced a 10.5 percent increase in population during the same period. The average annual household income is approximately $52,000 per year.

Waimānalo is in the Kailua School Complex. Waimanalo Elementary and Intermediate School is located adjacent to Kalanianaole Highway, near the town center and provides the area with kindergarten through eighth grade education. Blanche Pope Elementary School is in the eastern portion of Waimānalo and provides that area's children with kindergarten through sixth grade education.

Waimanalo Elementary is situated near the public library, the health center, the fire station and six housing developments. Enrollment was 558 during the 2002 to 2003 school-year, and has been declining slightly since 2000. Similarly, the total student count during the 2004 to 2005 school-year on O'ahu is down by 0.3 percent compared to the 2003 to 2004 school year (State of Hawaii, 2005d). The school has a full-time-equivalent staff of 42. Blanche Pope Elementary is built on Hawaiian Homelands. The school is located near the east end of Proposed Project, several blocks from Kalanianaole Highway, and has a current enrollment of 330 and a staff of 25.

Waimānalo is enjoyed for its rural character. Consequently, many employment opportunities in Waimānalo are agriculturally related, including farming, plant nurseries and dairy farms. Horse stables are also important to the community. Along Kalanianaole Highway there are a variety of commercial enterprises that make up the center of Waimanalo Town.

3.4 CLIMATE AND AIR QUALITY

The subtropical climate within the Koolaupoko district is typical of the island of O'ahu. Temperatures are usually mild with an average annual low of 69 degrees Fahrenheit and an average annual high of 80 degrees Fahrenheit (NOAA, 2005a). The predominant winds are from the northeast.

Annual rainfall is approximately 39 inches per year (DLNR, 1986). The state's heaviest rains are brought by winter storms during the October to April wet season (Armstrong, 1983). The storms of 2004 brought unusually high rainfall, with weather stations in Waimānalo receiving double the usual rainfall for the same period in previous years (NOAA, 2005b).

The State Department of Health reports that on the island of O'ahu generally, air pollutants remain well below state and federal standards. Waimānalo is a rural area and is not situated within an air quality maintenance or non-attainment area.

3.5 NOISE

Existing noise levels were measured in various locations along Kalanianaole Highway to assess the acoustical environment of the Proposed Project (Appendix D). The first two locations were

approximately 45 feet from the edge of the pavement of Kalanianaole Highway, while the third location was about 15 feet from the highway. The results are graphically represented in figures presented in Appendix D.

At 15 feet from the road the sound levels range from approximately 70 decibels (dBA) during the daylight hours, to approximately 60 dBA at night. Existing daylight noise levels immediately outside the nearest Waimānalo residences exceed the FHWA maximum guidelines of 67 dBA. It is likely that residences within 60 feet of the highway exceed the FHWA guidelines as well.

The primary factor affecting noise levels is traffic along Kalanianaole Highway. Other noise sources include wind, birds and small planes.

3.6 BIOLOGICAL

3.6.1. Flora

According to a Botanical Resources Assessment Study performed by Char & Associates in February 2004 (Appendix E), the existing highway easements support vegetation which is periodically maintained. Grassy mowed strips characterize the vegetation along most of the highway, especially in the residential areas. Koa haole scrub with Guinea grass and a few scattered trees were found on undeveloped areas bordering the highway easements.

No threatened and endangered species, identified by the U.S. Fish and Wildlife Service (USFWS), occur within the highway easements. The ma'o which is found along Kahawai and Inoa'ole streams is considered a species of concern by the USFWS. However, the plants represent planted, horticulturally obtained material and not a naturally occurring population. No sensitive native plant-dominated communities occur within the highway easements. No Exceptional Trees protected by the City and County of Honolulu Ordinance 78-91 and 81-32 occur within the highway easements.

3.6.2. Fauna

According to a Wildlife Survey performed in February 2004 (Appendix F), introduced birds common to the lowlands of O'ahu were found in the area of the proposed improvements. Those seen with the most frequency include the common myna (*Acridotheres tristis*), and the red-vented bulbul (*Pnycnonotus cafer*). The migratory Pacific golden plover (*Pluvialis dominica*), and Wandering tattler (*Heteroscelus incanus*), were also observed in the vicinity.

No mammals were seen during this survey, although there are likely to be feral cats (*Felis cattus*), mongoose (*Herpestes auropuncttus*), rats (*Rattus spp*) and mice (*Mus musculus*) in the area.

The common moorhen (*Gallinula chloropus sandvicensis*) was observed at Kahawai Stream. The common moorhen is federally listed as an endangered species. A survey conducted in 2000 also found the endangered Hawaiian duck (*Anans wyvilliana*) at Kahawai Stream (Appendix F). The USFWS reported that the threatened Newell's shearwater (*Puffinus auricularis newelli*) may occur within the project area (Appendix G) but they were not reported in the survey performed in February 2004 (Appendix F).

In general, the terrestrial habitat in the project area is not suitable for native birds with the exception of the migratory Pacific golden plover which occurred on lawns and in parks.

3.7 WATER RESOURCES

3.7.1. Surface and Ground Water

Surface Water and Drainage

Several drainage systems are present along Kalanianaole Highway. These systems were installed as part of the subdivision. The Waimanalo Core Development Project installed drainage systems at Kumuhau, Humuniki, and Mekia Street. The discharge point for Kumuhau Street is an 18-inch outlet pipe on the Makai-side of Kalanianaole Highway. The discharge point for Humuniki (30-inch pipe) and Mekia Street (18-inch pipe) is the Kahawai Stream. The systems were designed for a 10-year storm (Appendix C).

The Waimanalo Village project installed a drainage system at the Moole Street intersection. A grated inlet is connected to an 8-inch pipe that traverses Makai towards a drain manhole in the intersection (topographic survey did not find the manhole cover). The 8-inch pipe then continues into the subdivision (Appendix C).

The Inoaole Subdivision installed a drainage system within the subdivision. No drainage structures were constructed along Kalanianaole Highway at the Inoaole Street intersection. However, a concrete through gutter was installed to allow street runoff from the highway to by-pass the subdivision. Throughout the years as the highway has been resurfaced, the pavement elevation has increased which has created a steeper transition into the through gutter. The steeper transition forces vehicles to reduce speed to prevent “bottoming-out”. It is recommended that the pavement grade along Kalanianaole Highway be reduced to its original elevation to prevent the “bottoming-out” condition (Appendix C).

The Waimanalo Beach Lots (Makai-side - Aloiloi Street to Wailea Street) shows several drainage structures at Aloiloi and Wailea Street. The discharge location has not been determined but is assumed to be within the subdivision and not along Kalanianaole Highway (Appendix C).

The existing condition of the deteriorated road and shoulders has created ponding problems along Kalanianaole Highway. An Advance Planning Report for the proposed improvements was prepared by Akinaka & Associates in January 2006 (Appendix C). This report made recommendations to provide a temporary solution to eliminate the ponding in several areas and that a comprehensive drainage study be completed prior to construction to assure that the improved roadway complies with current drainage standards.

Ground Water

A small portion of the project area north of the Olomana Golf Course is located in the Waimanalo Aquifer System in the Windward Aquifer Sector. The aquifer in this area is a high level (fresh water not in contact with seawater), unconfined (where the water table is the upper surface of the saturated aquifer), dike (aquifers in dike compartments) aquifer. Ground water in this area is currently used as fresh [salinity < 250 milligram per liter Chloride (mg/L Cl^-)] drinking water and is classified as irreplaceable and highly vulnerable to contamination (Mink and Lau, 1990).

The remainder of the project area south of the Olomana Golf Course is also located in the Waimanalo Aquifer System in the Windward Aquifer Sector. The upper aquifer is a basal (fresh water in contact with seawater), unconfined, sedimentary (nonvolcanic lithology) aquifer and is

classified as currently used, ecologically important, low salinity (250 to 1,000 mg/L Cl^-), irreplaceable and highly vulnerable to contamination (Mink and Lau, 1990). The lower aquifer is a basal, confined (aquifer bounded by impermeable or poorly permeable formations, and top of saturated aquifer is below ground water surface), dike aquifer and is classified as currently used as a fresh drinking water source that is irreplaceable and has a low vulnerability to contamination (Mink and Lau, 1990).

3.7.2. Floodplains

The Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (FIRM) shows that portions of the project area are within the area subject to flooding every 100 years, zones AE and AO (Figure 3-5). Correspondence from DLNR Engineering Division (see Appendix A), states that the project site is located in FIRM zones X and X (Shaded). DLNR further states that the National Flood Insurance Program does not have any regulations for development within these areas.

The Tsunami Evacuation Zone Map shows that the area north of the highway, or makai, and between BAFS and Waimanalo Beach Park, borders the tsunami evacuation zone (Figure 3-6).

3.7.3. Wetlands

The area Mauka of the Inoaole Bridge is considered to be a wetland according to the Army Corps of Engineers (Appendix C).

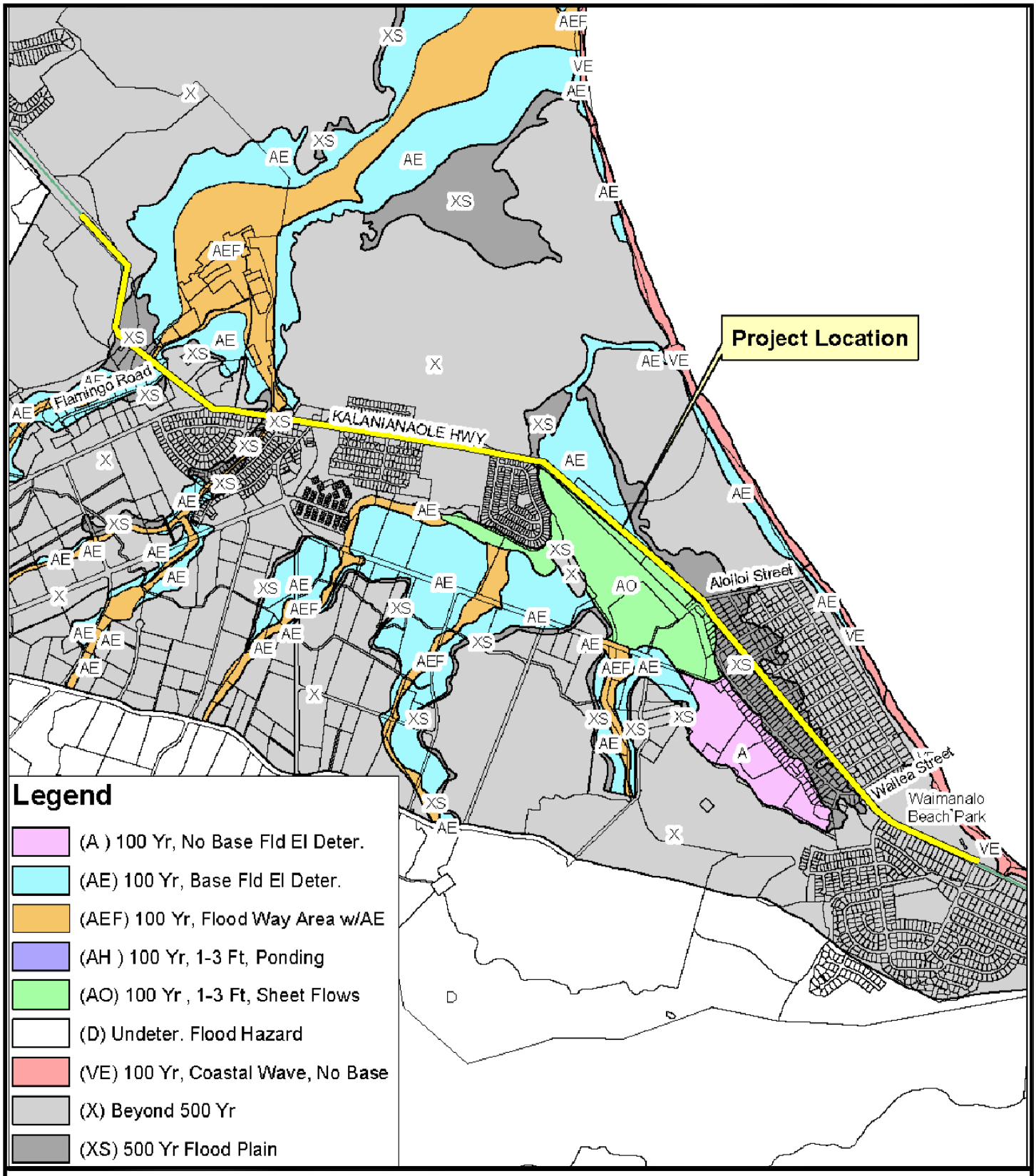
3.8 GEOGRAPHIC SETTING

3.8.1. Geologic Setting

Waimānalo is a broad amphitheater-shaped valley with a relatively level floor composed of moderately sloping alluvial fans. It is in the "late mature to old Age" stage of erosional development (MacDonald et al., 1983). The subject property is located in central Waimānalo on the "Waimānalo Plain" (Armstrong et al., 1973) along Kalanianaole Highway. Elevations within the project area range from approximately 5 feet above mean seal level at the southern boundary to 80 feet at the north.

3.8.2. Soils

There are twelve soil types of varying properties within the project area (Figure 3-7). The southeast half of the project area consists of Jaucas sand with some Kawaihapai clay loam 0-2% slopes, Mokulēʻia loam, Ewa silty clay loam 0-2% slopes, Haleiwa silty clay 0-2% slopes, and coral outcrop. The northwestern half of the project area consists of Ewa silty clay loam 0-2% slopes, Kokokahi clay 6-12% slopes, Pōhākupu silty clay loam 0-8% slopes, Kaloko clay, noncalcareous variant, Hanalei silty clay 0-2% slopes, Alaeloa silty clay 15-35% slopes, Papaa clay 6-20 % slopes, and Papaa clay 35-70% slopes. The soil survey of Oʻahu indicates that portions of the present project area are underlain by Jaucas Sand deposits which may contain traditional Hawaiian sites such as cultural layers and/or human burials. A detailed description of the soil types within the project area is included in Appendix C.



Source Map: Advanced Planning report for Kalanianaole Highway Improvements for the Proposed Kalanianaole, Federal Aid Project No. STP-072-1(44), Tax Map Key: 4-1-03 through 09,12,13,15,16,18,19,20,21,22,28,33,34, Akinaka & Associates, Ltd., December 2005

0 2000 4000

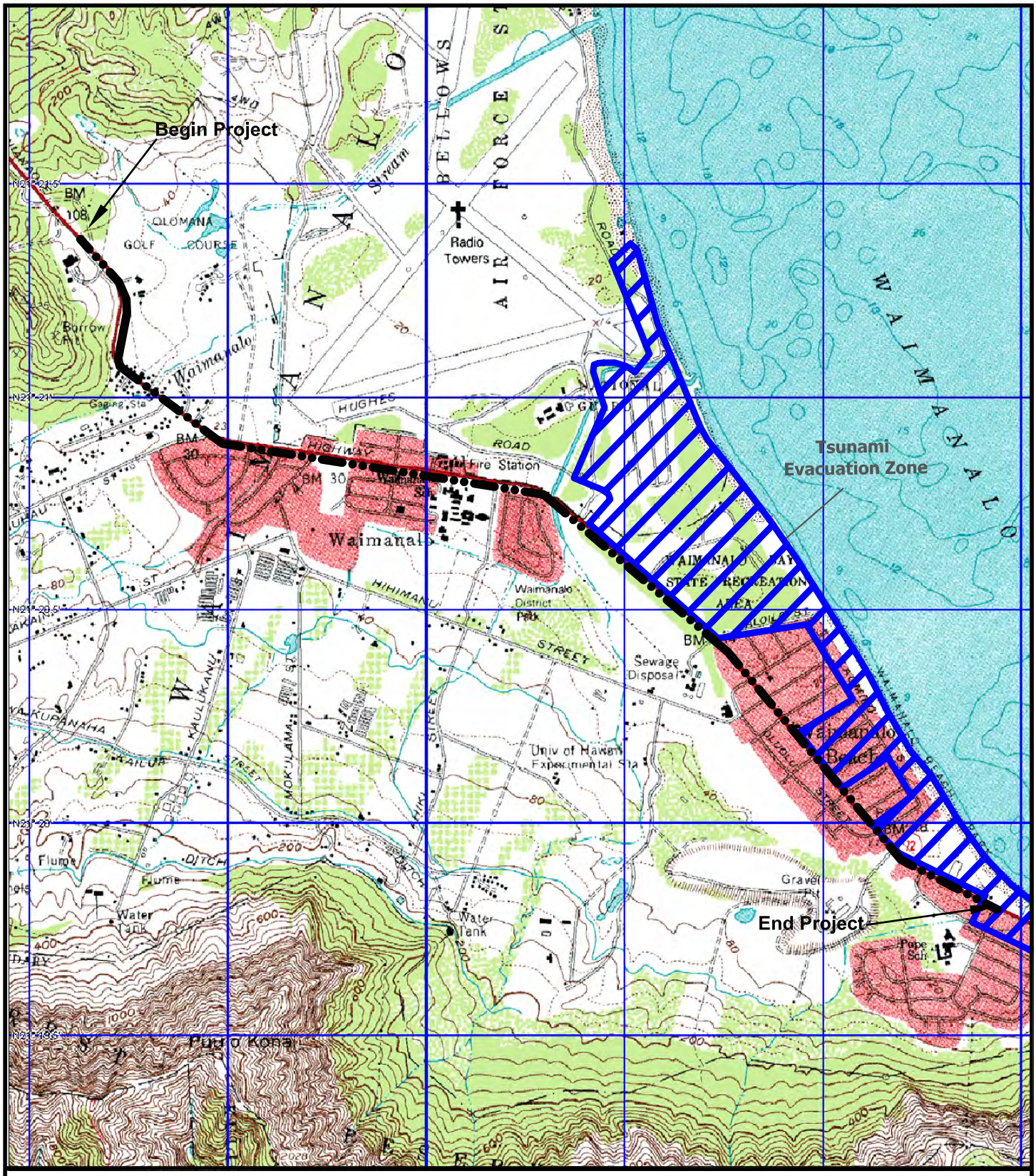
Scale In Feet

Scale: 1"=2000' Approximately

N

Figure 3-5
Flood Zone Map

Draft Environmental Assessment
Kalanianaole Highway Improvements
Federal Aid Project No. STP-072-1(44)



Reference: 3-D TopoQuads, Delorme, 1999
Source Map: USGS Topographic Map (1983), Koko Head Quadrangle, and Oahu Civil Defense Tsunami Evacuation Maps
Map 6 Waimanalo to Kailua, Copyright 2002-2005 City and County of Honolulu, 2005.

0 2000 4000

Scale In Feet

Scale: 1"=2000' Approximately

N

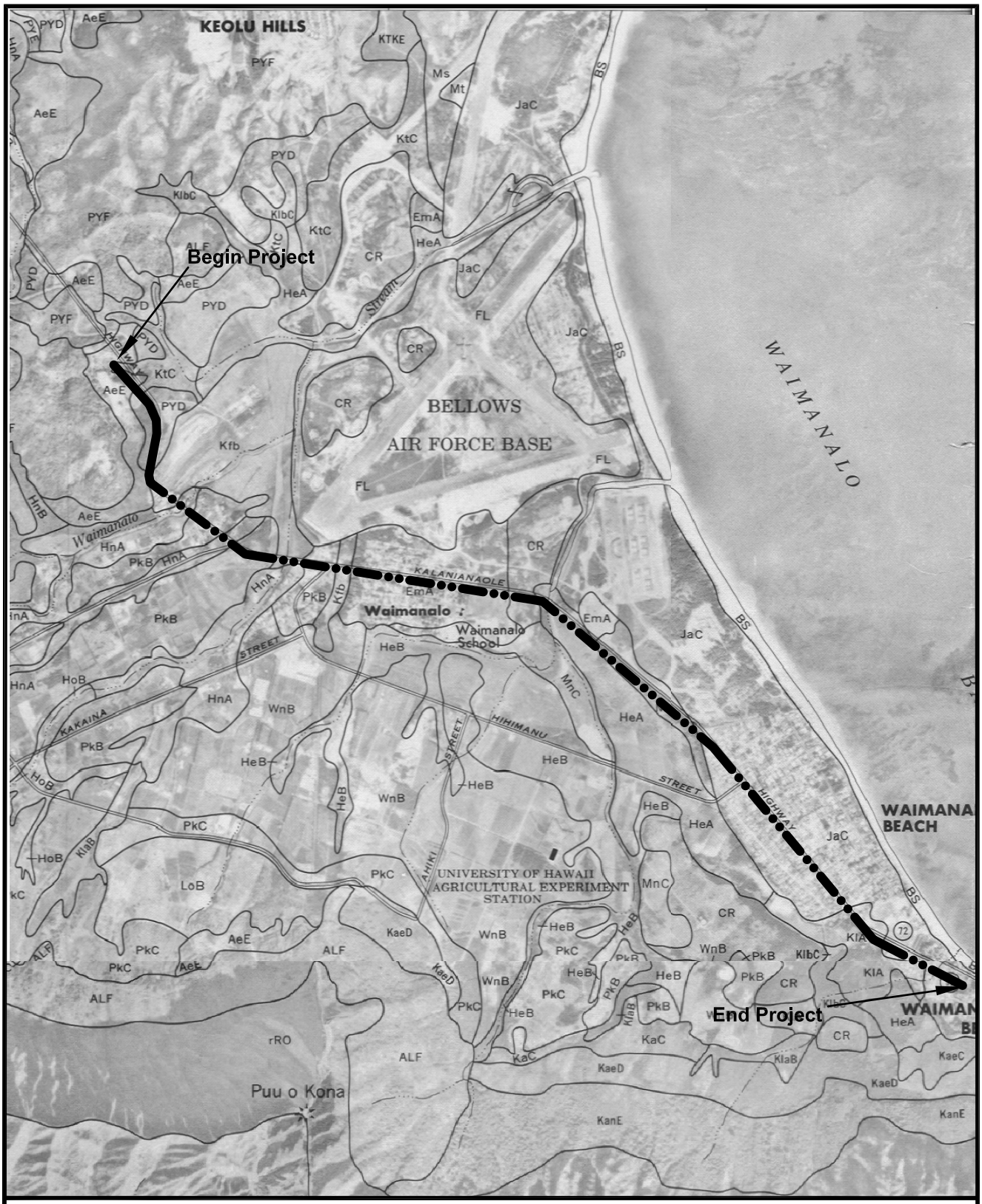
Legend

Project Location
Kalanianaole Highway

Tsunami Evacuation Zone

Figure 3-6
Tsunami Evacuation Zone Map

Draft Environmental Assessment
Kalanianaole Highway Improvements
Federal Aid Project No. STP-072-1(44)



Source Map: USDA Soil Conservation Survey, 1972.

0 2000 4000

Scale In Feet

Scale: 1"=2000' Approximately

N

Legend

Project Location
Kalanianaole Highway

Figure 3-7
Soils Map

Draft Environmental Assessment
Kalanianaole Highway Improvements
Federal Aid Project No. STP-072-1(44)

3.8.3. Earthquakes and Tsunami

Except for the island of Hawaii, the Hawaiian Islands are not a highly seismic area (Armstrong, 1973). Six years ago the Uniform Building Code for Oahu was upgraded from seismic zone 1 to seismic zone 2A (Fryer, 2005). Seismic zone 2A is not associated with a particular fault zone (IDNR, 2005).

The Tsunami Evacuation Zone Map provided by the Oahu Civil Defense Agency identifies the area north of Kalanianaole Highway, between the main gate of BAFS and the Waimanalo Beach Park, as the border of the evacuation zone. No other area within the project site is located within the evacuation zone (see Figure 3-6).

3.8.4. Hazardous Materials

An environmental database search and a site investigation for the project area were conducted in May 2005. Three areas of concern were identified during this investigation: 1) UNOCAL gas station, 2) former Chevron gas station, and 2) pole-mounted electrical transformers along the length of the project area.

On February 18, 1999, a release was reported at the UNOCAL gas station, located at 41-1517 Kalanianaole Highway. Cleanup of the petroleum release was initiated on December 21, 2001. The site investigation in May 2005 identified monitoring wells located within the existing right-of-way of Kalanianaole Highway, within the project area. The former Chevron station at 41-1510 Kalanianaole Highway, which is the property HDOT will need to acquire, also had a petroleum release; however, site cleanup was completed in 2002 and 2003 at this site (DOH, 2005).

Pole-mounted electrical transformers were identified along the entire length of the project area. Stained soil was observed beneath some pole-mounted transformers indicating potential leaks. Therefore, potential release of PCB-contaminated oil from the transformers may have occurred.

3.9 HISTORIC AND ARCHAEOLOGICAL RESOURCES

The archaeological work at the BAFS has been extensive. This area borders a large portion of the eastern end of the Proposed Project. At the BAFS dune site, human burials, lithic scatters, soil features and/or occupation layers have been found almost everywhere archaeological investigations have taken place (Appendix H). Archaeological work along the shoreline of BAFS has detailed some of the earliest known sites in the Hawaiian Islands. Research since the discovery of the early Bellows Dune occupation has focused on attempting to connect other archaeological finds in more inland areas of Bellows to this early Polynesian settlement. Bellows remains a focus of continuing archaeological research.

A Cultural Impact Assessment (Appendix H) was developed to evaluate the cultural resources within the project area. This assessment concluded that cultural deposits and/or human burials are likely to be found during subsurface excavations along the Kalanianaole Highway improvements project. This assessment also concluded that the proposed improvements will have minimal or no impact on the Hawaiian culture, its practices and traditions.

3.10 PARKLAND/SECTION 4(f)

3.10.1. Existing Resources

Golf and ocean activities are the predominate forms of recreation in the Waimānalo area. The following is a list of recreational facilities that are located in the general vicinity of the project area and their locations are shown on Figure 1-1:

- Olomana Golf Links
- Waimanalo Beach Park
- Waimanalo Bay Beach Park (Sherwood Forest)
- Bellows Air Force Station (BAFS)
- Waimanalo District Park
- Honolulu Polo Club

Olomana Golf Links is a popular 18-hole golf course located at the west end of the Proposed Project. Waimanalo Beach Park and Waimanalo Bay Beach Park, as well as BAFS, provide the public with an extensive beach area for recreation. Waimanalo District Park is the community park for field and playground activities.

According to the Koolaupoko Sustainable Communities Plan, there are no planned or proposed public parks within the project vicinity.

3.10.2. Section 4(f)

Section 4(f) of the Department of Transportation (DOT) Act of 1966 establishes a United States Government policy to preserve the natural beauty of the countryside and public park and recreation land, wildlife and waterfowl refuges, and historic sites. This policy states that if a project requires the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or land of a historic site of national, state, or local significance; the project will include all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use (FHWA, 2005).

The proposed improvements will be within the existing right-of-way; therefore, no use of public parks, recreation land, wildlife and waterfowl refuges, or known historic sites is proposed.

3.11 VISUAL ENVIRONMENT

Waimānalo is a rural, agriculturally oriented area. All development is low-rise, which allows for broad vistas. The ocean and Koolau Mountains are in close proximity to one another. The landscape is dramatic, with steep mountains in the back of Waimānalo and a sandy, gently sloping coastline. Waimānalo's beaches attract many visitors because of Waimānalo's long, undeveloped coast and friendly surf.

3.12 UTILITIES

Existing utilities within the project limits include a 36-inch water main, a 15-inch sewer main, and drain lines of varying sizes. Overhead electrical and telephone lines are hung from utility poles on both sides of the road. Highway streetlights are also mounted on some of the utility poles. The intersection at Poalima Street along Kalanianaole Highway is signalized (Appendix C).

The Draft EA stated that the Board of Water Supply (BWS) was preparing to install a new 36-inch water main, with the first phase of new transmission main entering Kalanianaole Highway at Poalima Street and connecting to the existing 36-inch main near the Olomana Golf Course. The BWS had intended to defer construction of the water main project so that it would coincide with construction of the proposed improvements; however, since publication of the Draft EA, this BWS project has been cancelled.

Existing electric, telephone and cable television distribution systems along the highway are provided with wood utility poles and overhead distribution wires. Existing highway lights are generally mounted on wood utility poles with metal bracket arms and luminaries. Some areas have existing highway light bracket arms, luminaries, and mounted metal standards. (Appendix C).

4.0 POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

This chapter describes the impacts of the Proposed Project and the No Action alternative on the resource areas presented in Chapter 3. This chapter also presents mitigation measures.

4.1 LAND USE

4.1.1. Potential Impacts on Land Use in the Project Area

Since the proposed improvements will be done mostly within the existing right-of-way, there will be no changes in land use under the Proposed Project. HDOT will acquire land at the Poalima Street intersection, but the use of the acquired land will comply with the current State Land Use designation of Urban and City and County of Honolulu Zoning designation of B-1, Neighborhood Business. Thus, the Proposed Project will not have any impacts on the land use in the project area.

The No Action alternative will have no impacts on the land use in the project area.

4.1.2. Government Plans, Policies and Controls

Hawaii State Plan

The Proposed Project upholds the applicable objectives and policies of the Hawaii State Plan by improving pedestrian safety and traffic flow in a manner in keeping with Waimānalo community objectives of retaining the area's rural character. Many members of the community have reviewed and approved of the proposed improvements.

The No Action alternative does not uphold the objectives and policies of the Hawaii State Plan because it does not "promote efficient, economical, safe, and convenient movement of people and goods."

Hawaii Statewide Transportation Plan

The Proposed Project allows the State an opportunity to provide the people of Waimānalo, as well as those passing through, the means to travel more conveniently by improving the flow of traffic. As previously noted, safety is an important element of the improvement project, and public safety is a prime consideration.

The No Action alternative does not comply with the Hawaii Statewide Transportation Plan because it does not "provide for the safe, economic, efficient, and convenient movement of people and goods."

Hawaii State Land Use Controls

The Proposed Project and the No Action alternative will not impact the Hawaii State Land Use controls.

Hawaii Coastal Zone Management

The proposed improvements included in the Proposed Project are consistent with the objectives and policies of the State's CZM Program. The proposed improvements will not have any impacts on recreational resources, coastal ecosystems, beach protection, and marine

resources. Discussions on the remaining areas of the State's CZM Program are presented in other sections of the Final EA. They are as follows:

- Historic Resources – see Section 4.9
- Scenic and Open Spaces – see Section 4.11
- Economic Uses – see Section 4.3
- Coastal Hazards – see Section 4.8.3
- Managing Development – see Section 4.1

An application for a CZM Federal Consistency Review was submitted to the State's CZM Program concurrent with the Draft EA. In a letter dated March 28, 2006, the State Department of Business, Economic Development & Tourism, Office of Planning concurred that the Proposed Project is consistent with the Hawaii CZM Program. A copy of the letter from the Office of Planning is contained in Appendix I.

Special Management Area

According to comments on the Draft EA received from the City and County of Honolulu Department of Planning and Permitting (Appendix B), as long as the Proposed Project work is within the existing highway easement, no Special Management Area Use Permit is needed for the portions of the highway in the SMA. All of the proposed improvements are located within the existing highway easement except for the Poalima Street intersection. Due to the additional width needed at the Poalima Street intersection to improve the turning radius for Makapuu-bound vehicles turning right, land acquisition will be required. The land to be acquired by HDOT at the Poalima Street intersection is not located within the SMA (see Figure 3-1); therefore, a SMA permit is not required, as confirmed by the Department of Planning and Permitting in their letter contained in Appendix B. The No Action alternative does not require a SMA permit because no improvements are proposed under this alternative.

Bike Plan Hawaii

The 2003 Bike Plan Hawaii states that a bicycle facility project is currently underway within the project area. This project consists of 2.1 miles of a signed shared road on Kalanianaole Highway from Olomana Golf Course to Aloiloi Street. This project is included in the proposed improvements to Kalanianaole Highway proposed in this Final EA. Therefore, the Proposed Project is consistent with the 2003 Bike Plan Hawaii. The signage will make the highway more bicycle friendly than it is currently without signage. The No Action alternative is not consistent with the 2003 Bike Plan Hawaii because it does not include the bicycle facility project stated in the plan.

Koolaupoko Sustainable Communities Plan

The Proposed Project will comply with the Koolaupoko Sustainable Communities Plan. The Proposed Project will implement the plan's two-fold vision of: 1) protecting the communities' natural, scenic, cultural, historic and agricultural resources by implementing improvements within the existing right-of way and 2) addressing the need to improve and replace the region's aging infrastructure by implementing improvements to comply with current ADA guidelines.

The No Action alternative complies with the first part of the plan's two-fold vision of protecting the communities' natural, scenic, cultural, historic and agricultural resources by proposing no improvements be implemented. However, this alternative does not comply with the plan's second part, addressing the need to improve and replace the region's aging infrastructure. The

No Action alternative proposes that the current substandard conditions remain the same and will further degrade in the future.

City and County of Honolulu, General Plan

The proposed improvements included in the Proposed Project are consistent with the objectives and policies of the City and County of Honolulu General Plan. The proposed improvements will not have any impacts on population, housing, energy, health and education, and government operations and fiscal management. Discussions on the remaining areas of the City's General Plan are presented in other sections of the Final EA. They are as follows:

- Economic Activity – see Section 4.3
- The Natural Environment – see Sections 4.4, 4.5, 4.6, 4.7, 4.8, and 4.11
- Transportation and Utilities – see Sections 4.2 and 4.12
- Physical Development and Urban Design – see Section 4.1.1
- Public Safety – see Section 4.2
- Culture and Recreation – See Sections 4.9 and 4.10

City and County of Honolulu, Zoning

The Proposed Project complies with the current zoning designated by the City and County of Honolulu because the proposed improvements are mostly within the existing right-of-way. HDOT will acquire land at the Poalima Street intersection but the use of the acquired land will comply with the current zoning. Therefore, the land use in the area of the proposed improvements will not change. The No Action alternative will not have an impact on the current zoning designated by the City and County of Honolulu.

4.2 TRANSPORTATION

4.2.1. Traffic Impacts

The Traffic Management Consultant prepared two reports (contained in Appendix C) analyzing the future conditions in the design year 2022 at intersections within the project area. Information presented in this section is from these two reports.

Future Traffic Volume Forecast Methodology

Traffic forecasts for 2022 were provided by HDOT. The 2022 average daily traffic (ADT) (vehicles per day) forecast represents about 0.8 percent annual growth in traffic. Therefore, a factor of 1.16 was applied uniformly to the existing traffic conditions to estimate the 2022 AM and PM peak hour traffic.

Intersection Level of Service and Summary of Results

Table 4-1 provides a tabular summary comparing the results of the traffic study showing existing conditions and the 2022 LOS for the intersections with the proposed improvements.

Potential Impacts

Construction of the highway improvements will cause delays for those traveling through Waimānalo. Lane closures and temporary roadway modifications will slow traffic and cause

temporary halts. Mitigation measures to minimize the impacts on traffic flow during construction will be taken. Construction will not take place during peak traffic times, and flag men and other traffic control measures will be taken to direct traffic.

Upon completion of the proposed improvements in the Proposed Project, traffic flow is expected to be more efficient. The addition of a third lane along the specified segment of Kalanianaole Highway will improve overall traffic flow along the roadway and side streets. Exclusive left-turn lanes, median shelter lanes, two-way left-turn lanes, and bus pull-outs will improve travel times for through traffic. The median shelter lanes and the two-way left-turn lanes will reduce delays for vehicles turning left onto Kalanianaole Highway from side streets and driveways. Traffic is not expected to increase as a result of highway improvement. Therefore, the Proposed Project will have overall beneficial impacts to the traffic in the project area.

Table 4-1: Future Conditions Level of Service Summary

Kalanianaole Highway Side Street Intersections	Existing Conditions				Year 2022 Conditions with Proposed Improvements			
	Turning onto Kalanianaole Highway		Turning off of Kalanianaole Highway		Turning onto Kalanianaole Highway		Turning off of Kalanianaole Highway	
	AM	PM	AM	PM	AM	PM	AM	PM
Flamingo Road	E	F	A	A	C	C	B	B
Kumuhau Street	F	F	A	A	D	E	B	B
Humuniki Street	F	D	A	A	D	C	B	B
Mekia Street	F	F	A	A	D	D	B	B
Moole Street								
Northbound/Eastbound	F	F	A	A	F	F	A	B
Southbound/Westbound	E	E	A	A	F	F	B	B
Inoaole Street	F	F	A	A	C	C	A	A
Aloiloi Street								
Northbound/Eastbound	E	E	A	A	F	F	B	B
Southbound/Westbound	C	E	A	A	C	C		A
Olomana Golf Course Driveway	F	E	B	B	D	C	B	B

The No Action alternative will result in adverse impacts to traffic in the project area. Current traffic congestion will continue and increase as the existing roadways degrade.

4.3 SOCIAL AND ECONOMIC

The Proposed Project will have beneficial social and economic impacts in the project area. The proposed improvements include improvements to comply with existing ADA guidelines and improvements to accommodate pedestrian, bicycle and equestrian traffic. The overall effect of the proposed improvements will allow Kalanianaole Highway to operate more efficiently; therefore, making it easier for area residents and visitors to access the businesses in the area. The proposed improvements will also make it safer and friendlier to pedestrian, bicycle and equestrian traffic in the project area.

In addition, improvements to Kalanianaole Highway will have no significant affect on population and employment in Waimānalo. It is likely that Waimānalo will continue to grow at its current

rate of about one percent a year. It is possible that during construction, members of the crew would come from Waimānalo.

The No Action alternative will have adverse social and economic impacts. The existing traffic congestion and unsafe conditions for pedestrians, bicycles, and equestrian traffic will continue.

4.4 AIR QUALITY

Climate should not be affected by the Proposed Project. There will not be significant change to the landscape and the amount of paved surface will not be greatly increased. The factors that can cause higher surface temperatures will remain fundamentally unchanged upon completion of the project.

A temporary reduction in air quality will occur during construction activity. The primary effects on air quality will come from construction equipment exhaust and the movement of soil. This will cause a temporary localized increase in particulate matter and air pollutants emitted from diesel engines. However, no violations of federal or state air quality standards are expected. Because the proposed improvements are located adjacent to the community center of Waimānalo as well as residential areas, mitigation measures will be necessary to reduce impacts to air quality. Mitigation measures to minimize the impacts on air quality during construction will be taken; these measures will include the use of barriers and regular wetting down of problem areas.

The No Action alternative will not have any impacts on air quality.

4.5 NOISE

The Proposed Project will have temporary adverse impacts to the noise levels in the area due to construction activities. Development of the site will involve excavation, grading, and construction of the new road. The various construction phases of the project will generate significant amounts of noise. This will affect surrounding residential properties due to their proximity to the project.

The actual noise levels produced during construction will be a function of the methods used during each stage of the construction process. Typical ranges of construction equipment noise are shown in figures included in Appendix D. Earth moving equipment, such as tractors and backhoes, cause some of the highest noise levels, ranging from approximately 72 dBA to more than 95 dBA at 50 feet.

When construction noise exceeds, or is expected to exceed, the State Department of Health's (DOH) "maximum permissible" property line noise levels (Appendix D), a permit must be obtained from the DOH. The permit will only allow construction between the hours of 7:00AM and 6:00PM Monday through Friday, and 9:00AM to 6:00PM on Saturdays. The permit does not limit the level of noise generated by construction. During construction, the contractor will use reasonable and standard practices, which include limited construction hours to mitigate noise impacts. However, DOH may require additional noise mitigation treatments if they consider the proposed mitigation measures substandard. After the highway improvements are completed, noise levels will return to pre-construction levels.

To evaluate pre-construction noise levels, noise measurement data were taken in June of 2000 and August of 2004 (Appendix D). The data showed that sound levels ranged from

approximately 70 dB during the daytime to 60 dB during nighttime hours when taken 15 feet from Kalanianaole Highway. The noise study concluded that residences living 60 feet from the highway currently experience noise levels that exceed FHWA guidelines. Mitigation of traffic noise to the residences should not be required for the subject project because there is only a 1 dB to 2 dB increase, which is considered to be an insignificant increase. Since the existing traffic noise at the project site currently exceeds FHWA guidelines, the traffic during and after construction will also likely exceed the guidelines.

The No Action alternative will not have any impacts to the noise levels in the project area.

4.6 BIOLOGICAL

4.6.1. Flora

According to a Botanical Resources Assessment Study (Appendix E), no threatened and endangered plant species, no sensitive native plant-dominated communities, and no "Exceptional Trees" protected by City and County of Honolulu Ordinance 78-91 and 81-32 exist within the highway easement. The maʻo, which is found along Kahawai and Inoaʻole Streams, is considered a species of concern. However, the plants represent planted, horticulturally obtained material and not a naturally occurring population. Therefore, the Proposed Project is not expected to have a significant negative impact on the botanical resources.

If the locations containing native plants are affected by the highway improvements, the plants will be transplanted to another location or repotted and set aside. After construction is completed, the potted plants or new plants will be set out at the Kahawai and Inoaʻole sites. In addition, the State will use native plants as landscape material.

The No Action alternative will not impact the botanical resources in the project area.

4.6.2. Fauna

The Proposed Project will primarily affect the area within the highway easement, which is already highly disturbed. HDOT submitted a letter (Appendix G), dated November 1, 2004, to the USFWS requesting concurrence with HDOT's determination that the proposed project will have no effect on fish and wildlife resources. In a reply letter dated December 7, 2004 (Appendix G), the USFWS concluded the following:

- Construction activities may cause minimal temporary disturbance to foraging opportunities for the Hawaiian duck and moorhen.
- The use of bright lights at night may confuse the Newell's shearwaters and may cause them to circle around the lights until they become exhausted and fall to the ground where they are injured or killed by vehicles or predators. Therefore, construction should be limited to daytime and in the nesting season (mid-April through November); construction activities may avoid impacting these species.
- There is no critical habitat in the vicinity of the proposed improvements.

Therefore, because there may be minimal temporary impacts to the Hawaiian duck and moorhen, the USFWS concurs that the proposed improvements are not likely to adversely affect those species. Also, if construction activities are limited to daytime and in the nesting season (mid-April through November), the USFWS concurs that the proposed improvements are not likely to adversely affect Newell's shearwaters.

As a mitigation measure, HDOT has agreed that construction activities will be limited to daytime in mid-April through November to minimize impact to the Newell's shearwaters. In addition, the proposed new lighting system for the highway will incorporate shielded lighting, designed to discourage the attraction of seabirds to the lights.

The No Action alternative will not impact wildlife resources in the project area.

4.7 WATER RESOURCES

4.7.1. Surface and Ground Water

The proposed drainage improvements included in the Proposed Project assume that no additional off-site flows are required to be managed. A comprehensive hydrologic analysis shall be performed to determine the existing hydrologic boundaries and define the new hydrologic boundaries. An increase in the hydrologic runoff is anticipated but will not have major impacts to the highway and adjacent properties. During the design phase of the project, a hydraulic analysis will be completed. Based on this analysis, appropriate mitigative measures will be taken to minimize any project impacts.

Although portions of the project reside within the 100-year flood zone (Zones AE and AO, as shown on Figure 3-5), the proposed improvements within this area should not cause an increase to the flooding condition. The flood zone primarily consists of the Waimanalo Polo field and Bellows Beach Park.

The proposed improvements will have limited impacts on hydrology. Project construction will not significantly affect streams or ground water. The improvement will cover two bridges, but this project does not include structural bridge improvement. Localized ponding from storms will be eliminated, providing the community with a cleaner, safer roadway. Since the proposed improvements require minimal excavation, it is unlikely that ground water will be encountered during construction, and therefore, no significant impact to ground water is anticipated. In addition, the contractor will be required to obtain a National Pollutant Discharge Elimination System (NPDES) permit for storm water discharge from a construction site and will be required to follow standard Best Management Practices (BMPs). The BMPs may include silt barriers and fabric bags at catch basins. After construction of the new drainage system and the elimination of localized ponding from storms, the Proposed Project will have an overall beneficial impact on the project area.

The No Action alternative will not have any impacts to the ground water in the project area. However, the No Action alternative will have an adverse impact to the surface water in the project area. Not implementing the proposed improvements will allow existing drainage problems in the project area to continue and increase as the existing substandard drainage system continues to degrade.

4.7.2. Floodplains

Correspondence from DLNR Engineering Division (see Appendix A), states that the project site is located in FIRM zones X and X (Shaded). DLNR further states that the National Flood Insurance Program does not have any regulations for development within these areas. Hazards to surrounding residential properties due to flooding will not be increased due to construction or

roadway improvements proposed in the Proposed Project. The elevation of the roadway easement will not be significantly changed after construction, and hazard levels will be unchanged.

The No Action alternative will have adverse impacts on the project area due to flooding, as it will allow the existing substandard drainage system to degrade.

4.7.3. Wetlands

No tidal, non-tidal, wetland or navigable waters will be affected by the Proposed Project or the No Action alternative. According to the Army Corp of Engineers, the area Mauka of the Inoaole Bridge is considered to be a wetland (Appendix C). Roadway improvements would not affect the wetland.

The stream crossing structure at Inoaole Stream will be replaced by HDOT; however, this bridge replacement project is not included in the proposed project's scope of work. Environmental clearance for the Inaole bridge replacement will be addressed in another document. The estimated start date of the Inoaole Stream bridge replacement is Fiscal Year 2011 to 2012.

4.8 GEOGRAPHIC SETTING

4.8.1. Geologic Setting

Because the proposed improvements lie mostly within the current roadway easement, negative environmental impacts to the geological setting of the area by the Proposed Project are not expected. Earth moving will take place to a limited extent; however, the terrain will remain essentially the same.

The No Action alternative will not have any impacts to the geological setting in the project area.

4.8.2. Soils

The proposed improvements are not expected to significantly impact soils. Construction will occur mostly within the roadway easement, an already highly disturbed area. Construction will entail earth moving activities. This may result in some soil erosion, the severity of which will be dependent on weather conditions. The contractor, however, will be required to obtain an NPDES permit for storm water discharge from a construction site and will be required to follow standard BMPs to control soil erosion. The BMPs may include silt barriers and fabric bags at catch basins. After construction, drainage will remain fundamentally the same; however, necessary improvements will be made in order to eliminate existing ponding problems. Therefore, the Proposed Project will not have any adverse impacts to the soils in the project area.

The No Action alternative will not have any impacts to the soils in the project area.

4.8.3. Earthquakes and Tsunami

Hazards to the surrounding residential properties due to seismic activity will not be increased due to construction or roadway improvements proposed in the Proposed Project. The No Action alternative will not have any impacts on the project area due to seismic activity.

The proposed improvements will be constructed in the existing road right-of-way and will provide better egress from coastal areas in the event of a coastal emergency. Therefore, the Proposed Project will provide beneficial impacts to the evacuation of the project area in the event of a coastal emergency.

The No Action alternative will not have adverse impacts on the evacuation of the project area in the event of a coastal emergency.

4.8.4. Hazardous Materials

An environmental database search and a site investigation for the project area identified three areas of concern regarding hazardous materials: 1) UNOCAL gas station (located at 41-1517 Kalanianaole Highway), 2) former Chevron gas station (located at 41-1510 Kalanianaole Highway), which is the property HDOT will need to acquire, and 3) pole-mounted electrical transformers along the length of the project area. Construction activities under the Proposed Project, within the area of the UNOCAL gas station, should be coordinated with the gas station owner to prevent any impacts to the existing monitoring wells. Although site cleanup was completed at the former Chevron gas station, HDOT may want to investigate the levels of contamination, if any, remaining in soil and groundwater at the site prior to acquiring the property. While subsurface contamination remaining at the site is not likely to impact the Proposed Project, (since the site has achieved cleanup status under regulatory oversight), HDOT may want to further evaluate their potential liability in acquiring the property. If stained soil under pole-mounted transformers is encountered during construction activities proposed under the Proposed Project, applicable hazardous materials management mitigation measures will be implemented. These measures may include notifying the electric company, removal of stained soil, soil sampling, and proper disposal of the soil.

The No Action alternative will not have any impacts on hazardous materials in the project area.

4.9 HISTORIC AND ARCHAEOLOGICAL RESOURCES

A Cultural Impact Assessment (Appendix H) was developed to evaluate the cultural resources within the project area. This assessment concluded that cultural deposits and/or human burials are likely to be found during subsurface excavations along the Kalanianaole Highway improvements project. This assessment also concluded that the proposed improvements will have minimal or no impact on the Hawaiian culture, its practices and traditions. Therefore, the Proposed Project will have minimal or no impact on cultural resources.

DOT submitted a letter (Appendix J), dated November 16, 2004, to the State Historic Preservation Officer (SHPO) at the Department of Land and Natural Resources (DLNR), State Historic Preservation Division (SHPD) in accordance with Section 106 of the National Historic Preservation Act. This letter states that the FHWA, in cooperation with HDOT, has requested that the SHPO determine if an archaeological inventory survey is necessary for the proposed improvements. This letter also states that the Cultural Impact Assessment concludes that the proposed improvements will have minimal or no impact on the Hawaiian culture, practices, or traditions.

DOT FHWA received a reply from the SHPO (Appendix J), dated May 27, 2005, which concurred that the proposed improvements will have no effect on significant cultural/historic properties. The letter also stated that the Cultural Impact Assessment (Appendix H) represents a good faith effort to consult with the Native Hawaiian community. Regarding the potential to

find cultural deposits and/or human burials, the SHPO stated that improvements, in areas of Jaucas sands, which will exceed the depth of the base course of the existing highway, and any ground disturbances for improvement which extend outside the current paved highway corridor may have an "adverse effect" on the significant historic sites which may be present in these sand deposits. The SHPO further stated that because the project is located within an existing highway corridor, a routine inventory survey would be unfeasible, but a program of on-site and on-call archaeological monitoring should be conducted for all ground disturbance associated with the proposed improvements that exceed the depth of the existing base course or will take place in unpaved/unimproved portions of the area. The SHPO required that the archaeological monitoring be conducted in accordance with an approved archaeological monitoring plan.

The Archaeological Monitoring Plan for the proposed improvements is attached as Appendix K. This plan states the following:

- An archaeological monitor will be on site during all ground disturbance activities below road grade or intruding 30 centimeters (1 foot) or more into undisturbed sediments.
- Before work commences on the project, the on-site archaeologist will explain to the entire construction crew what materials may be encountered and the procedures to follow if historical and archeological materials are encountered, as well as the role of the archaeologist.
- The monitoring archaeologist has the authority to halt construction in the immediate area of a find.
- If cultural deposits or human skeletal remains are encountered during ground disturbing activities, work will be stopped in that area and the archaeologist will notify the Burial Sites Program of the SHPD, the DLNR, and the Department of Hawaiian Home Lands of the nature of the discovery. The monitoring archaeologist will inspect all finds and then notify SHPD, contacting that Division's Archaeology Branch or, if the find is a human skeletal remain, the Burials Site Program, to discuss the context and agree upon the find's significance.
- Mitigation needs (as appropriate) for non-burial sites will be discussed and resolved with the Archaeology Branch, and treatment of burials, which are subject to the National American Graves Protection and Repatriation Act (NAGPRA), will be discussed with the Burial Sites Program and the Department of Hawaiian Home Lands.
- Reburial plans will be made in consultation with the Burial Sites Program of the SHPD/DLNR, the Department of Hawaiian Home Lands and appropriate agencies under NAGPRA.
- For non-burial finds consultation with the SHPD Archaeology Branch will be initiated to determine an appropriate mitigation program, including but not limited to the selection of sorted samples of charcoal, collection of bulk samples of midden material, and standard documentation (i.e., scale maps and stratigraphic profiles, photographs, detailed descriptions and interpretation).
- If other cultural materials are encountered, not in association with a human burial, then select sorted samples of charcoal and bulk samples of midden material will be collected and standard documentation conducted.
- Monitoring shall include some sampling.
- A minimum of five photographs showing work at various stages shall be part of the final report.
- A draft Archaeological Monitoring Report will be submitted within 90 days of completion of monitoring fieldwork to the SHPD/DLNR for review and approval.

The Archaeological Monitoring Plan was submitted to the SHPD for review. SHPD, in their comments on the Draft EA (Appendix B), requested three minor additions to the monitoring provisions cited in the Archaeological Monitoring Plan. These additions were incorporated into the revised Archaeological Monitoring Plan contained in Appendix K, and the Plan was resubmitted to SHPD. In a letter dated March 24, 2006 (Appendix J), the SHPD accepted the revised Archaeological Monitoring Plan.

HDOT submitted a letter (Appendix J), dated July 20, 2006, to the SHPD, on behalf of the FHWA, seeking to initiate consultation with the Oʻahu Island Burial Council as appropriate under Section 106 of the National Historic Preservation Act. The letter states that with the implementation of the archaeological monitoring program, the HDOT has determined that the project will have "no adverse effect" on historic property. In the letter, HDOT requested comment on this determination from the SHPD. The archaeological consultant for the project, Cultural Surveys Hawaii, Inc. also sent letters to the Oʻahu Island Burial Council, Hui Mālama I Nā Kūpuna o Hawaiʻi Nei, the Hawaiian Civic Club of Waimanalo, and the Office of Hawaiian Affairs to facilitate consultation as appropriate under Section 106. Copies of these letters are contained in Appendix J. In addition, Cultural Surveys Hawaii, Inc. conducted an informational presentation of the project at the September 13, 2006 meeting of the Oʻahu Island Burial Council. In a follow-up letter to the Oʻahu Island Burial Council dated September 25, 2006 (Appendix J), Cultural Surveys Hawaii, Inc. solicited comments on points raised by the Office of Hawaiian Affairs in their letter of March 7, 2006 commenting on the Draft EA. None of the Hawaiian agencies consulted provided any substantive comments. The FHWA, in cooperation with HDOT, sent a letter to the SHPD on December 11, 2006 (Appendix J) seeking to notify the SHPD of the conclusion of the Section 106 consultation, and requesting that the SHPD acknowledge the conclusion of the Section 106 consultation. At the time of publication of this Final EA, no response had yet been received from the SHPD.

The No Action alternative will not impact any historic or archaeological resources in the project area.

4.10 PARKLAND/SECTION 4(f)

The proposed improvements included in the Proposed Project will be mostly within the existing right-of-way. Therefore, the Proposed Project will not impact public parks, recreation land, wildlife and waterfowl refuges, or known historic sites within the project area; there is no 4(f) impact.

The No Action alternative will not impact public parks, recreation land, wildlife and waterfowl refuges, and known historic sites within the project area. Therefore, there is no 4(f) impact.

4.11 VISUAL ENVIRONMENT

The proposed upgrades to Kalanianaole Highway included in the Proposed Project should improve the aesthetics of the highway as it travels through Waimānalo due to the addition of grassed paths and other landscaping, and the optional placing of utilities underground. View planes will not be affected by the proposed improvements.

The No Action alternative will not affect the view planes within the project area.

4.12 UTILITIES

Existing utilities will be relocated, adjusted, or replaced under the Proposed Project. Underground utilities will be relocated only after approval from appropriate utility companies. Water and sewer manhole and valve covers will be adjusted as needed to the new finish grade. Existing power, telephone, and cable poles will be relocated, or removed and placed underground, to accommodate the new roadway configuration (Appendix C). The existing highway lighting system will be removed and a new highway lighting system will be constructed to comply with existing design criteria (Appendix C). The new lighting system will also include shielded lighting to discourage the attraction of seabirds to the lights, which is a concern of the USFWS in the Waimanalo area. Therefore, the Proposed Project will result in upgrading of existing utilities in the project area.

The No Action alternative will have no effect on the existing utilities in the project area.

4.13 CONSTRUCTION

During construction, public health and safety will be protected by the use of highway safety rules, namely Part 6 (Temporary Traffic Control) of the U.S. Department of Transportation, Federal Highway Administration, Manual on Uniform Traffic Control Devices. The contractor will be required to use and maintain barricades, signs, lights and other safety equipment in order to eliminate dangerous conditions.

To minimize traffic impacts during construction, construction will not take place during peak traffic times, and flagmen and other traffic control measures will be necessary to direct traffic. Potential noise impacts during construction will be minimized by limiting construction hours. The use of barriers and regular wetting down of problem areas will minimize the potential air quality impacts, during construction, within the project area. In addition, the contractor will be required to obtain an NPDES permit for storm water discharge from a construction site and will be required to follow standard BMPs to control storm water discharge. The BMPs may include silt barriers and fabric bags at catch basins. Management of hazardous materials, if encountered, will be coordinated with applicable State and private agencies. Construction activities will be limited to daytime and in the nesting season (mid-April through November) to minimize the impacts on area wildlife.

With the implementation of the construction mitigation measures listed above, the Proposed Project will have minimal impacts to the project area during construction activities.

No construction is proposed for the No Action alternative; therefore, there will be no adverse impacts due to construction for the No Action alternative.

4.14 PERMITS AND APPROVALS

The Proposed Project is expected to require the approvals and permits presented in Table 4-2. The No Action alternative is not expected to require any of these approvals.

Table 4-2: Permits and Approvals Required

Permit or Approval	Agency
State of Hawaii	
National Pollutant Discharge Elimination System (NPDES) Permit for Construction Storm Water	Department of Health
Noise Permit	Department of Health
Land Use Permit for Construction Work	Department of Transportation
City and County of Honolulu	
Grubbing, Grading, Excavation and Stockpiling Permit	Department of Planning and Permitting
Discharge of Waters Permit Hydrotesting Water	Department of Planning and Permitting
Traffic Control Plan	Department of Planning and Permitting
Street Usage Permit	Department of Transportation Services
Construction Drawing Approval	Board of Water Supply

4.15 EXECUTIVE ORDERS

4.15.1. Executive Order 11514, Protection and Enhancement of Environmental Quality

Executive Order 11514, dated May 29, 1969, was amended by Executive Order 11991 dated May 24, 1977. This Executive Order stated that "Federal agencies shall initiate measures needed to direct their policies, plans and programs so as to meet national environmental goals." This Final EA prepared in accordance with U.S. Department of Transportation's (DOT's) Technical Advisory 6640.8A, "Guidance for Preparing and Processing Environmental and Section 4(f) Documents" dated October 30, 1987, ensures that the Proposed Project and the No Action alternative comply with Executive Order 11991.

4.15.2. Executive Order 11593, Protection and Enhancement of the Cultural Environment

Executive Order 11593 dated May 13, 1971 (implemented by DOT Order 5650.1, dated November 20, 1972) states that Federal agencies shall:

1. "Administer the cultural properties under their control in a spirit of stewardship and trusteeship for future generations,
2. Initiate measures necessary to direct their policies, plans and programs in such a way that federally owned sites, structures, and objects of historical, architectural or archaeological significance are preserved, restored, and maintained for the inspiration and benefit of the people, and
3. In consultation with the Advisory Council on Historic Preservation (16 U.S.C. 470i), institute procedures to assure that Federal plans and programs contribute to the preservation and enhancement of non-federally owned sites, structures and objects of historical, architectural or archaeological significance."

The evaluation of historic and archaeological resources presented in Section 4.9, of this report, addresses the policies established by this Executive Order.

4.15.3. Executive Order 11988, Floodplain Management

Executive Order 11988 dated May 24, 1977 (implemented by DOT Order 5650.2, dated April 23, 1979) states that Federal agencies "shall provide leadership and take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare". It also states that Federal agencies shall "restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities for (1) acquiring, managing, and disposing of Federal lands, and facilities; (2) providing Federally undertaken, financed, or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land use".

The proposed improvements will improve the drainage system in the project area. Therefore, the Proposed Project will comply with the policies established by this Executive Order. The No Action alternative will not comply with the policies established by this Executive Order as it will allow the existing substandard drainage system to further degrade and increase the risk of future flooding.

4.15.4. Executive Order 11990, Protection of Wetlands

Executive Order 11990 dated May 24, 1977 (implemented by DOT Order 5660.1A, dated August 24, 1978) directs Federal agencies "to avoid to the extent possible the long and short term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative."

The evaluation of wetlands within the project area presented in Section 4.7.3, of this report, addresses the policies established by this Executive Order.

4.16 RELATIONSHIP BETWEEN SHORT-TERM AND LONG-TERM IMPACTS

The Proposed Project will have short-term environmental and economic losses, and long-term transportation, economic and social gains. The short-term adverse impacts include impacts to existing traffic flow, air quality, noise, and soils during construction activities. The long-term beneficial impacts include:

1. Reduced traffic congestion in the project area,
2. Improved conditions for pedestrian, bicycle, and equestrian traffic,
3. Improvement of existing utilities, and
4. Support of State and City and County of Honolulu development plans.

Considering the short-term adverse impacts and the long-term beneficial impacts, the proposed improvements are beneficial to the community and to the present and future land uses in the project area.

The No Action alternative will have no short-term impacts to the project area. However, this alternative will have adverse long-term impacts to the project area as existing traffic congestion would be allowed to continue and hazardous conditions will persist for pedestrian, bicycle, and equestrian traffic in the project area.

4.17 IRREVERSIBLE AND IRRETREVABLE COMMITMENTS OF RESOURCES

The implementation of the proposed improvements under the Proposed Project would require a commitment of natural, physical, human, and fiscal resources as follows:

- Ground cover in the existing right-of-way will be lost due to grubbing and grading activities.
- Fossil fuels will be consumed during construction activities.
- Labor required for construction, planning, engineering design, landscaping, purchasing, and services will be utilized.
- Construction materials will be committed.
- Construction would result in a one-time expenditure of government funds that would be irretrievably lost.

The commitment of these resources would be appropriate since residents and visitors would benefit from the completion of the proposed improvements as follows:

- Savings in time and convenience through the use of the improved roadways.
- Improved conditions for pedestrian, bicycle, and equestrian traffic.
- Support of State and City and County of Honolulu development plans and policies.

These benefits are anticipated to overcome the commitment of resources.

4.18 CUMULATIVE IMPACTS

The Draft EA stated that the Board of Water Supply (BWS) was in the design stage of a project for the installation of a 36-inch waterline from the Olomana Golf Course area to Poalima Street intersection and that BWS would delay construction of the waterline so that HDOT construction work could be done concurrently. Since publication of the Draft EA, this BWS 36-inch waterline project has been cancelled.

In addition to the Proposed Project, the stream crossing structure at Inoaole Stream will be replaced by HDOT. The estimated construction start for this project is Fiscal Year 2011 to 2012, which will coincide with construction of the Proposed Project in the Poalima Street to Aloiloi Street phase.

5.0 DETERMINATION

This chapter summarizes the potential impacts of the Proposed Project. The purpose of and need for the Proposed Project is presented in Chapter 1. The definition of the Proposed Project is presented in Chapter 2. Chapter 3 evaluates the existing environment of the project area. The analysis of the impacts of the Proposed Project and the No Action alternative is presented in Chapter 4.

Based on the Significance Criteria delineated in HAR §11-200-12(b) (State of Hawaii, 2005e), construction of the proposed improvements (the Proposed Project) will not have a significant impact on the environment for the following reasons:

1. There would be no irrevocable loss or destruction of any natural or cultural resource. The Proposed Project will be constructed mostly within the existing right-of-way; therefore, current use of the land will not change. The impact on flora and fauna and other natural resources is minimal considering the area is already highly disturbed. During construction, it is possible that archaeological resources may be discovered. An archaeological monitoring plan (Appendix K) has been prepared and will be implemented if required.

2. The beneficial use of the environment would not be curtailed. The current use of the environment would remain unchanged by the Proposed Project.

3. The Proposed Project is consistent with Chapter 343 HRS, State Environmental Policy. The Proposed Project is consistent with state environmental and planning policies, as specified in Chapter 4.

4. Economic and social welfare of nearby communities or the State of Hawaii would not be adversely affected. The Proposed Project would not adversely affect Waimānalo or the State of Hawaii. The Proposed Project would improve the social welfare of Waimānalo, and consequently the State of Hawaii.

5. The Proposed Project will not substantially affect public health within the project area.

6. The Proposed Project will not involve secondary impacts such as population changes in the project area. The Proposed Project will have beneficial secondary impacts on public facilities by providing improved traffic conditions in the project area.

7. There is no degradation of environmental quality. The Proposed Project is mostly within the existing right-of-way; therefore, the environmental quality of the area should remain unchanged or, possibly, improve.

8. Cumulative impacts are not significant. Construction will be organized in such a manner as to limit impacts on traffic and the surrounding area.

9. As stated in Section 4.6, the Proposed Project will not substantially affect rare, threatened, or endangered species, or their habitat in the project area. There are no rare or endangered species, or critical habitat in the project area.

10. Air quality, ambient noise levels and water quality will not be adversely affected. The Proposed Project will not violate State or National Ambient Air Quality Standards. Noise levels during construction will be within allowable standards. Upon project completion, air, noise, and water quality are expected to remain at current levels.

11. Environmentally sensitive areas will not be affected by the Proposed Project. There are no environmentally sensitive areas in the project area.

12. Scenic vistas will not be affected by the Proposed Project.

11. The Proposed Project will not substantially increase energy consumption. Vehicular traffic is not expected to increase as a result of the proposed improvements. Because traffic will flow more smoothly through Waimānalo, energy consumption may be reduced.

Based on the information within this document, FHWA has issued a finding of no significant impact (FONSI) for the Proposed Project. The Proposed Project will not negatively impact environmental, cultural, social or economic resources in the Waimānalo area.

6.0 LIST OF PREPARERS

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Wildlife Survey	Tim. J. Ohashi Certified Wildlife Biologist

7.0 ORGANIZATIONS AND AGENCIES CONSULTED

7.1 AGENCY CONSULTATION AND COORDINATION

The agencies and organizations listed below were asked to submit comments on the Kalanianaole Highway Improvements project at an early stage of the development process. Agencies and organizations followed by an asterisk replied or submitted comments which were incorporated into the Kalanianaole Highway Improvements Draft EA where possible. Comments received prior to publication of the Draft EA are contained in Appendix A. All of the organizations and agencies listed below were contacted during the 30-day comment period for the Kalanianaole Highway Improvements Draft EA. The Waimanalo Public Library and other libraries also received copies of the Draft EA for public review.

Federal Agencies

Department of Agriculture
- Agriculture Stabilization and Conservation Service
- Soil Conservation Service

Department of Defense
- Army Support Command
- Army Corps of Engineers, Pacific Ocean Division*
- Bellows Air Force Station
- Coast Guard
- Naval Base Pearl Harbor

Department of Housing and Urban Development

Department of the Interior
- Fish and Wildlife Service*
- Geological Survey
- National Park Service

Department of Transportation

Environmental Protection Agency

Federal Aviation Administration

State Agencies

Department of Accounting and General Services*

Department of Business, Economic Development and Tourism

Department of Defense

Department of Education*

Department of Hawaiian Home Lands

Department of Health
- Environmental Management Division, Environmental Planning Office*

Department of Human Services, Housing and Community Development Corporation*

Department of Land and Natural Resources
- Commission on Water Resources Management
- Division of Aquatic Resources
- Division of Forestry and Wildlife*
- Division of State Parks*
- Engineering Division*
- Oahu District Land Office*
- Office of Conservation and Coastal Lands
- State Historic Preservation Division

Oahu Burial Council
Office of Hawaiian Affairs*
University of Hawaii
    Environmental Center
    Water Resources Research Center

City and County of Honolulu
Department of Community Services*
Department of Design and Construction*
Department of Environmental Services
Department of Facility Maintenance
Department of Parks and Recreation*
Department of Planning and Permitting*
Department of Transportation Services*
Board of Water Supply*
Fire Department*
Police Department*

Private and Community Organizations and Elected Officials
American Lung Association
Conservation Council for Hawaii
GTE Hawaiian Telephone
Hawaii Audubon Society
Hawaiian Electric Company
Hawaiian Historic Society
Kuu Home O Waimanalo
Nature Conservancy
Sierra Club, Hawaii Chapter
The Outdoor Circle*
The Gas Company
City Councilmember Barbara Marshall
Waimanalo Neighborhood Board, No. 32
State Representative Tommy Waters, District 51
State Senator Fred Hemmings, District 25

7.2 PUBLIC INVOLVEMENT ACTIVITIES

In 1996 and 1997 the HDOT presented Kalanianaole Highway improvement options to interested community members and the Waimanalo Neighborhood Board. Consequently the Waimanalo Highway Improvement Task Force was formed. In a 1997 presentation to the community, residents did not support widening the existing highway from 2-lanes to 4-lanes because private land would be condemned and it would lead to speeding and more traffic accidents (Appendix C).

At a public meeting in September 1998, the Waimanalo Neighborhood Board informed HDOT that the community favored improving the existing highway by providing accessible concrete sidewalks and left turning lanes in lieu of constructing a by-pass road and widening the entire highway.

In 1999, former Representative Goodenow solicited recommendations and comments related to highway improvements from the Waimānalo community. A prioritized tabulation of these comments was given to HDOT in 2000, which in turn was used to develop the scope of work for the Planning Study included in Appendix C. The majority of the comments related to enhancing highway operations by providing left turning lanes and moving bus stops off the travel way, and improving the roadway shoulders and sidewalks to make it safer and ADA accessible.

Public Informational Meetings (PIM) were held on July 25, 2001 and August 29, 2001 to present design concepts based on the community requested improvements compiled earlier. In these PIMs, the stakeholders provided more specific information on problem areas that HDOT incorporated into the conceptual plans.

Considerable discussion concerning equestrian paths and crossings occurred in the two earlier PIMs. Consequently, HDOT conducted another public meeting specifically for stakeholders with equestrian interests in October 2001. In this meeting, high equestrian traffic areas were identified and incorporated into the plan. HDOT felt that since equestrian activities are part of the Waimānalo culture, it was important to incorporate them into the Planning Study included in Appendix C.

On June 25, 2002, the third PIM was conducted to show the semi-final conceptual plans and layouts. Since several stakeholders felt that the community was not adequately notified, HDOT conducted another PIM on July 9, 2002.

The most recent Public Informational Meeting (PIM) was held on June 30, 2004 at the Waimanalo Public and School Library. Conceptual plans for the Proposed Project were presented and public comments were solicited. Prior to this meeting a flier, describing the project and announcing the meeting, was distributed door-to-door along the entire route of the proposed improvements.

A Draft EA was submitted to OEQC for publication on February 8, 2006, and was submitted to various agencies as required by OEQC. A supplemental meeting was held with elected officials and community representatives on May 1, 2006 regarding the Draft EA. In addition to the supplemental meeting, the required 30-day comment period for the Draft EA was extended until March 31, 2006 to allow the public more time to comment. The following agencies, organizations, and individuals submitted comments on the Draft EA, which have been incorporated into the Final EA. Comments received on the Draft EA and corresponding responses from HDOT are contained in Appendix B. Appendix B also contains the letter inviting elected officials and community representatives to the May 1, 2006 meeting and the sign-in sheet for the meeting.

Federal Agencies
Department of the Interior
    Geological Survey

State Agencies
Department of Education
Department of Human Services, Housing and Community Development Corporation
Department of Land and Natural Resources
    State Historic Preservation Division
Office of Hawaiian Affairs

City and County of Honolulu
Department of Design and Construction
Department of Planning and Permitting
Department of Transportation Services
Board of Water Supply

Private and Community Organizations, Elected Officials, and Individuals
State Representative Tommy Waters, District 51
Ms. Beverly R. Addington, Democratic Council Representative
Ms. Heidi Ramseyer
Ms. Kim Lan Tasaka
Ms. Kehaulani Padilla
Mr. and Mrs. Solomon Spencer Jr.
Ms. Lisa Ferentinos

8.0 REFERENCES

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APPENDIX A

Pre-Consultation Comments

APPENDIX B

Comments on the Draft EA and Response to Comments

APPENDIX C

Advance Planning Report

APPENDIX D

Environmental Noise Assessment Report

APPENDIX E

Botanical Resources Assessment Study

APPENDIX F

Wildlife Survey

APPENDIX G

Correspondence with U.S. Fish and Wildlife Service

APPENDIX H

Cultural Impact Assessment

APPENDIX I

CZM Program Federal Consistency Review

APPENDIX J

Section 106 Correspondence

APPENDIX K

Archaeological Monitoring Plan

APPENDIX A

Pre-Consultation Comments

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IN REPLY REFER TO:

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

May 28, 2004

Dear Waimanalo Neighbor:

The State Department of Transportation (DOT) is preparing a Draft Environmental Assessment (EA) for the Kalanianaole Highway Improvements project and would appreciate your input. A Public Informational Meeting (PIM) is planned on Wednesday, June 30, 2004 from 7:00 pm to 9:00 pm at the Waimanalo Public and School Library (41-1320 Kalanianaole Highway). The purpose of the PIM is to discuss present the conceptual plans which the design will be based on and to allow the public an opportunity to provide comments for inclusion in the Draft EA. The purpose of the Draft EA is to address the environmental, social, and economic consequences of the proposed project before granting permits that allow construction to begin. Additionally, the EA process provides an opportunity for public involvement in planning projects that affect the community.

The DOT is planning to improve traffic operations on Kalanianaole Highway between Olomana Golf Course and Waimanalo Beach Park by making improvements within the existing highway right-of-way. The project location is shown on the opposite side of this page. Improving the highway will make the highway operate more efficiently and also make it safer and friendlier to pedestrians and other highway users.

Proposed improvements to the highway include left turning lanes at Flamingo Road, Kumuhau Street, Humuniki Street, Mekia Street, Moole Street (both directions), Inoaole Street, and Aloiloi Street. The left turning lanes will improve the through traffic along Kalanianaole Highway and provide for safer conditions. Shelter lanes are proposed for left turning vehicles entering Kalanianaole Highway from side streets to make it safer for those drivers and to help improve traffic flow along Kalanianaole Highway. Where space is available, bus pullouts are proposed to alleviate queuing and improve traffic flow. The bus pullouts will also allow vehicles to pass by the bus instead of going around the bus and crossing double yellow solid pavement markings.

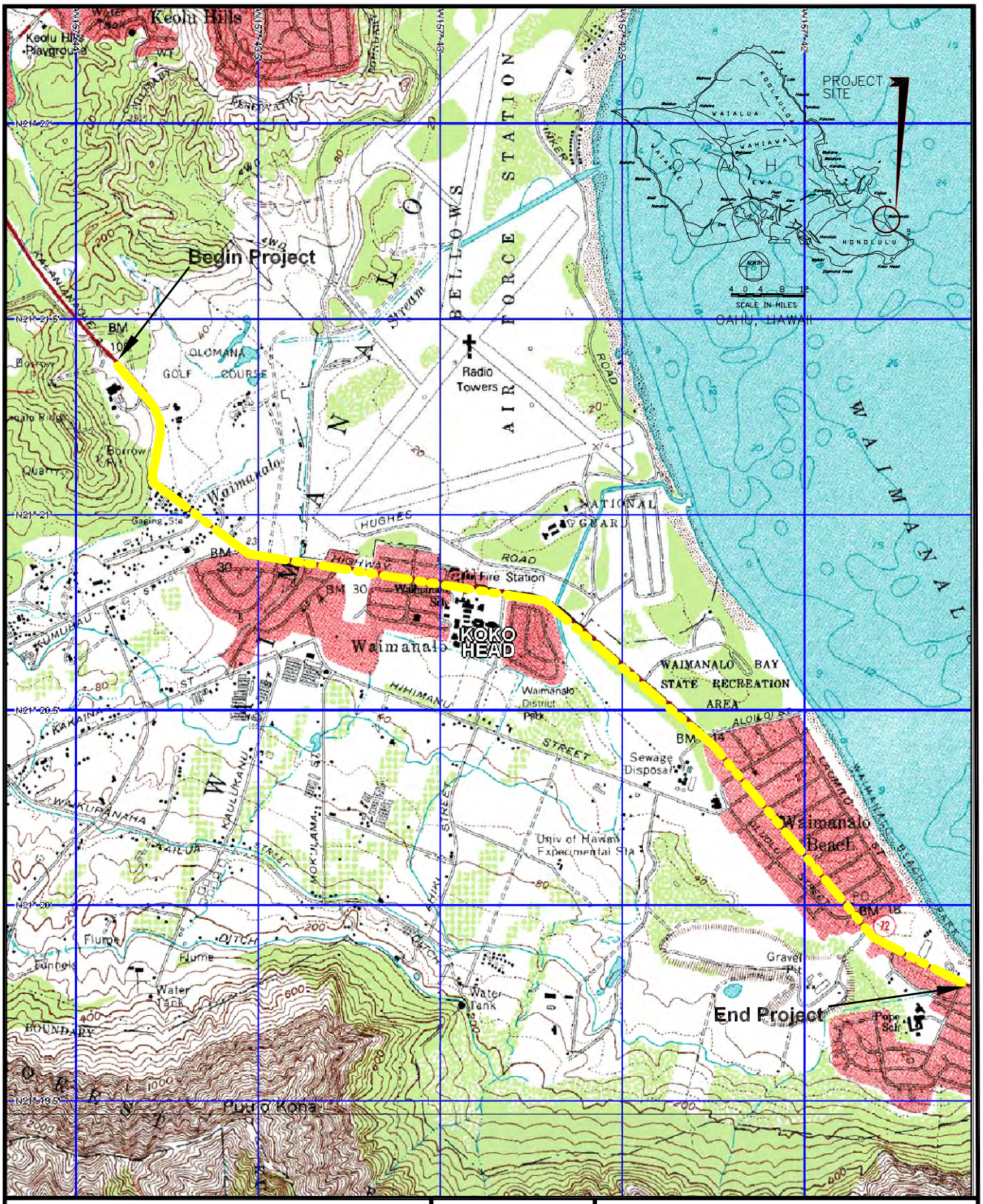
The plans also call for the existing concrete sidewalk on the mauka-side of the highway from Kumuhau Street to Inoaole Street to be reconstructed with a new ADA (Americans with Disabilities Act) accessible concrete sidewalk. The replacement will also include new ADA accessible driveways and curb ramps. This portion of the highway has been designated by the community as being one of the primary routes used by school children traveling to and from the Waimanalo Elementary and Intermediate School. Remaining areas along Kalanianaole Highway that do not have concrete sidewalks will have an asphalt concrete paved shoulder. Also, in locations identified by the community, a shared use grassed path (where available) is proposed to allow equestrian riders to traverse along Kalanianaole Highway to designated locations along the project.

We would greatly appreciate any questions, concerns or comments pertaining to the Kalanianaole Highway improvements. If you are interested in participating in preparation of the Draft EA, please send a letter with your questions, concerns or comments to:

State of Hawaii, Department of Transportation
Highways Division, Design Branch, Technical Design Services Office
601 Kamokila Blvd., Rm. 688
Kapolei, Hawaii 96707
Attn: Vincent Llorin

Fax: 692-7555

e-mail: vincent.llorin@hawaii.gov



Project Location

0 2000 4000

Scale In Feet

N

Reference: 3-D TopoQuads, Delorme, 1999
Source Map: USGS Topographic Map (1983)
Koko Head Quadrangle

Project:	03058-001
Approved by:	JKH
Drawn by:	LMS
Date:	October 2003
Scale: 1"=2000' Approximately	

Figure 1
Site Vicinity Map
Kalanianaole Highway Improvements
Olomana Golf Course to Waimanalo Beach Park
Waimanalo, Oahu, Hawaii

Mountain Edge Environmental, Inc.
Hydrogeological & Environmental Consulting

LINDA LINGLE
GOVERNOR

RODNEY K. HARAGA
DIRECTOR

Deputy Director
BRUCE Y. MATSUI
LINDEN H. JOESTING
BRIAN H. SEKIGUCHI

IN REPLY REFER TO:

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

May 28, 2004

SUBJECT: Draft Environmental Assessment Consultation and Public Informational Meeting (PIM)
Kalanianaole Highway Improvements
Between Olomana Golf Course and Waimanalo Beach Park
Waimanalo, Oahu, Hawaii

The State Department of Transportation (DOT) is preparing a Draft Environmental Assessment (EA) for the Kalanianaole Highway Improvements project and would appreciate your input. A Public Informational Meeting (PIM) is planned on Wednesday, June 30, 2004 from 7:00 pm to 9:00 pm at the Waimanalo Public and School Library (41-1320 Kalanianaole Highway). The purpose of the PIM is to present the conceptual plans which the design will be based on and to allow the public an opportunity to provide comments for inclusion in the Draft EA.

The DOT is planning to improve traffic operations on Kalanianaole Highway between Olomana Golf Course and Waimanalo Beach Park by making improvements within the existing highway right-of-way. The project location is shown on the attached figure. Improving the highway will make the highway operate more efficiently and also make it safer and friendlier to pedestrians and other highway users.

Proposed improvements to the highway include left turning lanes at Flamingo Road, Kumuhau Street, Humuniki Street, Mekia Street, Moole Street (both directions), Inoaole Street, and Aloiloi Street. The left turning lanes will improve the through traffic along Kalanianaole Highway and provide for safer conditions. Shelter lanes are proposed for left turning vehicles entering Kalanianaole Highway from side streets to make it safer for those drivers and to help improve traffic flow along Kalanianaole Highway. Where space is available, bus pullouts are proposed to alleviate queuing and improve traffic flow. The bus pullouts will also allow vehicles to pass by the bus instead of going around the bus and crossing double yellow solid pavement markings.

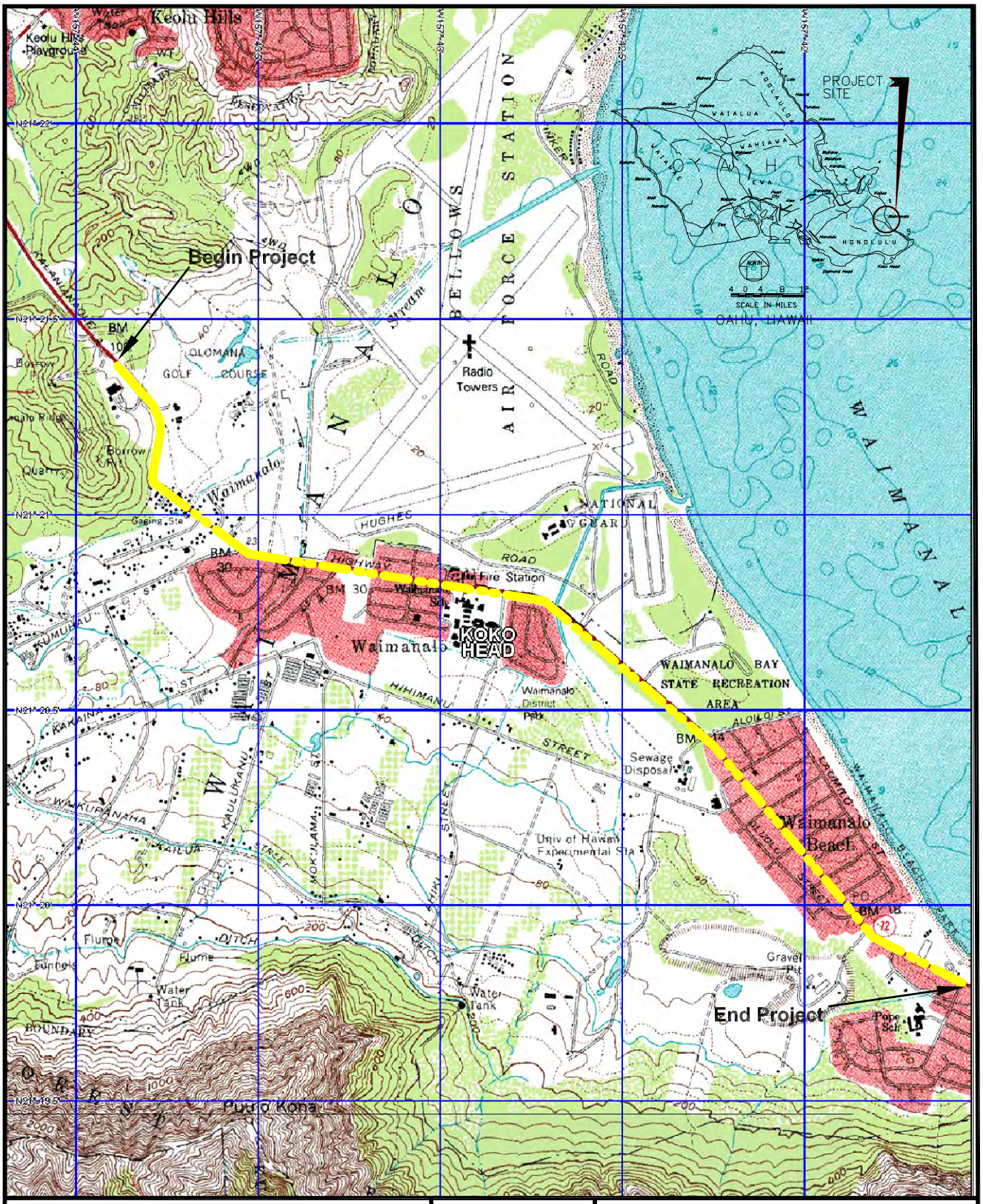
The plans also call for the existing concrete sidewalk on the mauka-side of the highway from Kumuhau Street to Inoaole Street to be reconstructed with a new ADA (Americans with Disabilities Act) accessible concrete sidewalk. The replacement will also include new ADA accessible driveways and curb ramps. This portion of the highway has been designated by the community as being one of the primary routes used by school children traveling to and from the Waimanalo Elementary and Intermediate School. Remaining areas along Kalanianaole Highway that do not have concrete sidewalks will have an asphalt concrete paved shoulder. Also, in locations identified by the community, a shared use grassed path (where available) is proposed to allow equestrian riders to traverse along Kalanianaole Highway to designated locations along the project.

If you would like to be a consulted party in preparation of the Draft EA, please send a letter with your questions, comments or concerns to:

State of Hawaii, Department of Transportation
Highways Division, Design Branch, Technical Design Services Office
601 Kamokila Blvd., Rm. 688
Kapolei, Hawaii 96707
Attn: Vincent Llorin

Fax: 692-7555

e-mail: vincent.llorin@hawaii.gov



Project Location

0 2000 4000

Scale In Feet

N

Reference: 3-D TopoQuads, Delorme, 1999
Source Map: USGS Topographic Map (1983)
Koko Head Quadrangle

Project:	03058-001
Approved by:	JKH
Drawn by:	LMS
Date:	October 2003
Scale: 1"=2000' Approximately	

Figure 1
Site Vicinity Map
Kalanianaole Highway Improvements
Olomana Golf Course to Waimanalo Beach Park
Waimanalo, Oahu, Hawaii

Mountain Edge Environmental, Inc.
Hydrogeological & Environmental Consulting

Summary of Pre-Consultation Comments

Organization	Contact With Questions	Comment Summary	Include in Draft EA
City and County of Honolulu Board of Water Supply	Joseph Kaakua (748-5442)	Construction drawings should be submitted for our approval. The construction schedule should be coordinated to minimize impacts to the community and the water system.	Yes
City and County of Honolulu Department of Community Services	Mr. Van Morita (527-5314)	No Comments to offer at this time.	Yes
City and County of Honolulu Department of Design and Construction	Dennis Toyama (523-4756)	They have a planning study in subject area and wish to be consulted.	Yes
City and County of Honolulu Department of Planning and Permitting	Robert Reed (523-4402)	Should include a section with discussions on how the proposed project is consistent with the objectives and policies of City and County's General Plan. Include section that discusses how the proposed project is consistent with Koolaupoko Sustainable Communities Plan. Should include a listing of required approvals. Portions of the project appear to be within the Special Management Area and may require a Permit. Please provide additional project information to our department for formal determination.	Yes
City and County of Honolulu Department of Parks and Recreation	John Reid, Planner (692-5454)	No Comments to offer at this time.	Yes
City and County of Honolulu Department of Transportation Services	Faith Miyamoto, Transportation Planning Division (527-6976)	Traffic Impact study should be conducted and should address public transit and pedestrian access issues. Bus stop/bus bay planning should be coordinated with the Public Transit Division of this department. EA should discuss the duration, closures and detours. effort to not detour through residential areas. Construction work should be done during off-peak hours to minimize the impact of the project. The possibility of night work should be explored. Area neighborhood board, residents, businesses, emergency personnel, bus personnel, etc., should be kept apprised of the detail of the proposed project and the impacts.	Yes
City and County of Honolulu Fire Department	Chief Lloyd Rogers, Fire Prevention Bureau (831-7778)	Maintain fire apparatus access throughout the construction site. Notify the Fire Communication Center at 523-4411 regarding any interruption of the existing fire hydrant system.	Yes
City and County of Honolulu Police Department	Captain Michael Correa (District 4)(247-2166) or Ms. Carol Sodentani (529-3658)	Concerned about traffic flow and pedestrian and vehicular safety. Recommend that traffic safety measures be in place during construction.	Yes
The Outdoor Circle	Kimberly Hillebrand (593-0300); comments provided via e-mail	Concerned about the possible removal of the historic ironwoods on the mauka side of the highway due to these proposed highway improvements.	Yes
State of Hawaii Department of Accounting And General Services	Mr. Lance Maja, Public Works Division (586-0483)	State Facilities Affected: 1)Pope Elementary School, 2) Waimanalo Elementary and intermediate School and 3) Waimanalo Public and School Library. Proper bus and pedestrian access must be maintained to facilities. Interruption to normal operations of these facilities must be minimized.	Yes
State of Hawaii Department of Human Services	Stephanie Aveiro, Executive Director	The Housing and Community Development Corporation of Hawaii manages several housing developments in the Waimanalo Area.	Yes

Summary of Pre-Consultation Comments

Organization	Contact With Questions	Comment Summary	Include in Draft EA
State of Hawaii Department of Land and Natural Resources, Oahu District Land Office.	Nicholas A. Vaccaro, Land Division Support Branch (587-0384)	No Comments to offer at this time.	Through Land Division
State of Hawaii Department of Land and Natural Resources, Forestry and Wildlife	Michael G Buck, Administrator, Division of Forestry and Wildlife	No Comments to offer at this time.	Through Land Division
State of Hawaii Department of Land and Natural Resources, State Parks	Nicholas A. Vaccaro, Land Division Support Branch (587-0384)	No Comments to offer at this time.	Through Land Division
State of Hawaii Department of Land and Natural Resources, Engineering Division	Mr. Andrew Mondern, Planning Branch (587-0229)	FIRM shows subject property to be located in Zones X and X (shaded). The NFIP does not have any regulations for development within these areas.	Through Land Division
State of Hawaii Department of Education	Rae M. Loui, Assistant Superintendent (586-3444) or Heidi Meeker, Facilities and Support Services (733-4862)	No Comments to offer at this time.	Yes
State of Hawaii Department of Health	Ryan Davenport, Environmental Planning (586-4346)	See Standard Comments (9 pages)	Yes
State of Hawaii Department of Health	June F. Harrigan-Lum, Manager	Land use review coordinator position will be vacant beginning July 1, 2004. Contact staff in a specific branch with questions. Call 586-4337 with any questions or to see when coordinated responses with office will resume. (gave each branch's phone number)	Yes
State of Hawaii Office of Hawaiian Affairs	Matthew Myers, Policy Advocate (594-1945)	No Comments to offer at this time.	Yes
United States Department of the Army	George P. Young, P.E. or Farley Watanabe (438-7701) File Number 200400352	Locate, identify, and label waters of the United States within the corridor. Note type of construction activity at each potential crossing of waters. Coordination will take place with the Corps to determine whether a DA permit will be required.	Yes

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843

JEREMY HARRIS, Mayor

EDDIE FLORES, JR., Chairman
CHARLES A. STED, Vice-Chairman
HERBERT S. K. KAOPUA, SR.
DAROLYN H. LENDIO

RODNEY K. HARAGA, Ex-Officio
LARRY J. LEOPARDI, Ex-Officio

CLIFFORD S. JAMILE
Manager and Chief Engineer

DONNA FAY K. KIYOSAKI
Deputy Manager and Chief Engineer

June 14, 2004

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1 8 2004
TECHNICAL DESIGN SVCS OFC
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Mr. Vincent Llorin
Highways Division, Design Branch
Department of Transportation
State of Hawaii
Technical Design Services Office
601 Kamokila Boulevard, Room 688
Kapolei, Hawaii 96707

Dear Mr. Llorin:

Subject: Your Letter of May 28, 2004 on the Draft Environmental Assessment for Kalanianaole Highway Improvements Between Olomana Golf Course and Waimanalo Beach Park

Thank you for the opportunity to comment on the proposed project.

The construction drawing should be submitted for our approval.

The construction schedule should be coordinated to minimize impacts to the community and the water system.

If you have any questions, please contact Joseph Kaakua at 748-5442.

Very truly yours,

for CLIFFORD S. JAMILE
Manager and Chief Engineer

DEPARTMENT OF COMMUNITY SERVICES
CITY AND COUNTY OF HONOLULU
715 SOUTH KING STREET, SUITE 311 • HONOLULU, HAWAII 96813
TELEPHONE: (808) 527-5311 • FAX: (808) 527-5498 • INTERNET: www.co.honolulu.hi.us

JEREMY HARRIS
MAYOR

MICHAEL T. AMII
DIRECTOR

JOHN R. SABAS
DEPUTY DIRECTOR

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June 15, 2004

Mr. Rodney K. Haraga, Director
State of Hawaii
Department of Transportation
Highways Division
Design Branch, Technical Design Services Office
601 Kamokila Boulevard, Room 688
Kapolei, Hawaii 96707

Attention: Mr. Vincent Llorin

Dear Mr. Haraga:

Subject: Draft Environmental Assessment Consultation and Public Information Meeting Between Olomana Golf Course and Waimanalo Beach Park Waimanalo, Oahu, Hawaii

Thank you for the opportunity to comment on the proposed project. We have no comments to offer on the project at this time.

If there are any questions please call Mr. Van Morita at 527-5314.

Sincerely,

MICHAEL T. AMII
Director

MTA:dk

DEPARTMENT OF DESIGN AND CONSTRUCTION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 11TH FLOOR
HONOLULU, HAWAII 96813
PHONE: (808) 523-4564 . FAX: (808) 523-4567
WEB SITE ADDRESS: www.co.honolulu.hi.us

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JEREMY HARRIS
MAYOR

TIMOTHY E. STEINBERGER, P.E.
DIRECTOR

CDP 04-0092

June 29, 2004

Mr. Vincent Llorin
Technical Design Services Office
Design Branch, Highways Division
State Department of Transportation
601 Kamokila Boulevard, Room 688
Kapolei, Hawaii 96707

Dear Mr. Llorin:

Subject: Draft Environmental Assessment (EA) Consultation
Kalanianaole Highway Improvements
Between Olomana Golf Course and Waimanalo Beach Park
Waimanalo, Oahu, Hawaii

We have a planning study in the subject area and would like to be a consulted party for the Draft EA.

If there are any questions, please contact Dennis Toyama at 523-4756.

Very truly yours,

TIMOTHY E. STEINBERGER, P.E.
Director

GS:dk

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET • HONOLULU, HAWAII 96813
TELEPHONE: (808) 523-4414 • FAX: (808) 527-6743 • INTERNET: www.co.honolulu.hi.us

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JEREMY HARRIS
MAYOR

ERIC G. CRISPIN, AIA
DIRECTOR

BARBARA KIM STANTON
DEPUTY DIRECTOR

KATHY SOKUGAWA
ACTING DEPUTY DIRECTOR

2004/ELOG-1212 (RR)

July 2, 2004

Mr. Vincent Llorin
State of Hawaii, Department of Transportation
Highways Division, Design Branch, Technical Design Services Office
601 Kamokila Boulevard, Room 688
Kapolei, Hawaii 96707

Dear Mr. Llorin:

Draft Environmental Assessment Pre-Assessment Consultation
Kalanianaole Highway Improvements, Waimanalo, Oahu, Hawaii

In response to your request regarding the pre-assessment consultation for Kalanianaole Highway Improvements, we have reviewed the proposal and offer the following comments:

1. The Draft Environmental Assessment (DEA) should include a section with discussions on how the proposed project is consistent with the objectives and policies of the City and County of Honolulu's General Plan.

2. The DEA should also include a section, which discusses how the proposed project is consistent with the Koolaupoko Sustainable Communities Plan.

3. The DEA should provide a listing of required approvals.

4. Portions of the project appear to be within the Special Management Area and may require a Special Management Area Permit. Please provide additional project information to our department for a formal determination.

Should you have any questions, please contact Robert Reed of our staff at 523-4402.

Sincerely yours,

for ERIC G. CRISPIN, AIA
Director of Planning and Permitting

EGC:mo
P:\Planning\DivFunction\Ea-eis\2004\elog-1212.doc

cc: Office of Environmental Quality Control

DEPARTMENT OF PARKS AND RECREATION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 10TH FLOOR • HONOLULU, HAWAII 96813
TELEPHONE: (808) 523-4182 • FAX: (808) 527-5725 • INTERNET: www.co.honolulu.hi.us

JEREMY HARRIS
MAYOR

WILLIAM D. BALFOUR, JR.
DIRECTOR

EDWARD T. "SKIPPA" DIAZ
DEPUTY DIRECTOR

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DESIGN BR
HIGHWAYS DIVISION
DEPT. OF TRANSPORTATION

June 8, 2004

Mr. Vincent Llorin
State of Hawaii
Department of Transportation, Highways Division
Design Branch, Technical Design Services Office
601 Kamokila Blvd., Room 688
Kapolei, Hawaii 96707

Dear Mr. Lloren:

Subject: Draft Environmental Assessment Consultation and Public Informational Meeting (PIM) Kalanianaole Highway Improvements Waimanalo, Oahu, Hawaii

Thank you for the notice of the Draft Environmental Assessment Consultation and Public Informational Meeting (PIM) relating to the proposed Kalanianaole Highway improvements between Olomana Golf Course and Waimanalo Beach Park.

The Department of Parks and Recreation has no comments on the project, but we do wish to remain as a consulted party in the preparation of the Draft EIS.

Should you have any questions, please contact Mr. John Reid, Planner, at 692-5454.

Sincerely,

W. D. Balfour Jr.

WILLIAM D. BALFOUR, JR.
Director

WDB:mk
(63973)

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 3RD FLOOR • HONOLULU, HAWAII 96813
TELEPHONE: (808) 523-4529 • FAX: (808) 523-4730 • INTERNET: www.co.honolulu.hi.us

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

GEORGE "KEOKI" MIYAMOTO
DEPUTY DIRECTOR

TP6/04-64550R

July 21, 2004

Mr. Vincent Llorin
Highways Division, Design Branch,
Technical Design Services Office
Department of Transportation
State of Hawaii
601 Kamokila Boulevard, Room 688
Kapolei, Hawaii 96707

Dear Mr. Llorin:

Subject: Kalanianaole Highway Improvements between Olomana Golf Course and Waimanalo Beach Park

In response to your May 28, 2004 letter, this is to request consulted party status in the preparation of the draft environmental assessment (EA) for the subject project.

We reviewed the information provided and submit the following comments for your consideration as you prepare the draft EA:

1. A traffic impact study should be conducted for this project. This study should also address public transit and pedestrian access issues.

2. Bus stop/bus bay planning should be coordinated with the Public Transit Division of this department.

3. The draft EA should discuss the expected duration of the project and any plans for road closures and detours. Every effort should be made to not detour traffic onto residential City streets.

4. Construction work should be done during off-peak hours to minimize the impact of the project on the surrounding neighborhood. The possibility of night work should be explored.

5. The area neighborhood board, as well as area residents, businesses, emergency personnel, bus personnel, etc., should be kept apprised of the details of the proposed project and the impacts of the project on the surrounding area.

We look forward to reviewing the draft EA. Should you have any questions regarding these comments, please contact Faith Miyamoto of the Transportation Planning Division at 527-6976.

Sincerely,

CHERYL D. SOON
Director

FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU
3375 KOAPAKA STREET, SUITE H425 • HONOLULU, HAWAII 96819-1869
TELEPHONE: (808) 831-7761 • FAX: (808) 831-7750 • INTERNET: www.honolulufire.org

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DEPT. OF TRANSPORTATION

JEREMY HARRIS
MAYOR

ATTILIO K. LEONARDI
FIRE CHIEF

JOHN CLARK
DEPUTY FIRE CHIEF

June 21, 2004

Mr. Vincent Llorin
Bicycle and Pedestrian Coordinator
Design Branch, Technical Design Services Office
State of Hawaii
Department of Transportation
Highways Division
601 Kamokila Boulevard, Room 688
Kapolei, Hawaii 96707

Dear Mr. Llorin:

Subject: Draft Environmental Assessment (DEA) Consultation and Public Information Meeting
Kalanianaole Highway Improvements Between the Olomana Golf Links and Waimanalo Beach Park
Waimanalo, Oahu, Hawaii

We received your letter dated May 28, 2004, requesting our review and comments on the above-mentioned DEA.

The Honolulu Fire Department requires that the following be complied with for the duration of the project:

1. Maintain fire apparatus access throughout the construction site.

2. Notify the Fire Communication Center at 523-4411 regarding any interruption of the existing fire hydrant system.

Should you have any questions, please call Battalion Chief Lloyd Rogers of our Fire Prevention Bureau at 831-7778.

Sincerely,

ATTILIO K. LEONARDI
Fire Chief

AKL/SK:bh

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

801 SOUTH BERETANIA STREET

HONOLULU, HAWAII 96813 - AREA CODE (808) 529-3111

http://www.honolulupd.org

www.co.honolulu.hi.us

JEREMY HARRIS
MAYOR

LEE D. DONOHUE
CHIEF

GLEN R. KAJIYAMA
PAUL D. PUTZULU
DEPUTY CHIEFS

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JUN 15 2004
TECHNICAL DESIGN SVCS OFC
DEPT. OF TRANSPORTATION

OUR REFERENCE CS-KP

June 7, 2004

Mr. Vincent Llorin, Design Branch
Highways Division
Department of Transportation
601 Kamokila Boulevard, Room 688
Kapolei, Hawaii 96707

Dear Mr. Llorin:

Thank you for the opportunity to review and comment on the Draft Environmental Assessment Consultation for the Kalanianaole Highway Improvements project.

During the construction phase, we are concerned about traffic flow and pedestrian and vehicular safety in the area as they will have a negative impact on calls for police service. We would like to recommend that traffic safety measures be in place during this time. However, after the improvements are completed, this project should have a positive impact on our concerns mentioned.

If there are any questions, please call Captain Michael Correa of District 4 at 247-2166 or Ms. Carol Sodetani of the Support Services Bureau at 529-3658.

Sincerely,

LEE D. DONOHUE
Chief of Police

By
KARL GODSEY
Assistant Chief of Police
Support Services Bureau

LINDA LINGLE
GOVERNOR

RUSS K. SAITO
COMPTROLLER

KATHERINE H. THOMASON
DEPUTY COMPTROLLER

STATE OF HAWAII

DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAII 96810

(P)1194.4

JUN 10 2004

RECEIVED
'04 JUN 15 A10:23

MEMORANDUM

TO: Mr. Vincent Llorin
Design Branch, Technical Design Services Office
Highways Division
Department of Transportation

FROM: Russ K. Saito
State Comptroller

SUBJECT: Draft Environmental Assessment Consultation and Public Informational Meeting for Kalanianaole Highway Improvements Between Olomana Golf Course and Waimanalo Beach Park, Waimanalo, Oahu, Hawaii

We have reviewed the information provided in your May 28, 2004, letter (copy attached for your reference) and offer the following comments:

1. Three State facilities near Kalanianaole Highway could be affected by the proposed improvements: Pope Elementary School; Waimanalo Elementary and Intermediate School; and the Waimanalo Public and School Library.

2. Because we service the Department of Education (DOE) and the Hawaii State Public Library System (HSPLS), our major concerns are:

   a. Proper bus, car, and pedestrian access must be maintained for these facilities.

   b. Interruption to normal operations of these facilities must be minimized during construction of the Kalanianaole Highway improvements.

We support the Department of Transportation's efforts to improve traffic flow on the highway and look forward to working with your staff to address these concerns. Accordingly, we request to be a consulted party, along with the DOE and HSPLS, during the preparation of the draft environmental assessment.

Thank you for this opportunity to comment on the proposed improvements to Kalanianaole Highway. If you have any questions, please call me or have your staff call Mr. Lance Maja of the Public Works Division at 586-0483.

Attachment
c: Mr. Raynor Minami, DOE-FSSB w/attachment
Mr. Keith Fujio, HSPLS w/attachment
Mr. James Richardson, DAGS-CSD w/attachment

LINDA LINGLE
GOVERNOR

STEPHANIE AVEIRO
EXECUTIVE DIRECTOR

PAMELA Y. DODSON
EXECUTIVE ASSISTANT

STATE OF HAWAII

DEPARTMENT OF HUMAN SERVICES
HOUSING AND COMMUNITY DEVELOPMENT CORPORATION OF HAWAII
677 QUEEN STREET, SUITE 300
Honolulu, Hawaii 96813
FAX: (808) 587-0600

IN REPLY REFER TO:
04:PEO/109

June 14, 2004

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DEPT. OF TRANSPORT.

TO: Department of Transportation
Highways Division, Design Branch, Technical Design Services Office

ATTN: Vincent Llorin

FROM: Stephanie Aveiro
Executive Director

SUBJECT: Draft Environmental Assessment Consultation for Kalanianaole Highway Improvements Between Olomana Golf Course and Waimanalo Beach Park

Thank you for your letter of May 28, 2004 informing the public of the preparation of a draft Environmental Assessment (EA) for the Kalanianaole Highway Improvements project.

The Housing and Community Development Corporation of Hawaii manages several housing developments in the Waimanalo area. As such, we would appreciate being a consulted party in the preparation of the draft EA.

LINDA LINGLE
GOVERNOR OF HAWAII

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PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

YVONNE Y. IZU
DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

June 16, 2004
DOTKALANIANAOLEHWY.RCM

LD-NAV

Mr. Vincent Llorin
State of Hawaii, Department of Transportation
Highways Division, Design Branch
Technical Design Services Branch
601 Kamokila Blvd., Room 688
Kapolei, Hawaii 96707

Dear Mr. Llorin:

SUBJECT: Department of Transportation (SOH) Pre-Assessment Consultation for Preparation of a Draft Environmental Assessment for the Proposed Kalanianaole Highway Improvements Between Olomana Golf Course and Waimanalo Beach Park, Island of Oahu, Hawaii

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR) Land Division distributed or made available a copy of your letter dated May 28, 2004 pertaining to the subject matter to the following DLNR Divisions for their review and comment:

- Division of Aquatic Resources
- Division of Forestry and Wildlife
- Division of State Parks
- Engineering Division
- Commission on Water Resource Management
- Office of Conservation and Coastal Lands
- Land-Oahu District Land Offices

Based on the attached responses, the Department of Land and Natural Resources has no comment to offer on the subject matter. Should you have any questions, please feel free to contact Nicholas A. Vaccaro of the Land Division Support Services Branch at 808-587-0384.

Very truly yours,

DIERDRE S. MAMIYA
Administrator

LINDA LINGLE
GOVERNOR OF HAWAII

RECEIVED
LAND DIVISION

2004 JUN 14 A 10: 00

DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

YVONNE Y. IZU
DEPUTY DIRECTOR - WATER

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

June 4, 2004
LD/NAV
DOTKKALANIANAOLEHWY.CMT

L-3046
Suspense Date: 6/14/04

MEMORANDUM:

TO: XXX Division of Forestry & Wildlife
XXX Division of Aquatic Resources
XXX Division of State Parks
XXX Engineering Division
XXX Commission on Water Resource Management
XXX Office of Conservation and Costal Lands
XXX Oahu District Land Office

FROM: Dierdre S. Mamiya, Administrator
Land Division

SUBJECT: Draft Environmental Assessment Consultation and Public Information Meeting Pertaining to the Department of Transportation (SOH) Kalanianaole Highway Improvements Between Olomana Golf Course and Waimanalo Beach Park, Island of Oahu, Hawaii

Please review the attached letter with attachment (map) pertaining to subject matter and submit your comments (if any) on Division letterhead by the suspense date.

Should you need more time to review the subject matter, please contact Nick Vaccaro at 587-0384.

If this office does not receive your comments on or before the suspense date, we will assume there are no comments.

(✓) We have no comments. ( ) Comments attached.

Name: Robert M. Ing

Signed:

Date: 6/10/2004

LINDA LINGLE
GOVERNOR OF HAWAII

RECEIVED
LAND DIVISION
2004 JUN 10 A 10: 27
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

YVONNE Y. IZU
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AQUATIC RESOURCES
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STATE PARKS

June 4, 2004
LD/NAV
DOTKKALANIANAOLEHWY.CMT

L-3046
Suspense Date: 6/14/04

MEMORANDUM:

TO: XXX Division of Forestry & Wildlife
XXX Division of Aquatic Resources
XXX Division of State Parks
XXX Engineering Division
XXX Commission on Water Resource Management
XXX Office of Conservation and Costal Lands
XXX Oahu District Land Office

FROM: Dierdre S. Mamiya, Administrator
Land Division

SUBJECT: Draft Environmental Assessment Consultation and Public Information Meeting Pertaining to the Department of Transportation (SOH) Kalanianaole Highway Improvements Between Olomana Golf Course and Waimanalo Beach Park, Island of Oahu, Hawaii

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Should you need more time to review the subject matter, please contact Nick Vaccaro at 587-0384.

If this office does not receive your comments on or before the suspense date, we will assume there are no comments.

(X) We have no comments.

( ) Comments attached.

Name: _____

Signed: MICHAEL G. BUCK, ADMINISTRATOR
DIVISION OF FORESTRY AND WILDLIFE

Date: _____ JUN - 7 2004

45539

TO:
___ ADMINISTRATOR
___ ASST ADMIN
___ DEV BR
___ PLAN BR
___ RES MGT BR
___ CLERICAL
___ ADMIN ASST
___ INTERP BR

FOR:
___ CIRC/POST/STAFF RM
___ COMMENTS & REC
___ DRAFT REPLY
___ FILE
___ FOLLOW UP
___ INFO
___ RUN COPIES _____
___ RUSH DUE _____
___ SEE ME
___ FAX/SEND COPY TO _____

LINDA LINGLE
GOVERNOR OF HAWAII

Department of Land and Natural Resources
State of Hawaii

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

RECEIVED
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STATE PARKS
JUN 7 3 04 PM '04

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

YVONNE Y. IZU
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
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FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

June 4, 2004
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DOTKKALANIANAOLEHWY.CMT

L-3046
Suspense Date: 6/14/04

RECEIVED
LAND DIVISION
2004 JUN 15 P 3:56
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

MEMORANDUM:

TO: XXX Division of Forestry & Wildlife
XXX Division of Aquatic Resources
XXX Division of State Parks
XXX Engineering Division
XXX Commission on Water Resource Management
XXX Office of Conservation and Costal Lands
XXX Oahu District Land Office

FROM: Dierdre S. Mamiya, Administrator
Land Division

SUBJECT: Draft Environmental Assessment Consultation and Public Information Meeting Pertaining to the Department of Transportation (SOH) Kalanianaole Highway Improvements Between Olomana Golf Course and Waimanalo Beach Park, Island of Oahu, Hawaii

Please review the attached letter with attachment (map) pertaining to subject matter and submit your comments (if any) on Division letterhead by the suspense date.

Should you need more time to review the subject matter, please contact Nick Vaccaro at 587-0384.

If this office does not receive your comments on or before the suspense date, we will assume there are no comments.

(✓) We have no comments. ( ) Comments attached.

Name: Daniel S. Quinn

Signed: [signature]

Date: 6/14/04

LINDA LINGLE
GOVERNOR OF HAWAII

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

YVONNE Y. IZU
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
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FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

June 4, 2004
LD/NAV
DOTKKALANIANAOLEHWY.CMT

L-3046
Suspense Date: 6/14/04

MEMORANDUM:

TO: XXX Division of Forestry & Wildlife
XXX Division of Aquatic Resources
XXX Division of State Parks
XXX Engineering Division
XXX Commission on Water Resource Management
XXX Office of Conservation and Costal Lands
XXX Oahu District Land Office

FROM: Dierdre S. Mamiya, Administrator
Land Division

RECEIVED
LAND DIVISION
2004 JUN 14 P 4:30
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

SUBJECT: Draft Environmental Assessment Consultation and Public Information Meeting Pertaining to the Department of Transportation (SOH) Kalanianaole Highway Improvements Between Olomana Golf Course and Waimanalo Beach Park, Island of Oahu, Hawaii

Please review the attached letter with attachment (map) pertaining to subject matter and submit your comments (if any) on Division letterhead by the suspense date.

Should you need more time to review the subject matter, please contact Nick Vaccaro at 587-0384.

If this office does not receive your comments on or before the suspense date, we will assume there are no comments.

( ) We have no comments. (X) Comments attached.

Name: _____

Signed: _____

Date: _____

Vincent Loehr
692-7555

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LA/NAV

Ref.: DOTKKANIANAOLEHWY.CMT

COMMENTS

( ) We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone ___.

(X) Please take note that the project sites, according to the Flood Insurance Rate Map (FIRM), are located in Zones X and X (Shaded). The National Flood Insurance Program (NFIP) does not have any regulations for development within these areas.

( ) Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ___.

( ) Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

( ) Mr. Robert Sumimoto at (808) 523-4254 or Mr. Mario Siu Li at (808) 523-4247 of the City and County of Honolulu, Department of Planning and Permitting.

( ) Mr. Kelly Gomes at (808) 961-8327 (Hilo) or Mr. Kiran Emler at (808) 327-3530 (Kona) of the County of Hawaii, Department of Public Works.

( ) Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.

( ) Mr. Mario Antonio at (808) 241-6620 of the County of Kauai, Department of Public Works.

( ) The applicant should include project water demands and infrastructure required to meet water demands. Please note that the implementation of any State-sponsored projects requiring water service from the Honolulu Board of Water Supply system must first obtain water allocation credits from the Engineering Division before it can receive a building permit and/or water meter.

( ) The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.

( ) Additional Comments:_____

( ) Other: _____

Should you have any questions, please call Mr. Andrew Monden of the Planning Branch at 587-0229.

Signed: Andrew M. Monden
for ERIC T. HIRANO, CHIEF ENGINEER

Date: 6/10/04

[redacted]
LINDA LINGLE
GOVERNOR

PATRICIA HAMAMOTO
SUPERINTENDENT

STATE OF HAWAI'I
DEPARTMENT OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAI'I 96804

OFFICE OF THE SUPERINTENDENT

RECEIVED
JUN 24 2004
TECHNICAL DESIGN SVCS OFC
DEPT. OF TRANSPORTATION

June 17, 2004

Mr. Vincent Llorin
Highways Division, Design Branch, Technical Design Services Office
Department of Transportation
601 Kamokila Boulevard, Room 688
Kapolei, Hawaii 96707

Dear Mr. Llorin:

SUBJECT: Pre-Assessment Consultation for
Kalanianaole Highway Improvements
Waimanalo, Oahu, Hawaii

The Department of Education has no specific comment or concern with the proposed improvements to Kalanianaole Highway at this time. However, we will be interested in the plans proposed for work on the sidewalks leading to Waimanalo Elementary and Intermediate School.

Thank you for the opportunity to offer comment at this early stage of the project. If you have any questions, please call Rae M. Loui, Assistant Superintendent of the Office of Business Services, at 586-3444 or Heidi Meeker of the Facilities and Support Services Branch at 733-4862.

Very truly yours,

Patricia Hamamoto
Superintendent

PH:jmb

c: Rae Loui, Asst. Supt.,OBS
Louise Wolcott, CAS, Kailua/Kalaheo Complexes

LINDA LINGLE
GOVERNOR OF HAWAII

CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. Box 3378
HONOLULU, HAWAII 96801-3378

In reply, please refer to:
EPO-04-130

June 4, 2004

Mr. Vincent Llorin
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Dear Mr. Llorin:

SUBJECT: Kalanianaole Highway Improvements
Waimanalo, O'ahu, Hawaii

Thank you for allowing us to review and comment on the subject document. We have the enclosed standard comments to offer. If there are any questions about these standard comments please contact Ryan Davenport with the Environmental Planning Office at 586-4346.

Sincerely,

June F. Harrigan-Lum

JUNE F. HARRIGAN-LUM, MANAGER
Environmental Planning Office

Enclosure

c. SDWB
EPO
SHWB
NRAIQ
CWB
WWB
CAB
HEER

Standard Comments

Environmental Planning Office Dated 3/2/04

The Environmental Planning Office (EPO) is responsible for several surface water quality management programs mandated by the federal Clean Water Act or dictated by State policy . (http://www.state.hi.us/doh/eh/epo/wqm/wqm.htm). Among these responsibilities, EPO:

- maintains the *List of Impaired Waters in Hawaii Prepared under Clean Water Act §303(d)* (http://www.state.hi.us/doh/eh/epo/wqm/303dpcfinal.pdf);
- develops and establishes Total Maximum Daily Loads (TMDLs) for listed waters (suggesting how much existing pollutant loads should be reduced in order to attain water quality standards, please see http://www.epa.gov/owow/tmdl/intro.html);
- writes TMDL Implementation Plans describing how suggested pollutant load reductions can be achieved; and
- conducts assessments of stream habitat quality and biological integrity.

To facilitate TMDL development and planning, and to assist our assessment of the potential impact of proposed actions upon water quality, pollutant loading, and biological resources in receiving waters, we suggest that environmental review documents, permit applications, and related submittals include the following standard information and analyses:

Waterbody type and class

1. Identify the waterbody type and class, as defined in Hawaii Administrative Rules Chapter 11-54 (http://www.state.hi.us/doh/rules/11-54.pdf), of all potentially affected water bodies[1].

Existing water quality management actions

2. Identify any existing National Pollutant Discharge Elimination System (NPDES) permits and related connection permits (issued by permittees) that will govern the management of water that runs off or is discharged from the proposed project site or facility. Please include NPDES and other permit numbers; names of permittees, permitted facilities, and receiving waters (including waterbody type and class as in 1. above); diagrams showing drainage/discharge pathways and outfall locations; and note any permit conditions that may specifically apply to the proposed project.

3. Identify any planning documents, groups, and projects that include specific prescriptions for water quality management at the proposed project site and in the potentially affected waterbodies. Please note those prescriptions that may specifically apply to the proposed project.

Pending water quality management actions

4. Identify all potentially affected water bodies that appear on the current *List of Impaired Waters in Hawaii Prepared under Clean Water Act §303(d)* including the listed waterbody, geographic scope of listing, and pollutant(s) (See Table 7 at http://www.state.hi.us/doh/eh/epo/wqm/303dpcfinal.pdf).

5. If the proposed project involves potentially affected water bodies that appear on the current *List of Impaired Waters in Hawaii Prepared under Clean Water Act §303(d)*, identify and quantify expected changes in the following site and watershed conditions and characteristics:
   - surface permeability
   - hydrologic response of surface (timing, magnitude, and pathways)
   - receiving water hydrology
   - runoff and discharge constituents
   - pollutant concentrations and loads in receiving waters
   - aquatic habitat quality and the integrity of aquatic biota

Where TMDLs are already established they include pollutant load allocations for the surrounding lands and point source discharges. In these cases, we suggest that the submittal specify how the proposed project would contribute to achieving the applicable load reductions.

Where TMDLs are yet to be established and implemented, a first step in achieving TMDL objectives is to prevent any project-related increases in pollutant loads. This is generally accomplished through the proper application of suitable best management practices in all phases of the project and adherence to any applicable ordinances, standards, and permit conditions. In these cases we suggest that the submittal specify how the proposed project would contribute to
reducing the polluted discharge and runoff entering the receiving waters, including plans for
additional pollutant load reduction practices in future management of the surrounding lands and drainage/discharge systems.

Proposed Action and Alternatives Considered

We suggest that each submittal identify and analyze potential project impacts at a watershed scale by considering consider the potential contribution of the proposed project to cumulative, multi-project watershed effects on hydrology, water quality, and aquatic and riparian ecosystems.

We also suggest that each submittal broadly evaluate project alternatives by identifying more than one engineering solution for proposed projects. In particular, we suggest the

consideration of "alternative," "soft," and "green" engineering solutions for channel modifications that would provide a more environmentally friendly and aesthetically pleasing channel environment and minimize the destruction of natural landscapes.

If you have any questions about these comments or EPO programs, please contact Ryan Davenport at 586-4346.

[1]"Potentially affected waterbodies" means those in which proposed project activity would take place and any that could receive water discharged by the proposed project activity or water flowing down from the proposed project site. These waterbodies can be presented as a chain of receiving waters whose top link is at the project site upslope and whose bottom link is in the Pacific Ocean, and can be named according to conventions established by Chapter 11-54 and the *List of Impaired Waters in Hawaii Prepared under Clean Water Act §303(d)*. For example, a recent project proposed for Nuhelewai Stream, Oahu might potentially affect Nuhelewai Stream, Kapalama Canal, and Honolulu Harbor and Shore Areas.
[OTHER EXAMPLES OR DIAGRAM??]

Solid and Hazardous Waste Branch Dated 3/2/04

1)
The OSWM recommends the development of a solid waste management plan that encompasses all project phases including demolition, construction, and occupation/operation of the completed project.

Specific examples of elements that the plan should address include:

- The recycling of green-waste during clear and grub activities;
- Recycling construction and demolition wastes, if appropriate;
- The use of locally produced compost in landscaping;
- The use of recycled content building materials;
- The provision of recycling facilities in the design of the project.

- -

2)
The developer shall ensure that all solid waste generated during project construction is directed to a Department of Health permitted solid waste disposal or recycling facility.

- -

3)
The developer should consider providing space in the development for recycling activities. The provision of space for recycling bins for paper, glass, and food/wet waste would help to encourage the recycling of solid waste(s) generated by building occupants.

- -

4)
The discussion of solid waste issues contained in the document is restricted to activities within the completed project. The OSWM recommends the development of a solid waste management plan that encompasses all project phases, from construction (and or demolition) to occupation of the project.

Specific examples of plan elements include: the recycling of green-waste during clear and grub activities; maximizing the recycling of construction and demolition wastes; the use of locally produced compost in the landscaping of the project; and the provision of recycling facilities in the design of the project.

- -

5)
Hawaii Revised Statutes Chapter 103D-407 stipulates that all highway and road construction and improvement projects funded by the State or a county or roadways that are to be accepted by the State or a county as public roads shall utilize a minimum of ten per cent crushed glass aggregate as specified by the department of transportation in all base-course (treated or untreated) and sub-base when the glass is available to the quarry or contractor at a price no greater than that of the equivalent aggregate.

If you have any questions, please contact the Solid and Hazardous Waste Branch at (808) 586-4240.

Noise, Radiation & Indoor Air Quality Branch Dated 3/2/04

"Project activities shall comply with the Administrative Rules of the Department of Health:

- Chapter 11-39 Air Conditioning and Ventilating.
- Chapter 11-45 Radiation Control.
- Chapter 11-46 Community Noise Control.
- Chapter 11-501 Asbestos Requirements.
- Chapter 11-502 Asbestos-Containing Materials in Schools.
- Chapter 11-503 Fees for Asbestos Removal and Certification
- Chapter 11-504 Asbestos Abatement Certification Program

Should there be any questions, please contact Russell S. Takata, Environmental Health Program Manager, Noise, Radiation and Indoor Air Quality Branch, at 586-4701."

Clean Water Branch Dated 3/2/04

1. The Army Corps of Engineers should be contacted at (808) 438-9258 to identify whether a Federal license or permit (including a Department of Army permit) is required for this project. Pursuant to Section 401(a)(1) of the Federal Water Pollution Act (commonly known as the "Clean Water Act"), a Section 401 Water Quality Certification is required for "[a]ny applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters...."

2. A National Pollutant Discharge Elimination System (NPDES) general permit coverage is required for the following activities:

a. Storm water associated with industrial activities, as defined in Title 40, Code of Federal Regulations, Sections 122.26(b)(14)(i) through 122.26(b)(14)(ix) and 122.26(b)(14)(xi).

b. Construction activities, including clearing, grading, and excavation, that result in the disturbance of equal to or greater than one (1) acre of total land area. The total land area includes a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under a larger common plan of development or sale. **An NPDES permit is required before the commencement of the construction activities.**

c. Discharges of treated effluent from leaking underground storage tank remedial activities.

d. Discharges of once through cooling water less than one (1) million gallons per day.

e. Discharges of hydrotesting water.

f. Discharges of construction dewatering effluent.

g. Discharges of treated effluent from petroleum bulk stations and terminals.

h. Discharges of treated effluent from well drilling activities.

i. Discharges of treated effluent from recycled water distribution systems.

j. Discharges of storm water from a small municipal separate storm sewer system.

k. Discharges of circulation water from decorative ponds or tanks.

The CWB requires that a Notice of Intent (NOI) to be covered by a NPDES general permit for any of the above activities be submitted at least 30 days before the commencement of the respective activities. The NOI forms may be picked up at our office or downloaded from our website at http://www.state.hi.us/health/eh/cwb/forms/genl-index.html.

3. The applicant may be required to apply for an individual NPDES permit if there is any type of activity in which wastewater is discharged from the project into State waters and/or coverage of the discharge(s) under the NPDES general permit(s) is not permissible (i.e. NPDES general permits do not cover discharges into Class 1 or Class AA receiving waters). An application for the NPDES permit is to be submitted at least 180 days before the commencement of the respective activities. The NPDES application forms may also be picked up at our office or downloaded from our website at http://www.state.hi.us/health/eh/cwb/forms/indiv-index.html.

4. Hawaii Administrative Rules, Section 11-55-38, also requires the owner to either submit a copy of the new NOI or NPDES permit application to the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD), or demonstrate to the satisfaction of the DOH that the project, activity, or site covered by the NOI or application has been or is being reviewed by SHPD.

Please submit a copy of the request for review by SHPD or SHPD's determination letter for the project.

If you have any questions, please contact the CWB at 586-4309.

Waste Water Branch Dated 3/2/04

All wastewater plans must conform to applicable provisions of the Department of Health's Administrative Rules, Chapter 11-62, "Wastewater Systems". We do reserve the right to review the detailed wastewater plans for conformance to applicable rules.

Should you have any questions, please contact the Planning & Design Section of the Wastewater Branch at 586-4294.

Clean Air Branch Dated 3/2/04

Construction/Demolition Involving Asbestos:

Since the proposed project would entail renovation/demolition activities which may involve asbestos, the applicant should contact the Asbestos Abatement Office in the Noise, Radiation and Indoor Air Quality Branch at 586-5800.

Control of Fugitive Dust:

A significant potential for fugitive dust emissions exists during all phases of construction. Proposed construction activities will occur in proximity to **existing residences, businesses, public areas and thoroughfares**, thereby exacerbating potential dust problems. It is recommended that a dust control management plan be developed which identifies and addresses all activities that have a potential to generate fugitive dust. Implementation of adequate dust control measures during all phases of development and construction activities is warranted.

Construction activities must comply with the provisions of Hawaii Administrative Rules, §11-60.1-33 on Fugitive Dust.

The contractor should provide adequate measures to control dust from the road areas and during the various phases of construction. These measures include, but are not limited to, the following:

a) Plan the different phases of construction, focusing on minimizing the amount of dust-generating materials and activities, centralizing on-site vehicular traffic routes, and locating potential dust-generating equipment in areas of the least impact;
b) Provide an adequate water source at the site prior to start-up of construction activities;
c) Landscape and provide rapid covering of bare areas, including slopes, starting from the initial grading phase;
d) Minimize dust from shoulders and access roads;

e) Provide adequate dust control measures during weekends, after hours, and prior to daily start-up of construction activities; and

f) Control dust from debris being hauled away from the project site.

Hazard Evaluation and Emergency Response Office(HEER) Dated 3/2/04

1. A phase I Environmental Site Assessment (ESA) should be conducted for developments or redevelopments. If the investigation shows that a release of petroleum, hazardous substance, pollutants or contaminants occurred at the site, the site should be properly characterized through an approved Hawaii State Department of Health (DOH)/Hazard Evaluation and Emergency Response Office (HEER) soil and or groundwater sampling plan. If the site is found to be contaminated, then all removal and remedial actions to clean up hazardous substance or oil releases by past and present owners/tenants must comply with chapter 128D, Environmental Response Law, HRS, and Title 11, Chapter 451, HAR, State Contingency Plan.

2. All lands formerly in the production of sugarcane should be characterized for arsenic contamination, If arsenic is detected above the US EPA Region (preliminary remediation goal (PRG) for non-cancer effects, then a removal and or remedial plan must be submitted to the Hazard Evaluation and Emergency Response (HEER) Office of the State Department of Health for approval. The plan must comply with Chapter 128D, Environmental Response Law, HRS, and Title 11, Chapter 451, HAR, State Contingency Plan.

3. If the land has a history of previous releases of petroleum, hazardous substances, pollutants, or contaminants, we recommend that the applicant request a "no further action" (NFA) letter from the Hawaii State Department of Health (DOH)/ Hazard Evaluation and Emergency Response (HEER) Office prior to the approval of the land use change or permit approval.

Safe Drinking Water Branch Dated 3/11/04

The Safe Drinking Water Branch administers programs in the areas of: 1) public water systems; 2) underground injection control; and 3) groundwater protection. Our general comments on projects are as follows.

Public Water Systems

- Federal and state regulations define a public water system as a system that serves 25 or more individuals at least 60 days per year or has at least 15 service connections. All public water system owners and operators are required to comply with Hawaii Administrative Rules, Title 11, Chapter 20, titled Rules Relating to Potable Water Systems.

- All new public water systems are required to demonstrate and meet minimum capacity requirements prior to their establishment. This requirement involves demonstration that the system will have satisfactory technical, managerial and financial capacity to enable the system to comply with safe drinking water standards and requirements.

- Projects that propose development of new sources of potable water serving or proposed to serve a public water system must comply with the terms of Section 11-20-29 of Chapter 20. This section requires that all new public water system sources be approved by the Director of Health prior to its use. Such approval is based primarily upon the submission of a satisfactory engineering report which addresses the requirements set in Section 11-20-29.

- The engineering report must identify all potential sources of contamination and evaluate alternative control measures which could be implemented to reduce or eliminate the potential for contamination, including treatment of the water source. In addition, water quality analyses for all regulated contaminants, performed by a laboratory certified by the State Laboratories Division of the state of Hawaii, must be submitted as part of the report to demonstrate compliance with all drinking water standards. Additional parameters may be required by the Director for this submittal or additional tests required upon his or her review of the information submitted.

- All sources of public water system sources must undergo a source water assessment which will delineate a source water protection area. This process is preliminary to the creation of a source water protection plan for that source and activities which will take place to protect the source of drinking water.

- Projects proposing to develop new public water systems or proposing substantial modifications to existing public water systems must receive approval by the Director of Health prior to construction of the proposed system or modification. These projects include treatment, storage and distribution systems of public water systems. The approval authority for projects owned and operated by a County Board or Department of Water or Water Supply has been delegated to them.

- All public water systems must be operated by certified distribution system and water treatment plant operators as defined by Hawaii Administrative Rules, Title 11, Chapter 11-25 titled; Rules Pertaining to Certification of Public Water System Operators.

- All projects which propose the use of dual water systems or the use of a non-potable water system in proximity to an existing potable water system to meet irrigation or other needs must be carefully design and operate these systems to prevent the cross-connection of these systems and prevent the possibility of backflow of water from the non-potable system to the potable system. The two systems must be clearly labeled and physically separated by air gaps or reduced pressure principle backflow prevention devices to avoid contaminating the potable water supply. In addition backflow devices must be tested periodically to assure their proper operation. Further, all non-potable spigots and irrigated areas

should be clearly labeled with warning signs to prevent the inadvertent consumption on non-potable water. Compliance with Hawaii Administrative Rules, Title 11, Chapter 11-21 titled; Cross-Connection and Backflow Control is also required.

- All projects which propose the establishment of a potentially contaminating activity (as identified in the Hawai`i Source Water Assessment Plan) within the source water protection area of an existing source of water for a public water supply should address this potential and activities that will be implemented to prevent or reduce the potential for contamination of the drinking water source.

- For further information concerning the application of capacity, new source approval, operator certification, source water assessment, backflow/cross-connection prevention or other public water system programs, please contact the Safe Drinking Water Branch at 586-4258.

Underground Injection Control (UIC)

- Injection wells used for the subsurface disposal of wastewater, sewage effluent, or surface runoff are subject to environmental regulation and permitting under Hawai`i Administrative Rules, Title 11, Chapter 11-23, titled Underground Injection Control (UIC). The Department of Health's approval must be first obtained before any injection well construction commences. A UIC permit must be issued before any injection well operation occurs.

- Authorization to use an injection well is granted when a UIC permit is issued to the injection well facility. The UIC permit contains discharge and operation limitations, monitoring and reporting requirements, and other facility management and operational conditions. A complete UIC permit application form is needed to apply for a UIC permit.
- A UIC permit can have a valid duration of up to five years. Permit renewal is needed to keep an expiring permit valid for another term.

For further information about the UIC permit and the Underground Injection Control Program, please contact the UIC staff of the Safe Drinking Water Branch at 586-4258.

Groundwater Protection Program

Projects that propose to develop a golf course are asked to use the Guidelines Applicable to Golf Courses in Hawai`i (Version 6) in order to address certain groundwater protection concerns, as well as other environmental concerns

Branches and Offices in the Environmental Health Administration

Hazard Evaluation and Emergency Response Office	586-4249
Environmental Planning Office	586-4337
Clean Air Branch	586-4200
Clean Water Branch	586-4309
Safe Drinking Water Branch	586-4258
Solid & Hazardous Waste Branch	586-4226
Wastewater Branch	586-4294
Noise, Radiation, Indoor & Air Quality Branch	586-4700
Sanitation Branch	586-8000
Food and Drug Branch	586-4725
Vector Control Branch	831-6767

LINDA LINGLE
GOVERNOR OF HAWAII

RECEIVED
JUN 24 2004
TECHNICAL DESIGN SVCS OFC
DEPT OF TRANSPORTATION

CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. Box 3378
HONOLULU, HAWAII 96801-3378

In reply, please refer to:
EPO

July 1, 2004

To: Persons Requesting Department of Health Comments on Land Use Documents

From: June F. Harrigan-Lum, Manager
Environmental Planning Office

Our land use review coordinator position will be vacant beginning July 1, 2004. We will be filling this position as soon as possible. In the meantime, starting July 1, 2004, the Environmental Planning Office (EPO) will not be accepting any land use documents for coordinated replies.

If you would like to request to have staff in a specific branch or office to comment on your proposal, you are welcome to contact the staff directly. If a document has already been received by EPO and you wish to have us send it to a specific branch, you may call 586-4337 and ask for the clerical staff to send it to the appropriate branch. Please describe the document and the date of your cover letter.

You may call the above number and check with the clerical staff to see when coordinated responses from this office will resume.

Thank you for your cooperation and patience in this matter.

Enclosure

C: DDEH

RECEIVED

DIR 1062

'04 JUN -9 P12:57

DIRECTOR'S OFFICE
DEPT. OF
TRANSPORTATION

DESIGN BR
HIGHWAYS DIV
DEPT. OF TRANSP

2004 JUN -4 P 2:55

PHONE (808) 594-1888

FAX (808) 594-1865

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

HRD04-1424

June 2, 2004

Rodney K. Haraga
Director
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, HI 96813-5097

Subject: Draft Environmental Assessment Consultation and Public Information Meeting (PIM), Kalanianaole Highway Improvements, Between Olomana Golf Course and Waimanalo Beach Park, Waimanalo, Oahu, Hawaii (No TMKs provided)

Dear Mr. Haraga:

Thank for your letter dated May 28, 2004 regarding the Draft Environmental Assessment Consultation and Public Information Meeting (PIM), Kalanianaole Highway Improvements, located between Olomana Golf Course and Waimanalo Beach Park, Waimanalo, Oahu, Hawaii (No Tax Map Keys (TMK) provided). Your letter requests that the Office of Hawaiian Affairs (OHA) review and comment on the proposed project.

Project Description

The project involves the following: "The DOT is planning to improve traffic operations on Kalanianaole Highway between Olomana Golf Course and Waimanalo Beach Park by making improvements within the existing highway right-of-way."

Specific proposed improvements include left turning lanes at Flamingo Road, Kumuhau Street, Humuniki Street, Mekia Street, Moole Street (both directions), Ianoaole Street and Aloiloi Street, bus lane pullouts, the existing sidewalk from Kumuhau Street to Inoaole Street is to be reconstructed with a new Americans with Disabilities Act accessible sidewalk (driveways and curb ramps) and a shared use grassed path (where available) is proposed to allow equestrian riders to traverse along designated portions of Kalanianaole Highway.

OHA looks forward to your Draft EA for the proposed project, which should clarify the project scope and define the project footprint more clearly.

Please also provide TMKs for the parcels of land that the highway improvement project impacts.

If you have questions or concerns please contact Matthew Myers, Policy Advocate at 594-1945 or matthewm@oha.org.

'O wau iho nö,

Clyde W. Nämu'o
Administrator

DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
FT. SHAFTER, HAWAII 96858-5440

RECEIVED
JUN 14 2004
TECHNICAL DESIGN SVCS OFC
DEPT OF TRANSPORTATION

REPLY TO
ATTENTION OF

June 9, 2004

Regulatory Branch

Mr. Vincent Llorin
Project Manager
Technical Design Services Office
Design Branch, Highways Division
Hawaii State Department of Transportation
601 Kamokila Bold., Room 688
Kapolei, HI 96707

Dear Mr. Llorin:

This responds to your request dated May 28, 2004 for written comments to the draft Environmental Assessment (dEA) being prepared for the Kalanianaole Highway Improvements project which addresses activities proposed along the current highway right-of-way between Olomana Golf Course and the City and County Waimanalo Beach Park, Waimanalo, Oahu Island. The information to be provided in the dEA should locate, identify, and label those waters of the United States (including intermittent and perennial streams and wetlands) within that study corridor. The dEA should note what type of construction activity will occur at each potential crossing of these waters, and that coordination will take place with the Corps on a location-by-location basis to determine whether a Department of Army (DA) permit will, or will not be, required. We look forward to being a consulted party in preparation of the dEA and to assist you with these jurisdictional determinations when specific engineering design solutions become available.

In the future, written correspondence regarding the project in general should be addressed to the Commander, U.S. Army Engineer District, Honolulu, and correspondence regarding Department of Army permit requirements in specific should be addressed to Mr. George P. Young, Chief, Regulatory Program. Please contact Mr. Farley Watanabe of my staff at 438-7701 if you have any questions or additional information. Please refer to File Number 200400352 in all future correspondence with us.

Sincerely,

George P. Young, P.E.
Chief, Regulatory Branch

United States Department of the Interior

U.S. GEOLOGICAL SURVEY

PACIFIC ISLANDS WATER SCIENCE CENTER
677 Ala Moana Blvd., Suite 415
Honolulu, HI 96813
Phone: (808) 587-2400/Fax: (808) 587-2401

February 17, 2006

Mr. Rodney K. Haraga
Director of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813

Mr. Abraham Wong, Division Administrator
U.S. Department of Transportation
Federal Highway Administration
P.O. Box 50206
Honolulu, Hawaii 96850

DEPT OF TRANSPORTATION
2006 FEB 24 A 8: 58
HIGHWAYS DIVISION

Dear Mr. Rodney K. Haraga and Mr. Abraham Wong:

Subject: Draft Environmental Assessment, Kalanianaole Highway Improvements, Olomana Golf Course to Waimanalo Beach Park, Waimanalo, Oahu, Hawaii, Tax Map Key: 4-1-03 through 09,12,13,15,16,18,19,20,21,22,28,33,34) Federal Aid Project No. STP-072-1(44)

Thank you for forwarding the subject Draft Environmental Assessment for review and comment by the staff of the U.S. Geological Survey Pacific Islands Water Science Center. We regret however, that due to prior commitments and lack of available staff, we are unable to review this document and are returning it for your future use.

We appreciate the opportunity to participate in the review process.

Sincerely,

Gordon Tribble
Director

Enclosure to Mr. Wong

FEB 28 9 35 AM '06
HIGHWAY PLANNING

RECEIVED
'06 MAR -3 P12:54
DESIGN BRANCH
HIGHWAYS DIVISION
DEPT. OF TRANSPORTATION

LINDA LINGLE
GOVERNOR

RODNEY K. HARAGA
DIRECTOR

Deputy Directors
BARRY FUKUNAGA
BRENNON T. MORIOKA
BRIAN H. SEKIGUCHI

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:

HWY-DS 2.1112

MAY 30 2006

Mr. Gordon Tribble, Director
U. S. Department of the Interior
U. S. Geological Survey
677 Ala Moana Boulevard, Suite 415
Honolulu, Hawaii 96813

Dear Mr. Tribble:

Subject: Draft Environmental Assessment (DEA) comments
Kalanianaole Highway Improvements
Federal Aid Project No. STP-072-1(44)

Thank you for your letter of February 17, 2006, regarding the DEA for the Kalanianaole Highway Improvements. We appreciate your efforts in returning the DEA Assessment and taking the time to notify us that your department will be unable to comment or review this document.

If there are any questions, please contact Mr. Vincent Llorin at 692-7568, Technical Design Service Office, Highways Division.

Very truly yours,

BRENNON T. MORIOKA
Deputy Director-Highways

DIR 0404

RECI

'06 MAR 30 P3:00

DIRECTOR'S OFFICE
DEPT. OF
TRANSPORTATION

2006 MAR 20 P 4:55

TRAFFIC BRANCH
HIGHWAYS DIVISION
DEPT. OF TRANSPORTATION

DEPT OF TRANSPORTATION
2006 MAR 23 A 8:47
HIGHWAYS DIVISION

HOUSE OF REPRESENTATIVES

STATE OF HAWAII
STATE CAPITOL
HONOLULU, HAWAII 96813

March 14, 2006

Mr. Rodney Haraga, Director
Department of Transportation
869 Punchbowl Street
Honolulu, HI 96813

Dear Mr. Haraga:

I am writing regarding the Kalanianaole Highway Improvements from Olomana Golf Course to Waimanalo Beach Park. At last night's Waimanalo Neighborhood Board Meeting members raised questions about the left turn lane that runs the length of the highway work area. Residents are concerned that a middle lane that is unobstructed will be used as a passing lane. I share their concern for the safety of motorists and pedestrians in Waimanalo.

We recognize the need for left turn lanes at Flamingo Street, Kumuhau Street, Humuniki Street, Mekia Street, Mo`ole Street, Inoaole Street, and Aloiloi Street. I would suggest that you install grass medians in the middle lane at intervals along the highway to prevent motorists from using this left turn lane as a passing lane.

Mahalo,

Tommy Waters, 51st District
State Representative

CC: Mr. Llorin, DOT Highways Division
Ms. Hernando, Mountain Edge Environmental, Inc.
Ms. Salmonson, OEQC

RECEIVED
2006 MAR 24 A 11:10
TRAFFIC BRANCH
HIGHWAYS DIVISION
DEPT OF TRANSPORTATION

LINDA LINGLE
GOVERNOR

RODNEY K. HARAGA
DIRECTOR

Deputy Directors
BARRY FUKUNAGA
BRENNON T. MORIOKA
BRIAN H. SEKIGUCHI

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:

DIR 0460
HWY-DS 2.1113

MAY 2 6 2006

The Honorable Tommy Waters
District 51
Hawaii State Capitol, Room 426
Honolulu, Hawaii 96813

Dear Representative Waters:

Subject: Draft Environmental Assessment (DEA) comments
Kalanianaole Highway Improvements
Federal Aid Project No. STP-072-1(44)

Thank you for your letter of March 14, 2006, regarding the Draft Environmental Assessment (DEA) for the Kalanianaole Highway Improvements.

We appreciate your comment with the concern that an unobstructed middle lane may potentially be used as a passing lane. We understand that you would like grass medians installed in the middle lane at intervals along the highway to prevent this problem.

The conceptual drawings shown in the DEA do show raised medians with curbs and landscaping. The plan is to install these types of medians where space is available along the highway. If space is available, striping improvements such as solid yellow lines alerting motorists of no passing zones and centerline median rumble strips will be incorporated. The drawings shown in the DEA are conceptual drawings for planning purposes only. The community will have additional opportunities to comment on the proposed highway improvements during the design phases of the project. Project design is scheduled to occur in 2007 for the highway improvements in the vicinity of Olomana Golf Course, in 2007 to 2008 for Olomana Golf Course to Poalima Street, in 2009 to 2010 for Poalima Street to Aloiloi Street, and in 2013 for Aloiloi Street to Waimanalo Beach Park.

If there are any questions, please contact Mr. Vincent Llorin at 692-7568, Technical Design Service Office, Highways Division.

Very truly yours,

BRENNON T. MORIOKA
Deputy Director-Highways

DIR 0237

LINDA LINGLE
GOVERNOR

RECEIVED
'06 FEB 21 P1:36

DESIGN BRANCH
HIGHWAYS DIVISION
DEPT. OF TRANSPORTATION

STEPHANIE AVEIRO
EXECUTIVE DIRECTOR

PAMELA Y. DODSON
EXECUTIVE ASSISTANT

STATE OF HAWAII
DEPARTMENT OF HUMAN SERVICES
HOUSING AND COMMUNITY DEVELOPMENT CORPORATION OF HAWAII
677 QUEEN STREET, SUITE 300
Honolulu, Hawaii 96813
FAX: (808) 587-0600

IN REPLY REFER TO:

06:PEO/39

February 8, 2006

DEPT OF TRANSPORTATION
2006 FEB 16 A 8:24
HIGHWAYS DIVISION
2006 FEB 10 P 2:08

✓Mr. Rodney Haraga, Director
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

Mr. Abraham Wong, Division Administrator
U.S. Department of Transportation
Federal Highway Administration
P. O. Box 50206
Honolulu, Hawaii 96950

Dear Messrs. Haraga and Wong:

Subject: Draft Environmental Assessment
Kalanianaole Highway Improvements
Olomana Golf Course to Waimanalo Beach Park
Waimanalo, Oahu, Hawaii

Thank you for the opportunity to review the above subject Draft Environmental Assessment (January 25, 2006) for the proposed Kalanianaole Highway Improvements—Olomana Golf Course to Waimanalo Beach Park in Waimanalo, Oahu, Hawaii.

We note that the proposed project does not include any work to improve the culverts under Kalanianaole Highway at Inoaole Stream. The Housing and Community Development Corporation of Hawaii has received complaints about the stagnant conditions of Inoaole Stream mauka of the culverts at Kalanianaole Highway. It appears that the existing culverts under Kalanianaole Highway may be impeding the free flow of Inoaole Stream into the ocean. Please consider the inclusion of an enlargement of the culverts at Inoaole Stream and/or a lowering of the bottom elevations of the culverts, as part of the proposed work to facilitate the free flow of Inoaole Stream into the ocean.

Thank you for your consideration of our comments.

Should there be any questions or comments regarding this matter, please contact Stan S. Fujimoto, Project Manager, at 587-0541.

Sincerely,

Stephanie Aveiro

Stephanie Aveiro
Executive Director

c: Stan S. Fujimoto, Project Manager

LINDA LINGLE
GOVERNOR

RODNEY K. HARAGA
DIRECTOR

Deputy Directors
BARRY FUKUNAGA
BRENNON T. MORIOKA
BRIAN H. SEKIGUCHI

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:
HWY-DS 2.0294

MAR 21 2006

TO: STEPHANIE AVEIRO, EXECUTIVE DIRECTOR
HOUSING AND COMMUNITY DEVELOPMENT CORPORATION OF HAWAII
DEPARTMENT OF HUMAN SERVICES

FROM: BRENNON T. MORIOKA
DEPUTY DIRECTOR-HIGHWAYS

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT
KALANIANAOLE HIGHWAY IMPROVEMENTS
OLOMANA GOLF COURSE TO WAIMANALO BEACH PARK
FEDERAL AID PROJECT NO. STP-072-1(44)

Thank you for your comments regarding the Inoaole Stream bridge. A separate Draft Environmental Assessment (DEA) is being prepared for the following State Department of Transportation Project:

Kalanianaole Highway, Replacement of Inoaole Stream Bridge
District of Koolaupoko, Island of Oahu
Federal Aid Project No. STP-072-1(43)

The DEA is scheduled to be completed in the second quarter of 2006. Your comments have been forwarded to the appropriate project manager and will be addressed in that DEA.

Should you have any questions, please call Vincent Llorin at 692-7568, Technical Design Services Office, Design Branch, Highways Division.

LINDA LINGLE
GOVERNOR OF HAWAII

MAR 22 3 26 PM '06

DIRECTOR'S OFFICE
DEPT. OF
TRANSPORTATION

2006 MAR 20 P 4: 47

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA
DEPUTY DIRECTOR - LAND

DEAN NAKANO
ACTING DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

March 15, 2006

Mr. Rodney Haraga
Director of Transportation
State of Hawaii Department of Transportation
869 Punchbowl Street
Honolulu, HI 96813

LOG NO: 2006.0702
DOC NO: 0603CM53
Archaeology

RECEIVED
'06 MAR 28 A8:31
DESIGN BRANCH
HIGHWAYS DIVISION
DEPT. OF TRANSPORTATION

Dear Mr. Haraga:

SUBJECT: **National Historic Preservation Act Section 106 Review [State DOT/FHA]–**
Kalanianaole Highway Improvements (Draft EA)
Olomana Golf Course to Waimanalo Beach Park
Waimānalo Ahupua'a, Ko'olaupoko District, Island of Oahu
TMK: (1) 4-1-various plats and parcels

Thank you for the opportunity to comment on the aforementioned project, which we received on February 1, 2006. The proposed undertaking consists of roadway widening and sidewalk reconstruction and improvements. The project area extends along the Kalaniana'ole Highway from the Olo Mana Golf Course to Waimanalo Beach Park.

Our review of the Draft Environmental Assessment (DEA) has determined that the proposed undertaking may have an "adverse effect" on historic properties that may be present in subsurface deposits. This may be mitigated by implementing an archaeological monitoring program, which you have addressed in Addendum I (*Archaeological Monitoring Plan for the Proposed Kalaniana'ole Highway Improvements Project, Waimānalo Ahupua'a, Ko'olaupoko District, O'ahu,* Hammatt *et al.* 2005, Cultural Surveys of Hawai'i).

We have reviewed the archaeological monitoring plan in a letter (LOG NO: 2006.0701, DOC NO: 0603CM52) dated March 15, 2006, and have provisionally accepted the document, with minor changes. The monitoring plan calls for 100% "on site" monitoring of "...all ground disturbance activities below road grade or intruding 30 cm (1 foot) or more into undisturbed sediments." We concur with this mitigation recommendation.

For your information, we have requested the following minor revisions to the "Archaeological Monitoring Provisions":

(1) Under Treatment of Remains Encountered (item no. 3), please state that, if human remains are positively identified, no screening of back dirt piles or other invasive procedures (*e.g.*, cleaning of soil profiles, digging into trench walls) will be conducted unless instructed by the SHPD.

(2) Please state that photographs of excavations will be included in the final report, even if no significant cultural resources are documented.

(3) Please state that, in the event that human remains are discovered, the Burial Sites Program may request additional documentation, including letter memos and/or other reports, as necessary.

We also note that you have included a Cultural Impact Assessment by Cultural Surveys of Hawai'i, and we commend you for preparing a thorough DEA. We have no further comments at this time, and will work with your archaeological consultant to finalize the monitoring plan.

Please contact Dr. Chris Monahan at (808) 692-8015 if you have any questions regarding this letter.

Aloha,

Peter Young, Chair
State Historic Preservation Officer

CM

Cc: Mr. Abraham Wong, Division Administrator, U.S. Department of Transportation, FHA

LINDA LINGLE
GOVERNOR OF HAWAII

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA
DEPUTY DIRECTOR - LAND

DEAN NAKANO
ACTING DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
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CONSERVATION AND RESOURCES ENFORCEMENT
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FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

March 24, 2006

Dr. H.H. Hammatt
Cultural Surveys Hawaii, Inc.
P.O. Box 1114
Kailua, Hawai'i 96734

LOG NO: 2006.0839
DOC NO: 0603CM84
Archaeology

Dear Dr. Hammatt:

SUBJECT: **Chapter 6E-8 Historic Preservation Review [State DOT] –**
Revised Archaeological Monitoring Plan
Proposed Kalaniana'ole Highway Improvements Project
Waimānalo Ahupua'a, Ko'olaupoko District, Island of O'ahu
TMK: (1) 4-1-various plats and parcels

Thank you for the opportunity to review the aforementioned revised report by Hammatt *et al.* (2006), which we received on March 23, 2006. In a letter (LOG NO: 2006.0701, DOC NO: 0603CM52) dated March 15, 2006, we requested three minor additions to the monitoring provisions, which you have revised to our satisfaction.

The monitoring plan is accepted in fulfillment of the requirements of Hawai'i Administrative Rules (HAR) Chapter 13-279.

Please contact Chris Monahan at 808-692-8015, if you have questions about this letter.

Aloha,

Melanie Chinen, Administrator
State Historic Preservation Division

CM

LINDA LINGLE
GOVERNOR

RODNEY K. HARAGA
DIRECTOR

Deputy Directors
BARRY FUKUNAGA
BRENNON T. MORIOKA
BRIAN H. SEKIGUCHI

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:

HWY-DS 2.1114

MAY 30 2006

TO: THE HONORABLE PETER YOUNG, CHAIR
DEPARTMENT OF LAND AND NATURAL RESOURCES

FROM: BRENNON T. MORIOKA
DEPUTY DIRECTOR-HIGHWAYS

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT (DEA)
KALANIANAOLE HIGHWAY IMPROVEMENTS
FEDERAL AID PROJECT NO. STP-072-1(44)

Thank you for your letter (LOG NO: 2006.0702, DOC NO: 0603CM53) of March 15, 2006 regarding the DEA for the Kalanianaole Highway Improvements.

As you are aware we have revised the Archaeological Monitoring Plan to incorporate your requested revisions. Based on your letter (LOG NO: 2006.0839, DOC 0603CM53) dated March 24, 2006 we understand that you are satisfied with the revisions and that the Archaeological Monitoring Plan is accepted in fulfillment of the requirements of Hawaii Administrative Rules Chapter 13-279.

If there are any questions, please contact Mr. Vincent Llorin at 692-7568, Technical Design Service Office, Highways Division.

LINDA LINGLE
GOVERNOR

PATRICIA HAMAMOTO
SUPERINTENDENT

DIR 0408

DIRECTOR'S OFFICE
DEPT. OF
TRANSPORTATION

2006 MAR -8 P 12: 38

STATE OF HAWAI'I
DEPARTMENT OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAI'I 96804

OFFICE OF THE SUPERINTENDENT

RECEIVED
'06 MAR 24 A10:22
DESIGN BRANCH
HIGHWAYS DIVISION
DEPT OF TRANSPORTATION

DEPT OF TRANSPORTATION
2006 MAR 17 P 2: 57
HIGHWAYS DIVISION

March 6, 2006

MEMO TO: The Honorable Rodney Haraga, Director
Department of Transportation

F R O M: Patricia Hamamoto, Superintendent
Department of Education

SUBJECT: Draft Environmental Assessment for Kalanianaole Highway Improvements, Waimanalo, Oahu, Hawaii

The Department of Education (DOE) is concerned that there has been no consultation with Waimanalo Elementary and Intermediate School about the Kalanianaole Highway improvements described in the Draft Environmental Assessment (DEA).

We have the following questions and concerns:

1. Was there any study done of the number of cars turning in and out of the school campus during peak hours?

2. It appears there are two center left turn lanes proposed for the Highway where it crosses the main part of the school campus. However, the left turn lanes end abruptly and landscaping starts just beyond the exit-only driveway from the school. It is not clear in Exhibit 6, Sheet 11, whether left and right turns will be permitted from the exit driveway onto the Highway.

3. Design of the landscaping in front of the school's service entrance appears to only permit right-in/right-out. Was that the intention of the design? Where will trucks coming from the east turn around to enter the service driveway? Where will trucks headed west turn around if they are forced to go east out of the driveway?

4. Where are the drawings to illustrate the road cross sections, particularly across the front of the school, where there is a rock wall and trees on the campus and not much room for a bike path and an ADA regulation five-foot sidewalk?

The DOE requests that the principals of Waimanalo Elementary and Intermediate and Blanche Pope Elementary schools be notified as to when construction would begin in the areas closest to their schools. They should also be notified in advance when construction would close or reroute traffic past the entrances to either school, keeping in mind that most students use the sidewalk to get to school. Considering the noise, dust, and safety precautions, it would seem highly advisable to schedule the segment of the project in front of the school during the schools' summer break.

Thank you for the opportunity to ask questions raised by our review of the DEA. If you have any questions, please call Heidi Meeker of the Facilities Development Branch at 733-4862.

PH:jmb

cc: Randolph Moore, Acting Assistant Superintendent, OBS
Duane Kashiwai, Facilities Development Branch
Louise Wolcott, Ed.D., CAS, Kailua/Kalaheo Complex Areas
Abraham Wong, Federal Highway Administration
Principal, Waimanalo Elementary & Intermediate
Principal, Blanche Pope Elementary

LINDA LINGLE
GOVERNOR

RODNEY K. HARAGA
DIRECTOR

Deputy Directors
BARRY FUKUNAGA
BRENNON T. MORIOKA
BRIAN H. SEKIGUCHI

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:

HWY-DS 2.1179

MAY 31 2006

TO: THE HONORABLE PATRICIA HAMAMOTO
SUPERINTENDENT, DEPARTMENT OF EDUCATION

FROM: BRENNON T. MORIOKA
DEPUTY DIRECTOR-HIGHWAYS

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT (DEA)
KALANIANAOLE HIGHWAY IMPROVEMENTS
FEDERAL AID PROJECT NO. STP-072-1(44)

Thank you for your letter of March 6, 2006, regarding the DEA for the Kalanianaole Highway Improvements project.

We appreciate your comments on the DEA and have provided the following responses:

1. A study of the number of cars turning in and out of the school campus during peak hours was not conducted.

2. and 3. The purpose of the DEA is to evaluate the social and environmental impacts that could result from the proposed highway improvements. The drawings shown in the DEA are conceptual drawings for planning purposes only. The exit-only and right-in/right-out traffic designators are based on the existing configuration. The community will have additional opportunities to comment on the proposed highway improvements during the design phases of the project. Project design is scheduled to occur in 2007 for the highway improvements in the vicinity of Olomana Golf Course, in 2007 to 2008 for Olomana Golf Course to Poalima Street, in 2009 to 2010 for Poalima Street to Aloiloi Street, and in 2013 for Aloiloi Street to Waimanalo Beach Park.

4. Bike paths and Americans with Disabilities Act regulation five-foot sidewalks will be added where space is available along the project area. Again, the drawings shown in the DEA are conceptual drawings for planning purposes only and the community will have additional opportunities to comment on the design.

5. The Department of Transportation will coordinate construction with the principals of Waimanalo Elementary and Intermediate and Blanche Pope Elementary schools as to when construction would begin in the areas closest to their schools. Construction in the area fronting Waimanalo Elementary and Intermediate Schools is currently scheduled for construction in fiscal year 2008. Construction in the area of Blanche Pope Elementary School is currently scheduled for fiscal year 2015.

MAY 31 2006

Seven Public Information Meetings (PIMs) were held for the project, the first one in 1999 and the last one in June 2004. The purpose of the PIMs was to receive public input, present semi-final conceptual plans, receive additional input, and prepare final conceptual plans. In addition to the PIMs, a flier was delivered door-to-door along the proposed project route and letters were sent to various agencies and organizations soliciting input prior to preparation of the DEA. Flyers were left at the Waimanalo Elementary and Intermediate school, and a pre-solicitation letter was sent to the Department of Education. The community will have additional opportunities to comment on the proposed highway improvements during the design phases of the project.

Again, thank you for the valuable feedback. If there are any questions, please contact Mr. Vincent Llorin at 692-7568, Technical Design Service Office, Highways Division.

DIR 0449

PHONE (808) 594-1888

FAX (808) 594-1865

RECEIVED
'06 MAR 30 P3:16
DESIGN BRANCH
HIGHWAYS DIVISION
DEPT. OF TRANSPORTATION

DIRECTOR'S OFFICE
DEPT. OF
TRANSPORTATION
2006 MAR 14 A 10:27

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

HRD06/1424C

March 7, 2006

Rodney Haraga
State of Hawai'i Department of Transportation
Punchbowl Street, Room, 509
Honolulu, HI 96813

RE: Draft Environmental Assessment for the Proposed Kalaniana'ole Highway Improvements, Olomana Golf Course to Waimanalo Beach Park, Waimānalo, O'ahu.

Dear Mr. Haraga,

The Office of Hawaiian Affairs (OHA) is in receipt of your February 9, 2006 request for comment on the above listed proposed project. OHA offers the following comments:

Our staff strongly feels that, in contrast with Department of Transportation Federal Highway Administration and the Hawai'i State Historic Preservation Division determinations that "the proposed improvements will have no effect on significant cultural/historic properties", the project will very likely impact historic properties as is defined in the amended National Historic Preservation Act of 1966. Adverse impacts from ground altering activities, particularly to Native Hawaiian burial grounds, are expected in coastal Waimānalo.

Our staff asks that the Archeological Monitoring Plan stipulate that one monitor will be present for each active excavating machine, meaning that three simultaneous excavations will require three archeological monitors. We feel that this level of attention is appropriate when excavating in Jaucus sand deposits in coastal Waimānalo.

It may also be appropriate for the applicant to solicit from the community individuals who are interested in acting as cultural monitors for the proposed project. As impacts to historic properties are likely, the surrounding community should be involved in decision making process regarding the project.

OHA also asks that, in accordance with Section 6E-46.6, Hawaii Revised Statutes and Chapter 13-300, Hawaii Administrative Rules, if any significant cultural deposits or human skeletal remains are encountered, work shall stop in the immediate vicinity and the State Historic Preservation Division (SHPD/DLNR) shall be contacted.

Thank you for the opportunity to comment. If you have further questions or concerns, please contact Jesse Yorck, Native Rights Policy Advocate, at (808) 594-0239 or jessey@oha.org.

'O wau iho nō,

Clyde W. Nāmu'o
Administrator

CC: Abraham Wong
Federal Highway Administration, Hawaii Division
P.O. Box 50206
300 Ala Moana Blvd., Room 3-306
Honolulu, HI 96850

LINDA LINGLE
GOVERNOR

RODNEY K. HARAGA
DIRECTOR

Deputy Directors
BARRY FUKUNAGA
BRENNON T. MORIOKA
BRIAN H. SEKIGUCHI

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:
DIR 0449
HWY-DS 2.1115

MAY 30 2006

TO: CLYDE W. NAMUO, ADMINISTRATOR
OFFICE OF HAWAIIAN AFFAIRS

FROM: BRENNON T. MORIOKA
DEPUTY DIRECTOR-HIGHWAYS

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT (DEA)
KALANIANAOLE HIGHWAY IMPROVEMENTS
FEDERAL AID PROJECT NO. STP-072-1(44)

Thank you for your letter of March 7, 2006, regarding the DEA for the Kalanianaole Highway Improvements. We appreciate your comments regarding revisions to the Archaeological Monitoring Plan.

Please note that the Archaeological Monitoring Plan has already been approved by the State Historic Preservation Division; however, as part of project implementation we will coordinate with the Koolaupoko representative of the Oahu Island Burial Council to consider soliciting community individuals interested in acting as cultural monitors for the proposed project. We will also consider your suggestion for one cultural monitor for each active excavating machine.

The Archaeological Monitoring Plan already addresses stopping work and contacting the State Historic Preservation Division if cultural deposits or human skeletal remains are encountered, see Appendix I (Archaeological Monitoring Plan), Section 4 (Archaeological Monitoring Needs and Provisions), sub-section B (Archaeological Monitoring Provisions) of the DEA. The Archaeological Monitoring Plan states the following:

> 3. *<u>Treatment of remains encountered</u>: If cultural deposits or human skeletal remains are encountered during ground disturbing activities, work will be stopped immediately in that area and the archaeologist will notify the Burial Sites Program of the SHPD/DLNR of the nature of the discovery. Burial finds will be treated according to Hawaii Administrative Rules (HAR) 13-300-39 governing the inadvertent discovery of human remains.*
>
> *No remains will be removed without the knowledge and consent of the Burial Sites Program of the SHPD/DLNR. If any associated materials are encountered with an inadvertent human burial, all material will be treated as grave goods. If other cultural materials are encountered, not in association with a human burial, including an intact cultural layer, charcoal, artifacts or midden deposits, or any disturbed objects or deposits, then select sorted samples of charcoal, and bulk samples of midden material will be collected and standard documentation conducted (i.e., scale maps and stratigraphic profiles drawn in the field,*

MAY 3 0 2006

photographs, detailed descriptions, and interpretation). Monitoring shall include some sampling. A minimum of five photographs showing work at various stages shall be part of the final report. Any reburial plans will be made in consultation with the Burial Sites Program of the SHPD/DLNR.

4. *Authority to halt construction. The monitoring archaeologist has the authority to halt construction in the immediate area of the find in order to carry out the plan. The field archaeologist will make it clear to construction personnel with whom he/she is working that the archaeologist has the authority to halt work when it is appropriate.*

If there are any questions, please contact Mr. Vincent Llorin at 692-7568, Technical Design Service Office, Highways Division.

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843

MUFI HANNEMANN, Mayor

RANDALL Y. S. CHUNG, Chairman
HERBERT S. K. KAOPUA, SR.
SAMUEL T. HATA
ALLY J. PARK

RODNEY K. HARAGA, Ex-Officio
LAVERNE T. HIGA, Ex-Officio

CLIFFORD P. LUM
Manager and Chief Engineer

DONNA FAY K. KIYOSAKI
Deputy Manager and Chief Engineer

February 13, 2006

2006 FEB 15 P 4:03

RECEIVED
'06 FEB 23 P3:45
DESIGN BRANCH
HIGHWAYS DIVISION
DEPT. OF TRANSPORTATION

Mr. Rodney Haraga
Director of Transportation
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Haraga:

Subject: Draft Environmental Assessment for Kalanianaole Highway Improvements Between Olomana Golf Course and Waimanalo Beach Park

Our comments dated June 14, 2004, which are included in the assessment, are still applicable.

If you have any questions, please contact Robert Chun at 748-5443.

Very truly yours,

KEITH S. SHIDA
Principal Executive
Customer Care Division

FEB 21 4 03 PM '06

cc: Abraham Wong, Division Administrator
U.S. Department of Transportation

LINDA LINGLE
GOVERNOR

RODNEY K. HARAGA
DIRECTOR

Deputy Directors
BARRY FUKUNAGA
BRENNON T. MORIOKA
BRIAN H. SEKIGUCHI

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:

HWY-DS 2.1116

MAY 30 2006

Mr. Keith S. Shida, Principal Executive
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

Dear Mr. Shida:

Subject: Draft Environmental Assessment (DEA) comments
Kalanianaole Highway Improvements
Federal Aid Project No. STP-072-1(44)

Thank you for your letter of February 13, 2006, regarding the DEA for the Kalanianaole Highway Improvements.

We appreciate your confirmation that your July 14, 2004 comments are still applicable. Construction drawings will be submitted for Board of Water Supply approval, and the construction schedule will be coordinated to minimize impacts to the community and the water system, as per your request.

If there are any questions, please contact Mr. Vincent Llorin at 692-7568, Technical Design Services Office, Design Branch, Highways Division.

Very truly yours,

BRENNON T. MORIOKA
Deputy Director-Highways

DEPARTMENT OF DESIGN AND CONSTRUCTION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 11TH FLOOR
HONOLULU, HAWAII 96813
PHONE: (808) 523-4564 . FAX: (808) 523-4567
WEB SITE ADDRESS: www.co.honolulu.gov

MUFI HANNEMANN
MAYOR

DIRECTOR

EUGENE C. LEE, P.E.
DEPUTY DIRECTOR

CDP 06-140777

February 15, 2006

Mr. Vincent Llorin
Technical Design Services Office
Design Branch
Highways Division
Department of Transportation
State of Hawaii
601 Kamokila Boulevard, Room 688
Kapolei, Hawaii 96707

Dear Mr. Llorin:

Subject: Draft Environmental Assessment (EA)
Kalanianaole Highway Improvements
Olomana Golf Course to Waimanalo Beach Park
Waimanalo, Oahu, Hawaii

We have reviewed the Draft EA and have no comments to offer. Thank you for the opportunity to comment on the proposed project.

If there are any questions, please contact Gregory Sue at 527-6304.

Very truly yours,

Eugene C. Lee, P.E.
Deputy Director

GS:dk

LINDA LINGLE
GOVERNOR

RODNEY K. HARAGA
DIRECTOR

Deputy Directors
BARRY FUKUNAGA
BRENNON T. MORIOKA
BRIAN H. SEKIGUCHI

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:

HWY-DS 2.1117

MAY 30 2006

Mr. Eugene C. Lee, P.E., Deputy Director
Department of Design and Construction
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Lee:

Subject: Draft Environmental Assessment (DEA) comments
Kalanianaole Highway Improvements
Federal Aid Project No. STP-072-1(44)

Thank you for your letter of February 15, 2006, regarding the DEA for the Kalanianaole Highway Improvements. We understand that you have no comments to offer.

If there are any questions, please contact Mr. Vincent Llorin at 692-7568, Technical Design Services Office, Design Branch, Highways Division.

Very truly yours,

BRENNON T. MORIOKA
Deputy Director-Highways

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
TELEPHONE: (808) 523-4432 • FAX: (808) 527-6743
DEPT. INTERNET: www.honoluludpp.org • INTERNET: www.honolulu.gov

MUFI HANNEMANN
MAYOR

HENRY ENG, FAICP
DIRECTOR

DAVID K. TANOUE
DEPUTY DIRECTOR

2006/ELOG-225(rns)

March 14, 2006

Mr. Abraham Wong, Division Administrator
U. S. Department of Transportation
Federal Highway Administration
P. O. Box 50206
Honolulu, Hawaii 96950

Mr. Rodney Haraga, Director
State Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Wong and Mr. Haraga:

Re: Draft Environmental Assessment
Kalanianaole Highway Improvements, Waimanalo, Oahu

In response to your request regarding the Draft Environmental Assessment (DEA) for Kalanianaole Highway Improvements, we have reviewed the draft and offer the following comments:

1. The Tax Map Key (TMK) information provided on Figure 3-2 on page 3-6 is incomplete, not permitting identification of the specific parcels affected by the project. The numbers provided give only the zone, section, and plat numbers.

2. Regarding the Special Management Area (SMA) discussion on page 4-2, so long as work is within the existing highway easement, no Special Management Area Use Permit is needed for the portions of the highway in the SMA. We confirm that the land acquisition area at Poalima Street Intersection in Waimanalo Village is outside the SMA.

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MAR 17 2006
HAWAII DIVISION

3. With regard to Table 4.2 on page 4-12, the Street Usage Permit is issued by the Department of Transportation Services (DTS), not the Department of Planning and Permitting (DPP) as shown. However, a Traffic Control Plan will have to be reviewed and approved by the Traffic Review Branch of the DPP before DTS will issue the Street Usage Permit.

Should you have any questions, please contact Bob Stanfield of our staff at 527-6094.

Very truly yours,

Henry Eng, FAICP, Director
Department of Planning and Permitting

HE:mo
435425

cc: Office of Environmental Quality Control

LINDA LINGLE
GOVERNOR

RODNEY K. HARAGA
DIRECTOR

Deputy Directors
BARRY FUKUNAGA
BRENNON T. MORIOKA
BRIAN H. SEKIGUCHI

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:

HWY-DS 2.1181

MAY 31 2006

Mr. Henry Eng, FAICP, Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Dear Mr. Eng:

Subject: Draft Environmental Assessment (DEA) comments
Kalanianaole Highway Improvements
Federal Aid Project No. STP-072-1(44)

Thank you for your letter of March 14, 2006, regarding the DEA for the Kalanianaole Highway Improvements project.

We appreciate your comments on the DEA, and have provided the following responses:

1. The Tax Map Key (TMK) information provided on Figure 3-2 is incomplete regarding the specific parcels that will be affected by the proposed highway improvements. The proposed improvements are located within the existing easement of the highway with the exception of the Poalima Street intersection and therefore, unnecessary to list individual parcel numbers. The Poalima Street parcel is designated as TMK: (1) 4-1-1: parcel 1.

2. Thank you for your confirmation that no Special Management Area (SMA) permit is required as long as proposed improvements occur only within the existing easement of the highway and that the land acquisition area at Poalima Street intersection is outside of the SMA.

3. Table 4.2 on page 4-12 will be revised to show that the Department of Transportation Services will issue the Street Usage Permit and that the Department of Planning and Permitting will review and approve the Traffic Control Plan.

If there are any questions, please contact Mr. Vincent Llorin at 692-7568, Technical Design Services Office, Design Branch, Highways Division.

Very truly yours,

for BRENNON T. MORIOKA
Deputy Director-Highways

DIR 0447

DEPARTMENT OF TRANSPORTATION SERVICES

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 3RD FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 523-4529 • Fax: (808) 523-4730 • Internet: www.honolulu.gov

DIRECTOR'S OFFICE
DEPT. OF
TRANSPORTATION

2006 MAR 14 A10:51

MUFI HANNEMANN
MAYOR

MELVIN N. KAKU
ACTING DIRECTOR

ALFRED A. TANAKA, P.E.
DEPUTY DIRECTOR

TP2/06-138565R

RECEIVED
'06 MAR 28 A8:30
DESIGN BRANCH
HIGHWAYS DIVISION
DEPT. OF TRANSPORTATION

March 8, 2006

Mr. Abraham Wong, Division Administrator
U.S. Department of Transportation
Federal Highway Administration
P.O. Box 50206
Honolulu, Hawaii 96850

Dear Mr. Wong:

Subject: Kalanianaole Highway Improvements
Olomana Golf Course to Waimanalo Beach Park

Thank you for sending us a copy of the draft environmental assessment (EA) for our review and comment. We have the following comments regarding the document:

1. The duration of the construction phase should be noted in the EA.

2. The discussion in Section 3.2.3 Public Transit (Page 3-10) should include Route 89 (Waimanalo/Kailua Express) as another bus route serving the project area.

3. The area neighborhood board, as well as community residents, businesses, emergency personnel, bus personnel, etc., should be kept apprised of the details of the proposed project and the impacts the project may have on the adjoining local street network area.

Should you have any questions regarding these comments, please contact Faith Miyamoto of the Transportation Planning Division at 527-6976.

Sincerely,

Melvin N. Kaku

MELVIN N. KAKU
Acting Director

√cc: Mr. Rodney Haraga, Director
State Department of Transportation

LINDA LINGLE
GOVERNOR

RODNEY K. HARAGA
DIRECTOR

Deputy Directors
BARRY FUKUNAGA
BRENNON T. MORIOKA
BRIAN H. SEKIGUCHI

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:
DIR 0447
HWY-DS 2.1118

MAY 30 2006

Mr. Melvin N. Kaku, Acting Director
Department of Transportation Services
City and County of Honolulu
650 South King Street, 3rd Floor
Honolulu, Hawaii 96813

Dear Mr. Kaku:

Subject: Draft Environmental Assessment (DEA) comments
Kalanianaole Highway Improvements
Federal Aid Project No. STP-072-1(44)

Thank you for your letter of March 8, 2006, regarding the DEA for the Kalanianaole Highway Improvements.

We appreciate your comments on the DEA and have provided the following responses:

1. The duration of the construction phases will be added to Section 2.1 of the Environmental Assessment.
2. In Section 3.2.3 Public Transit (Page 3-10), bus Route 89 (Waimanalo/Kailua Express) will be added.
3. The community will have additional opportunities to comment on the proposed highway improvements during the design phases of the project. Project design is scheduled to occur in 2007 for the highway improvements in the vicinity of Olomana Golf Course, in 2007 to 2008 for Olomana Golf Course to Poalima Street, in 2009 to 2010 for Poalima Street to Aloiloi Street, and in 2013 for Aloiloi Street to Waimanalo Beach Park.

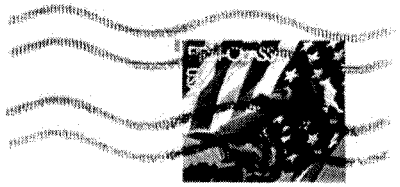
If there are any questions, please contact Mr. Vincent Llorin at 692-7568, Technical Design Services Office, Design Branch, Highways Division.

Very truly yours,

BRENNON T. MORIOKA
Deputy Director-Highways

Beverly R. Addington
Democratic Council Representative
District 51, Precinct 3
41-209 Ikauhole Street, #28
Waimanalo, HI 96795

HONOLULU HI 968
23 MAR 2006 PM 3 L



Jennifer Hernandez
Mt. Edge Environmental Inc.
62-180 Emerson Road
Haleiwa, HI 96712

3/21/06

Jennifer Hernando
Mt Edge Environmental Inc
62 180 Emerson Road
Haleiwa, Hi 96712

Re: Traffic Lights
Na Kini Street / Kalanianaole Hwy
Waimanalo, Hi 96795
HRS 343 DEA

Dear Mrs. Hernando:

This is the follow-up letter to my phone call regarding installing traffic light at the corner of Nakini Street and Kalanianaole Hwy during the planned Kalanianaole Highway improvement from Olomana Golf Course to Waimanalo Beach Park, HRS 343 DEA.

According to State Rep. Tommy Waters, the Public Comment deadline is 3/31/06, therefore, I am urgently requesting traffic lights be installed to protect the many elderly residents who have to cross the H-way to catch the bus, shop, etc. An accident is just waiting to happen because the automobiles do not slow down

and crossing that highway is a very dangerous procedure.
I live in a senior citizen complex with 84 other seniors. Many depend on public transportation and several are in wheelchairs. Hopefully, the road will be easier to push a wheelchair on with the scheduled repaving when this project is done.
I appreciate any help regarding the needed traffic light.

Very truly yours,

Beverly R Addington
41-209 Ilauhole St #28
Waimanalo, HI 96795
426-1232
Democratic Council Rep.
District 51, Precinct 3

LINDA LINGLE
GOVERNOR

RODNEY K. HARAGA
DIRECTOR

Deputy Directors
BARRY FUKUNAGA
BRENNON T. MORIOKA
BRIAN H. SEKIGUCHI

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:
HWY-DS 2.1119

MAY 31 2006

Ms. Beverly R. Addington
Democratic Council Representative
District 51, Precinct 3
41-209 Ilauhole Street #28
Honolulu, Hawaii 96795

Dear Ms. Addington:

Subject: Draft Environmental Assessment (DEA) comments
Kalanianaole Highway Improvements, Federal Aid Project No. STP-072-1(44)

Thank you for your telephone call and the follow-up letter of March 31, 2006, regarding the DEA for the Kalanianaole Highway Improvements project.

Project improvements include the reconstruction of the existing concrete sidewalk on the mauka side of the highway from Kumuhau Street to Inoaole Streeet and will comply with current Americans with Disabilities Act guidelines. In addition, remaining areas along Kalanianaole Highway that do not have a concrete sidewalk will have a five-foot paved asphalt shoulder.

Currently, no traffic light is scheduled for installation at Nakini Street and Kalanianaole Highway. Requests were made at the Public Informational Meetings to identify traffic signal requirements within the project limits. A traffic signal warrant study was conducted on Kalanianaole Highway for the intersections of Kumuhau Street and Moole Street, which determined that traffic signals were not warranted at these intersections. It is highly unlikely that a traffic signal will be warranted at the Nakini Street intersection.

The purpose of the DEA is to evaluate the social and environmental impacts that could result from the proposed highway improvements. The drawings presented in the DEA are conceptual drawings for planning purposes only. The community will have additional opportunities to comment on the proposed highway improvements during the design phases of the project. Project design is scheduled to occur in 2007 for the highway improvements in the vicinity of Olomana Golf Course, in 2007 to 2008 for Olomana Golf Course to Poalima Street, in 2009 to 2010 for Poalima Street to Aloiloi Street, and in 2013 for Aloiloi Street to Waimanalo Beach Park.

We will include your comments in the Final Environmental Assessment and thank you for your feedback.

If there are any questions, please contact Mr. Vincent Llorin at 692-7568, Technical Design Services Office, Design Branch, Highways Division.

Very truly yours,

for BRENNON T. MORIOKA
Deputy Director-Highways

ILIMA HO
<ilimz1@yahoo.com>
03/31/2006 02:27 PM

To vincent.llorin@hawaii.gov
cc
bcc
Subject Kalanianaole Improvements???

History: This message has been forwarded.

Aloha,

I am writing regarding the so called improvements to Kalanianaole Highway in Waimanalo. I am not sure who made these suggestions, but I am sure that the Waimanalo Community was not involved.

Are these improvements being made for the betterment of our community, or is it for all the cars speeding through on their daily commute???

Our keiki are much more important than John Doe and Joe Blow passing through, whether it be from east to west or vice versa. We, Waimanalo people aren't concerned about them. We care and take care of each other and can't be bothered with those that are merely taking the shortcut to their destination.

We don't want to be the next Farrington Highway, with our kids getting run down or drag racing at all hours.

Ours is a quite community and we like it that way. Our Kupuna take their daily Sunday drive and need not be hurried by the outsiders trying to get from point A to point B.

If they don't like the traffic, tell them to go around.

As for your plan, the draft that I got to see??? Well, actually the one that I really couldn't see... was it just a hurry up, lets set the deadline before anybody takes a good look.

Isn't it the right way to do things, by coming into the community and letting people know what you are going to do??? And yes I was at the neighborhood board meeting when Mr. Haraga paid us a visit. So, you need not wonder.

Thank God for true Waimanalo people who got the word out last night that the deadline did not pass, and that there was an extension. I hope many people take the time to write in today. So maybe you guys can do your **real** job and get over here and tell us what's going on.

Think About It!!!

Thank You,

Heidi Ramseyer
41-256 Nakini Street
Waimanalo, Hawaii 96795
808-259-8587

PS

I AM HAWAIIAN AND I VOTE!

LINDA LINGLE
GOVERNOR

RODNEY K. HARAGA
DIRECTOR

Deputy Directors
BARRY FUKUNAGA
BRENNON T. MORIOKA
BRIAN H. SEKIGUCHI

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:

HWY-DS 2.1120

MAY 30 2006

Ms. Heidi Ramseyer
41-256 Nakini Street
Waimanalo, Hawaii 96795

Dear Ms. Ramseyer:

Subject: Draft Environmental Assessment (DEA) comments
Kalanianaole Highway Improvements
Federal Aid Project No. STP-072-1(44)

Thank you for your email dated March 31, 2006, in response to the DEA for the Kalanianaole Highway Improvement project.

We appreciate your comments on the DEA and have provided the following responses:

- Community Involvement: We regret that you feel that the community was not involved in the decision making, and that the project was rushed in order to pass by the public. Seven Public Information Meetings (PIMs) were held for the project, the first one in 1999 and the last one in June 2004. The purpose of the PIMs was to receive public input, present semi-final conceptual plans, receive additional input, and prepare final conceptual plans. In addition to the PIMs, a flier was delivered door-to-door along the proposed project route and letters were sent to various agencies and organizations soliciting input prior to preparation of the DEA. Please note that the purpose of the DEA is to evaluate the social and environmental impacts that could result from the proposed highway improvements. The drawings presented in the DEA are conceptual drawings for planning purposes only. The community will have additional opportunities to comment on the proposed highway improvements during the design phases of the project. Project design is scheduled to occur in 2007 for the highway improvements in the vicinity of Olomana Golf Course, in 2007 to 2008 for Olomana Golf Course to Poalima Street, in 2009 to 2010 for Poalima Street to Aloiloi Street, and in 2013 for Aloiloi Street to Waimanalo Beach Park.

- Intention of Project: The intention of the entire project is to upgrade the highway and bring it up to current design and Americans with Disabilities Act (ADA) guidelines, and to make the highway operate more efficiently. The proposed improvements will make the highway safer and friendlier to pedestrians and other highway users, and address drainage problems along portions of the highway.

- Speeding: The proposed improvements will improve the movement of traffic by installing bus pullouts and left-turning lanes along the project route. As vehicles approach Waimanalo from Kailua, a lane taper will begin approximately 900 feet before the Old Kalanianaole Road. This will promote a reduction in travel speed, reduce the travel lanes to one lane and a driver feedback

MAY 30 2006

speed display sign will also be installed. In addition, centerline median rumble strips and raised landscaped medians will be incorporated throughout the project where space permits.

- Safety: Reconstruction of the existing concrete sidewalks on the mauka side of the highway from Kumuhau Street to Inoaole Street is proposed. This area was designated by the community as the primary route for school children. In addition to the sidewalk reconstruction, a five-foot paved asphalt shoulder and a grass path will be placed where space is available in the project area.

We will be including your comments in the Final Environmental Assessment. Again, thank you for the feedback.

If there are any questions, please contact Mr. Vincent Llorin at 692-7568, Technical Design Services Office, Design Branch, Highways Division.

Very truly yours,

BRENNON T. MORIOKA
Deputy Director-Highways

KAOHIMANU@aol.com
03/31/2006 04:17 PM

To vincent.llorin@hawaii.gov
cc
bcc
Subject Fwd: Kalanianaole Improvements???

History: This message has been forwarded.

In a message dated 3/31/2006 2:34:17 P.M. Hawaiian Standard Time, ilimz1@yahoo.com writes:
from kim lan tasaka
41-310 hihimanu streaet
waimanalo, hi 96795

i and my ohana the tasaka's do not want the improvements to kalanianaole highway.
we want to remain a small town with two lanes only.

----- Message from ILIMA HO <ilimz1@yahoo.com> on Fri, 31 Mar 2006 16:27:22 -0800 (PST) -----

To: vincent.llorin@hawaii.gov
Subject: Kalanianaole Improvements???

Aloha,

I am writing regarding the so called improvements to Kalanianaole Highway in Waimanalo. I am not sure who made these suggestions, but I am sure that the Waimanalo Community was not involved.

Are these improvements being made for the betterment of our community, or is it for all the cars speeding through on their daily commute???

Our keiki are much more important than John Doe and Joe Blow passing through, whether it be from east to west or vice versa. We, Waimanalo people aren't concerned about them. We care and take care of each other and can't be bothered with those that are merely taking the shortcut to their destination.

We don't want to be the next Farrington Highway, with our kids getting run down or drag racing at all hours.

Ours is a quite community and we like it that way. Our Kupuna take their daily Sunday drive and need not be hurried by the outsiders trying to get from point A to point B.

If they don't like the traffic, tell them to go around.

As for your plan, the draft that I got to see??? Well, actually the one that I really couldn't see... was it just a hurry up, lets set the deadline before anybody takes a good look.

Isn't it the right way to do things, by coming into the community and letting people know what you are going to do??? And yes I was at the neighborhood board meeting when Mr. Haraga paid us a visit. So, you need not wonder.

Thank God for true Waimanalo people who got the word out last night that the deadline did not pass, and that there was an extension. I hope many people take the time to write in today. So maybe you guys can do your **real** job and get over here and tell us what's going on.

Think About It!!!

Thank You,

Heidi Ramseyer
41-256 Nakini Street
Waimanalo, Hawaii 96795
808-259-8587

PS

I AM HAWAIIAN AND I VOTE!

LINDA LINGLE
GOVERNOR

RODNEY K. HARAGA
DIRECTOR

Deputy Directors
BARRY FUKUNAGA
BRENNON T. MORIOKA
BRIAN H. SEKIGUCHI

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:

HWY-DS 2.1163

MAY 30 2006

Ms. Kim Lan Tasaka
41-310 Hihimanu Street
Waimanalo, Hawaii 96795

Dear Ms. Tasaka and Family:

Subject: Draft Environmental Assessment (DEA) comments
Kalanianaole Highway Improvements, Federal Aid Project No. STP-072-1(44)

Thank you for your email dated March 31, 2006, in response to the DEA for the Kalanianaole Highway Improvement project.

We appreciate your comments on the DEA and have provided the following responses:

- No improvements: The need for improvement to Kalanianaole Highway was identified in 1980. The Waimanalo Highway Improvement Task Force was formed as a result of the briefings to the Waimanalo Neighborhood Board in 1996 and 1997. At a public meeting in September 1998, the Waimanalo Neighborhood Board informed the Hawaii Department of Transportation that the community favored improving the existing highway by providing accessible concrete sidewalks and left turning lanes in lieu of construction a by-pass road or widening the entire highway. The proposed project is in response to the community's requested improvements.

- Number of Lanes: Kalanianaole Highway will remain a two-lane highway with shelter lanes and left-turn lanes at certain intersections only. The project also includes: raised landscaped medians, bus pull-outs, reconstruction of sidewalks, Americans with Disabilities Act accessible driveways and curb ramps, a grass path, and a five-foot paved asphalt shoulder.

The community will have additional opportunities to comment on the proposed highway improvements during the design phases of the project. Project design is scheduled to occur in 2007 for the highway improvements in the vicinity of Olomana Golf Course, in 2007 to 2008 for Olomana Golf Course to Poalima Street, in 2009 to 2010 for Poalima Street to Aloiloi Street, and in 2013 for Aloiloi Street to Waimanalo Beach Park.

We will be including your comments in the Final Environmental Assessment. If there are any questions, please contact Mr. Vincent Llorin at 692-7568, Technical Design Services Office, Design Branch, Highways Division.

Very truly yours,

BRENNON T. MORIOKA
Deputy Director-Highways

"Kehaulani Padilla"
<kpadilla@hacbed.org>

03/31/2006 03:06 PM

Please respond to
<kpadilla@hacbed.org>

To <vincent.llorin@hawaii.gov>

cc

bcc

Subject Waimanalo Road Widening

History: This message has been forwarded.

Aloha,

Please do not go ahead with the road widening project on Kalanianaole Hwy. as it is set forth in the Environmental Assessment that I recently reviewed. I am opposed to its' design. Please give the residents more time to comment on the design. I have lived in Waimanalo all my life and am familiar with the driving habits of our residents and the proposed design will do more harm than good. The safety of the residents and the children will be at stake. Please go back to the community and ask for their input in creating the design. It is not fair that you go to the neighborhood board three years ago and silently come out with the EA. You must give us time to voice our opinion at an open forum such as our next neighborhood board meeting. At least give us that chance!!! I urge you to take this seriously – the lives of our residents and keiki are at risk. I can be reached at 224-9193 my cell or 259-7135 my home. Thank you, I hope you are listening.

Kehaulani Padilla
HACBED
Phone: (808) 550-2661 Ext. 23
Fax: (808) 534-1199
kpadilla@hacbed.org

LINDA LINGLE
GOVERNOR

RODNEY K. HARAGA
DIRECTOR

Deputy Directors
BARRY FUKUNAGA
BRENNON T. MORIOKA
BRIAN H. SEKIGUCHI

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:

HWY-DS 2.1164

MAY 30 2006

Ms. Kehaulani Padilla
HACBED
kpadilla@hacbed.org

Dear Ms. Padilla:

Subject: Draft Environmental Assessment (DEA) comments
Kalanianaole Highway Improvements, Federal Aid Project No. STP-072-1(44)

Thank you for your email dated March 31, 2006, in response to the DEA for the Kalanianaole Highway Improvement project.

We appreciate your comments on the DEA and have provided the following responses:

Kalanianaole Highway will remain a two-lane highway with shelter lanes and left turn lanes at certain intersections only. The project also includes: raised landscaped medians, bus pull-outs, reconstruction of sidewalks, Americans with Disabilities Act accessible driveways and curb ramps, a grass path, and a five-foot paved asphalt shoulder.

The purpose of the DEA is to evaluate the social and environmental impacts that could result from the proposed highway improvements. The drawings presented in the DEA are conceptual drawings for planning purposes only. Seven Public Information Meetings (PIMs) were held for the project, the first one in 1999 and the last one in June 2004. The purpose of the PIMs was to receive public input, present semi-final conceptual plans, receive additional input, and prepare final conceptual plans. In addition to the PIMs, a flier was delivered door-to-door along the proposed project route and letters were sent to various agencies and organizations soliciting input prior to preparation of the DEA. The community will have additional opportunities to comment on the proposed highway improvements during the design phases of the project. The project design schedule is 2007 for the highway improvements in the vicinity of Olomana Golf Course, in 2007 to 2008 for Olomana Golf Course to Poalima Street, in 2009 to 2010 for Poalima Street to Aloiloi Street, and in 2013 for Aloiloi Street to Waimanalo Beach Park.

We will be including your comments in the Final Environmental Assessment. Again, thank you for the feedback.

If there are any questions, please contact Mr. Vincent Llorin at 692-7568, Technical Design Services Office, Design Branch, Highways Division.

Very truly yours,

BRENNON T. MORIOKA
Deputy Director-Highways

State of Hawaii, Department of Transportation 03/17/06
688 Kamokila Blvd. Room 688
Kapolei, Hi. 96707

Re: Kalanianaole Hwy Improvement from Olomana to Waimanalo Beach Park

As members of the Waimanalo Neighborhood Board, we support the plan for the improvement of Kalanianaole Highway, including turning lanes on this highway.

WE DO NOT AGREE OR SUPPORT A THREE- LANED HIGHWAY.

It has been our intent to improve the roadways of our community, with sidewalks, wheel chair ramps, bike paths or bike lanes, traffic signal upgrades, utility relocation and drainage improvements.

WE ARE NOT SUPPORTING AN EXTRA LANE FOR ONGOING TRAFFIC.

We believe in controlling the traffic, to be more sensitive to each other, and hold outside community to our pace. We are aware that neighboring communities use Waimanalo, as a speed way to go to and from Kailua to Hawaii Kai. We support Waimanalo to remain as a community with a two-lane highway. Other neighboring communities must slow down and respect our need to control our highway. Getting somewhere faster, must not be an option. Waimanalo residents tend to drive differently on Kalanianaole Highway. We let each other out. We will slow down when we see children crossing. At times residents drive slower to, cause attention to other drivers wanting to go faster.

Turning Lanes are created only prior to intersections. The turning lanes should also have markers that make you slow down. This will deter speeding in this lane.

The driveways into each resident should be without obstruction such as rocks, plants, and etc. the roadway should be level. These pathways, whether it is a resident's driveway or a walkway, if merged with bike lanes, should be level, no rocks or items that will cause safety issues. Smooth pathways large enough for resident's exiting or entering their private driveways.. This construction should have consideration for residents that live on the highway. The frontage of each property should be level and smooth with enough room into their residential driveways.

The pathways for sidewalks must be leveled evenly, avoiding unforeseen hazards. As an example Kailua has a perfect roadway from Kailua Police Station intersection north on Kainalu Road. The construction included residents driveways and bike lanes from the beginning of that intersection all through out the project, including crosswalks.

The major stop lights in Waimanalo must have curbs to deter drivers from going on to the sidewalks. The drainage at these stop lights must work properly. They must be hooked up to an operational drainage system.

In regards to the Trees on Kalanianaole Hwy, they must be removed or pruned. With the heavy rains and winds this area rarely is provided with maintenance. It would be safe to clear the old shrubbery. Safety must be a priority; hazards must be addressed and immediately remedied.

We thank you for the opportunity to provide input into this process.

Solomon C Spencer Jr. 41-1378 Kuhimana Street
Mabel Ann Spencer Waimanalo, Hawaii 96795

LINDA LINGLE
GOVERNOR

RODNEY K. HARAGA
DIRECTOR

Deputy Directors
BARRY FUKUNAGA
BRENNON T. MORIOKA
BRIAN H. SEKIGUCHI

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:
HWY-DS 2.1165

MAY 26 2006

Mr. and Mrs. Solomon Spencer Jr.
41-1378 Kuhimana Street
Waimanalo, Hawaii 96795

Dear Mr. and Mrs. Spencer:

Subject: Draft Environmental Assessment (DEA) comments
Kalanianaole Highway Improvements
Federal Aid Project No. STP-072-1(44)

Thank you for your fax dated March 17, 2006, in response to the (DEA) for the Kalanianaole Highway Improvement Project.

We appreciate your comments on the DEA and have provided the following responses:

- Number of Lanes: Kalanianaole Highway will remain a two-lane highway with shelter lanes and left-turn lanes at certain intersections only. The project also includes: raised landscaped medians, bus pull-outs, reconstruction of sidewalks, Americans with Disabilities Act (ADA) accessible driveways and curb ramps, a grass path, and a five-foot paved asphalt shoulder.

- Speeding: The proposed improvements will improve the movement of traffic by installing bus pullouts and left turning lanes along the project route. To promote a reduction in travel speed as vehicles approach Waimanalo from Kailua, a lane taper will begin (approximately 900 feet before the Old Kalanianaole Road) to reduce the travel lanes to one lane, and a driver feedback speed display sign will also be installed. In addition, centerline median rumble strips and raised landscaped medians will be incorporated throughout the project where space permits.

- Other improvements: The proposed project includes the addition of the following based on available space and need: raised landscaped medians, shelter lanes, bus pull-outs, left-turn lanes, reconstruction of sidewalks, ADA accessible driveways and curb ramps, a grass path, and a paved five-foot shoulder.

The purpose of the DEA is to evaluate the social and environmental impacts that could result from the proposed highway improvements. The drawings presented in the DEA are conceptual drawings for planning purposes only. The community will have additional opportunities to comment on the proposed highway improvements during the design phases of the project. Project design is scheduled to occur in 2007 for the highway improvements in the vicinity of Olomana Golf Course, in 2007 to 2008 for Olomana Golf Course to Poalima Street, in 2009 to 2010 for Poalima Street to Aloiloi Street, and in 2013 for Aloiloi Street to Waimanalo Beach Park.

MAY 26 2006

We are including your comments in the Final Environmental Assessment. Thank you again for your comments.

If there are any questions, please contact Mr. Vincent Llorin at 692-7568, Technical Design Services Office, Design Branch, Highways Division.

Very truly yours,

BRENNON T. MORIOKA
Deputy Director-Highways

Lisa Ferentinos
<ferentinos@hawaii.rr.com>

03/31/2006 09:05 AM

To Vincent.Llorin@hawaii.gov

cc repwaters@capitol.hawaii.gov, senhemmings@capitol.hawaii.gov

bcc

Subject Waimanalo EA Comments

History: This message has been forwarded.

Dear Mr. Llorin-

Attached please find my comments on the Draft Environmental Assessment for Kalanianaole Highway Improvements in Waimanalo. Thank you for extending the public comment period until today, March 31, 2006.

Mahalo,

Lisa Ferentinos Kal Hwy Comments.doc

Lisa Ferentinos
41-041 Hinalea St.
Waimanalo, Hawai`i 96795
ph/f ax 259-5376 or cell 358-5376

March 30, 2006

Rodney Haraga, Director of Transportation
State of Hawaii, Department of Transportation
869 Punchbowl St.
Honolulu, HI 96813

Abraham Wong, Division Administrator
US Dept. Of Transportation
PO Box 50206
Honolulu, HI 96950

RE: DRAFT ENVIRONMENTAL ASSESSMENT
KALANIANAOLE HIGHWAY IMPROVEMENTS, WAIMANALO, OAHU, HAWAII

Lack of Adequate Communication with the Affected Community
It has been difficult for community members to make comments on this draft E.A. due to the fact that most of the information is contained in the maps which are very small and difficult to read (Exhibits 6 and 7). No community informational meetings were held nor mailings sent to allow the community to see the maps in a readable scale and to ask questions. Most people in Waimanalo have no information concerning the details in these plans.

Environmentally Unacceptable Discharges to Kahawai Stream
Plans show a grated inlet and 24" drain pipe discharging highway run-off directly to Kahawai Stream at the bridge north of Mekia Street. Oil slicks and sediment have been observed in the stream in water run-off from the highway. Other rubbish is also coming from the highway into the stream. This bridge is the site of a community-based stream bank restoration project. Thousands of community hours and federal funds have been put into improving the environment of the stream for the endangered water birds such as the `alae `ula that are nesting in the area. This stream leads directly into Waimanalo Bay where thousands of people come to swim and fish. The D.O.T. should install and maintain a vaulted storm drain that adequately separates oil, floating garbage, and sediment before it enters the stream.

Lack of Barriers to Using the Middle Lane for Passing Increases Danger
From Flamingo Road past Poalima St. there are no landscaped medians. The striped areas between the pocket and turn lanes will be used for passing unless there is some deterrent to doing so. The inconvenience to just a few driveways being blocked from making left turns does not justify increasing the danger to the thousands using the road everyday. All striped areas (non-turn lanes) should be converted to landscaped medians. All landscaping should be done with native plants.

Lack of Bus Turnouts at the Major Intersection at Poalima St. and Kalanianaole Highway
The refusal of D.O.T. to consider purchasing private land or to utilize other state owned lands to create bus turnouts at the main stoplight is dangerous and will continue to contribute to large traffic back ups during rush hours. Currently, some people use the left turn lane into the shopping center as a way to pass buses stopped in the middle of the highway to pick up passengers in front of the Jack in the Box and the Seven Eleven. If they don't, it creates a long line of traffic through town because the backed up cars can't all make it through on the green light. The bus stop on the makai side of the road could be moved north to state land where there is room for a turn out. On the mauka side, a small amount of unutilized land could be purchased from Kuni's Auto Repair shop to create a bus turnout. Refusing to do so is short sighted.

No Sidewalks on Makai Side Between Saddle City Road and the Stoplight at Poalima
Many children walk to school from Weinberg Village. The map shows only a asphalt shoulder on the makai side instead of sidewalk. A sidewalk should lead from the existing sidewalk at the corner of Saddle City Road at least to the corner at Poalima where children can safely cross the highway at the stoplight.

Alignment of Poalima Street with Shopping Center Entrance
Although a small adjustment has been made at the corner of Poalima Street, the lanes are still not lined up which creates a dangerous situation when cars are turning left from Poalima onto the highway a the same time as cars are turning left out of the shopping center. Either the shopping center entrance or Poalima St. should be shifted over so that the lanes line up.

Width of Lanes
With the addition of the asphalt shoulder, it will become more difficult for seniors and children to safely cross the highway. Especially in the area from Aloiloi St. to Waimanalo Beach Park, there are many people crossing with no stoplights. The lanes in this area should not be widened even though the right of way allows it because it will make it even harder to cross safely and it will encourage speeding. Studies have shown that the wider the lane, the faster the cars will go.

More Turn Lanes from Puuone St to Wailea St.
Due to the many businesses and post office in this area, there needs to be a turn lane into and out of Puuone St. and from the highway into the parking lot areas. This is very congested area where a pedestrian was killed not long ago. Also, the landscaped median in front of the Seven Eleven appears to block one of the driveways into their parking lot. That is also a very heavily congested area especially during the early morning rush hour and on weekends.

Bury all Power Lines
This is the perfect opportunity to bury all the power lines along the highway for safety and aesthetic reasons. Millions of tourists drive through here every year. The power lines are a mess. This area is prone to high winds and power outages.

Thank you for this opportunity to comment.
(Signed)
Lisa Ferentinos

LINDA LINGLE
GOVERNOR

RODNEY K. HARAGA
DIRECTOR

Deputy Directors
BARRY FUKUNAGA
BRENNON T. MORIOKA
BRIAN H. SEKIGUCHI

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:

HWY-DS 2.1180

MAY 31 2006

Ms. Lisa Ferentinos
41-041 Hinalea Street
Waimanalo, Hawaii 96795

Dear Ms. Ferentinos:

Subject: Draft Environmental Assessment (DEA) comments
Kalanianaole Highway Improvements
Federal Aid Project No. STP-072-1(44)

Thank you for your letter dated March 30, 2006, in response to the DEA for the Kalanianaole Highway Improvements Project.

We appreciate your comments on the DEA and have provided the following responses:

- Community Involvement: The purpose of the DEA is to evaluate the social and environmental impacts that could result from the proposed highway improvements. The drawings presented in the DEA are conceptual drawings for planning purposes only. Seven Public Information Meetings (PIMs) were held for the project, the first one in 1999 and the last one in June 2004. The purpose of the PIMs was to receive public input, present semi-final conceptual plans, receive additional input, and prepare final conceptual plans. In addition to the PIMs, a flier was delivered door-to-door along the proposed project route and letters were sent to various agencies and organizations soliciting input prior to preparation of the DEA. The community will have additional opportunities to comment on the proposed highway improvements during the design phases of the project. Project design is scheduled to occur in 2007 for the highway improvements in the vicinity of Olomana Golf Course, in 2007 to 2008 for Olomana Golf Course to Poalima Street, in 2009 to 2010 for Poalima Street to Aloiloi Street, and in 2013 for Aloiloi Street to Waimanalo Beach Park.

- Discharge to Kahawai Stream: We appreciate your comment concerning the storm drain discharging to Kahawai Stream. Again, the drawings presented in the DEA are conceptual drawing for planning purposes only. Installation of a vaulted storm drain will be considered during the project design.

- Barriers for Middle Lane: Raised/landscaped medians are being added as space allows in the project area. The conceptual plans have already specified that native landscape materials will be used, see Draft Environmental Assessment, Section 4.0 Potential Environmental Impacts and Mitigation Measures, Subsection 4.6.1 Flora.

MAY 31 2006

- Bus Turnout at Poalima Street: The conceptual drawings do not show a bus turnout at the Poalima Street and Kalaianaole Highway intersection due to insufficient space; however, as part of the project design, we will consider moving the bus stops. Please note that the community will have additional opportunities to comment during the project design phase, which is scheduled to occur in 2007 to 2008.

- Sidewalks: The proposed project improvements include the reconstruction of the existing concrete sidewalk on the mauka side of the highway from Kumuhau Street to Inoaole Streeet to comply with current Americans with Disabilities Act guidelines. In addition, remaining areas along Kalanianaole Highway that do not have a concrete sidewalk will have a paved asphalt shoulder.

- Alignment of Poalima Street: At this time, the conceptual drawings do not show Poalima Street lining up with the Shopping Center Entrance. Your comment will be considered as part of the project design phase.

- Width of Lanes from Aloiloi Street to Waimanalo Beach Park: As shown in the conceptual drawings, the lanes are not planned to be widened. During the PIMs, it was the community's suggestion to have paved shoulders for bikes. Again, the drawings shown in the DEA are conceptual drawings for planning purposes only. The design phase for this portion of the project is scheduled to occur in 2013.

- More Turn Lanes from Puuone Street to Wailea Street: A turning lane for Puuone Street and Wailea Street was not included as part of the original scope of the project; however, during the project design phase, we will look at alternatives. The design phase for this portion of the project is scheduled to occur in 2013.

- Bury the Power Lines: The project does not have sufficient funds to provide underground power lines at this time.

We will include your comments in the Final Environmental Assessment and thank you for your feedback.

If there are any questions, please contact Mr. Vincent Llorin at 692-7568, Technical Design Services Office, Design Branch, Highways Division.

Very truly yours,

BRENNON T. MORIOKA
Deputy Director-Highways

LINDA LINGLE
GOVERNOR

RODNEY K. HARAGA
DIRECTOR

Deputy Directors
BARRY FUKUNAGA
BRENNON T. MORIOKA
BRIAN H. SEKIGUCHI

IN REPLY REFER TO:
HWY DS 2.0713

April 17, 2006

The Honorable Tommy Waters
51st Representative District
Twenty-third State Legislature
State Capitol, Room 426
Honolulu, Hawaii 96813

Dear Representative Waters:

Subject: Kalanianaole Highway Improvements
Olomana Golf Course to Waimanalo Beach Park
Federal-Aid Project No. STP-072-1(44)

We request you or your representative's attendance at a meeting on the subject project. We would like to present the proposed improvements to elected officials and Department of Education officials within the project area and solicit your support for the project. The meeting is scheduled for Monday, May 1, 2006, at 10:30 a.m., 5th Floor Conference Room, Department of Transportation (DOT); Aliiaimoku Building; 869 Punchbowl Street; Honolulu, Hawaii 96813.

Also attending from the DOT are:
Rodney K. Haraga, Director
Brennon T. Morioka, Deputy Director
Glenn M. Yasui, Administrator, Highways Division
DOT consultants: Akinaka and Associates, Inc. and Mountain Edge Environmental, Inc.

Please confirm your attendance by e-mail to vincent.llorin@hawaii.gov.

If there are any questions, please contact Mr. Vincent Llorin at 692-7568, Technical Design Services Office, Design Branch, Highways Division.

Very truly yours,

BRENNON T. MORIOKA
Deputy Director-Highways

Same letter also sent to:

LOUISE P. WOLCOTT, ED. D.
COMPLEX AREA SUPERINTENDENT KAILUA/KALAHEO
WINDWARD OAHU DISTRICT OFFICE
46-169 Kamehameha Highway
Kaneohe, Hawaii 96744

SUSAN HUMMEL, PRINCIPAL
WAIMANALO ELEMENTARY AND INTERMEDIATE SCHOOL
41-1330 Kalanianaole Highway
Waimanalo, Hawaii 96795

OFELIA CARAG, PRINCIPAL
BLANCHE POPE ELEMENTARY SCHOOL
41-133 Huli Street
Waimanalo, Hawaii 96795

Legislators:
The Honorable Tommy Waters
51st Representative District
Twenty-third State Legislature
State Capitol, Room 426
Honolulu, Hawaii 96813

The Honorable Fred Hemmings
25th Senatorial District
Twenty-third State Legislature
State Capitol, Room 221
Honolulu, Hawaii 96813

Wilson Kekoa Ho, Chair
Waimanalo Neighborhood Board
41-696 Kalanianaole Highway
Waimanalo, Hawaii 96795

The Honorable Barbara Marshall
Councilmember, District 3
Chair, Committee on Zoning
City and County of Honolulu
Honolulu Hale
Honolulu, Hawaii 96813

bc: HWY-DS (VL) ,HWY, DEP-HY, DIR

VL/asf

Sign-in Sheet

Project: Kalanianaole Highway Improvements, Olomana Golf Course to Waimanalo Beach Park
Fed.-Aid Project No. STP-072-1(44)
Date: May 1, 2006 (Mon.)
Time: 10:30 am
Place: 5th Floor Conference Room, 869 Punchbowl St. (HDOT Bldg.)

Name	Office	Phone	e-mail address
Rod Haraga	HDOT Director	587-2150	rodney.haraga@hawaii.gov
Brennon Morioka	HDOT Deputy Director	587-2156	brennon.morioka@hawaii.gov
	HWY Administrator	587-2220	glenn.yasui@hawaii.gov
Vincent Llorin	HDOT Project Manager	692-7568	vincent.llorin@hawaii.gov
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APPENDIX B

Comments on the Draft EA and Response to Comments

ADVANCE PLANNING REPORT

FOR

KALANIANAOLE HIGHWAY IMPROVEMENTS

FEDERAL AID PROJECT NO. STP-072-1(44)

TAX MAP KEY: 4-1-03 through 09,12,13,15,16,18,19,20,21,22,28,33,34

PREPARED FOR:

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I. INTRODUCTION

A. Purpose and Project Scope

The objective of this project is to develop engineering concepts to improve Kalanianaole Highway from Olomana Golf Course to Waimanalo Beach Park. This study considers traffic operations, right-of-way, environmental impact, construction and cost to improve ADA accessibility, safety, usability, and highway operations within the described limits.

The scope of this advance planning project is to develop a conceptual engineering design which implements safety, roadway improvements and usability for Kalanianaole Highway from Olomana Golf Course to the east end of Waimanalo Beach Park. The conceptual engineering design will also incorporate community requested improvements compiled by the former Representative Goodenow.

In addition, the scope included the conducting of six Public Informational Meetings (PIMs) to obtain additional community comments and to obtain community “buy-in” of the proposed improvements.

The scope also included a traffic count survey, analysis of the existing traffic conditions, analysis of the proposed improvements under the projected usage, identification of the impacts as a result of the proposed improvements, and recommendations to the roadway improvements to mitigate the identified traffic impacts.

A traffic study will be performed and a report generated to present the findings and proposed improvements. The proposed improvements will be evaluated for use in the conceptual engineering design.

Recommendations to improve the drainage condition will also be provided.

An Environmental Assessment (E.A.) will be prepared and will conform to the requirements of 23 CFR Part 771, Hawaii Revised Statutes Chapter 343, Hawaii Administrative Rules Title 11, Chapter 200.

B. History

In 1980, the State Highways Division (HDOT) identified the need for an improved highway to be constructed in the Waimanalo area to accommodate future traffic growth. Alternative highway alignments were examined and were later presented to interested community

members and the Waimanalo Neighborhood Board in 1996 and 1997. As a result of these briefings, a Waimanalo Highway Improvement Task Force was formed. In a 1997 presentation to the community, residents did not support widening the existing highway from 2-lanes to 4-lanes because private land would be condemned and it would lead to speeding and more traffic accidents.

In a public meeting in September 1998, the Waimanalo Neighborhood Board informed HDOT that the community favored improving the existing highway by providing sidewalks and left turning lanes in lieu of constructing a bypass road and widening the entire highway. The Board also informed HDOT that they favored improvements to the highway over widening or constructing a by-pass.

In 1999, the former Representative Goodenow solicited recommendations and comments related to highway improvements from the Waimanalo community. A prioritized tabulation of these comments were given to HDOT in 2000, which in turn was used to develop the scope of work for this planning study. The majority of the comments related to enhancing highway operations by providing left turning lanes, moving bus stops off the travel-way, and improving the roadway shoulders and sidewalks to make it safer and ADA accessible.

Two Public Informational Meetings (PIM) were held on July 25, 2001 and August 29, 2001 to present design concepts based on the community requested improvements compiled earlier. In these PIMs, the stakeholders provided more specific information on problem areas that HDOT incorporated into the conceptual plans.

Since considerable discussions concerning horse paths and crossings occurred in the two earlier PIMs, on October 11, 2001, HDOT conducted another public meeting specifically for stakeholders with equestrian interests. In this meeting, high horse traffic areas were identified and incorporated into the plan. HDOT felt that since equestrian activities are part of the Waimanalo culture, it was important to incorporate it into this planning study.

On June 25, 2002, the fourth PIM was conducted to show the semi-final conceptual plans and layouts. Since several stakeholders felt that the community was not adequately notified, HDOT conducted another PIM on July 9, 2002. In this meeting, several community members asked if a by-pass road similar to Haleiwa could be considered in addition to the proposed Kalanianaole Highway improvements.

The fifth PIM was held on November 26, 2002 to update the community of the project status. The meeting reviewed the comments received

from the past PIM's and presented the latest conceptual plan and layout. Renderings of several locations along the project were presented to illustrate the design intent. Preliminary costs were also presented based on alternate designs. The community was updated on the upcoming schedule and was informed that the Environmental Assessment was about to begin.

On June 30, 2004, a sixth and final PIM was conducted. The Director of Transportation updated the community on the status of the project and the final conceptual plans and layout was presented. The community was informed that although the plans were final, it was still in a conceptual stage and that the design process would provide opportunities to work out detailed issues.

C. Other Projects

Inoaole Stream Bridge Replacement. The stream crossing structure at Inoaole Stream will be replaced by HDOT. The estimated construction start for this project is FY 2011-2012.

II. EXISTING CONDITIONS

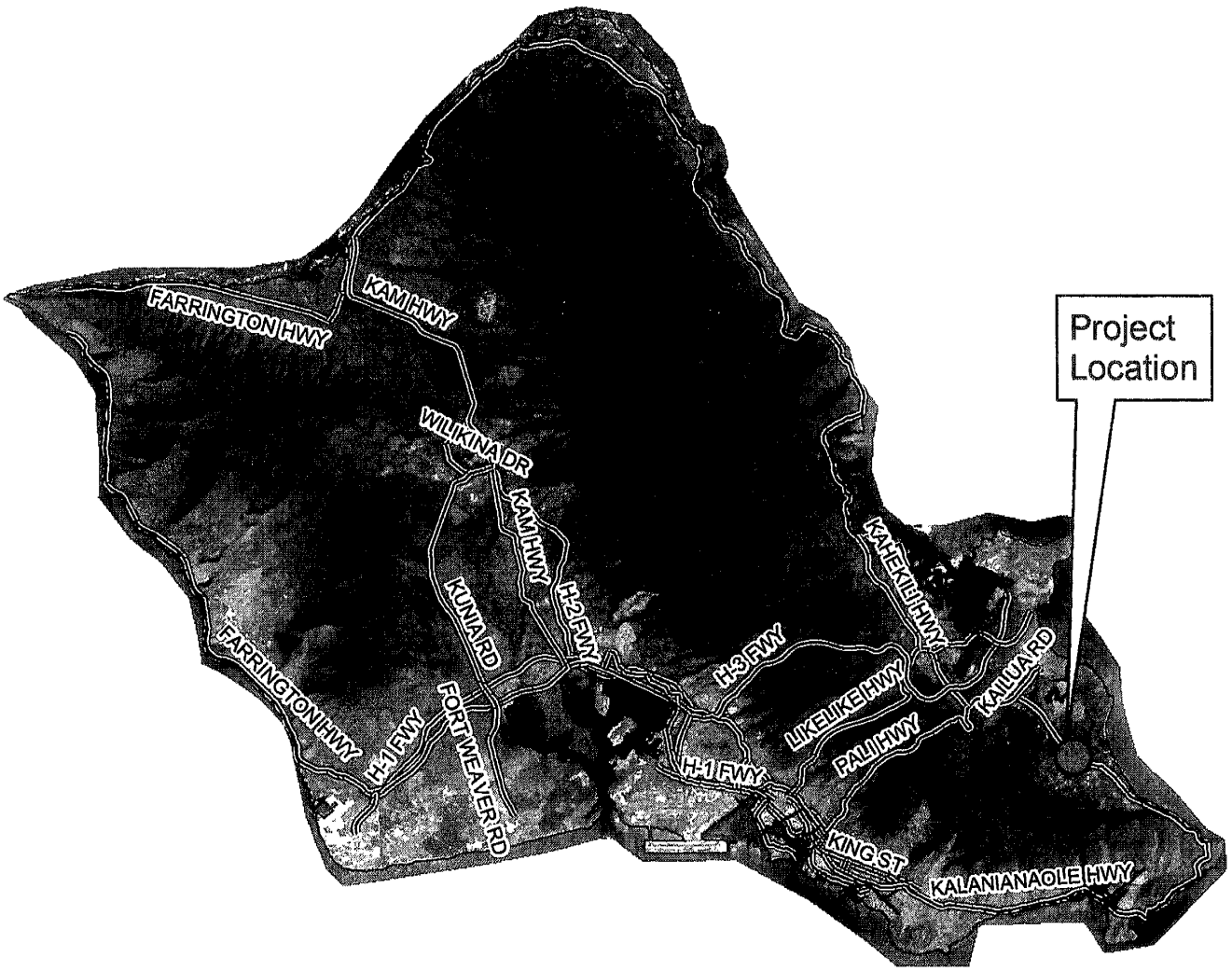
A. Project Location

The project is located on the windward side on the island of Oahu (see **EXHIBIT 1 – ISLAND MAP**)

The project begins at the Old Kalanianaole Road intersection and ends at the east entrance to the Waimanalo Beach Park (see **EXHIBIT 2 – LOCATION MAP).**

B. Existing Highway Facility

Kalanianaole Highway is the only major facility passing through the Waimanalo District and consequently is a heavily traveled route. Commuter traffic between Hawaii Kai and Kailua occurs on a regular basis and acute traffic circulation problems usually develop during weekends and holidays due to the popular local beach areas. Concerns about the safety of children walking to and from the nearby schools were raised during the Public Informational Meetings. Many sections of existing sidewalks and narrow unimproved walkways are not in compliance with current ADA guidelines.



0 0.5 1 2 3 4 5 6 7 8 9 10 11 12 Miles

Exhibit 1
Island Map

Kalanianaole Highway Improvements
Waimanalo Beach Park to Olomana Golf Course
Federal Job No. STP-072-1(41)
Scale: As Shown Date: October 15, 2002

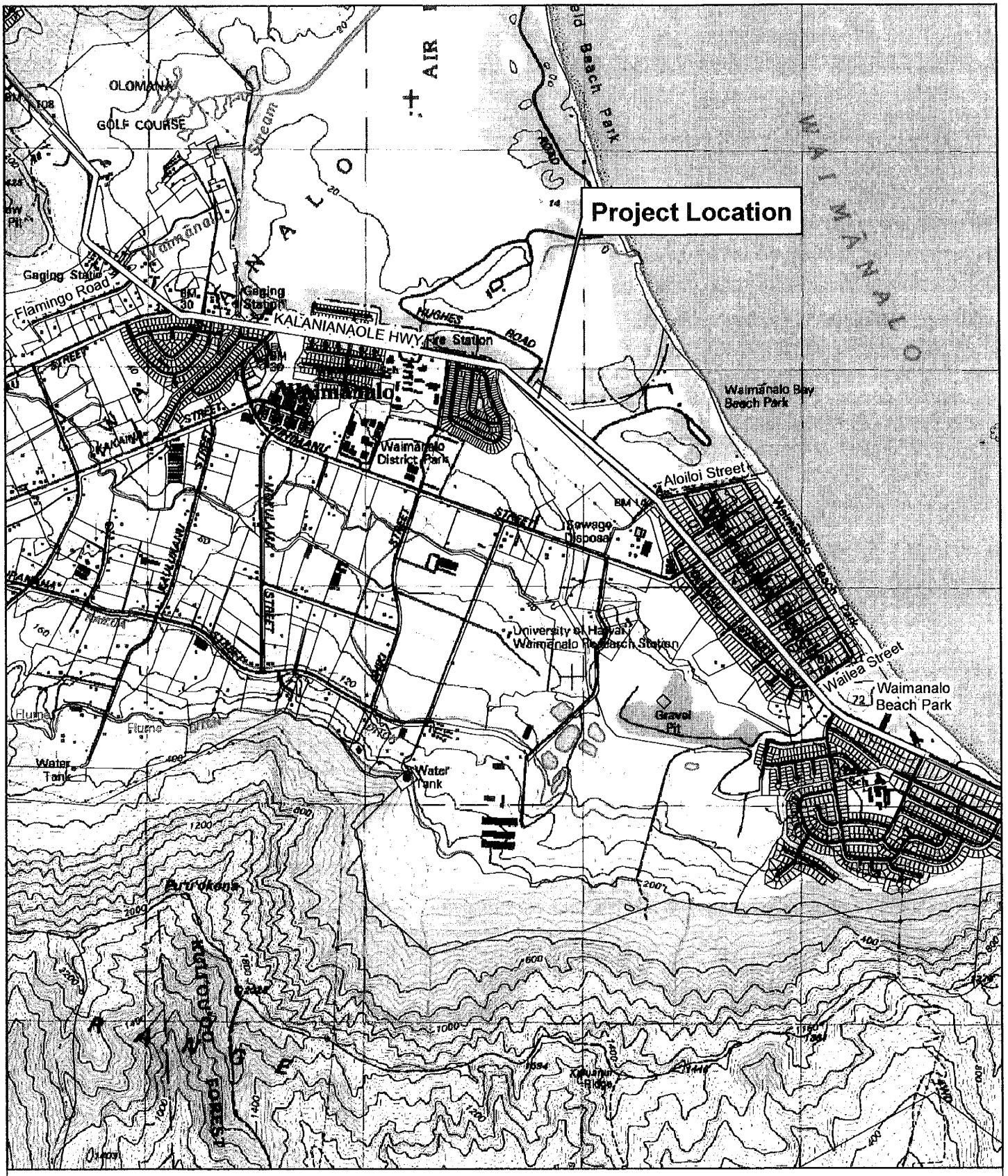


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Exhibit 2
Location Map

Kalanianaole Highway Improvements
Waimanalo Beach Park to Olomana Golf Course
Federal Job No. STP-072-1(41)
Scale: As Shown Date: October 15, 2002

C. Land Use and Ownership along Highway

The variation in land use along the project consists of residential, business, educational and community facilities. Larger land use includes the Olomana Golf Course, the Waimanalo Town Center, the Waimanalo Elementary and Intermediate School, the Bellows Landing Field, the Honolulu Polo Club, and the Waimanalo Beach Park.

Ownership along the project limits besides private landowners include the State of Hawaii, the City & County of Honolulu, the State of Hawaii's Department of Education, the Department of Hawaiian Home Lands and the U.S. Air Force.

The zoning and development plan classification along the project limits are shown on **EXHIBIT 3 – ZONING MAP** and **EXHIBIT 4 – DEVELOPMENT PLAN**.

D. Right-of-Way

The Right-of-way widths along the project vary from 50-feet to 100-feet.

LOCATION	RIGHT-OF-WAY WIDTH
Flamingo Road to Aloiloi Street	50-feet
Aloiloi Street to Wailea Street	100-feet
Wailea Street to Waimanalo Beach Park	80-feet

The existing Right-of-way is completely used within the 50-foot width. However, the 80- and 100-foot widths are not being fully utilized.

E. Soils

The Soils Conservations Soil Survey map of the island identified twelve soil types of varying properties. **APPENDIX A – SOIL TYPES**, lists all twelve-soil types along with its soil characteristics.

F. Flood Hazard Areas

The Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (FIRM), shows that a portion of the project resides within the special flood area subject to flooding during a 100-year flood (Zones A and AE). See **EXHIBIT 5 – FLOOD ZONE MAP**.

The Tsunami Evacuation Zone Map identifies the majority of the Makai area between the main gate of Bellows field and the Waimanalo Beach Park to border the evacuation zone.

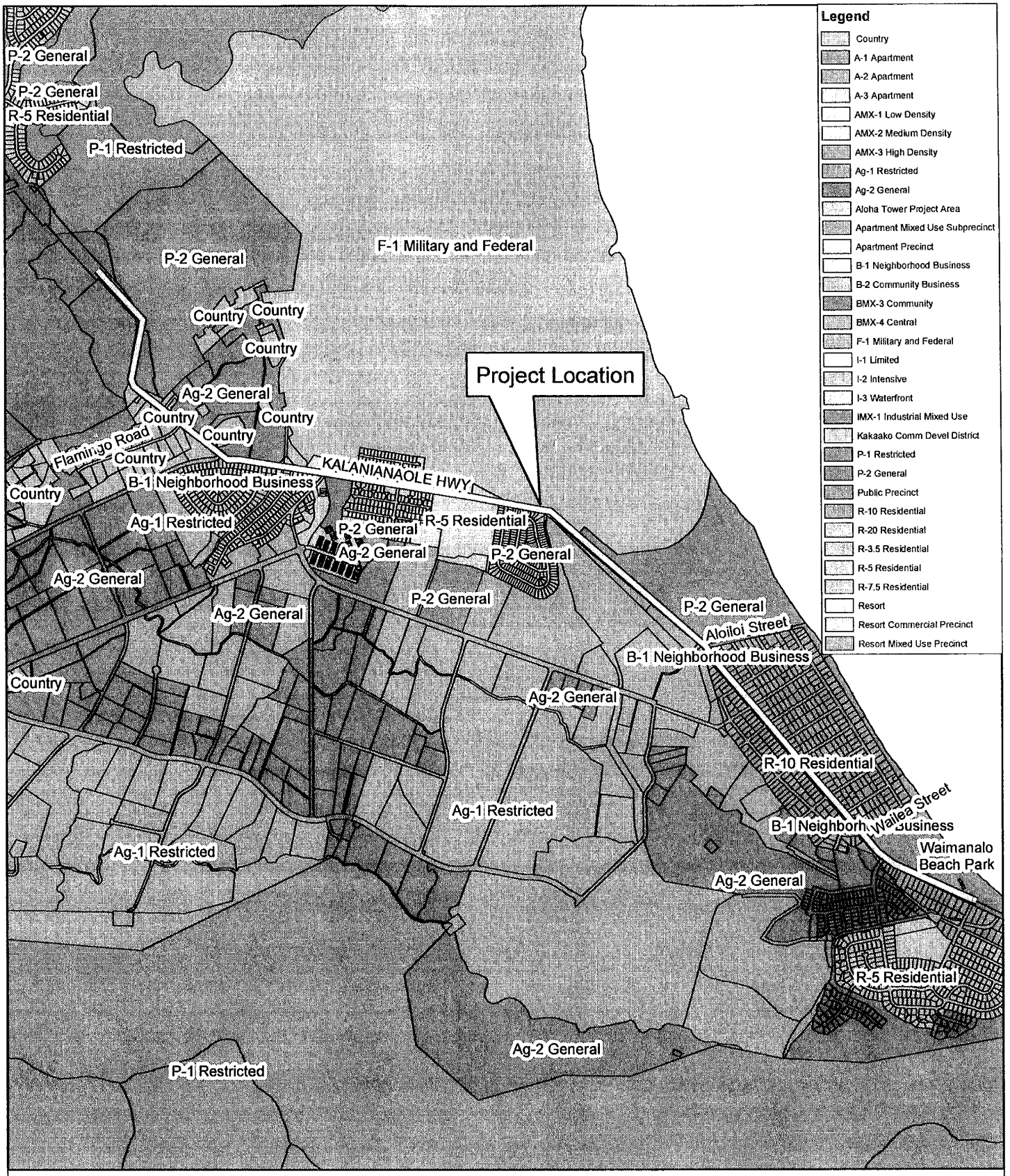
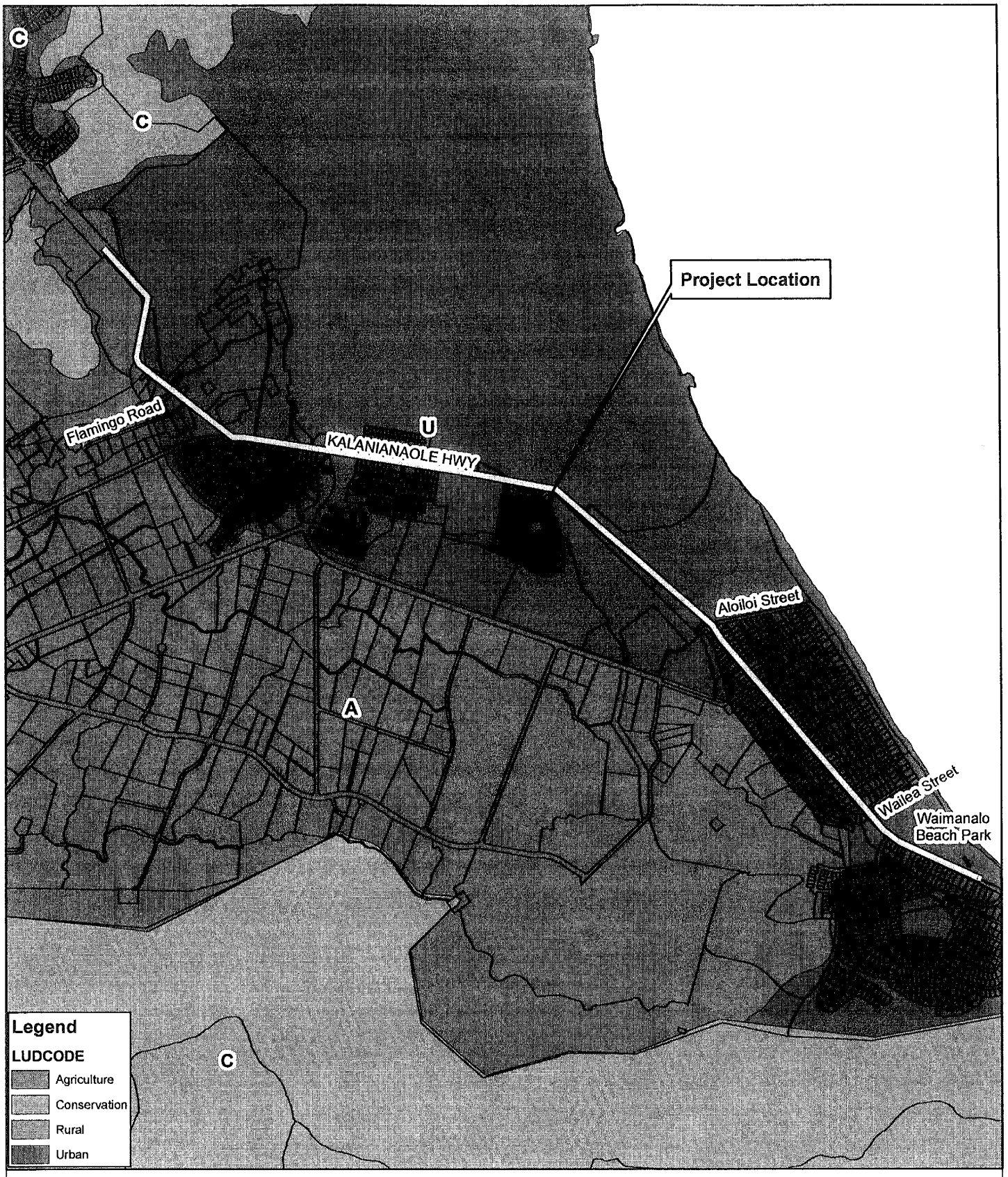


Exhibit 3
Zoning Map

Kalanianaole Highway Improvements
Waimanalo Beach Park to Olomana Golf Course
Federal Job No. STP-072-1(41)
Scale: As Shown Date: October 15, 2002



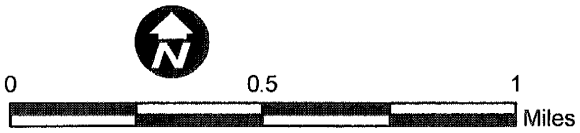
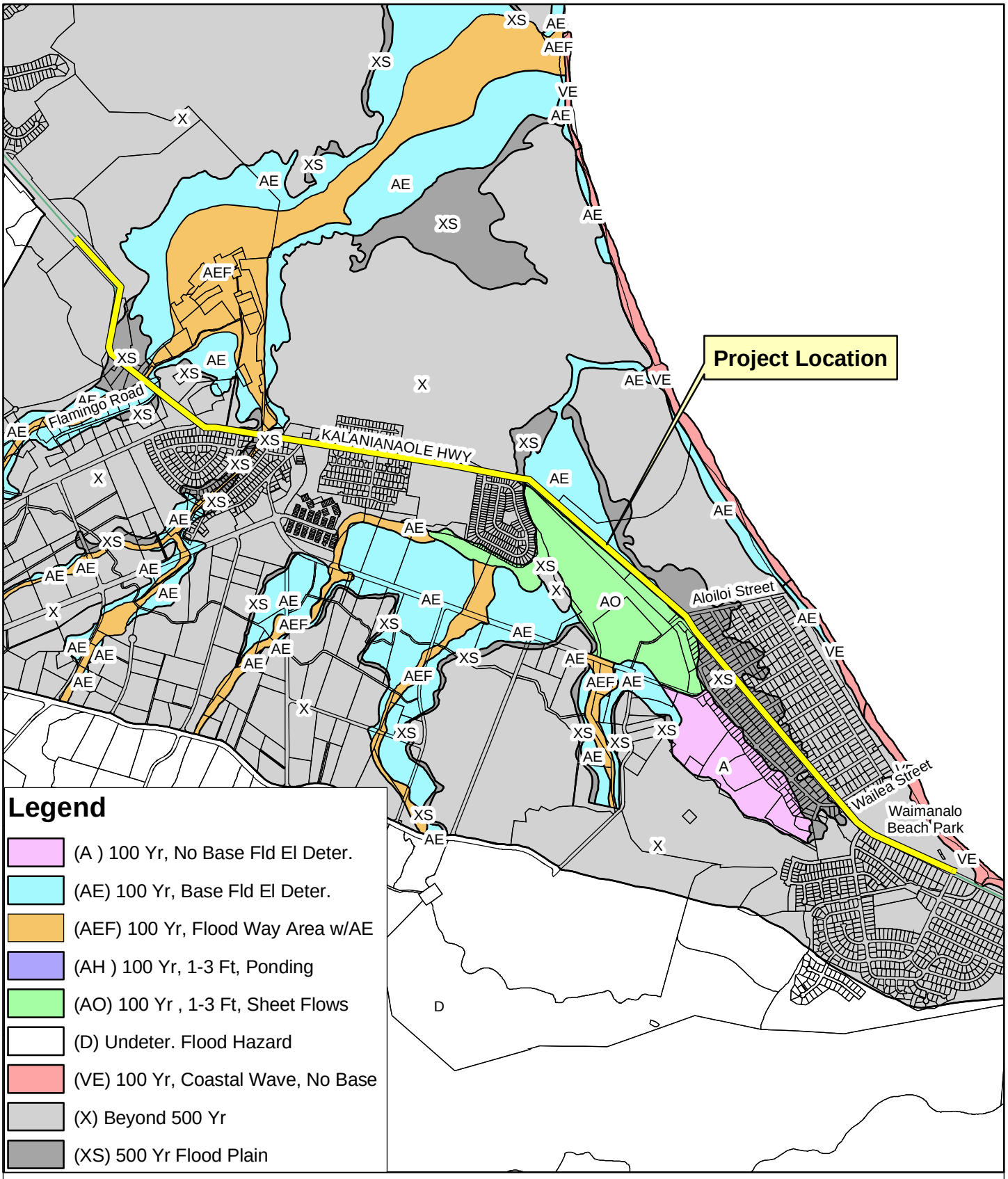


Exhibit 4
Development Plan

Kalanianaole Highway Improvements
Waimanalo Beach Park to Olomana Golf Course
Federal Job No. STP-072-1(41)
Scale: As Shown Date: October 15, 2002



0 0.5 1 Miles

Exhibit 5
Flood Zone Map

Kalanianaole Highway Improvements
Waimanalo Beach Park to Olomana Golf Course
Federal Job No. STP-072-1(41)
Scale: As Shown Date: October 15, 2002

G. Wetlands

According to the Army Corp of Engineers, the area Mauka of the Inoaole Bridge is considered to be a wetland.

H. Special Management Areas

A large portion of the project borders the Special Management Area (SMA). The project may be exempt from obtaining an SMA permit if the proposed project remains completely within public right-of-way and is not considered to be a “development”. However, if the project extends beyond the right-of-way, an SMA permit would be required. For the land acquisition at the corner of Poalima Street, this area does not border the SMA and will not require an SMA permit.

I. Utilities

Existing utilities included within the project limits include a 36-inch water main, a 15-inch sewer main, and drain lines of varying sizes. Overhead electrical and telephone lines are hung from utility poles on both sides of the road. Highway streetlights are also mounted on some of the utility poles. Two intersections along Kalanianaole Highway are signalized, Poalima and Moole Street.

Water and sewer manhole and valve covers will be adjusted as needed to the new finish grade. Existing power poles will be relocated to accommodate the new roadway configuration.

Existing electric, telephone and cable television distribution systems along the highway are provided with wood utility poles and overhead distribution wires.

J. Drainage

Several drainage systems are present along Kalanianaole Highway. These systems were installed as part of the subdivision improvements.

The Waimanalo Core Development project installed drainage systems at Kumuhau, Humuniki, and Mekia Street. The discharge point for Kumuhau Street is an 18-inch outlet pipe on the Makai-side of Kalanianaole Highway. The discharge point for Humuniki (30-inch pipe) and Mekia Street (18-inch pipe) is the Kahawai Stream. The systems were designed for a 10-year storm.

The Waimanalo Village project installed a drainage system at the Moole Street intersection. A grated inlet is connected to an 8-inch pipe that

traverses Makai towards a drain manhole in the intersection (topographic survey did not find the manhole cover). The 8-inch pipe then continues into the subdivision.

The Inoaole Subdivision installed a drainage system within the subdivision. No drainage structures were constructed along Kalanianaole Highway at the Inoaole Street intersection. However, a concrete thru gutter was installed to allow street runoff from the highway to by-pass the subdivision. Throughout the years as the highway has been resurfaced, the pavement elevation has increased which has created a steeper transition into the thru gutter. The steeper transition forces vehicles to a reduced speed to prevent “bottoming-out”. It is recommended that the pavement grade along Kalanianaole Highway be reduced to its original elevation to prevent the “bottoming-out” condition.

The Waimanalo Beach Lots (Makai-side - Aloiloi Street to Wailea Street) shows several drainage structures at Aloiloi and Wailea Street. The discharge location has not been determined but is assumed to be within the subdivision and not along Kalanianaole Highway.

Presently, the existing condition of the deteriorated road and shoulders has created ponding problems along Kalanianaole Highway. This report has made recommendations to provide a temporary solution to eliminate the ponding in several areas. A comprehensive drainage study is recommended to assure that the improved roadway complies to current drainage standards.

K. Highway Lights

Existing highway lights are generally mounted on wood utility poles with metal bracket arms and luminaries. Some areas have existing highway light bracket arms with luminaires mounted on metal utility poles.

III. NEED

Certain elements of Kalanianaole Highway do not meet current highway design criteria and ADA guidelines. Improving the highway will make the highway operate more efficiently and also make it friendlier for the bicyclists, pedestrians, and equestrians.

The lack of turning lanes at key intersections causes queuing when vehicles attempt to make left turning movements onto side streets. Many of the bus stops require buses to stop in the travel-way which contributes to traffic delays. It has been reported by community members that impatient drivers cross the

double yellow center stripe to pass the stopped buses, and also drivers attempt to pass the buses along the roadway shoulders.

Sections of existing concrete sidewalks do not meet current ADA guidelines and are not wheelchair and pedestrian friendly. Similarly, existing shoulders are narrow in many locations which causes wheelchair and pedestrian traffic to move close to the travel-way, thus causing potential conflicts which results in undesirable conditions.

Several areas have drainage problems that result in ponding of storm runoff that is not only unsightly but may cause vector control concerns if left un-addressed.

IV. TRAFFIC STUDIES

A traffic study was prepared by The Traffic Management Consultant (see **APPENDIX B – TRAFFIC ENGINEERING REPORT**).

The report confirmed that the morning and afternoon peak hour traffic produced unsatisfactory conditions for vehicles exiting side streets onto Kalanianaole Highway.

Through traffic for vehicles on Kalanianaole Highway also experienced delayed travel times during the peak hours. Vehicles trying to make left turns into the side streets and buses stopping at the bus stops block the through travel lane and prevent vehicles from continuing through. In some instances, through vehicles pass the turning vehicles or buses by driving on the unpaved shoulders or cross the double solid line.

With the proposed improvements, the traffic study showed that the turning movements out of the side streets and the vehicle travel time for through traffic will improve considerably.

Although not specifically mentioned in the report, it is highly anticipated that the improvements will produce a favorable condition for motorists, pedestrians, and other users traveling along the Highway. Vehicles turning onto Kalanianaole Highway will have a refuge lane on the highway to merge into the through traffic. Where available, buses will be able to move out of the travel lane into bus pull-outs and will allow the through traffic to continue on. Pedestrians will also benefit by using the ADA accessible walkways. Other users such as equestrian riders will have a grass strip (where available) to use.

A traffic study addendum was also prepared by The Traffic Management Consultant (see **APPENDIX C – TRAFFIC ENGINEERING REPORT ADDENDUM**).

The addendum report studied three intersections and provided recommendations and conclusions for each intersection.

Olomana Golf Course Driveway Intersection
Provide a left turn pocket lane to turn into the golf course driveway. An exclusive right turn lane into the golf course driveway is not recommended.

Kumuhau Street Intersection
A signalized intersection is not recommended at this time.

Moole Street Intersection
A signalized intersection is not recommended at this time.

Several traffic safety analyses were performed as part of the Highway Safety Improvement Program (HSIP) under Title 23, United States Code, Section 152. The analyses can be found in **APPENDIX D – HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP).**

V. DESIGN CRITERIA

A. Design Considerations

Highway Functional Classification – Major Arterial
Posted Speed Limit – Varies from 25 to 45 mph
Design Speed – Varies from 35 to 55 mph (10 mph above the posted speed limit)

B. Storage Lane Length

The length of the storage lane was provided by the traffic study. This ‘exclusive left-turn lane’ would provide storage for vehicles turning left into the side street and would reduce the delay to the through traffic on Kalanianaole Highway. The design should consider the deceleration length when space is available.

C. Lane Width

Lane widths for through lanes are typically eleven-feet (fourteen-feet travel lanes from Ehukai Street to Nakini Street due to the larger right-of-way width). Left turn pockets and shared use lanes are ten-feet.

The lane widths are constrained by the available right-of-way widths and the desired shoulder improvements.

D. Shoulder Widths

Again, widths are constrained by the available right-of-way widths and the desired shoulder improvements.

Asphalt Concrete (AC) shoulders has a minimum width of five-feet. In addition to the AC shoulder, an unpaved shoulder adjacent to the AC shoulder will allow vehicles to safely pull-off of the travel-way under emergency situations.

During community meetings, a grassed path was requested. The locations for the path (three-feet wide from Flamingo Road to Saddle City Street and six-feet wide from Aloiloi Street to Waimanalo Beach Park) were identified by the community and are not continuous throughout the project. Continuity throughout the project was not requested as the grassed path was only needed where the community felt it would best serve the equestrians normal travel pattern.

E. Concrete Sidewalk Width

The sidewalk width utilizes the available width to provide an ADA accessible route and a smooth driveway transition. Current ADA guidelines require a three-foot minimum width, provided a five-foot wide section is provided every 250 feet. A five-foot minimum width is recommended for continuous sidewalks. In this project, a five-foot minimum width is provided.

Between Kumuhau and Poalima Street, a wider sidewalk is recommended due to the existing driveways to residential homes along this area. The wider sidewalk aids drivers exiting the driveways by providing additional space to view oncoming traffic and meeting ADA guidelines.

From Poalima to Inoaole Street, the sidewalk width can be narrower since no driveways are present. However, the sidewalk must be wide enough to be ADA accessible.

F. Electric, Telephone and Cable Television System.

1. The electric utility system relocation work shall comply with the requirements of Hawaiian Electric Company.

2. The telephone utility system relocation work shall comply with the requirements of Hawaiian Telcom.

3. The cable television system relocation work shall comply with the requirements of Time Warner Oceanic Cable Company.

G. Highway Lights (see **APPENDIX E – HIGHWAY ILLUMINATION CALCULATIONS**)

1. The new highway lighting system shall comply with the following design criteria:

   a) Roadway Classification shall be Major / Residential
   b) Average minimum maintained footcandle level shall be 0.8 fc.
   c) Average to Minimum Uniformity ratio shall be 3:1.

H. Design References and Guidelines:

1. State of Hawaii's Department of Transportation Statewide Uniform Design Manual for Streets and Highways.
2. American Association of State Highway and Transportation Officials (AASHTO), 2001.
3. Roadside Design Guide, American Association of State Highway and Transportation Officials (AASHTO), 2002 Edition
4. ADAAG Manual a guide to the Americans with Disabilities Act Accessibility Guidelines, 2002
5. Manual on Uniform Traffic Control Devices (MUTCD), Federal Highways Administration (FHWA), 2003
6. Design Criteria for Highway Drainage, State of Hawaii's Department of Transportation Highways Division, updated 2001
7. Highway Capacity Manual, Special Report 209, Transportation Research Board, 2000 Edition
8. Highway Capacity Software, Federal Highways Administration, release 2001.
9. An Informational Guide for Roadway Lighting (AASHTO), 2005
10. AASHTO's Guide for the Development of Bicycle Facilities, 3rd Edition 1999

VI. <u>RECOMMENDED IMPROVEMENTS</u> (See **EXHIBIT 6 – ROADWAY PLAN** and **EXHIBIT 7 – ROADWAY ELECTRICAL PLAN**)

A. Left Turning Lanes

As indicated in the Traffic Study, the dedicated left turning lanes at Flamingo Road, Kumuhau Street, Humuniki Street, Mekia Street, Moole Street (both directions), Inoaole Street, and Aloiloi Street will improve the through traffic along Kalanianaole Highway.

In addition to improving the through traffic's travel time, the left turning lane provides for a favorable condition. The existing condition results in vehicles using the shoulder to avoid waiting behind vehicles attempting to make a left turn.

B. Shelter Lanes

Shelter lanes are provided for left turning vehicles entering Kalanianaole Highway from side streets to make it easier for those drivers and to help improve traffic flow along Kalanianaole Highway.

C. Bus Pullouts

Where space is available, Bus Pullouts are recommended to alleviate queuing and improve traffic flow.

In addition to improving traffic flow, the Bus Pullout provides for a favorable condition. The existing condition results in vehicles going around the bus at the bus stop by crossing the double yellow solid pavement markings to avoid waiting behind the bus while the bus is loading/unloading. Residents have reported that vehicles sometimes drive along the shoulders of the roadway to pass buses.

All Bus Pullouts will be made ADA accessible by providing an 8'x5' concrete landing pad where wheel chair users will board /depart the buses that have the accessible lift built into the bus.

D. Sidewalks and Shared Use Paths

The existing concrete sidewalk on the mauka-side of the highway from Kumuhau Street to Inoaole Street will be reconstructed with a new ADA accessible concrete sidewalk. The replacement will also include new ADA accessible driveways and curb ramps. This portion of the highway has been designated by the community as being one of the primary routes used by school children traveling to and from the Waimanalo Elementary and Intermediate School.

Remaining areas along Kalanianaole Highway that do not have concrete sidewalks will have an AC paved shoulder. Vehicles will be able to use the paved shoulder during emergencies. Pedestrians not wanting to use the adjacent grassed area will also be able to use the AC shoulder. From Aloiloi Street to the Waimanalo Beach Park, the existing AC sidewalk on the Mauka-side of the highway will be replaced with a new five-foot AC sidewalk.

In locations identified by the community, a grassed path will be installed to allow equestrian riders to traverse along Kalanianaole Highway to designated locations along the project. The grassed path, which varies from three-feet to eight-feet, will be wide enough to allow equestrian riders and pedestrian traffic to travel along Kalanianaole Highway.

E. Center Left-Turn Lanes

Center left-turn lanes were provided to allow vehicles to make left-turning movements into driveways along Kalanianaole Highway. Similar to a left turning lane at an intersection, the center left-turn lane improves the through traffic's travel time. In addition, the center left-turn lane would provide a beneficial condition for vehicles exiting driveways by allowing vehicles to remain in the center left-turn lane till it is clear to enter the through travel lane.

F. Drainage

The original comments provided by the community indicated that there are several locations along the project limits that experience drainage problems.

Near the Mekia Street Intersection, on the Makai-side of the highway fronting the sewer pump station, ponding on the shoulder area has been observed. During larger storm events, the ponding encroaches onto the travel-way. To eliminate the ponding, a grated inlet is recommended in the unpaved shoulder area. A drainpipe from the inlet can be discharged into the nearby Kahawai Stream.

Other locations along the highway that experience minor ponding are a result of "patch-work" resurfacing throughout the years. Resetting the roadway elevation to its original designed profile can mitigate the minor ponding.

The proposed drainage improvements assume that no additional off-site flows are required to be managed. A comprehensive hydrologic analysis shall be performed to determine the existing hydrologic

boundaries and define the new hydrologic boundaries. An increase in the hydrologic runoff is anticipated but will not have major impacts to the highway and adjacent properties. During the design phase, a hydraulic analysis would need to be performed. Based on the analysis, appropriate mitigative measures would be taken to minimize any project impacts.

Although portions of the project resides within the 100-year flood zone (Zones AE and AO), the proposed improvements within this area should not cause an increase to the flooding condition. The flood zone primarily consists of the Waimanalo Polo field and Bellows Beach Park.

G. Pavement Reconstruction

Over the years, the existing pavement has been resurfaced numerous times. As a result, the existing road profile has been raised causing transition problems at several intersections.

At Moole Street and Inoaole Street, a concrete through gutter has prevented the resurfacing from extending into these side streets. As a result, the transition into and out of these side streets are steeper than desired and causes vehicles to slow excessively.

It is recommended that the existing built up pavement be removed and the profile adjusted back to its original profile.

For estimating purposes, a pavement section consisting of 2” super pave asphalt concrete over 10” of plant mix glassphalt concrete base course be used. A pavement Justification Report will need to be prepared in the design phase of this project.

H. Median Improvements

A median barrier at the Olomana Golf Course area is proposed to diminish the possibility of vehicles crossing into incoming traffic. Centerline median rumble strips will also be incorporated where possible.

I. Striping Improvements

In addition to the striping improvements to provide the left turning lanes and bus pull-outs, striping improvements are proposed near the Old Kalanianaole Road. To promote a reduction in travel speed as vehicles approach Waimanalo from Kailua, a lane taper will begin (approximately nine hundred-feet before the Old Kalanianaole Road) to

reduce the travel lanes to one lane. A driver feedback speed display sign is also proposed to promote the speed reduction.

J. Electric, Telephone and Cable Television Systems

1. The existing wood utility pole locations in most of the areas along the project limits will be in conflict with the proposed improvements. The conflict can be resolved as follows:

   a) The existing wood utility pole and lines to be relocated to provide adequate roadside clearance and ADA accessibility.

   b) The existing wood utility pole and lines to be removed and converted to an underground utility distribution system.

K. Highway Lights

1. Due to the relocation or removal of the existing wood utility pole line system, the existing highway lighting system will be removed and provided with new highway lighting metal standards, bracket arms and luminaires on concrete foundations.
2. Several locations (bus stop near Olomana Golf Course & Inoaole Street intersection) were identified during the community meetings which seem to lack sufficient lighting. The proposed highway lighting system will provide adequate lighting for the entire length of the project.
3. The proposed highway lighting shall incorporate cut-off type luminaries to minimize effects to the Shearwater birds.

L. Renderings

To illustrate the proposed improvements, several renderings were prepared showing the additional turning lane, bus pull-outs and relocated utility poles. See **APPENDIX F** for renderings.

M. Permits Needed

1. National Pollutant Discharge Elimination System (NPDES) - construction activity, dewatering
2. Noise Permit
3. Land Use Permit for Construction
4. Grubbing, Grading, Excavation and Stockpiling permit
5. Discharge of Water Permit (Hydrotesting)
6. Street Usage Permit

N. Land Acquisition

Land Acquisition at the south-west corner of Poalima Street (former Chevron gas station) will be required to provide a larger turning radius to allow WB-50 trailer trucks to safely maneuver the right turn from Kalanianaole Highway into Poalima Street.

O. Landscaping

During one of the PIM's, a community member suggested utilizing native, drought tolerant, low maintenance plants where available. Recent community projects have installed this type of landscaping.

The design shall also consult a botanist to identify existing trees which may be relocated as a result of the adding of sidewalks, paved shoulders, bus pull-outs and other hardening improvements which would displace the existing trees.

P. Permanent Best Management Practices (BMP)

The Design Consultant shall verify with the Highways Division if the subject project will be required to provide permanent BMP measures. If required, the design shall incorporate permanent BMP measures such as grass swales, filter strips, or other structural devices that will minimize pollutants from being discharged into State waters.

VII. ENVIRONMENTAL ASSESSMENT

A. Based on the proposed improvements, an Environmental Assessment will be prepared to meet the requirements of the National Environmental Policy Act (NEPA); FHWA regulations (23 CFR 711, Environmental Impact and Related Procedures); Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500-1508); Chapter 343 of the Hawaii Revised Statues (HRS); and Hawaii Administrative Rules (HAR) of the Department of Heath (Title 11, Chapter 200, Environmental Impact Statement Rules). The EA for this project will be coordinated with separate EA's prepared for the two other projects described below.

B. The Department of Transportation Highways Division is also preparing an Environmental Assessment to replace Inoaole Bridge. The bridge improvements involve the widening of the bridge to allow for future roadway improvements and to upgrade the bridge railings to meet the current roadway standards. The construction schedule for this project

will also be incorporated into the schedule for the roadway improvements.

VIII. COST ESTIMATE

The preliminary cost estimate for the project is presented with varying alternatives.

Alternative 1 (**TABLE 1 – ALTERNATIVE 1 COST ESTIMATE**) assumes that the existing utility poles will be relocated to provide adequate roadside clearance and ADA accessibility. Provide new highway light standards and underground highway lighting wiring system along the project limits. The alternate will reconstruct the existing pavement section to its original profile. The two traffic signals (and loop detectors) will also be replaced to current ADA criteria. The total project cost for Alternative 1 is **$16,561,818**.

Alternative 2 (**TABLE 2 – ALTERNATIVE 2 COST ESTIMATE**) assumes that the existing utility poles will be removed and all overhead utilities will be placed underground. Provide new highway light standards and underground highway lighting wiring system along the project limits. The alternate will reconstruct the existing pavement section to its original profile. The traffic signal (and loop detectors) will also be replaced to current ADA guidelines. The total project cost for Alternative 2 is **$51,480,558**.

Alternative 3 (**TABLE 3 – ALTERNATIVE 3 COST ESTIMATE**) assumes the existing overhead utilities where the right-of-way width is 50 feet will be placed underground so that the available space can be better utilized. In areas where the right-of-way widens to more than 50 feet, the overhead utilities will be moved outwards to accommodate the proposed improvements and to meet clear zone requirements. Provide new highway light standards and underground highway lighting wiring system along the project limits. The total project cost for Alternative 3 is **$38,733,373**.

IX. CONCLUSION AND RECOMMENDATIONS

This Advanced Planning Report developed conceptual engineering concepts to improve Kalanianaole Highway from Olomana Golf Course to Waimanalo Beach Park. The proposed improvements will bring the highway up to current design standards.

Due to the existing operating conditions as observed and reported by community members, it is recommended that improvements be done to improve operations not only for vehicular traffic, but for other users also. The construction alternatives presented provides some options for HDOT to

implement based on construction funding that is available at the time of implementation.

If sufficient construction funding is available and if HDOT's Director and other concurring parties are in agreement with undergrounding of utilities, it is recommended that Alternative 3 be implemented. This alternative provides the best balance between trying to achieve the best product from a practical and cost effective standpoint.

If construction funds for undergrounding is not available, or if HDOT's Director or other participating parties is not in agreement, Alternative 1 is recommended.

ENGINEER'S PRELIMINARY DETAILED ESTIMATE
FEDERAL AID PROJECT NO. STP - 072 - 1(44)
JANUARY 10, 2006

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
629.1010	4-INCH PAVEMENT STRIPING (71,600 L.F.)	L.S.	L.S.	L.S.	$ 71,600.00
629.1014	8-INCH PAVEMENT STRIPING (1,890 L.F.)	L.S.	L.S.	L.S.	$ 2,835.00
629.1015	12-INCH PAVEMENT STRIPING (1,905 L.F.)	L.S.	L.S.	L.S.	$ 7,620.00
629.1020	CROSSWALK MARKING	62	LANE	$ 350.00	$ 21,700.00
629.1030	PAVEMENT ARROW SINGLE	96	EACH	$ 100.00	$ 9,600.00
629.1040	PAVEMENT WORD (ONLY)	14	EACH	$ 150.00	$ 2,100.00
629.2010	PAVEMENT MARKERS (1,520 EACH)	L.S.	L.S.	L.S.	$ 7,600.00
650.0100	CURB RAMPS	19	EACH	$ 2,000.00	$ 38,000.00
680.1001	RELOCATE UTILITY POLES SYSTEM (BY RESPECTIVE UTILITY COMPANY)	11,050	LIN. FT.	$ 150.00	$ 1,657,500.00
693.0100	TAU-II SYSTEM TERMINAL IMPACT ATTENUATOR	6	EACH	$ 40,000.00	$ 240,000.00
694.0200	MOVEABLE CONCRETE BARRIER (MCB) SYSTEM	980	LIN. FT.	$ 350.00	$ 343,000.00
	SUBTOTAL CONTRACT ITEMS				$ 12,906,780.00
	CONTINGENCY (5%)				$ 645,339.00
	SUBTOTAL				$ 13,552,119.00
	CONSTRUCTION ENGINEERING (15%)				$ 2,032,817.00
	STAFF LABOR				$ 1,882,238.00
	NON-LABOR (5% OF STAFF LABOR)				$ 94,112.00
	DESIGN SUPPORT (3% OF STAFF LABOR)				$ 56,467.00
	INDIRECT COST (51.9% STAFF LABOR)				$ 976,882.00
	TOTAL PROJECT COST				$ 16,561,818.00

ENGINEER'S PRELIMINARY DETAILED ESTIMATE
FEDERAL AID PROJECT NO. STP - 072 - 1(44)
JANUARY 10, 2006

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
104.0100	PARTNERING	F.A.	F.A.	F.A.	$ 25,000.00
202.0440	REMOVAL OF DEBRIS FROM DRAIN STRUCTURES (INCL. FLUSHING)	L.S.	L.S.	L.S.	$ 5,000.00
203.0100	ROADWAY EXCAVATION (12" DEPTH)	24,020	CU YD	$ 50.00	$ 1,201,000.00
209.0100	WATER POLLUTION AND EROSION CONTROL	F.A.	F.A.	F.A.	$ 200,000.00
312.1110	PLANT MIX GLASSPHALT CONCRETE BASE COURSE (10")	43,775	TON	$ 130.00	$ 5,690,750.00
402.0100	SUPER PAVE ASPHALT CONCRETE PAVEMENT (2")	8,760	TON	$ 145.00	$ 1,270,200.00
603.1006	18-INCH REINFORCED CONCRETE PIPE	35	LIN. FT.	$ 50.00	$ 1,750.00
604.2300	GRATED INLET	1	EACH	$ 5,000.00	$ 5,000.00
608.0200	CONCRETE SIDEWALK	3,000	SQ YD	$ 50.00	$ 150,000.00
608.6000	BED COURSE FOR SIDEWALK (4")	335	CU YD.	$ 35.00	$ 11,725.00
609.2725	CURB AND GUTTER, TYPE 2DG	3,980	LIN. FT.	$ 32.00	$ 127,360.00
617.0100	PLANTING SOIL (1550 CU. YD.)	L.S.	L.S.	L.S.	$ 46,500.00
617.0200	SOIL AMENDMENTS (83,750 SQ. FT.)	L.S.	L.S.	L.S.	$ 8,375.00
619.8001	PLANTING GRASS, COMMON BERMUDA GRASS (83,750 SQ. FT.)	L.S.	L.S.	L.S.	$ 12,565.00
619.9100	MAINTENANCE OF LANDSCAPING	12	MONTH	$ 2,500.00	$ 30,000.00
622.1001	NEW HIGHWAY LIGHT STANDARD, LUMINAIRE AND BRACKET ARM ON CONCRETE FOUNDATION	121	EACH	$ 5,000.00	$ 605,000.00
622.1002	NEW UNDERGROUND HIGHWAY LIGHTING WIRING	16,700	LIN. FT.	$ 50.00	$ 835,000.00
622.1003	NEW ELECTRICAL SERVICE FOR NEW HIGHWAY LIGHTING SYSTEM	1	EACH	$ 20,000.00	$ 20,000.00
623.1000	TRAFFIC SIGNAL SYSTEM (INCLUDING LOOP DETECTORS)	2	EACH	$ 130,000.00	$ 260,000.00

ENGINEER'S PRELIMINARY DETAILED ESTIMATE
FEDERAL AID PROJECT NO. STP - 072 - 1(44)
JANUARY 10, 2006

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
629.1010	4-INCH PAVEMENT STRIPING (71,600 L.F.)	L.S.	L.S.	L.S.	$ 71,600.00
629.1014	8-INCH PAVEMENT STRIPING (1,890 L.F.)	L.S.	L.S.	L.S.	$ 2,835.00
629.1015	12-INCH PAVEMENT STRIPING (1,905 L.F.)	L.S.	L.S.	L.S.	$ 7,620.00
629.1020	CROSSWALK MARKING	62	LANE	$ 350.00	$ 21,700.00
629.1030	PAVEMENT ARROW SINGLE	96	EACH	$ 100.00	$ 9,600.00
629.1040	PAVEMENT WORD (ONLY)	14	EACH	$ 150.00	$ 2,100.00
629.2010	PAVEMENT MARKERS (1,520 EACH)	L.S.	L.S.	L.S.	$ 7,600.00
650.0100	CURB RAMPS	19	EACH	$ 2,000.00	$ 38,000.00
680.1002	CONVERT EXISTING OVERHEAD UTILITY SYSTEM TO AN UNDERGROUND DISTRIBUTION SYSTEM INCLUDING UTILITY CHARGES	14,500	LIN. FT.	$ 2,000.00	$ 29,000,000.00
693.0100	TAU-II SYSTEM TERMINAL IMPACT ATTENUATOR	6	EACH	$ 40,000.00	$ 240,000.00
694.0200	MOVEABLE CONCRETE BARRIER (MCB) SYSTEM	980	LIN. FT.	$ 350.00	$ 343,000.00
	SUBTOTAL CONTRACT ITEMS				$ 40,119,280.00
	CONTINGENCY (5%)				$ 2,005,964.00
	SUBTOTAL				$ 42,125,244.00
	CONSTRUCTION ENGINEERING (15%)				$ 6,318,786.00
	STAFF LABOR				$ 5,850,728.00
	NON-LABOR (5% OF STAFF LABOR)				$ 292,536.00
	DESIGN SUPPORT (3% OF STAFF LABOR)				$ 175,522.00
	INDIRECT COST (51.9% STAFF LABOR)				$ 3,036,528.00
	TOTAL PROJECT COST				$ 51,480,558.00

ENGINEER'S PRELIMINARY DETAILED ESTIMATE
FEDERAL AID PROJECT NO. STP - 072 - 1(44)
JANUARY 10, 2006

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
104.0100	PARTNERING	F.A.	F.A.	F.A.	$ 25,000.00
202.0440	REMOVAL OF DEBRIS FROM DRAIN STRUCTURES (INCL. FLUSHING)	L.S.	L.S.	L.S.	$ 5,000.00
203.0100	ROADWAY EXCAVATION (12" DEPTH)	24,020	CU YD	$ 50.00	$ 1,201,000.00
209.0100	WATER POLLUTION AND EROSION CONTROL	F.A.	F.A.	F.A.	$ 200,000.00
312.1110	PLANT MIX GLASSPHALT CONCRETE BASE COURSE (10")	43,775	TON	$ 130.00	$ 5,690,750.00
402.0100	SUPER PAVE ASPHALT CONCRETE PAVEMENT (2")	8,760	TON	$ 145.00	$ 1,270,200.00
603.1006	18-INCH REINFORCED CONCRETE PIPE	35	LIN. FT.	$ 50.00	$ 1,750.00
604.2300	GRATED INLET	1	EACH	$ 5,000.00	$ 5,000.00
608.0200	CONCRETE SIDEWALK	3,000	SQ YD	$ 50.00	$ 150,000.00
608.6000	BED COURSE FOR SIDEWALK (4")	335	CU YD.	$ 35.00	$ 11,725.00
609.2725	CURB AND GUTTER, TYPE 2DG	3,980	LIN. FT.	$ 32.00	$ 127,360.00
617.0100	PLANTING SOIL (1550 CU. YD.)	L.S.	L.S.	L.S.	$ 46,500.00
617.0200	SOIL AMENDMENTS (83,750 SQ. FT.)	L.S.	L.S.	L.S.	$ 8,375.00
619.8001	PLANTING GRASS, COMMON BERMUDA GRASS (83,750 SQ. FT.)	L.S.	L.S.	L.S.	$ 12,565.00
619.9100	MAINTENANCE OF LANDSCAPING	12	MONTH	$ 2,500.00	$ 30,000.00
622.1001	NEW HIGHWAY LIGHT STANDARD, LUMINAIRE AND BRACKET ARM ON CONCRETE FOUNDATION	121	EACH	$ 5,000.00	$ 605,000.00
622.1002	NEW UNDERGROUND HIGHWAY LIGHTING WIRING	16,700	LIN. FT.	$ 50.00	$ 835,000.00
622.1003	NEW ELECTRICAL SERVICE FOR NEW HIGHWAY LIGHTING SYSTEM	1	EACH	$ 20,000.00	$ 20,000.00
623.1000	TRAFFIC SIGNAL SYSTEM (INCLUDING LOOP DETECTORS)	1	EACH	$ 130,000.00	$ 130,000.00

ENGINEER'S PRELIMINARY DETAILED ESTIMATE
FEDERAL AID PROJECT NO. STP - 072 - 1(44)
JANUARY 10, 2006

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
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629.1014	8-INCH PAVEMENT STRIPING (1,890 L.F.)	L.S.	L.S.	L.S.	$ 2,835.00
629.1015	12-INCH PAVEMENT STRIPING (1,905 L.F.)	L.S.	L.S.	L.S.	$ 7,620.00
629.1020	CROSSWALK MARKING	62	LANE	$ 350.00	$ 21,700.00
629.1030	PAVEMENT ARROW SINGLE	96	EACH	$ 100.00	$ 9,600.00
629.1040	PAVEMENT WORD (ONLY)	14	EACH	$ 150.00	$ 2,100.00
629.2010	PAVEMENT MARKERS (1,520 EACH)	L.S.	L.S.	L.S.	$ 7,600.00
650.0100	CURB RAMPS	19	EACH	$ 2,000.00	$ 38,000.00
680.1001	RELOCATE UTILITY POLES SYSTEM (BY RESPECTIVE UTILITY COMPANY)	5,440	LIN. FT.	$ 150.00	$ 816,000.00
680.1002	CONVERT EXISTING OVERHEAD UTILITY SYSTEM TO AN UNDERGROUND DISTRIBUTION SYSTEM INCLUDING UTILITY CHARGES	9,060	LIN. FT.	$ 2,000.00	$ 18,120,000.00
693.0100	TAU-II SYSTEM TERMINAL IMPACT ATTENUATOR	6	EACH	$ 40,000.00	$ 240,000.00
694.0200	MOVEABLE CONCRETE BARRIER (MCB) SYSTEM	980	LIN. FT.	$ 350.00	$ 343,000.00
	SUBTOTAL CONTRACT ITEMS				$ 30,185,280.00
	CONTINGENCY (5%)				$ 1,509,264.00
	SUBTOTAL				$ 31,694,544.00
	CONSTRUCTION ENGINEERING (15%)				$ 4,754,181.00
	STAFF LABOR				$ 4,402,019.00
	NON-LABOR (5% OF STAFF LABOR)				$ 220,101.00
	DESIGN SUPPORT (3% OF STAFF LABOR)				$ 132,061.00
	INDIRECT COST (51.9% STAFF LABOR)				$ 2,284,648.00
	TOTAL PROJECT COST				$ 38,733,373.00

ENGINEER'S PRELIMINARY DETAILED ESTIMATE
FEDERAL AID PROJECT NO. STP - 072 - 1(44)
JANUARY 10, 2006

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
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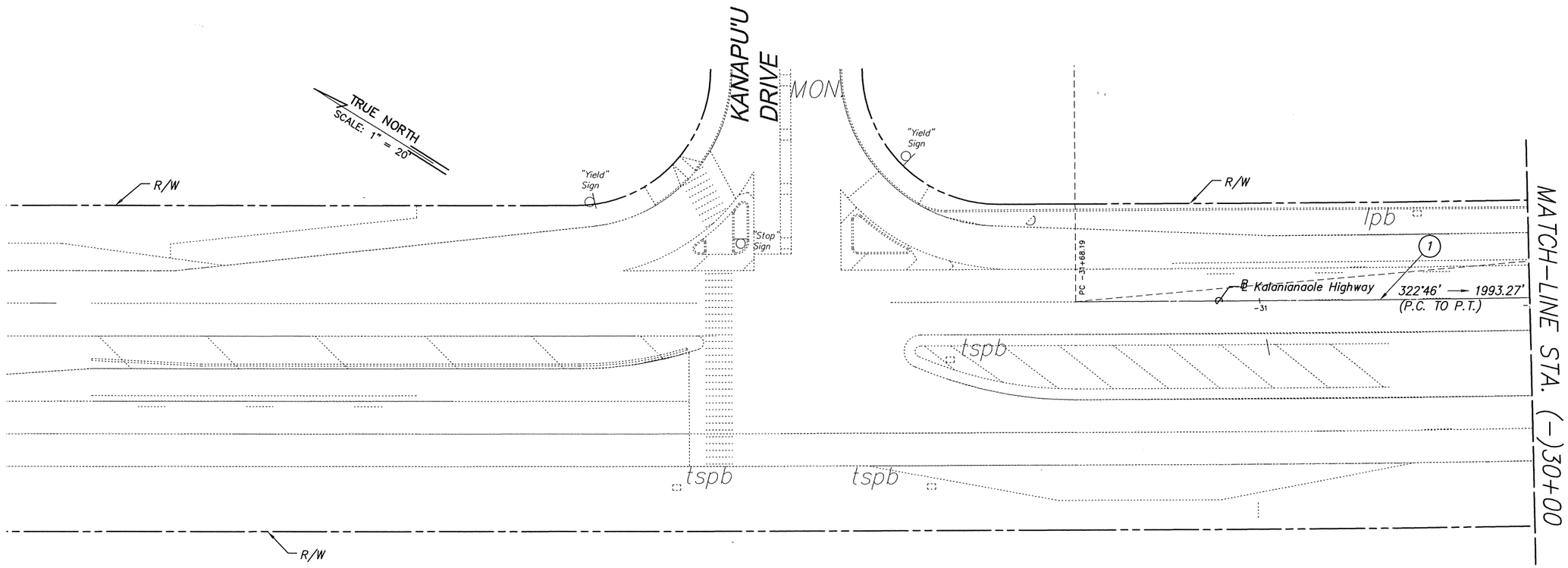
202.0440	REMOVAL OF DEBRIS FROM DRAIN STRUCTURES (INCL. FLUSHING)	L.S.	L.S.	L.S.	$ 5,000.00
203.0100	ROADWAY EXCAVATION (12" DEPTH)	24,020	CU YD	$ 50.00	$ 1,201,000.00
209.0100	WATER POLLUTION AND EROSION CONTROL	F.A.	F.A.	F.A.	$ 200,000.00
312.1110	PLANT MIX GLASSPHALT CONCRETE BASE COURSE (10")	43,775	TON	$ 130.00	$ 5,690,750.00
402.0100	SUPER PAVE ASPHALT CONCRETE PAVEMENT (2")	8,760	TON	$ 145.00	$ 1,270,200.00
603.1006	18-INCH REINFORCED CONCRETE PIPE	35	LIN. FT.	$ 50.00	$ 1,750.00
604.2300	GRATED INLET	1	EACH	$ 5,000.00	$ 5,000.00
608.0200	CONCRETE SIDEWALK	3,000	SQ YD	$ 50.00	$ 150,000.00
608.6000	BED COURSE FOR SIDEWALK (4")	335	CU YD.	$ 35.00	$ 11,725.00
609.2725	CURB AND GUTTER, TYPE 2DG	3,980	LIN. FT.	$ 32.00	$ 127,360.00
617.0100	PLANTING SOIL (1550 CU. YD.)	L.S.	L.S.	L.S.	$ 46,500.00
617.0200	SOIL AMENDMENTS (83,750 SQ. FT.)	L.S.	L.S.	L.S.	$ 8,375.00
619.8001	PLANTING GRASS, COMMON BERMUDA GRASS (83,750 SQ. FT.)	L.S.	L.S.	L.S.	$ 12,565.00
619.9100	MAINTENANCE OF LANDSCAPING	12	MONTH	$ 2,500.00	$ 30,000.00
622.1001	NEW HIGHWAY LIGHT STANDARD, LUMINAIRE AND BRACKET ARM ON CONCRETE FOUNDATION	121	EACH	$ 5,000.00	$ 605,000.00
622.1002	NEW UNDERGROUND HIGHWAY LIGHTING WIRING	16,700	LIN. FT.	$ 50.00	$ 835,000.00
622.1003	NEW ELECTRICAL SERVICE FOR NEW HIGHWAY LIGHTING SYSTEM	1	EACH	$ 20,000.00	$ 20,000.00
623.1000	TRAFFIC SIGNAL SYSTEM (INCLUDING LOOP DETECTORS)	2	EACH	$ 130,000.00	$ 260,000.00

CURVE	1
Δ	9°59'56"
Δ/2	4°59'58"
R	11436.39
T	1000.00
C	1993.27
Lc	1995.80

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	1	23



Legend

- Concrete Sidewalk
- AC Shoulder
- Grass
- Landscaping
- Existing Marking
- Existing Striping
- New Marking
- New Striping

PLAN
SCALE: 1" = 20'

20' 0 20' 40'
SCALE: 1" = 20'

EXHIBIT 6

BARRY K. MURANAKA LICENSED PROFESSIONAL ENGINEER No.8418-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY PLAN
BEGIN TO STA. (-)30+00
Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: As Shown Date: July 2005

SHEET NO. 1 OF 23 SHEETS

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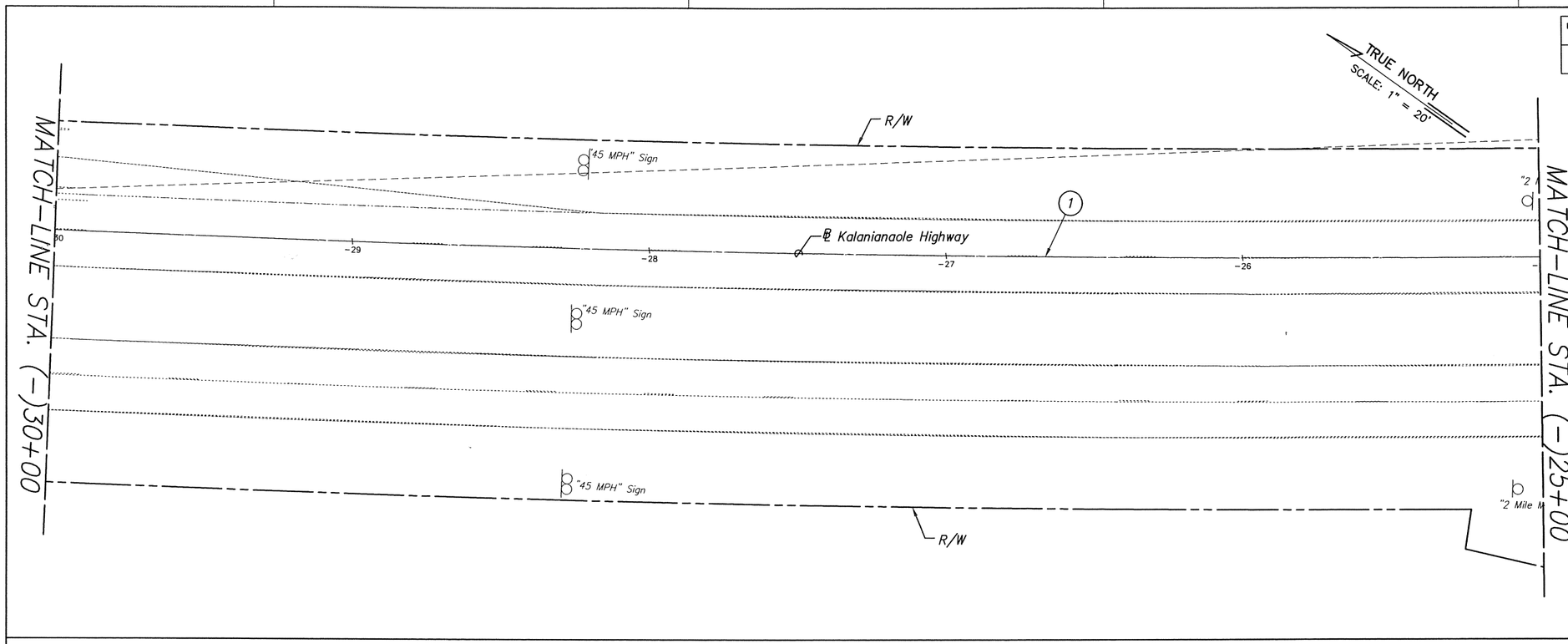
LAST MODIFIED: Wed, 10 Aug 2005 - 1:28pm

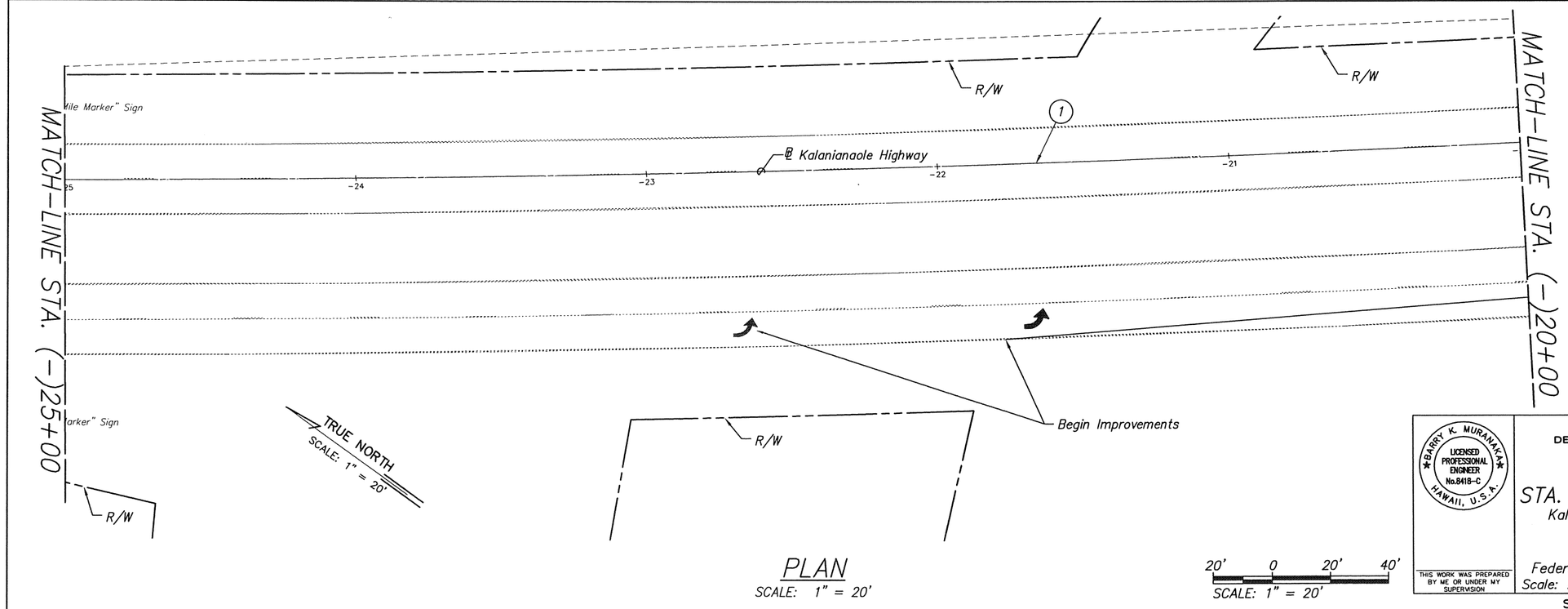
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	2	23



Legend

- Concrete Sidewalk
- AC Shoulder
- Grass
- Landscaping
- Existing Marking
- Existing Striping
- New Marking
- New Striping

CURVE	1
Δ	9°59'56"
Δ/2	4°59'58"
R	11436.39
T	1000.00
C	1993.27
Lc	1995.80



PLAN
SCALE: 1" = 20'

20' 0 20' 40'
SCALE: 1" = 20'

EXHIBIT 6

BARRY K. MURANAKA
LICENSED PROFESSIONAL ENGINEER
No.8418-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY PLAN
STA. (-)30+00 TO (-)20+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: As Shown Date: July 2005

SHEET NO. 2 OF 23 SHEETS

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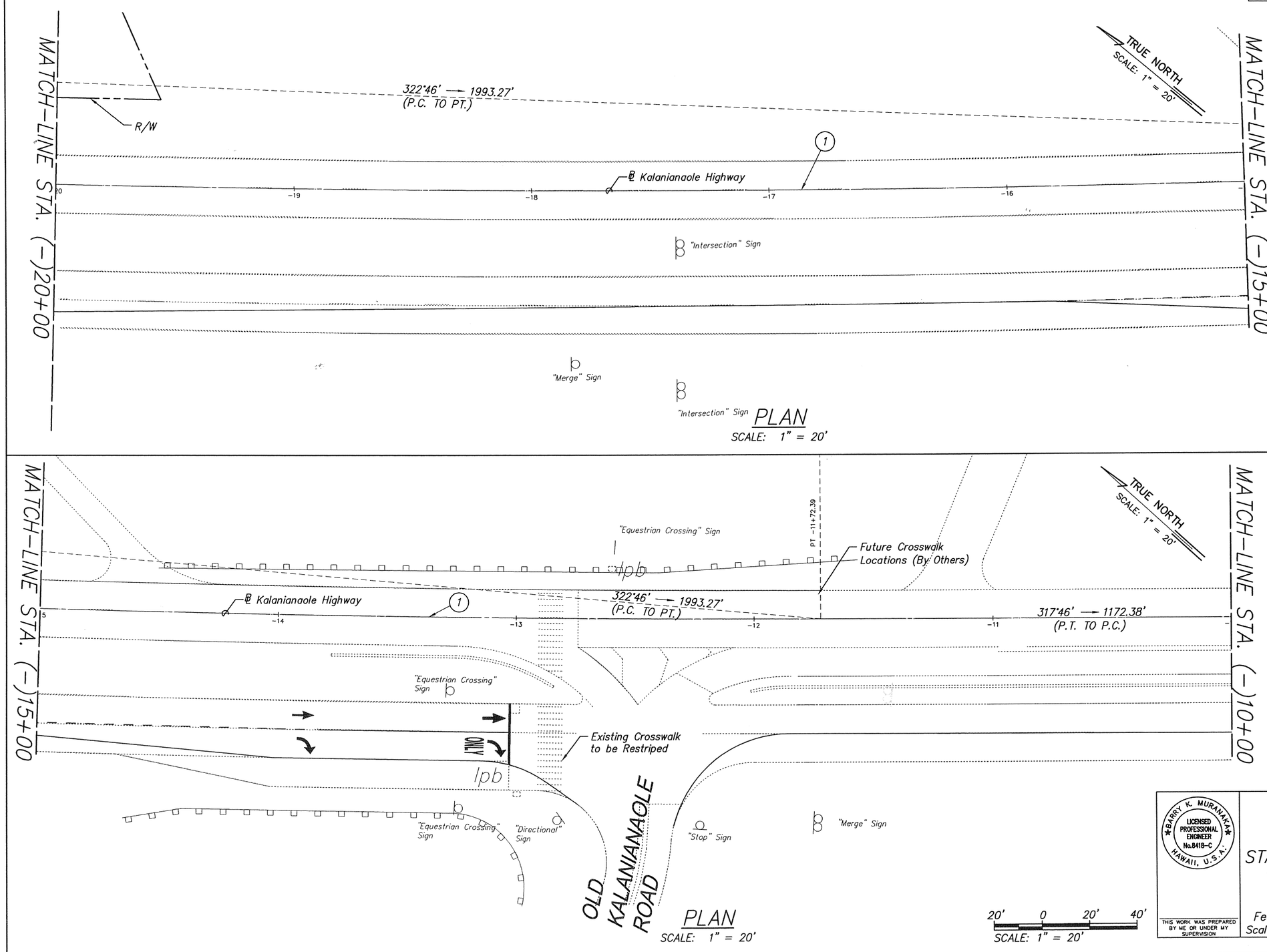
PREV. OPR:
CURRENT TIME: Aug 10, 2005 - 11:33am
LAST SAVED BY: rgq
LAST MODIFIED: Tue, 19 Jul 2005 - 2:47pm

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	3	23



PLAN
SCALE: 1" = 20'

PLAN
SCALE: 1" = 20'

Legend

- Concrete Sidewalk
- AC Shoulder
- Grass
- Landscaping
- Existing Marking
- Existing Striping
- New Marking
- New Striping

CURVE	1
Δ	9°59'56"
Δ/2	4°59'58"
R	11436.39
T	1000.00
C	1993.27
Lc	1995.80

EXHIBIT 6

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY PLAN
STA. (–)20+00 TO (–)10+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)

Scale: As Shown Date: July 2005

BARRY K. MURANAKA
LICENSED PROFESSIONAL ENGINEER
No.8418-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

SHEET NO. 3 OF 23 SHEETS

P.M.: STY
CURRENT OPR: jsk3
PREV. OPR:
CURRENT TIME: Aug 10, 2005 – 11:33am
LAST SAVED BY: rgq
LAST MODIFIED: Tue, 19 Jul 2005 – 2:47pm

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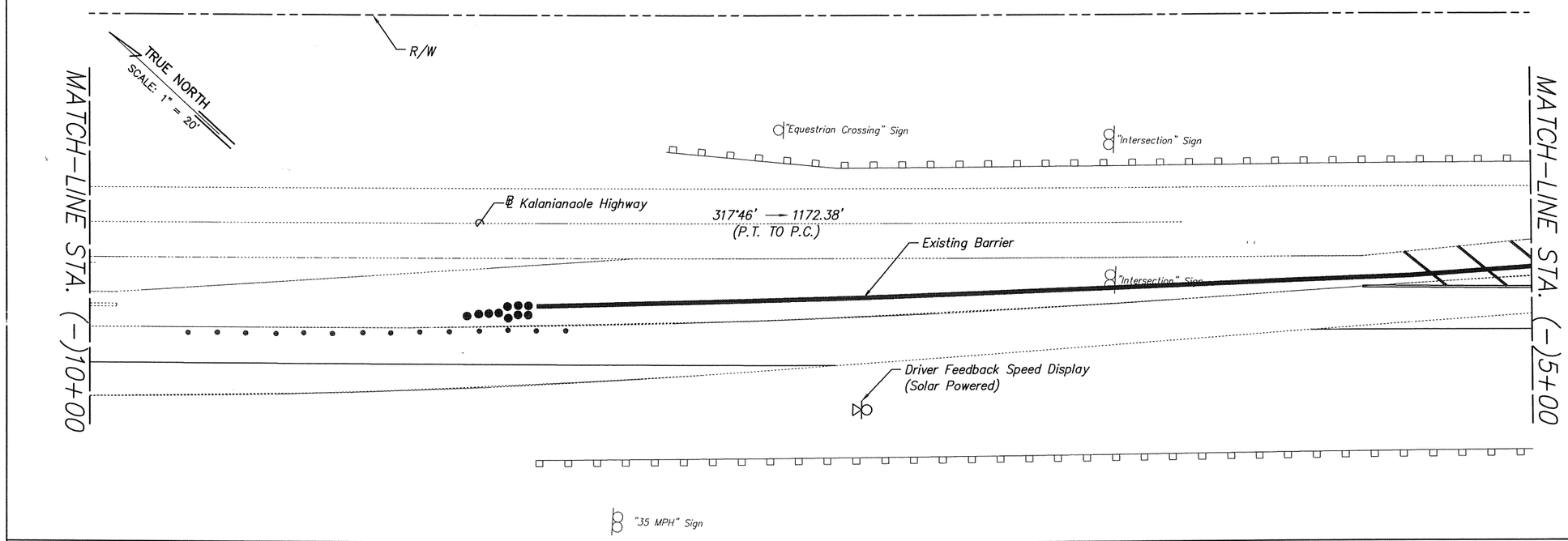
SCALE: 1=1

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	4	23



Legend

- Concrete Sidewalk
- AC Shoulder
- Grass
- Landscaping
- Existing Marking
- Existing Striping
- New Marking
- New Striping

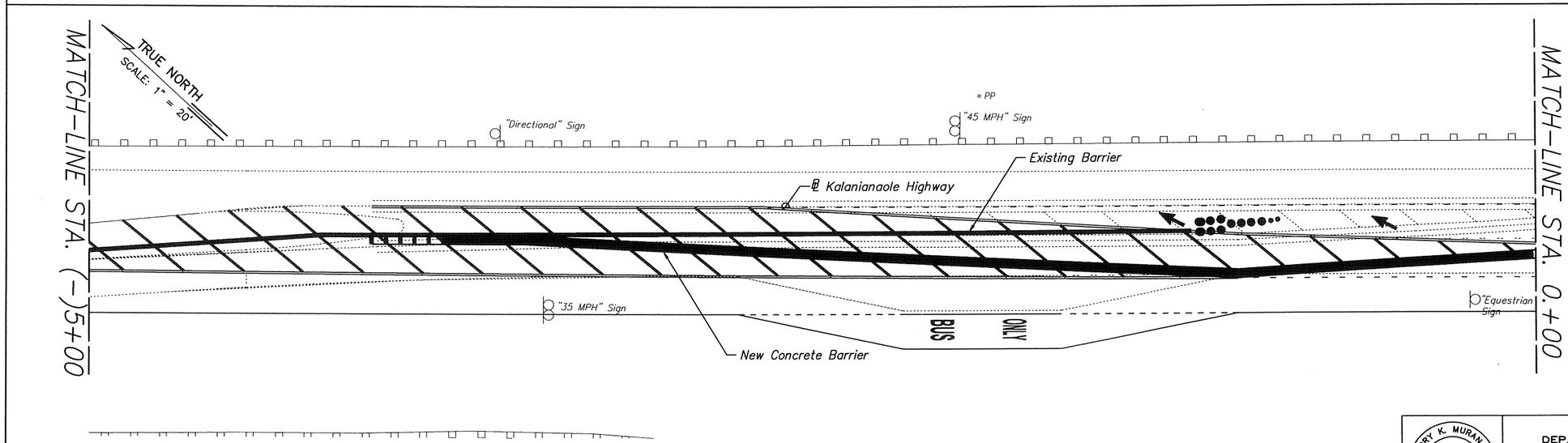


EXHIBIT 6

PLAN

SCALE: 1" = 20'

20' 0 20' 40'
SCALE: 1" = 20'

BARRY K. MURANAKA
LICENSED PROFESSIONAL ENGINEER
No.8418-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

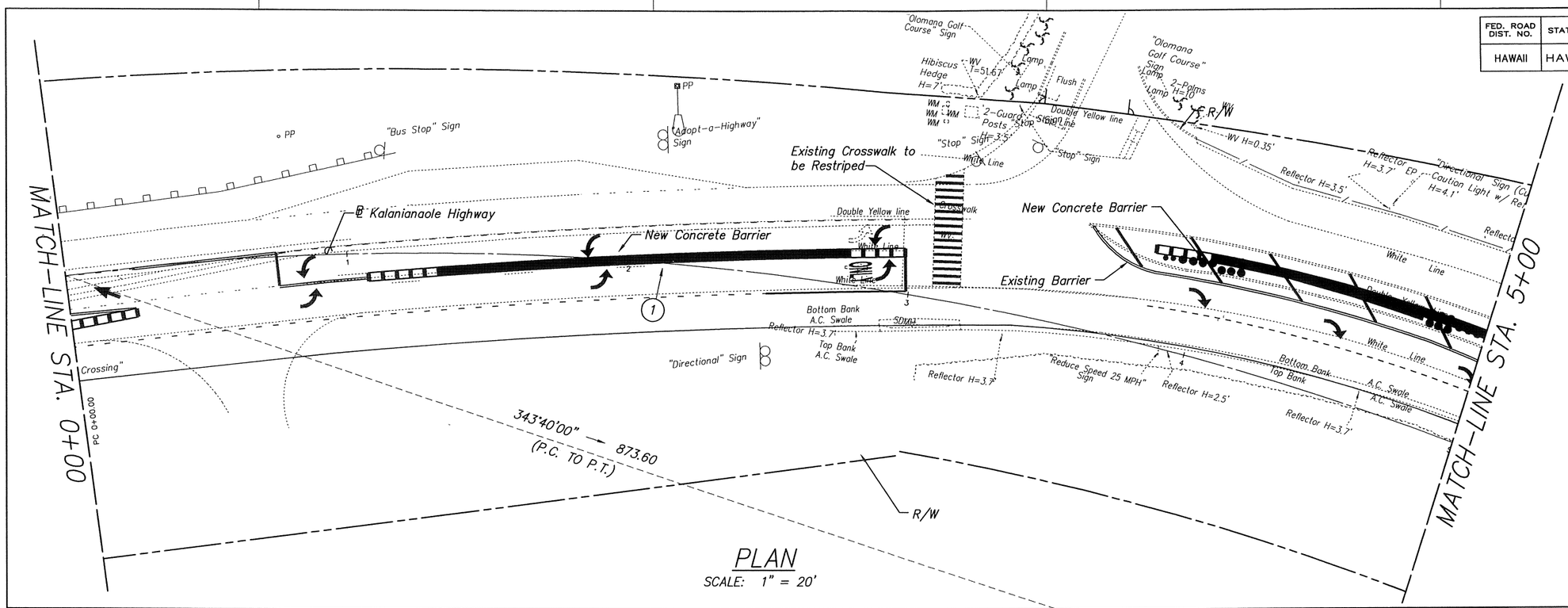
ROADWAY PLAN
STA. (-)10+00 TO 0+00
Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: As Shown Date: July 2005

SHEET NO. 4 OF 23 SHEETS

P.M.: STY
CURRENT OPR: jsk3
PREV. OPR:
CURRENT TIME: Aug 10, 2005 - 11:34am
LAST SAVED BY: rgg
LAST MODIFIED: Tue, 19 Jul 2005 - 2:48pm

PREFIX: G:\doth00-01\acad\
FILE: doth0001007.dwg
BEGIN: 12/01/99
SCALE: 1=1

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	5	23



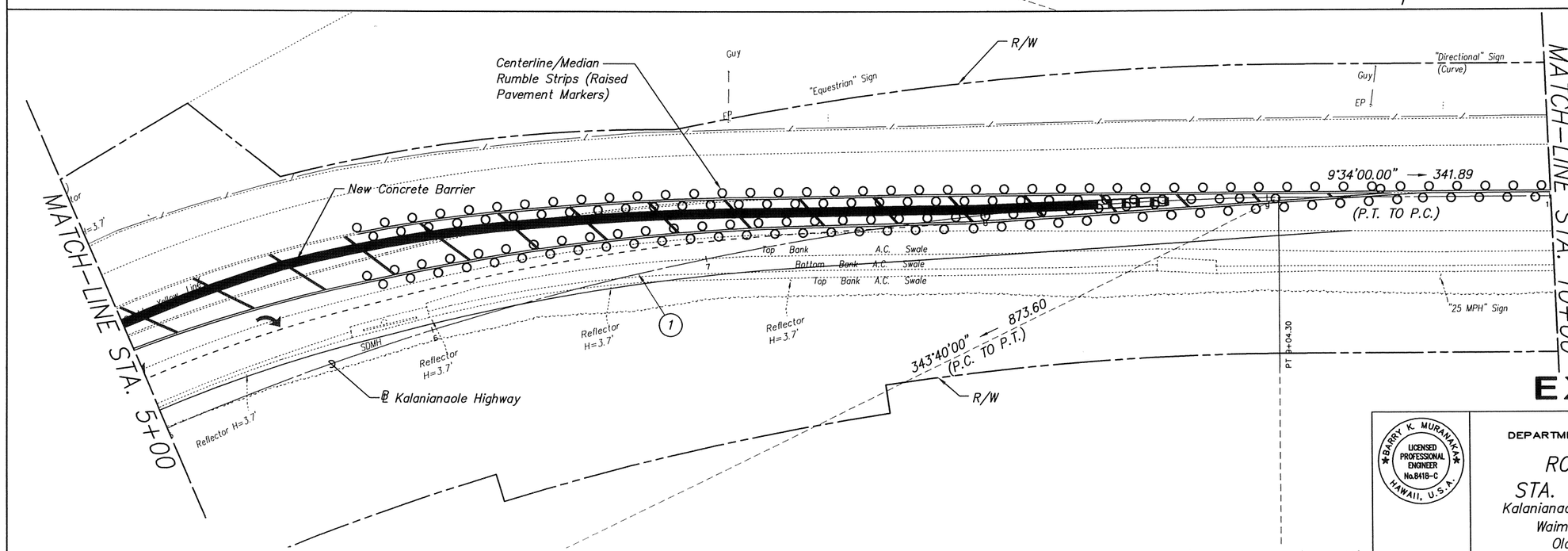
PLAN

SCALE: 1" = 20'

Legend

- Concrete Sidewalk
- AC Shoulder
- Grass
- Landscaping
- Existing Marking
- Existing Striping
- New Marking
- New Striping

CURVE	1
Δ	51°48'00"
Δ/2	25°54'00"
R	1000.00
T	485.57
C	873.60
Lc	904.08



PLAN

SCALE: 1" = 20'

20' 0 20' 40'

SCALE: 1" = 20'

EXHIBIT 6

BARRY K. MURANAKA LICENSED PROFESSIONAL ENGINEER No.8418-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY PLAN

STA. 0+00 TO 10+00

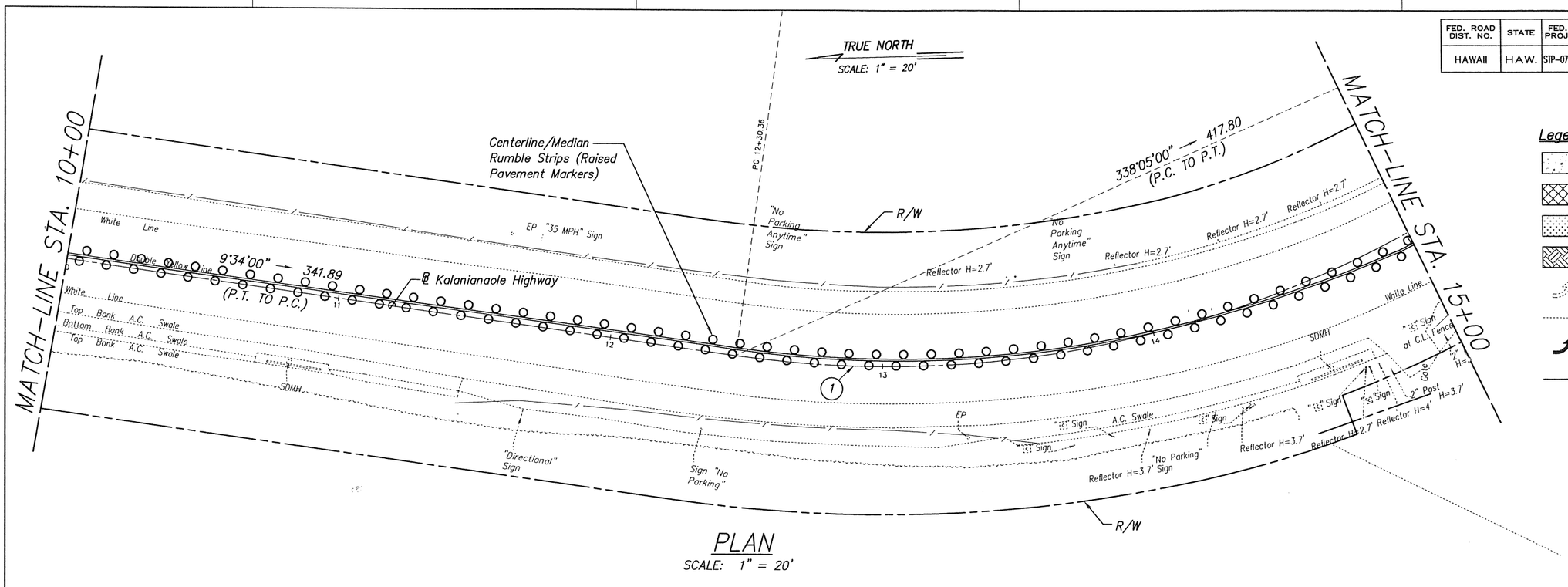
Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: As Shown Date: July 2005

SHEET NO. 5 OF 23 SHEETS

P.M.: STY
CURRENT OPR: jsk3
PREV. OPR:
CURRENT TIME: Aug 10, 2005 - 11:34am
LAST SAVED BY:
LAST MODIFIED: Tue, 19 Jul 2005 - 2:53pm

PREFIX: G:\dath00-01\acad\
FILE: dath0001008.dwg
BEGIN: 12/01/99
SCALE: 1=1

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	6	23



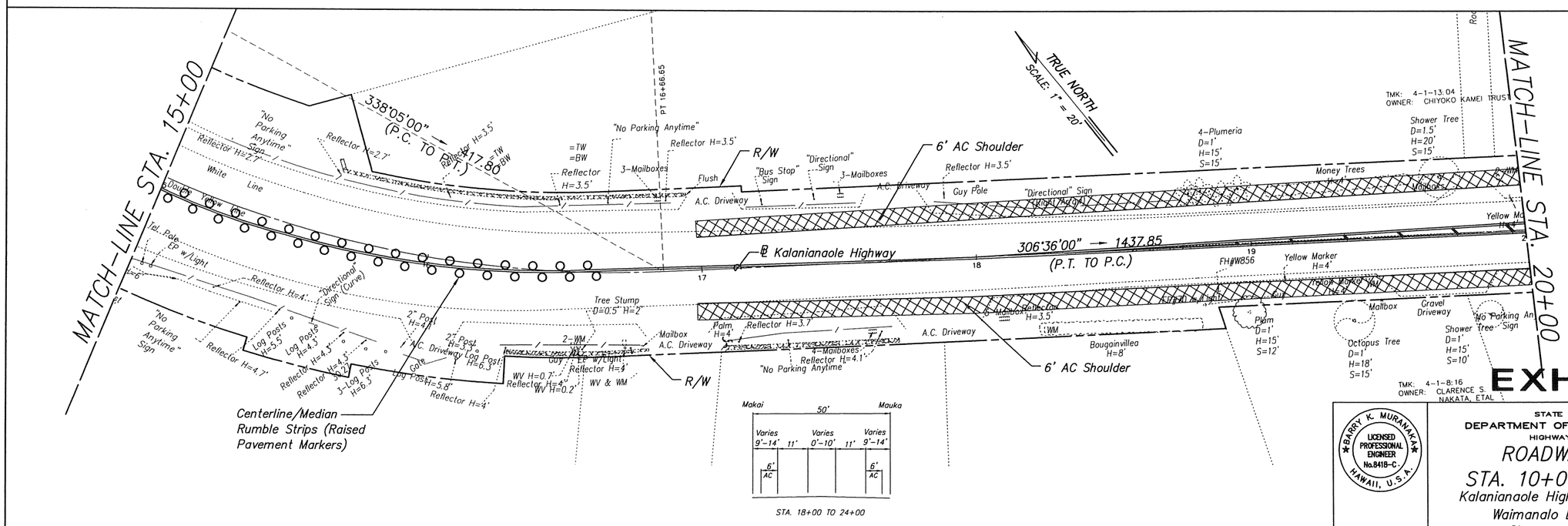
PLAN

SCALE: 1" = 20'

CURVE	1
Δ	62°58'00"
Δ/2	31°29'00"
R	400.00
T	244.96
C	417.80
Lc	439.59

Legend

- Concrete Sidewalk
- AC Shoulder
- Grass
- Landscaping
- Existing Marking
- Existing Striping
- New Marking
- New Striping



PLAN

SCALE: 1" = 20'

20' 0 20' 40'

SCALE: 1" = 20'

EXHIBIT 6

BARRY K. MURANAKA — LICENSED PROFESSIONAL ENGINEER No.8418-C — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY PLAN

STA. 10+00 TO 20+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)

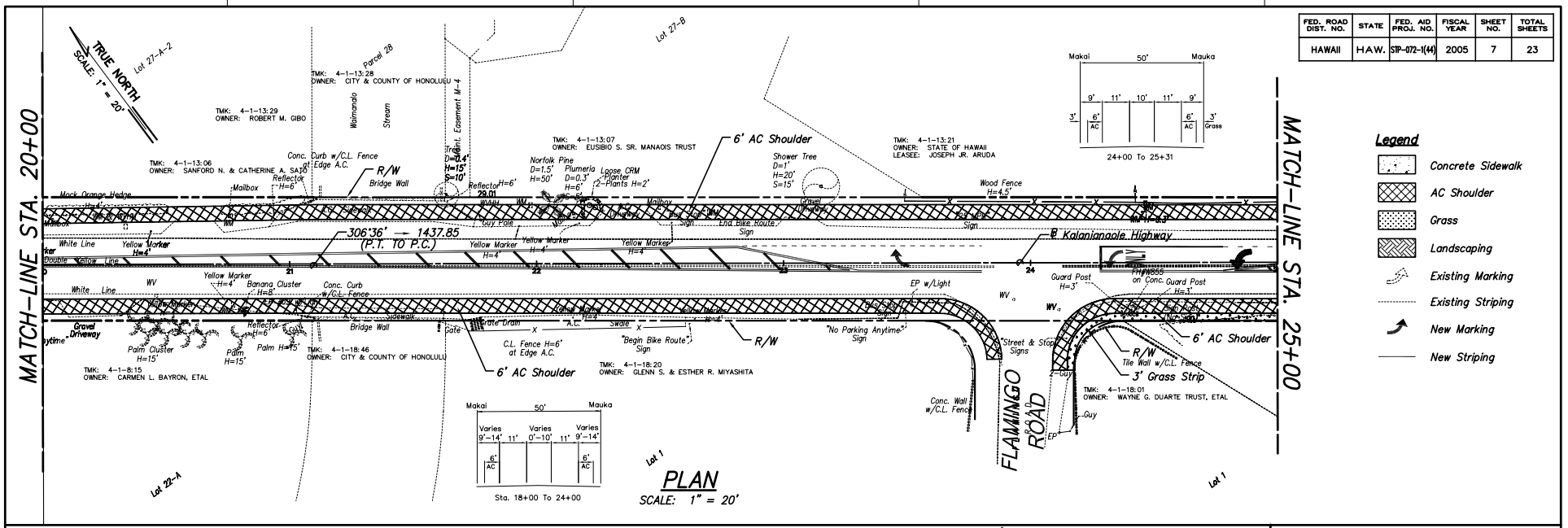
Scale: As Shown Date: July 2005

SHEET NO. 6 OF 23 SHEETS

PREFIX: G:\dath00-01\acad\
FILE: dath0001009.dwg
BEGIN: 12/01/99
SCALE: 1=1

P.M.: STY
CURRENT OPR: jsk3
PREV. OPR:
CURRENT TIME: Aug 10, 2005 - 11:34am
LAST SAVED BY:
LAST MODIFIED: Thu, 07 Jul 2005 - 11:59am

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	7	23



Legend

- Concrete Sidewalk
- AC Shoulder
- Grass
- Landscaping
- Existing Marking
- Existing Striping
- New Marking
- New Striping

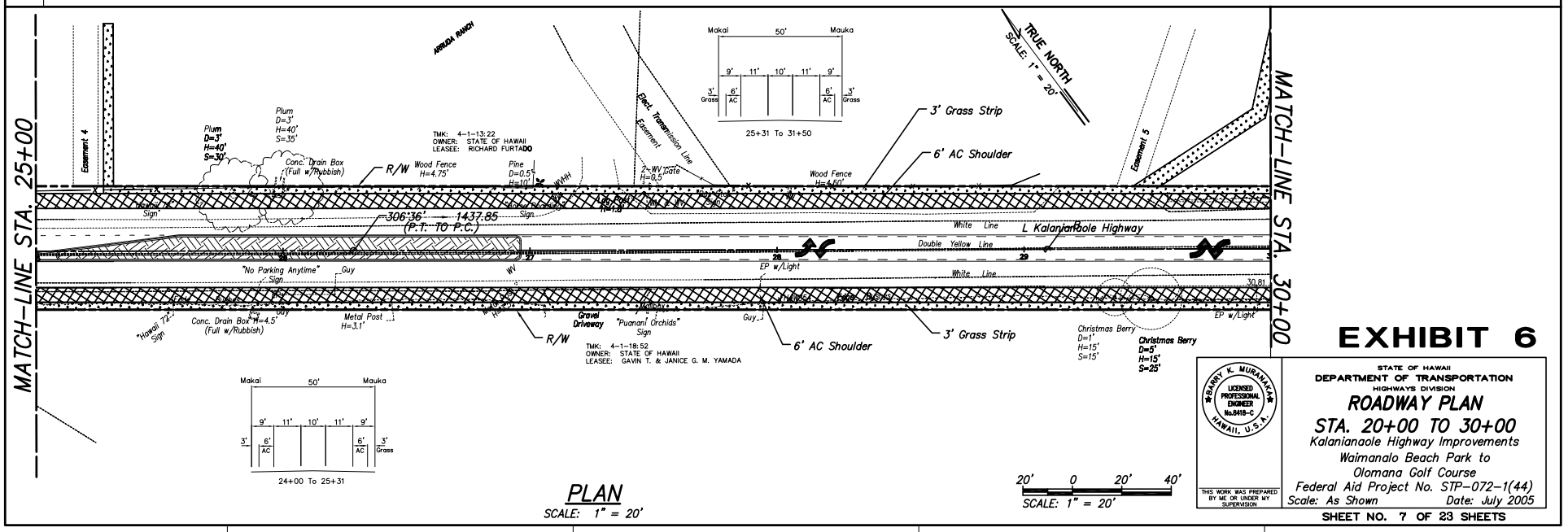


EXHIBIT 6

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY PLAN

STA. 20+00 TO 30+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: As Shown Date: July 2005

BARRY K. MURAMAKA
LICENSED PROFESSIONAL ENGINEER
No.8418-C
HAWAII, U.S.A.

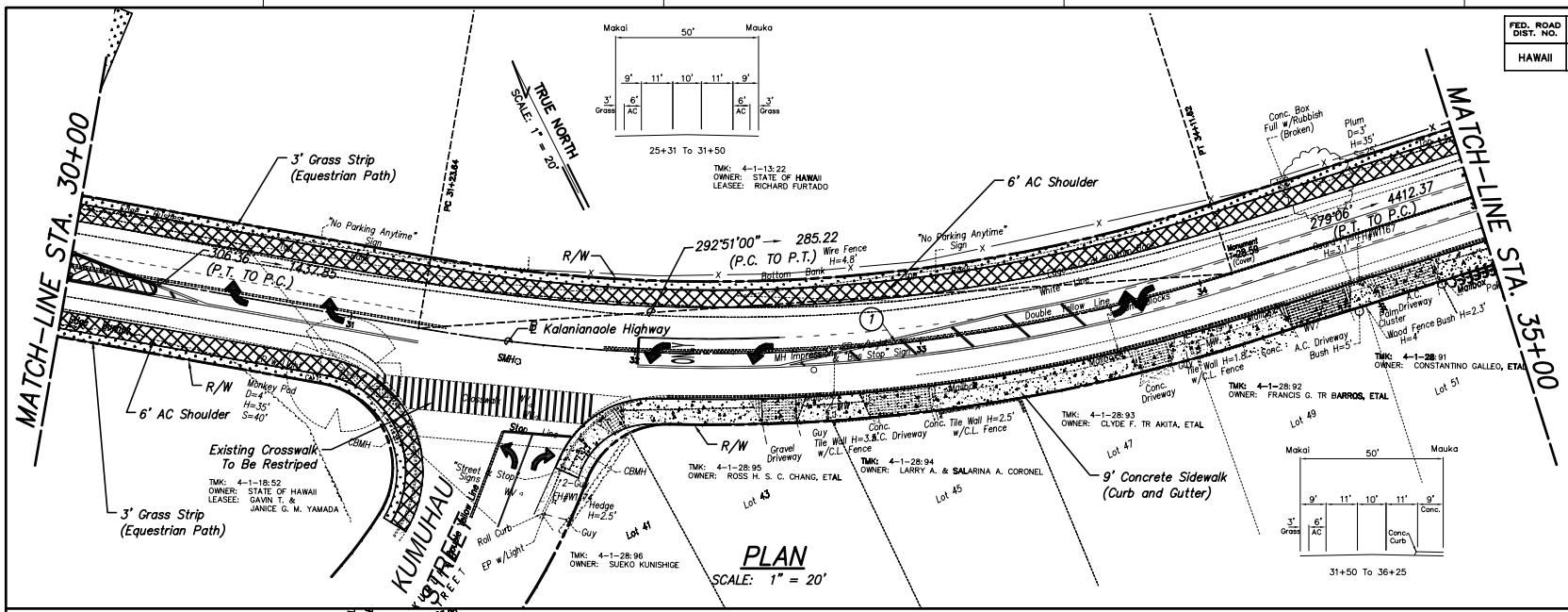
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

SHEET NO. 7 OF 23 SHEETS

P.M.: STY
CURRENT OPR: bkm
PREV. OPR:
CURRENT TIME: Jun 19, 2006 - 2:26pm
LAST SAVED BY:
LAST MODIFIED: Wed, 10 Aug 2005 - 9:00am

PREFIX: G:\doth00-01\acad\
FILE: doth0001010.dwg
BEGIN: 12/01/99
SCALE: 1=1

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	8	23



Legend

- Concrete Sidewalk
- AC Shoulder
- Grass
- Landscaping
- Existing Marking
- Existing Striping
- New Marking
- New Striping

CURVE	1
Δ	27°30'00"
Δ/2	13°45'00"
R	600.00
T	146.82
C	285.22
Lc	287.98

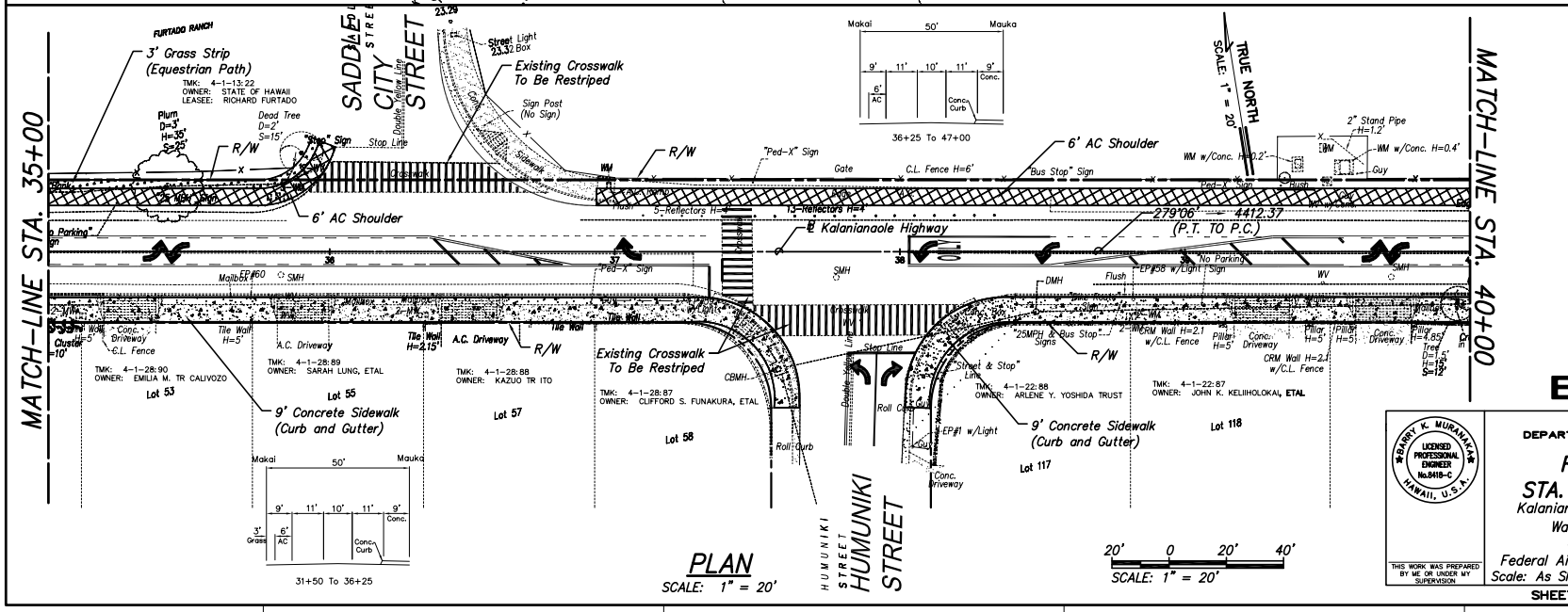


EXHIBIT 6

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY PLAN

STA. 30+00 TO 40+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)

Scale: As Shown Date: July 2005

BARRY K. MURAMAKA LICENSED PROFESSIONAL ENGINEER No.8418-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

SHEET NO. 8 OF 23 SHEETS

P.M.: STY
CURRENT OPR: bkm
PREV. OPR:
CURRENT TIME: Jun 19, 2006 – 2:24pm
LAST SAVED BY:
LAST MODIFIED: Thu, 07 Jul 2005 – 12:02pm

PREFIX:G:\doth00-01\ocad\
FILE:doth0001011.dwg
BEGIN: 12/01/99
SCALE: 1=1

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	9	23

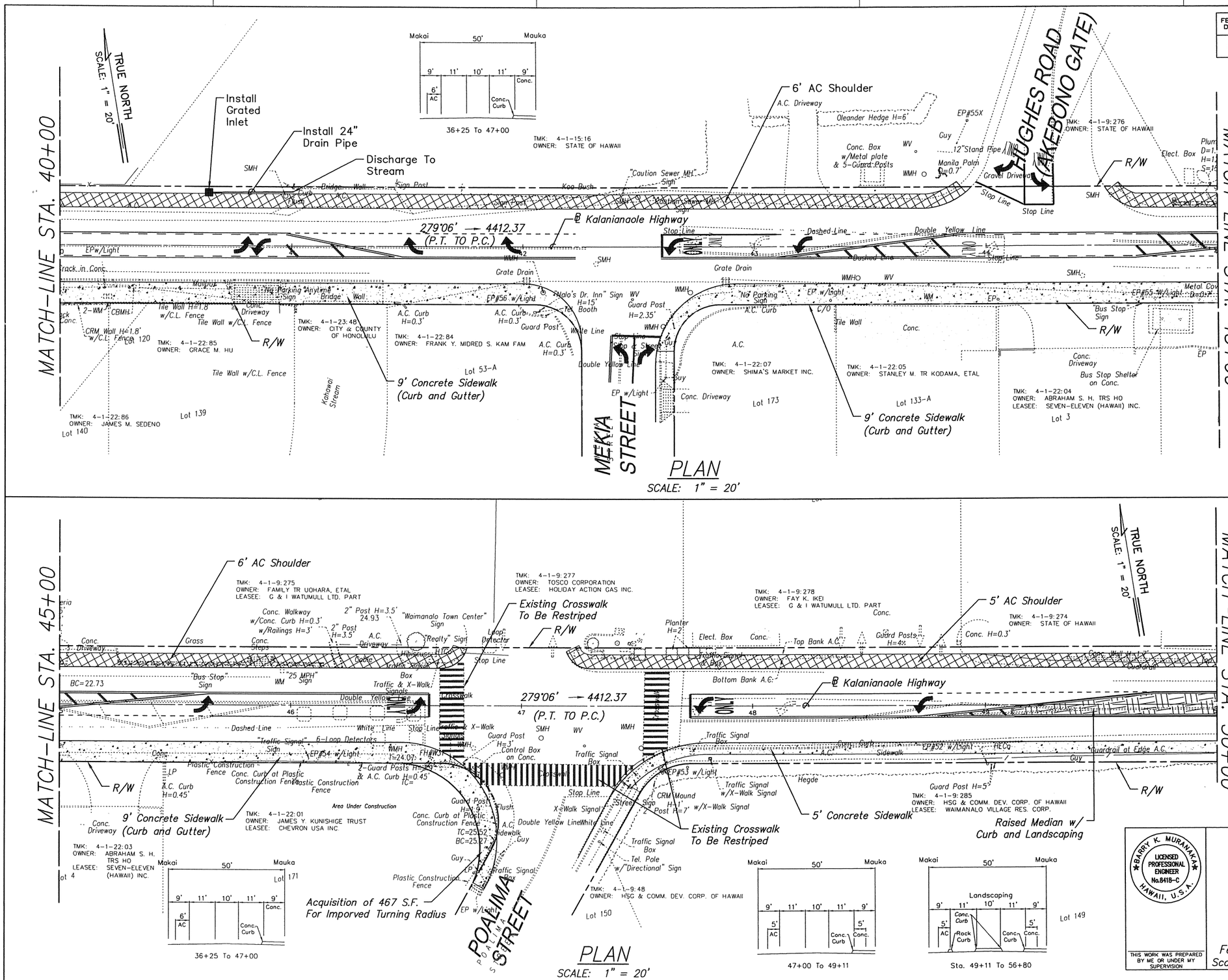


EXHIBIT 6

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BARRY K. MURANAKA
LICENSED PROFESSIONAL ENGINEER
No.8418-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

ROADWAY PLAN

STA. 40+00 TO 50+00

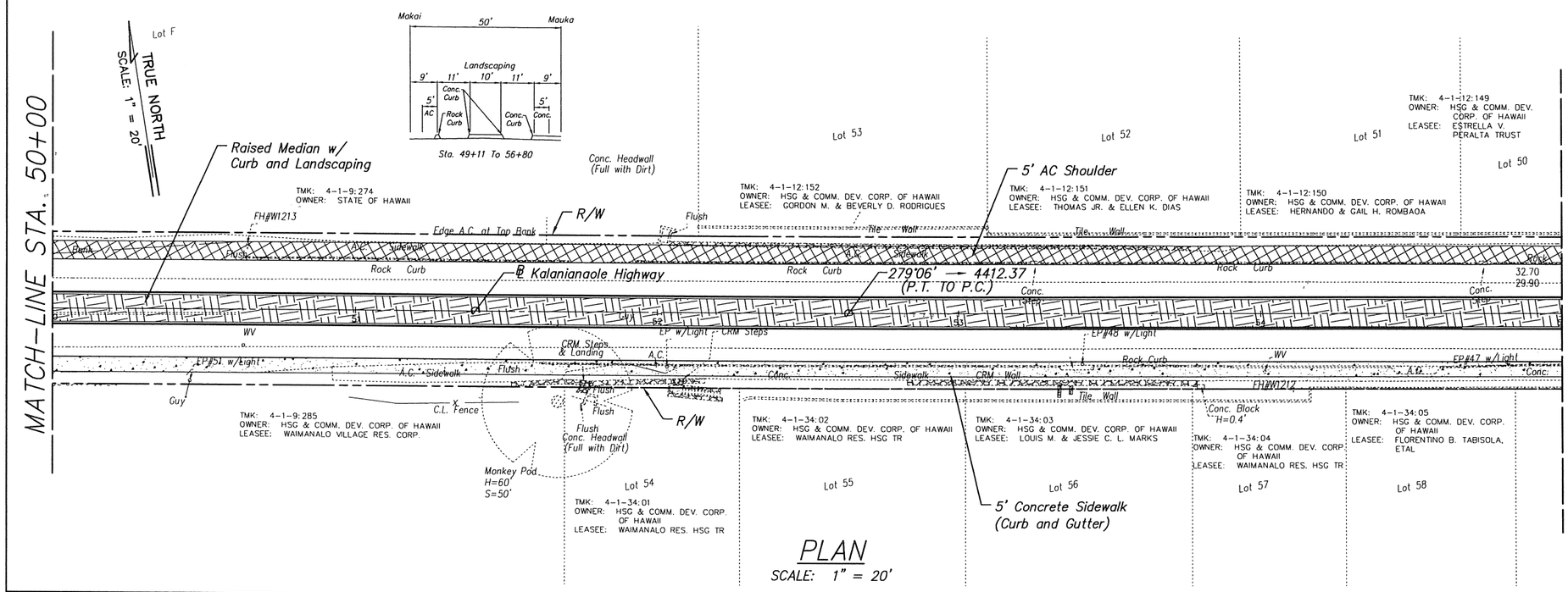
Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: As Shown Date: July 2005

SHEET NO. 9 OF 23 SHEETS

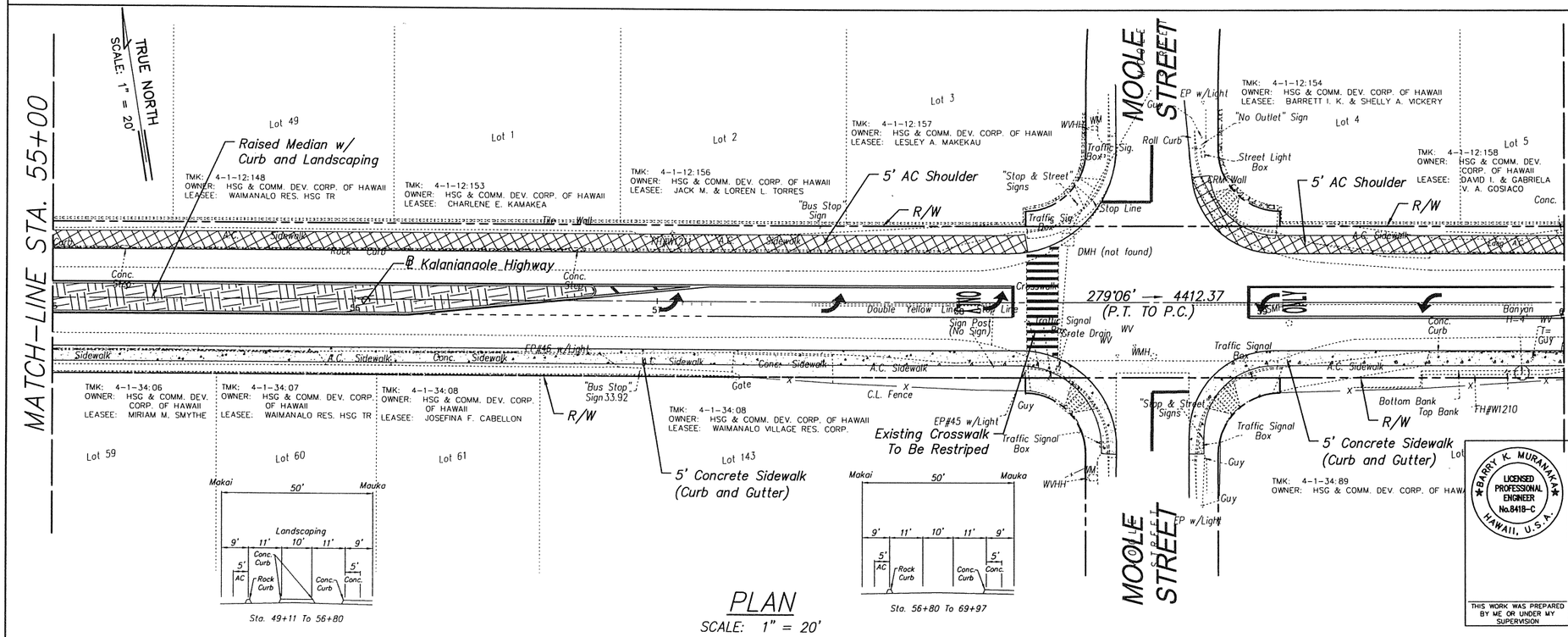
P.M.: STY
CURRENT OPR: jsk3
PREV. OPR:
CURRENT TIME: Aug 10, 2005 - 11:35am
LAST SAVED BY:
LAST MODIFIED: Tue, 19 Jul 2005 - 3:03pm

PREFIX: G:\dath00-01\acad\
FILE: dath0001012.dwg
BEGIN: 12/01/99
SCALE: 1=1

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	10	23



PLAN
SCALE: 1" = 20'



PLAN
SCALE: 1" = 20'

20' 0 20' 40'
SCALE: 1" = 20'

EXHIBIT 6

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY PLAN
STA. 50+00 TO 60+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: As Shown Date: July 2005

BARRY K. MURANAKA
LICENSED PROFESSIONAL ENGINEER
No.8418-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

SHEET NO. 10 OF 23 SHEETS

PREFIX: G:\doth00-01\acad\
FILE: doth0001013.dwg
BEGIN: 12/01/99
SCALE: 1=1

P.M.: STY
CURRENT OPR: jsk3
PREV. OPR:
CURRENT TIME: Aug 10, 2005 - 11:35am
LAST SAVED BY:
LAST MODIFIED: Tue, 19 Jul 2005 - 3:09pm

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	11	23

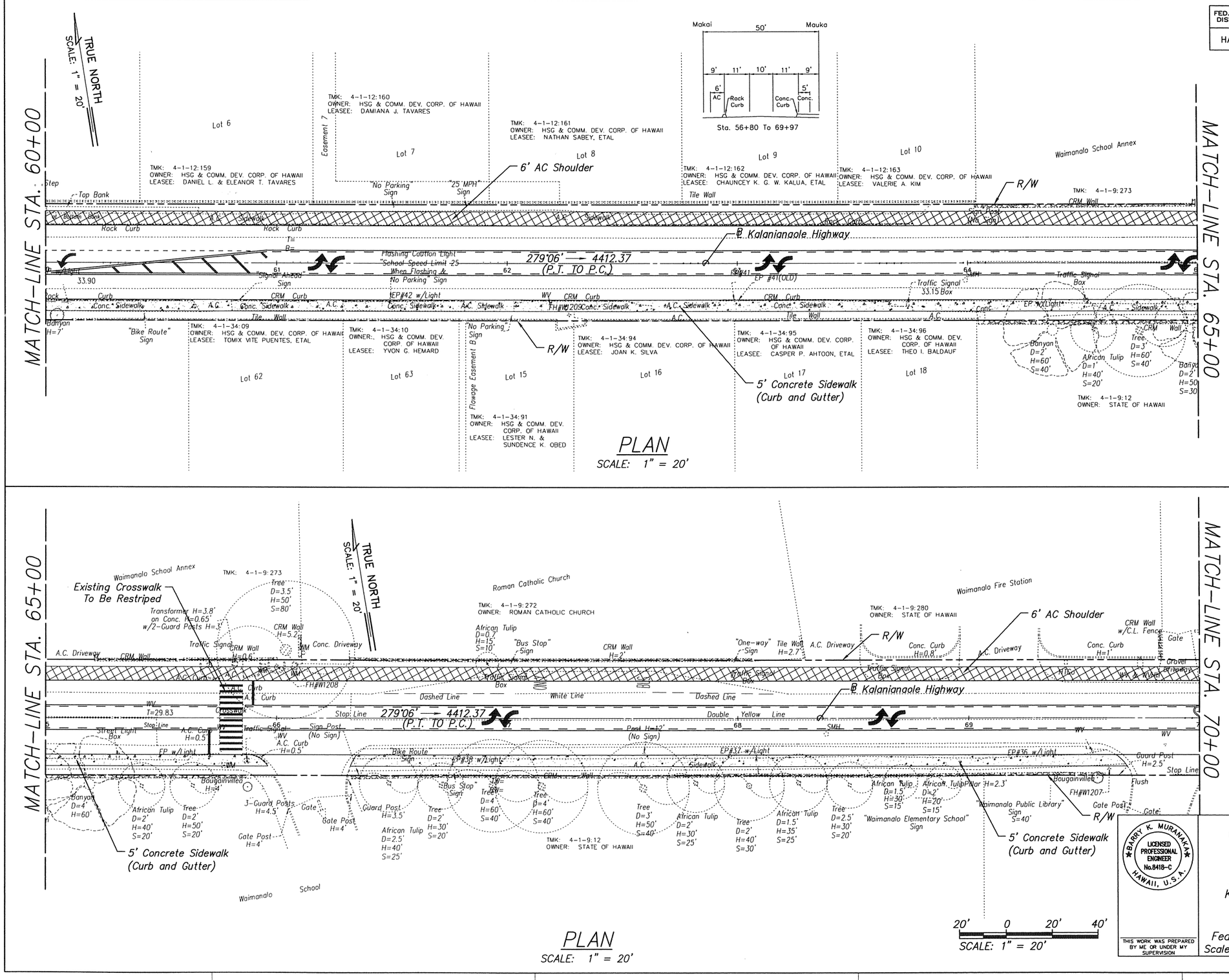


EXHIBIT 6

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY PLAN

STA. 60+00 TO 70+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: As Shown Date: July 2005

BARRY K. MURANAKA
LICENSED PROFESSIONAL ENGINEER
No. 8418-C
HAWAII, U.S.A.

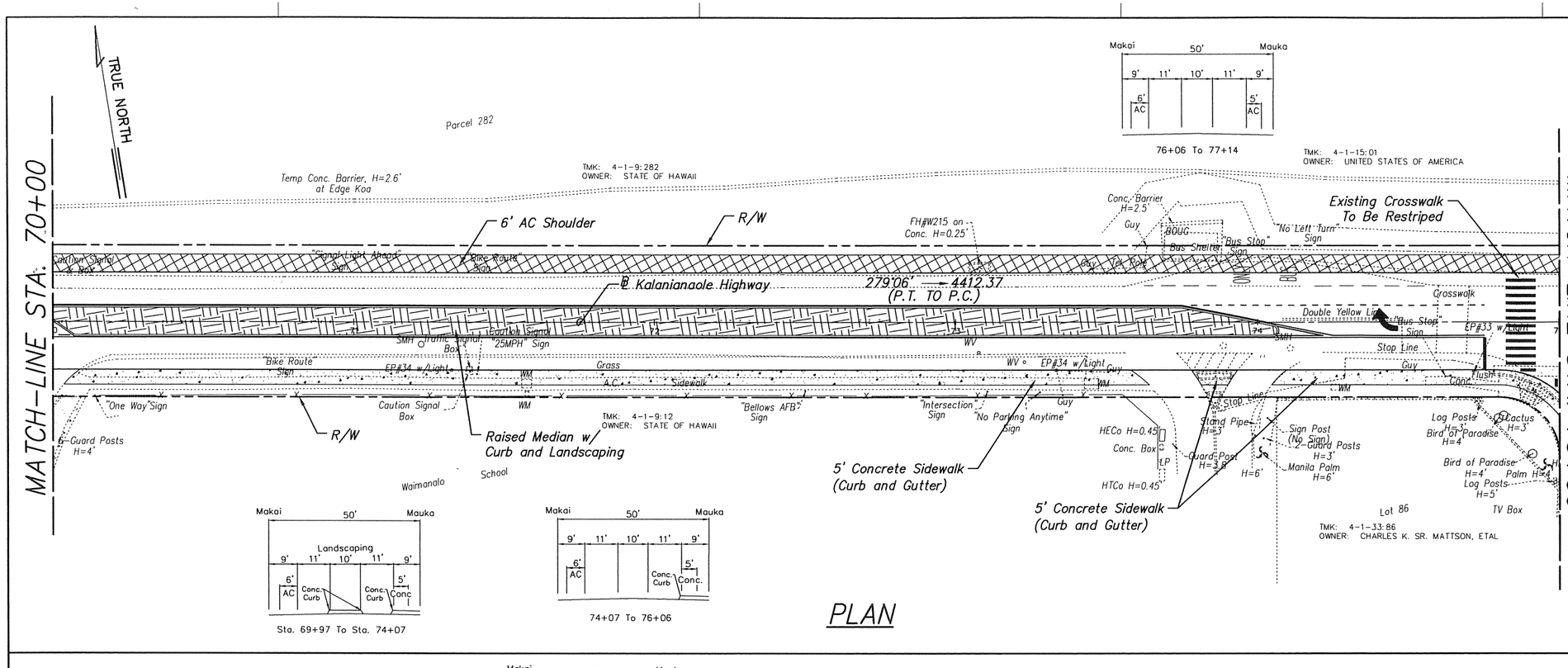
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

SHEET NO. 11 OF 23 SHEETS

PREFIX G:\dath00-01\acad\
FILE: dath0001014.dwg
BEGIN: 12/01/99
SCALE: 1=1

P.M.: STY
CURRENT OPR: jsk3
PREV. OPR:
CURRENT TIME: Aug 10, 2005 - 3:14pm
LAST SAVED BY:
LAST MODIFIED: Thu, 07 Jul 2005 - 12:03pm

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	12	23



CURVE	1
Δ	31°30"30"
Δ/2	15°45'15"
R	800.00
T	225.69
C	434.42
Lc	439.94

Legend

- Concrete Sidewalk
- AC Shoulder
- Grass
- Landscaping
- Existing Marking
- Existing Striping
- New Marking
- New Striping

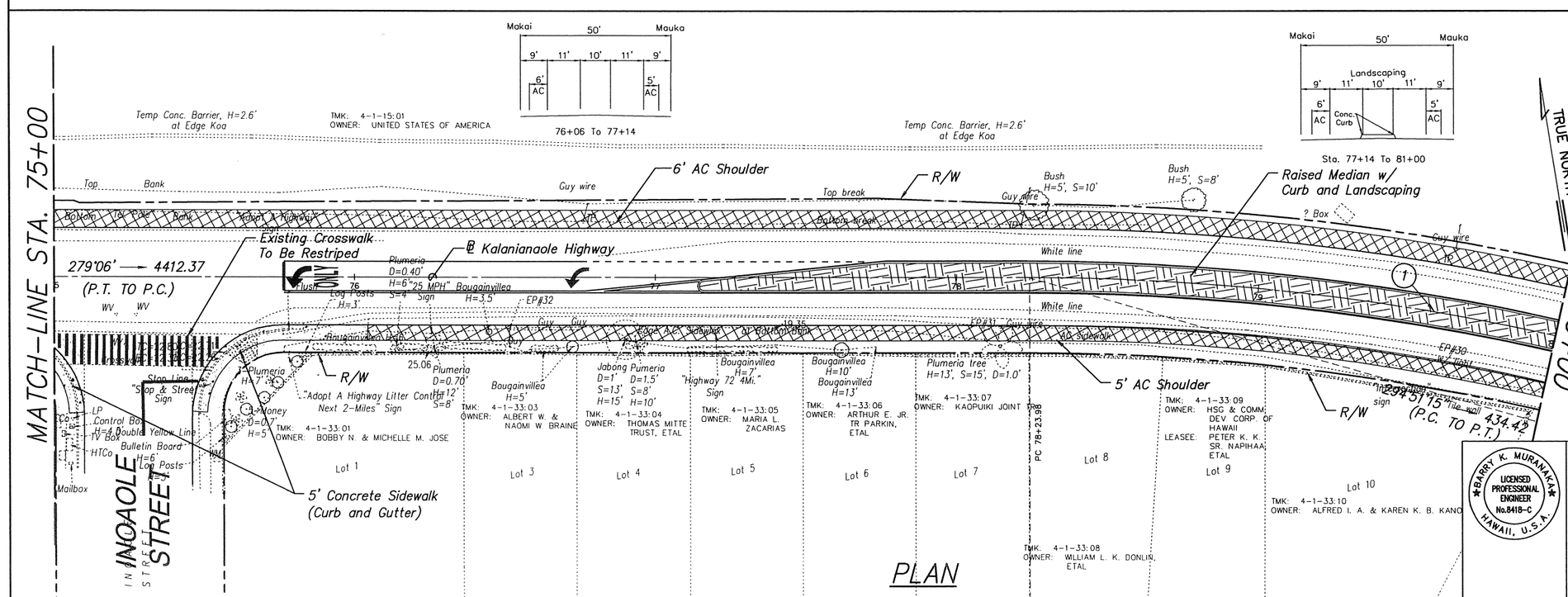


EXHIBIT 6

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY PLAN

STA. 70+00 TO 80+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)

Scale: As Shown Date: July 2005

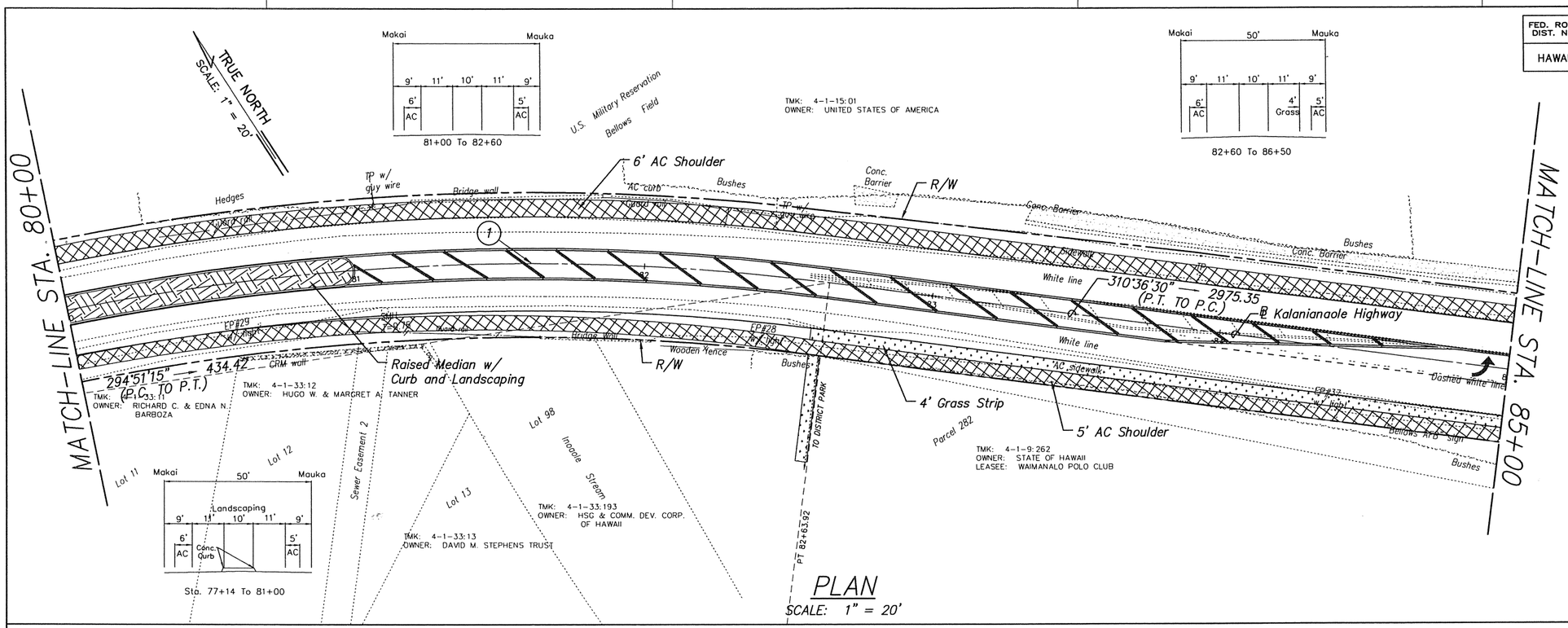
BARRY K. MURANAKA LICENSED PROFESSIONAL ENGINEER No.8418-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

SHEET NO. 12 OF 23 SHEETS

PREFIX:C:\Documents and Settings\Wkl\Local Settings\Temp\BGPlot_3744\
FILE: doth0001015.dwg CURRENT OPR: rkl
PREV. OPR:
CURRENT TIME: Dec 09, 2005 - 4:16pm
LAST SAVED BY:
LAST MODIFIED: Wed, 10 Aug 2005 - 2:07pm
BEGIN: 12/01/99
SCALE: 1=1'

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	13	23



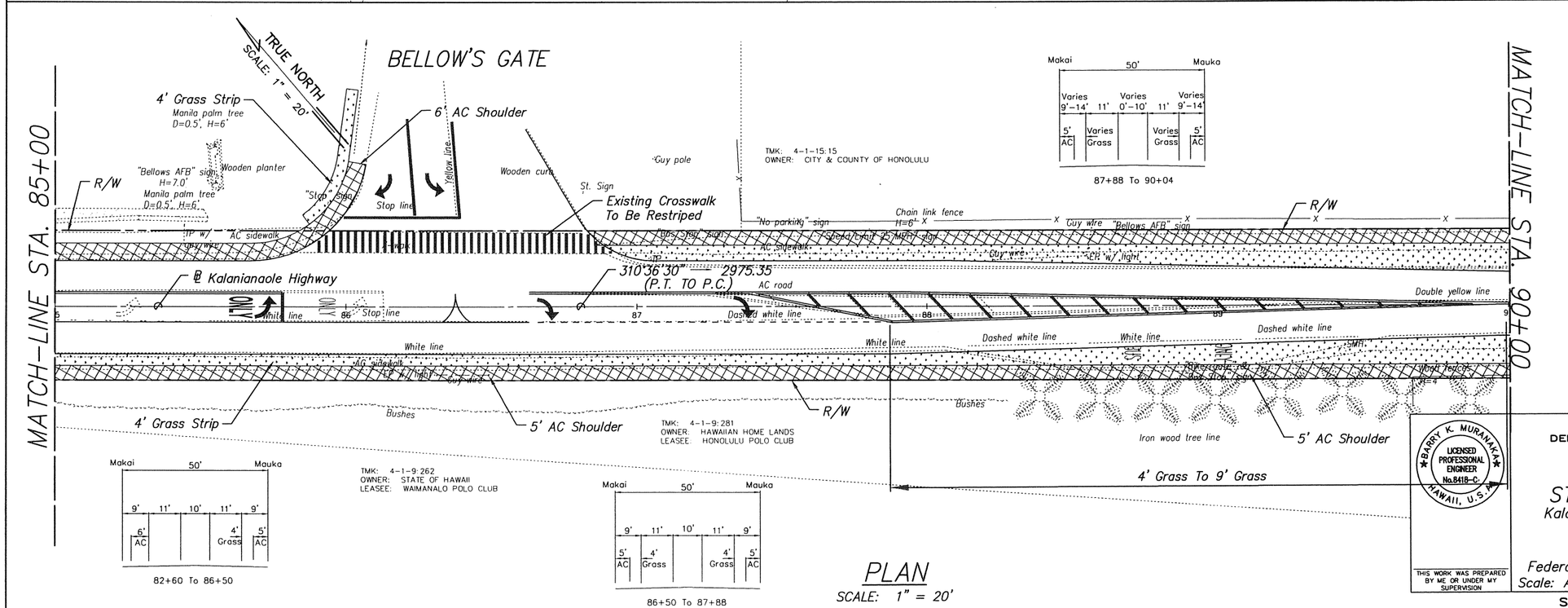
PLAN

SCALE: 1" = 20'

Legend

- Concrete Sidewalk
- AC Shoulder
- Grass
- Landscaping
- Existing Marking
- Existing Striping
- New Marking
- New Striping

CURVE	1
Δ	31°30"30"
Δ/2	15°45'15"
R	800.00
T	225.69
C	434.42
Lc	439.94



PLAN

SCALE: 1" = 20'

20' 0 20' 40'

SCALE: 1" = 20'

EXHIBIT 6

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY PLAN

STA. 80+00 TO 90+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: As Shown Date: July 2005

BARRY K. MURANAKA
LICENSED PROFESSIONAL ENGINEER
No.8418-C
HAWAII, U.S.A.

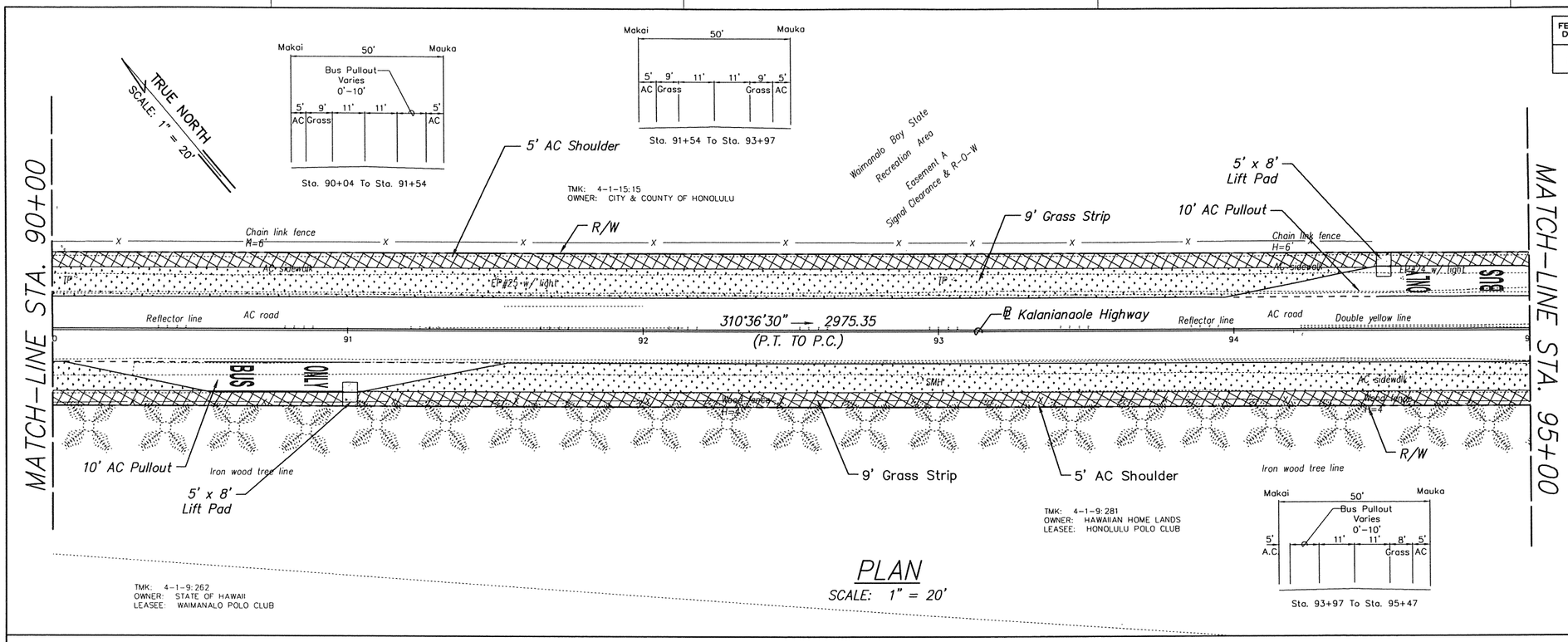
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

SHEET NO. 13 OF 23 SHEETS

PREFIX: G:\dath00-01\acad\
FILE: dath0001016.dwg
BEGIN: 12/01/99
SCALE: 1=1

P.M.: STY
CURRENT OPR: jsk.3
PREV. OPR:
CURRENT TIME: Aug 10, 2005 - 3:14pm
LAST SAVED BY:
LAST MODIFIED: Thu, 21 Jul 2005 - 8:54am

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	14	23

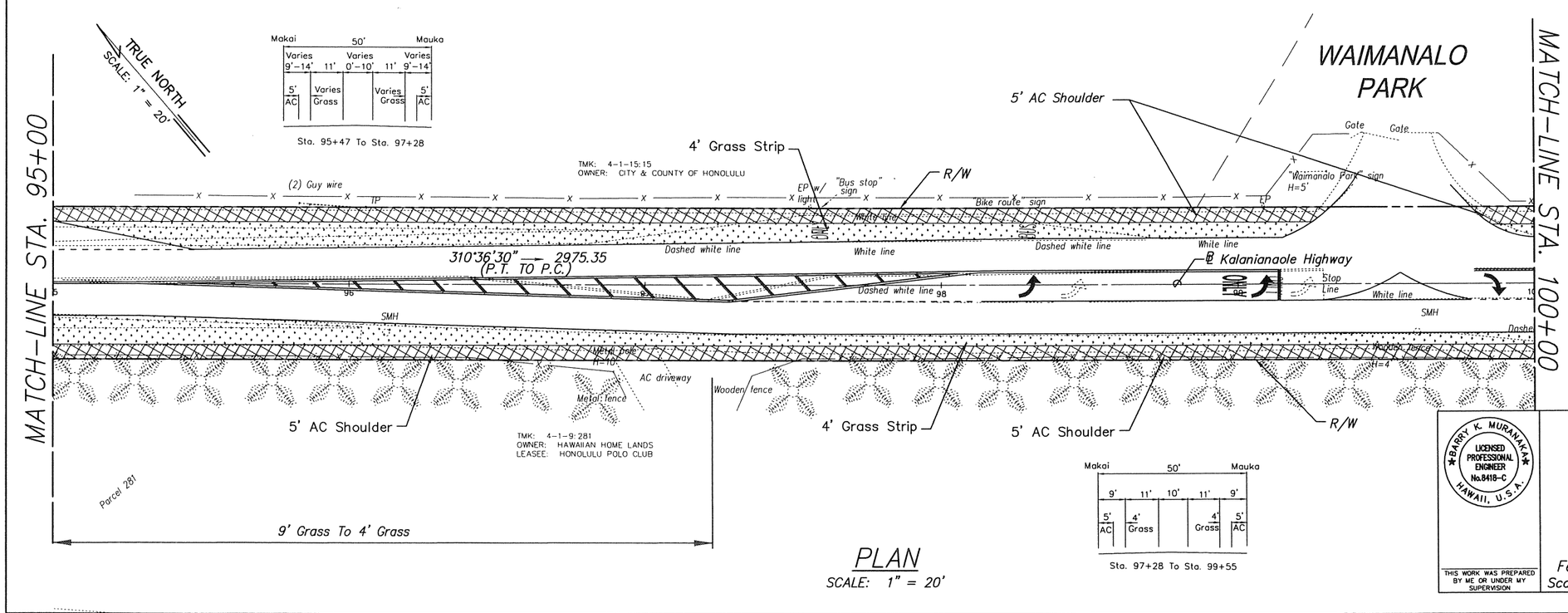


PLAN

SCALE: 1" = 20'

Legend

- Concrete Sidewalk
- AC Shoulder
- Grass
- Landscaping
- Existing Marking
- Existing Striping
- New Marking
- New Striping



PLAN

SCALE: 1" = 20'

20' 0 20' 40'

SCALE: 1" = 20'

EXHIBIT 6

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY PLAN

STA. 90+00 TO 100+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: As Shown Date: July 2005

BARRY K. MURANAKA
LICENSED PROFESSIONAL ENGINEER
No. 8418-C
HAWAII, U.S.A.

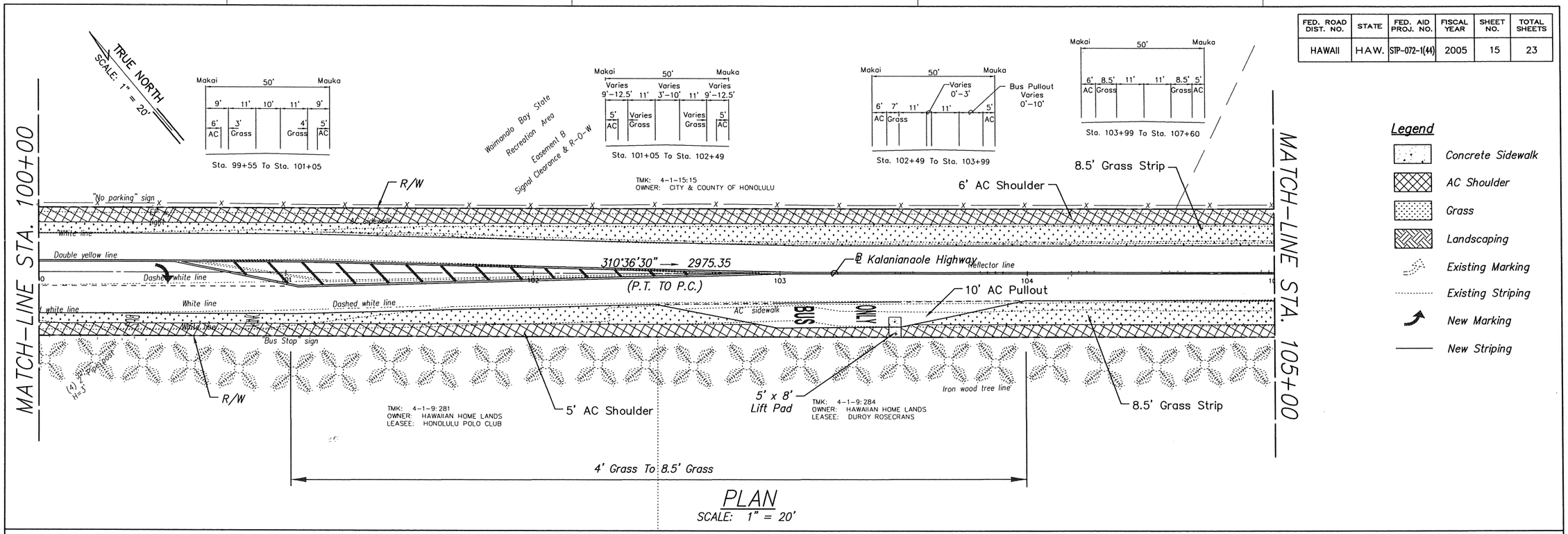
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

SHEET NO. 14 OF 23 SHEETS

P.M.: STY
CURRENT OPR: jsk3
PREV. OPR:
CURRENT TIME: Aug 10, 2005 - 3:14pm
LAST SAVED BY:
LAST MODIFIED: Tue, 19 Jul 2005 - 3:18pm

PREFIX: G:\doth00-01\acad\
FILE: doth0001017.dwg
BEGIN: 12/01/99
SCALE: 1=1

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	15	23



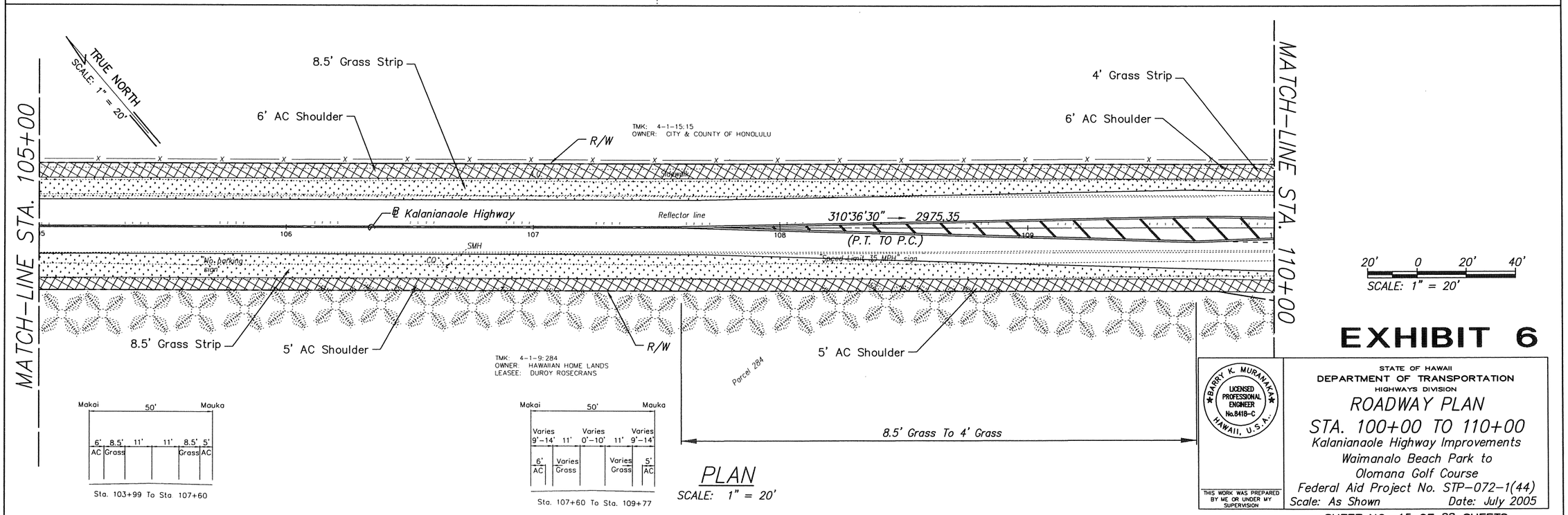


EXHIBIT 6

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY PLAN

STA. 100+00 TO 110+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course

Federal Aid Project No. STP-072-1(44)

Scale: As Shown Date: July 2005

BARRY K. MURANAKA LICENSED PROFESSIONAL ENGINEER No.8418-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

SHEET NO. 15 OF 23 SHEETS

PREFIX: G:\dath00-01\acad\
FILE: dath0001018.dwg
BEGIN: 12/01/99
SCALE: 1=1

P.M.: STY
CURRENT OPR: jsk3
PREV. OPR:
CURRENT TIME: Aug 10, 2005 - 3:15pm
LAST SAVED BY:
LAST MODIFIED: Tue, 19 Jul 2005 - 3:19pm

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	16	23

CURVE	1
Δ	9°25'30"
Δ/2	4°42'45"
R	600.00
T	49.46
C	98.59
Lc	98.70

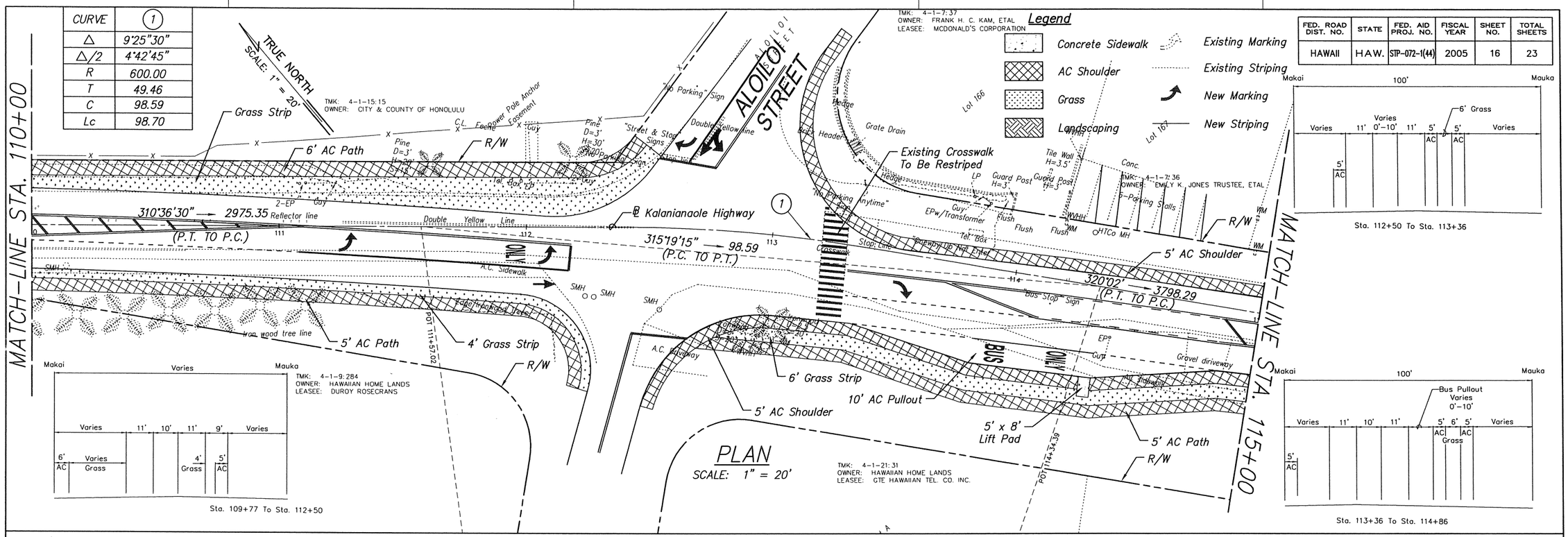


EXHIBIT 6

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY PLAN
STA. 110+00 TO 120+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: As Shown Date: July 2005

BARRY K. MURANAKA
LICENSED PROFESSIONAL ENGINEER No.8418-C
HAWAII, U.S.A.

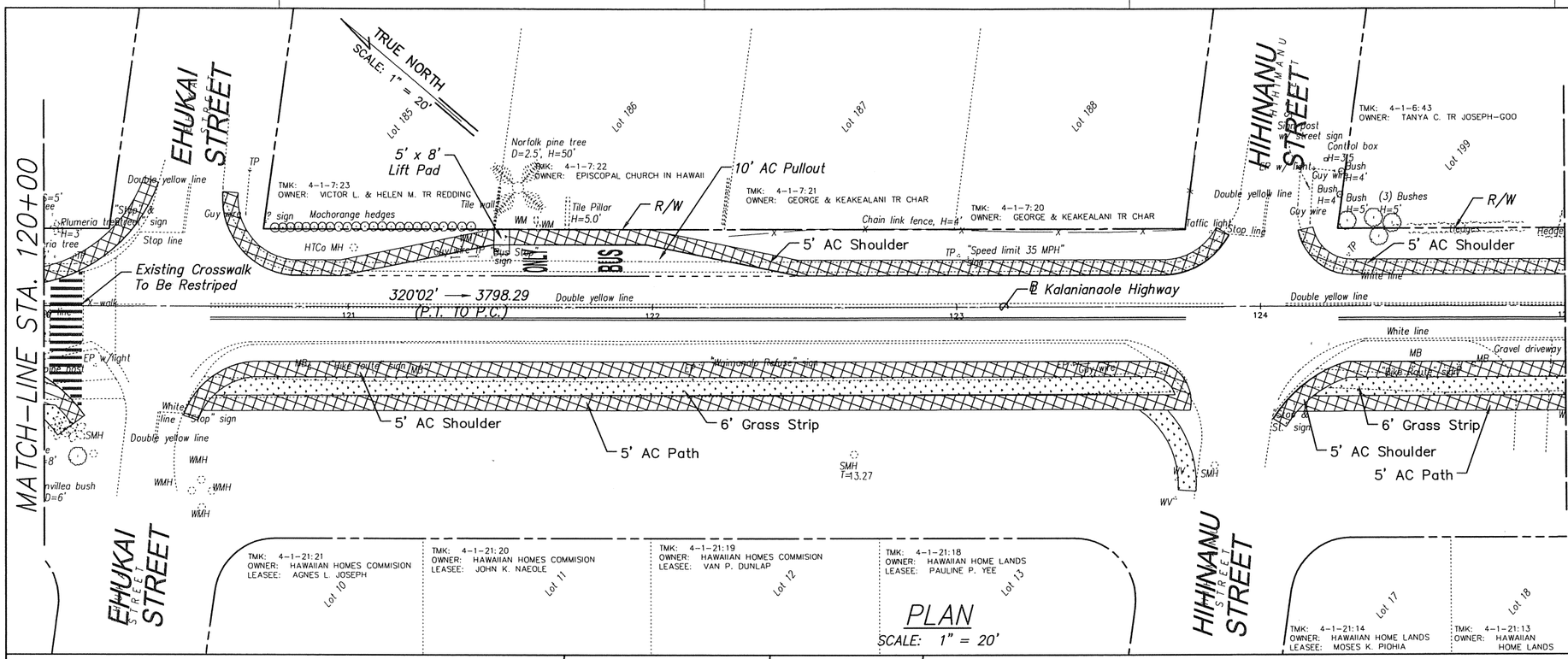
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

SHEET NO. 16 OF 23 SHEETS

P.M.: STY
CURRENT OPR: jsk3
PREV. OPR:
CURRENT TIME: Aug 10, 2005 - 3:15pm
LAST SAVED BY:
LAST MODIFIED: Tue, 19 Jul 2005 - 3:20pm

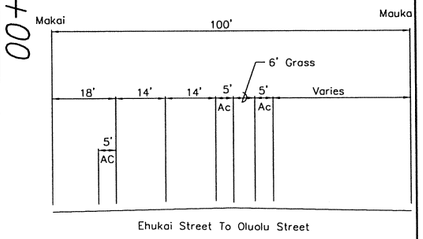
PREFIX: G:\dath00-01\acad\
FILE: dath0001019.dwg
BEGIN: 12/01/99
SCALE: 1=1

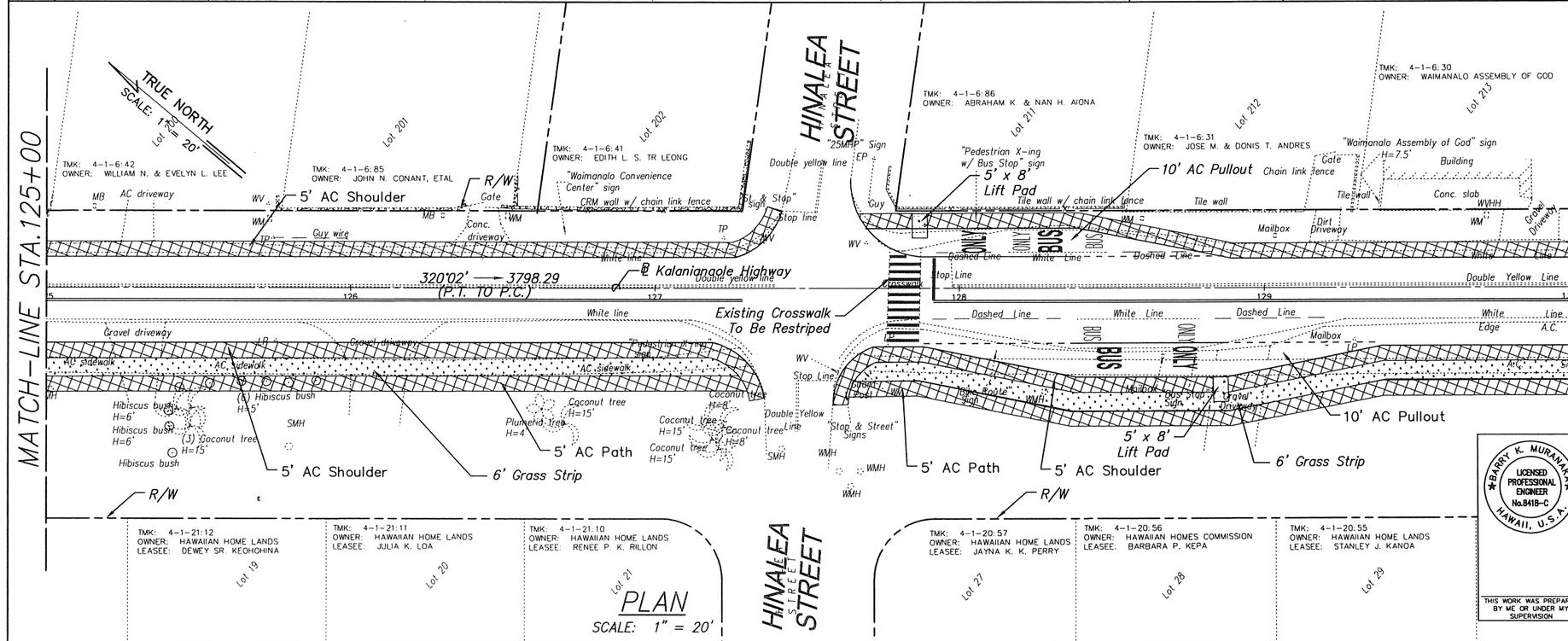
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	17	23

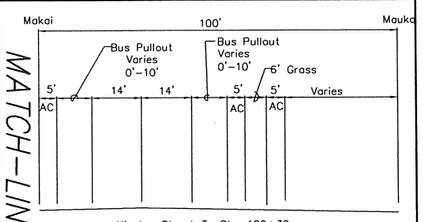


Legend

- Concrete Sidewalk
- AC Shoulder
- Grass
- Landscaping
- Existing Marking
- Existing Striping
- New Marking
- New Striping







20' 0 20' 40'

SCALE: 1" = 20'

EXHIBIT 6

BARRY K. MURANAKA LICENSED PROFESSIONAL ENGINEER No.8418-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY PLAN

STA. 120+00 TO 130+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course

Federal Aid Project No. STP-072-1(44)

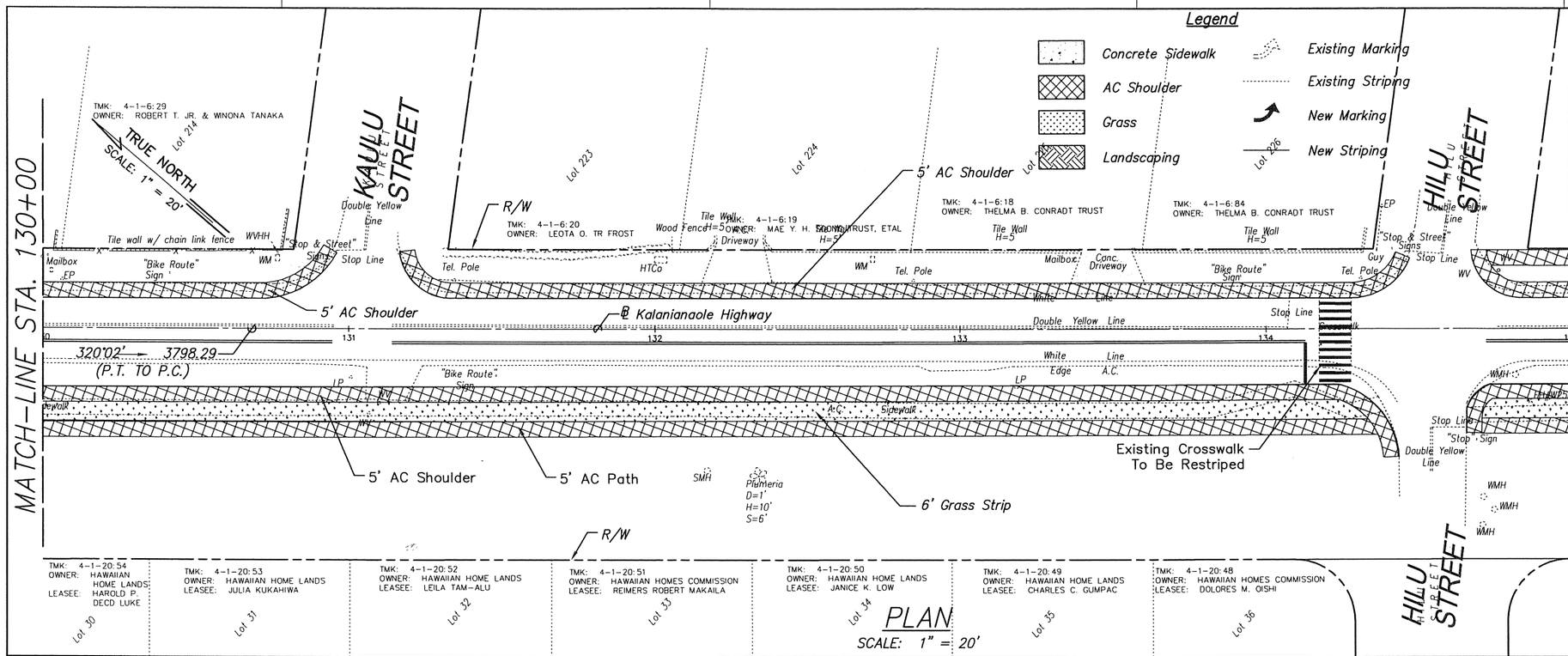
Scale: As Shown Date: July 2005

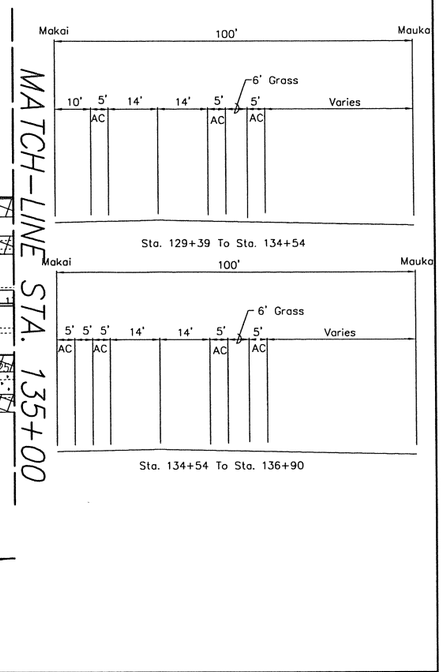
SHEET NO. 17 OF 23 SHEETS

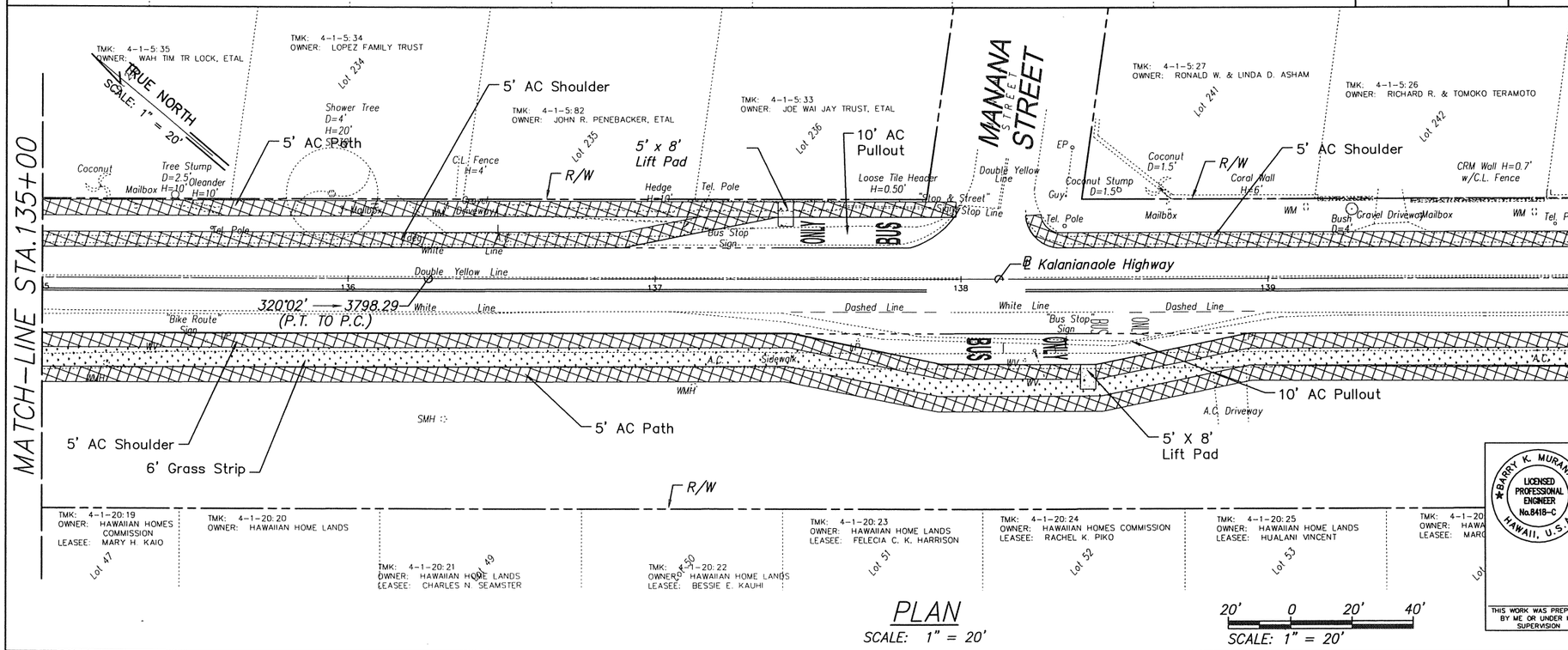
PREFIX: G:\dath00-01\acad\
FILE: dath0001020.dwg
BEGIN: 12/01/99
SCALE: 1=1

P.M.: STY
CURRENT OPR: jsk.3
PREV. OPR:
CURRENT TIME: Aug 10, 2005 - 3:15pm
LAST SAVED BY:
LAST MODIFIED: Tue, 19 Jul 2005 - 3:22pm

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	18	23







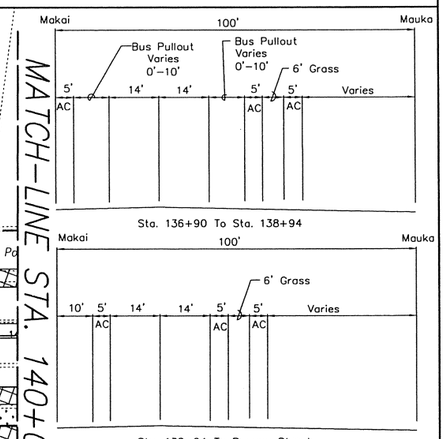


EXHIBIT 6

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BARRY K. MURANAKA
LICENSED PROFESSIONAL ENGINEER
No.8418-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

ROADWAY PLAN

STA. 130+00 TO 140+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)

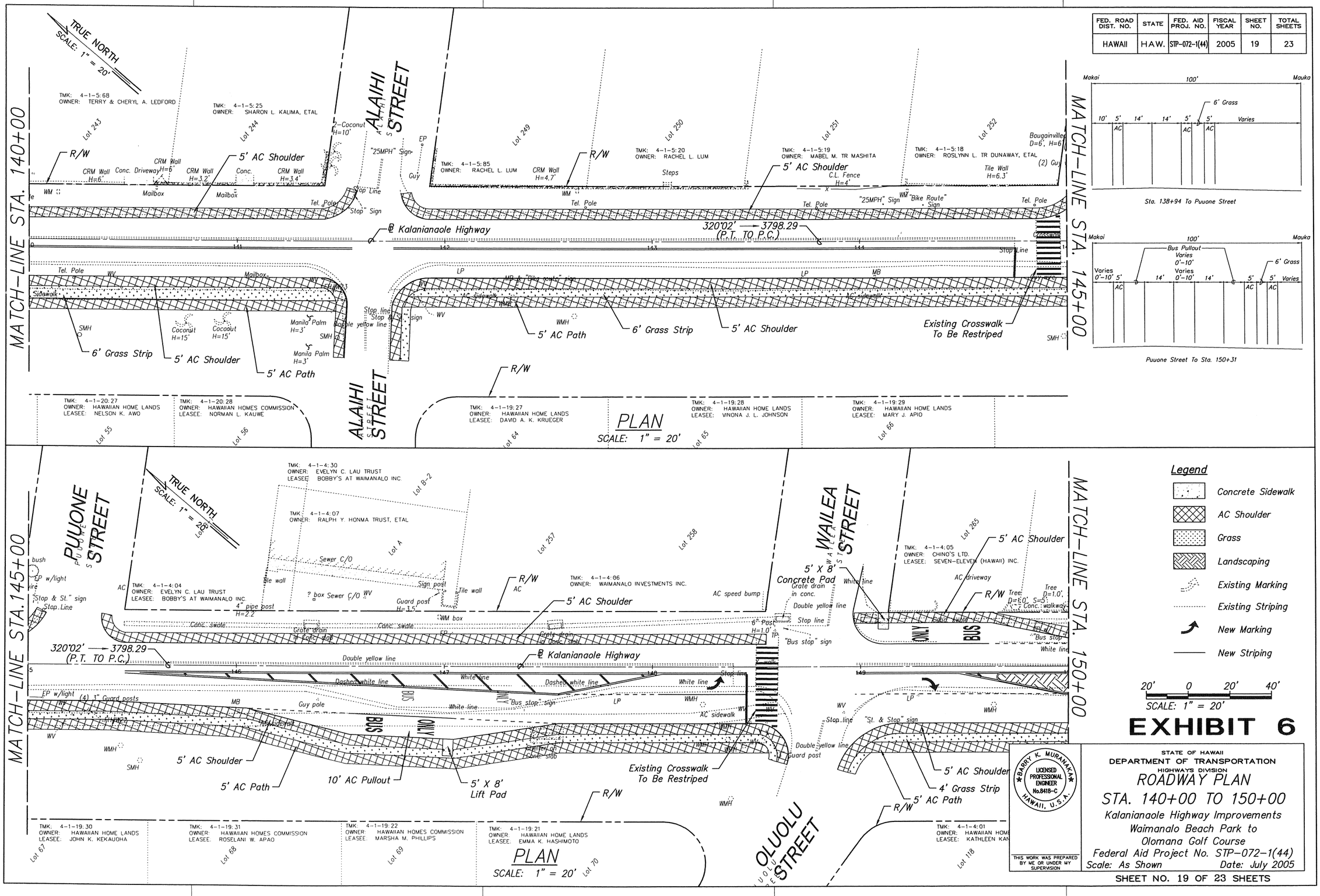
Scale: As Shown Date: July 2005

SHEET NO. 18 OF 23 SHEETS

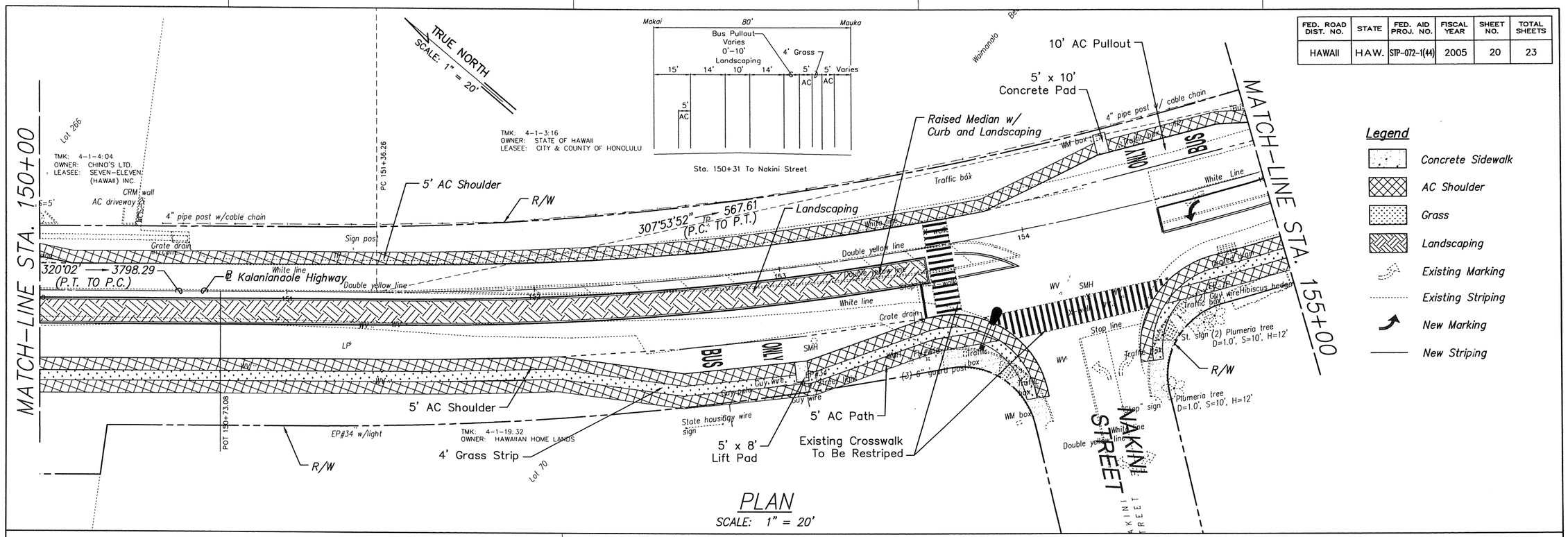
PREFIX: G:\dath00-01\acad\
FILE: dath00001021.dwg
BEGIN: 12/01/99
SCALE: 1=1

P.M.: STY
CURRENT OPR: jsk3
PREV. OPR:
CURRENT TIME: Aug 10, 2005 - 3:16pm
LAST SAVED BY:
LAST MODIFIED: Tue, 19 Jul 2005 - 3:24pm

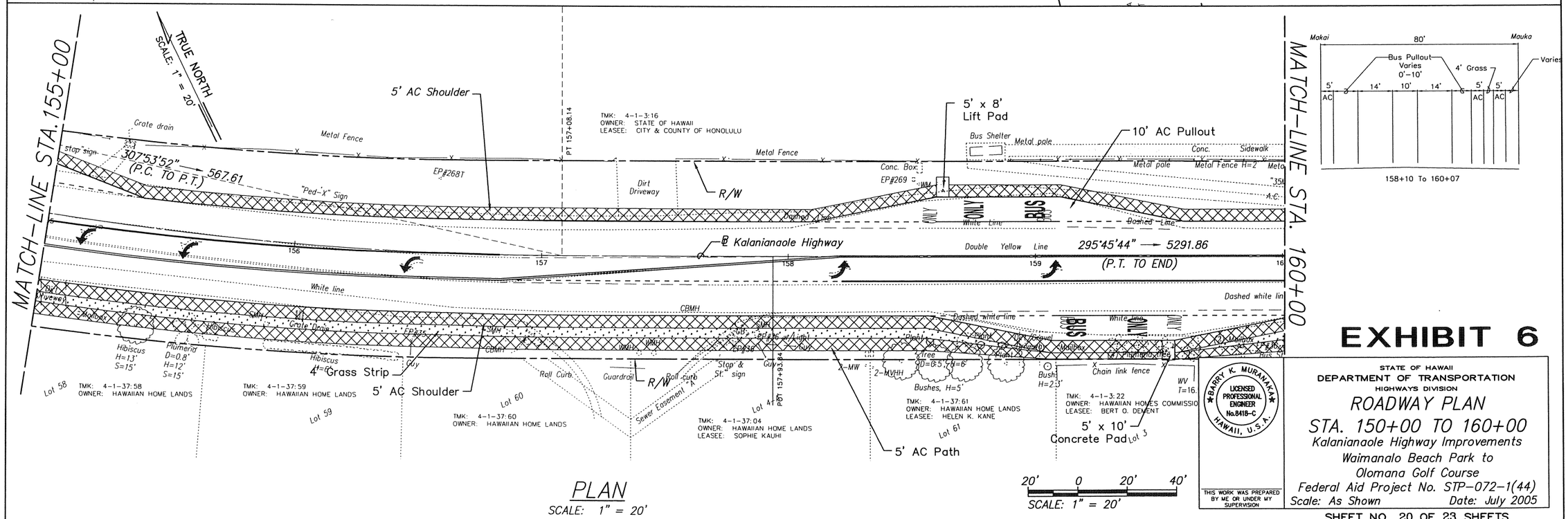
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	19	23



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	20	23



PLAN
SCALE: 1" = 20'



PLAN
SCALE: 1" = 20'

20' 0 20' 40'
SCALE: 1" = 20'

EXHIBIT 6

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY PLAN

STA. 150+00 TO 160+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: As Shown Date: July 2005

BARRY K. MURANAKA
LICENSED PROFESSIONAL ENGINEER
No.8418-C
HAWAII, U.S.A.

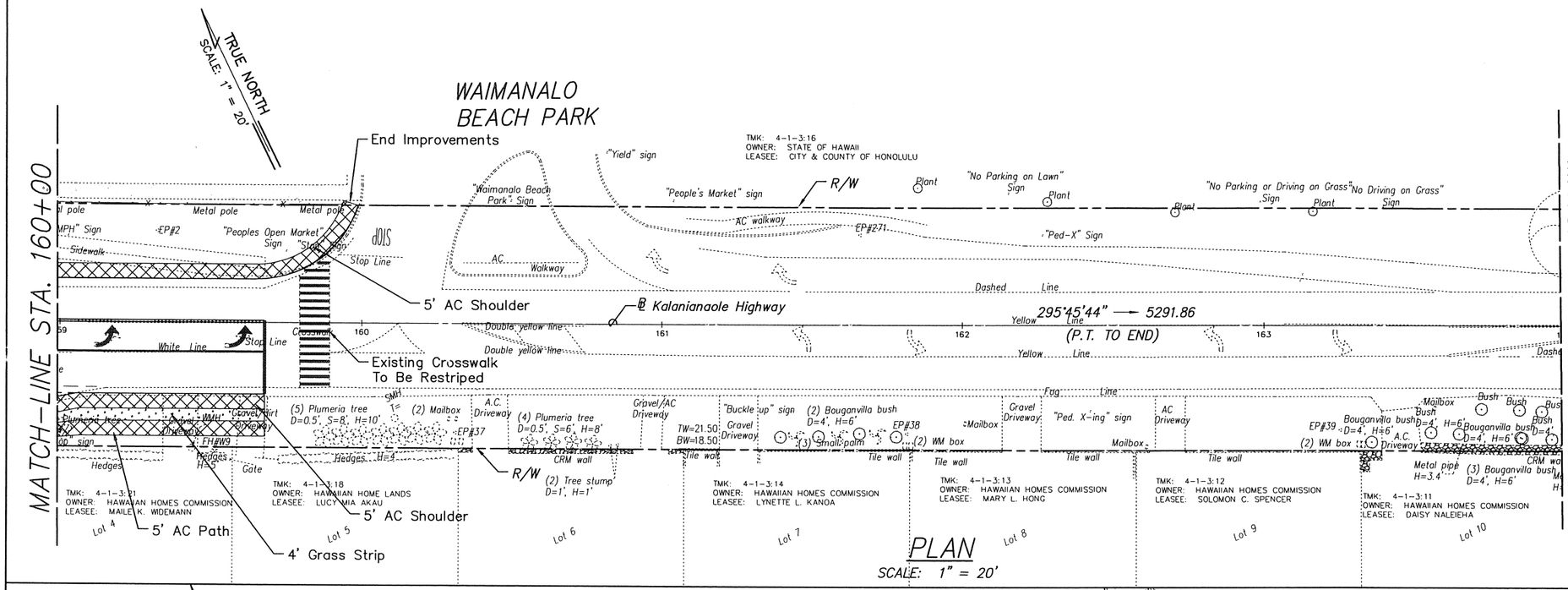
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

SHEET NO. 20 OF 23 SHEETS

PREFIX: G:\doth00-01\acad\
FILE: doth0001023.dwg
BEGIN: 12/01/99
SCALE: 1=1

P.M.: STY
CURRENT OPR: jsk3
PREV. OPR:
CURRENT TIME: Aug 10, 2005 - 3:16pm
LAST SAVED BY:
LAST MODIFIED: Tue, 19 Jul 2005 - 3:26pm

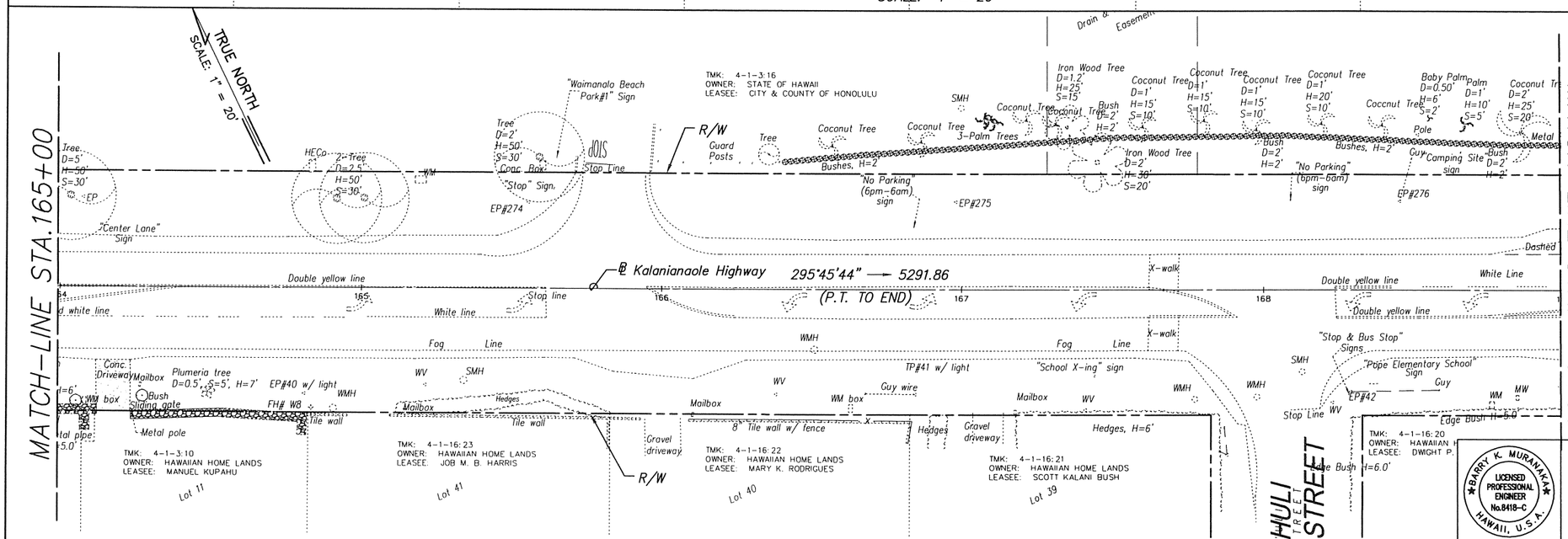
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	21	23



PLAN
SCALE: 1" = 20'

Legend

- Concrete Sidewalk
- AC Shoulder
- Grass
- Landscaping
- Existing Marking
- Existing Striping
- New Marking
- New Striping



PLAN
SCALE: 1" = 20'

20' 0 20' 40'
SCALE: 1" = 20'

P.M.: STY
CURRENT OPR: jsk3
PREV. OPR:
CURRENT TIME: Aug 10, 2005 - 3:16pm
LAST SAVED BY:
LAST MODIFIED: Tue, 19 Jul 2005 - 3:28pm

PREFIX: G:\doth00-01\acad\
FILE: doth0001024.dwg
BEGIN: 12/01/99
SCALE: 1=1

EXHIBIT 6

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY PLAN

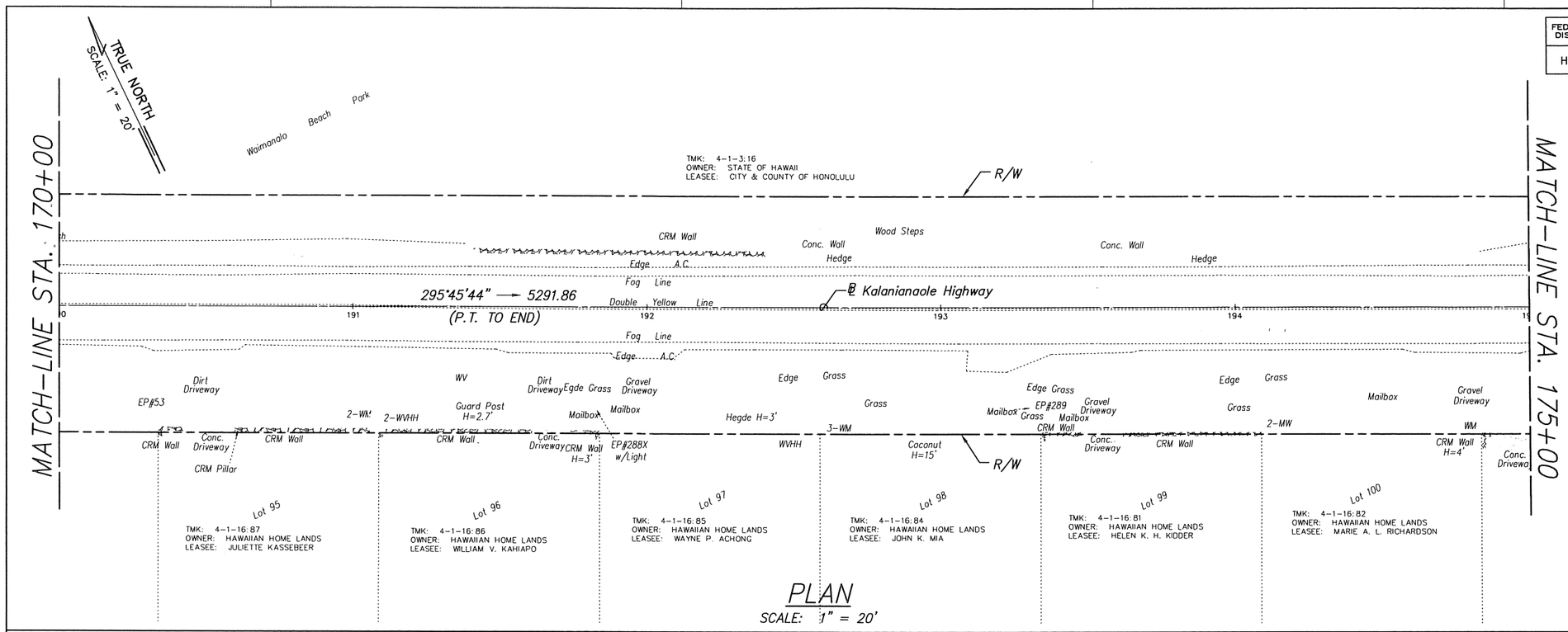
STA. 160+00 TO 170+00
Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: As Shown Date: July 2005

BARRY K. MURANAKA
LICENSED PROFESSIONAL ENGINEER
No.8418-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

SHEET NO. 21 OF 23 SHEETS

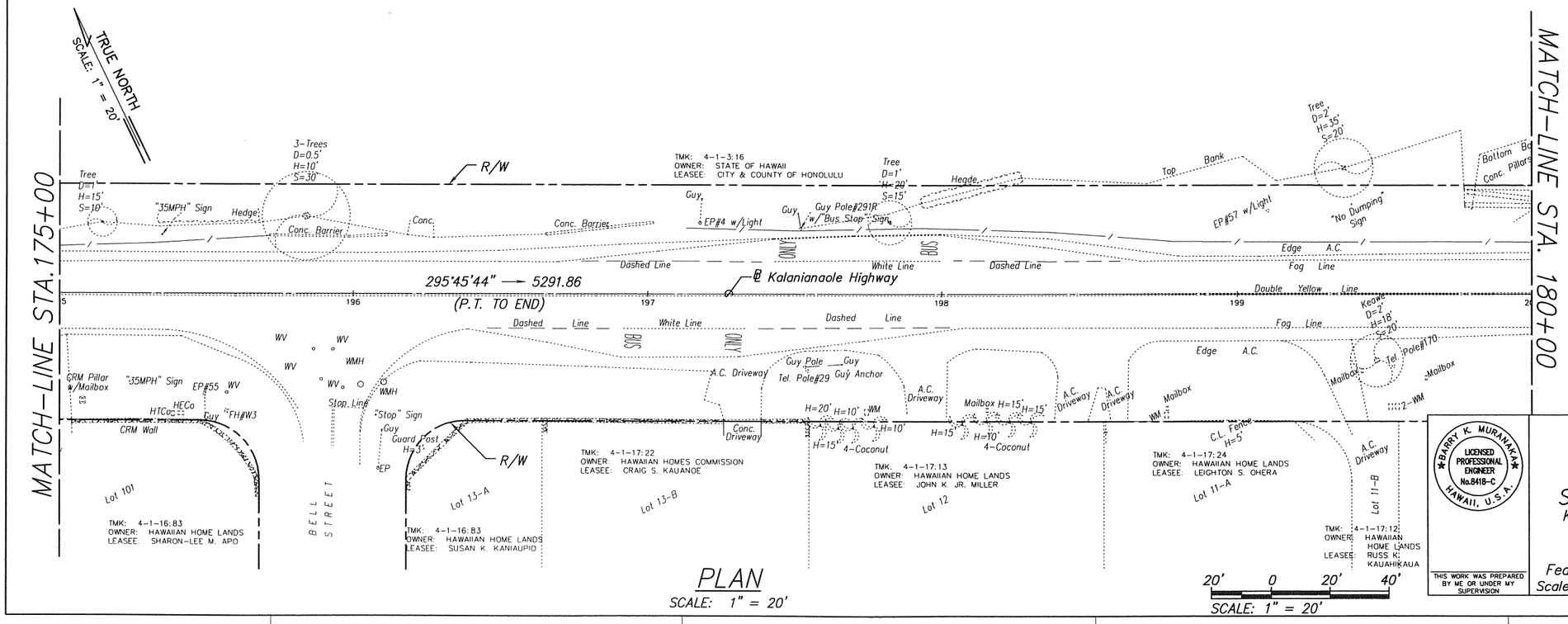
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	22	23



PLAN
SCALE: 1" = 20'

Legend

- Concrete Sidewalk
- AC Shoulder
- Grass
- Landscaping
- Existing Marking
- Existing Striping
- New Marking
- New Striping



PLAN
SCALE: 1" = 20'

EXHIBIT 6

BARRY K. MURANAKA
LICENSED PROFESSIONAL ENGINEER
No.8418-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY PLAN

STA. 170+00 TO 180+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)

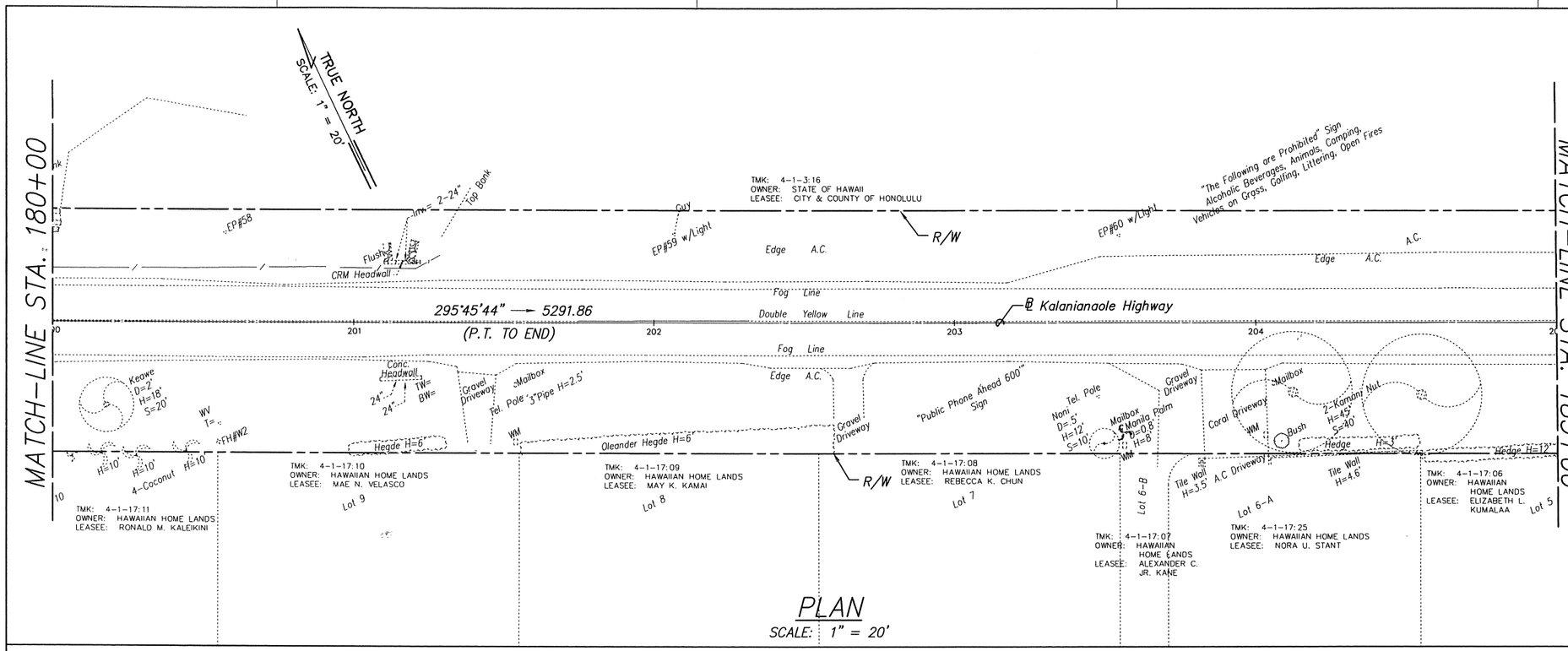
Scale: As Shown Date: July 2005

SHEET NO. 22 OF 23 SHEETS

PREFIX: G:\dath00-01\acad\
FILE: dath0001027.dwg
BEGIN: 12/01/99
SCALE: 1=1

P.M.: STY
CURRENT OPR: jsk3
PREV. OPR:
CURRENT TIME: Aug 10, 2005 - 3:17pm
LAST SAVED BY:
LAST MODIFIED: Thu, 07 Jul 2005 - 1:35pm

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	23	23

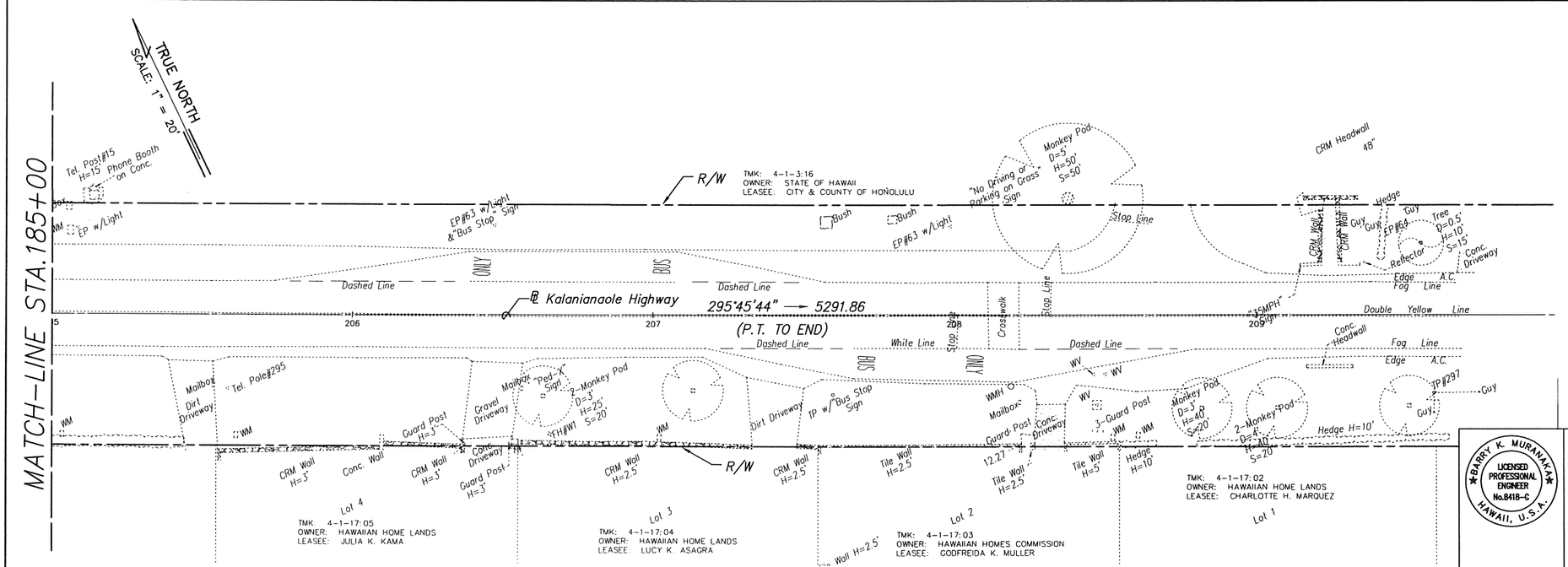


PLAN

SCALE: 1" = 20'

Legend

- Concrete Sidewalk
- AC Shoulder
- Grass
- Landscaping
- Existing Marking
- Existing Striping
- New Marking
- New Striping



PLAN

SCALE: 1" = 20'

20' 0 20' 40'

SCALE: 1" = 20'

PREFIX: G:\oath00-01\acad\
FILE: oath0001028.dwg
BEGIN: 12/01/99
SCALE: 1=1

P.M.: STY
CURRENT OPR: jsk3
PREV. OPR:
CURRENT TIME: Aug 10, 2005 - 3:17pm
LAST SAVED BY:
LAST MODIFIED: Thu, 07 Jul 2005 - 1:15pm

EXHIBIT 6

BARRY K. MURANAKA
LICENSED PROFESSIONAL ENGINEER
No.8418-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

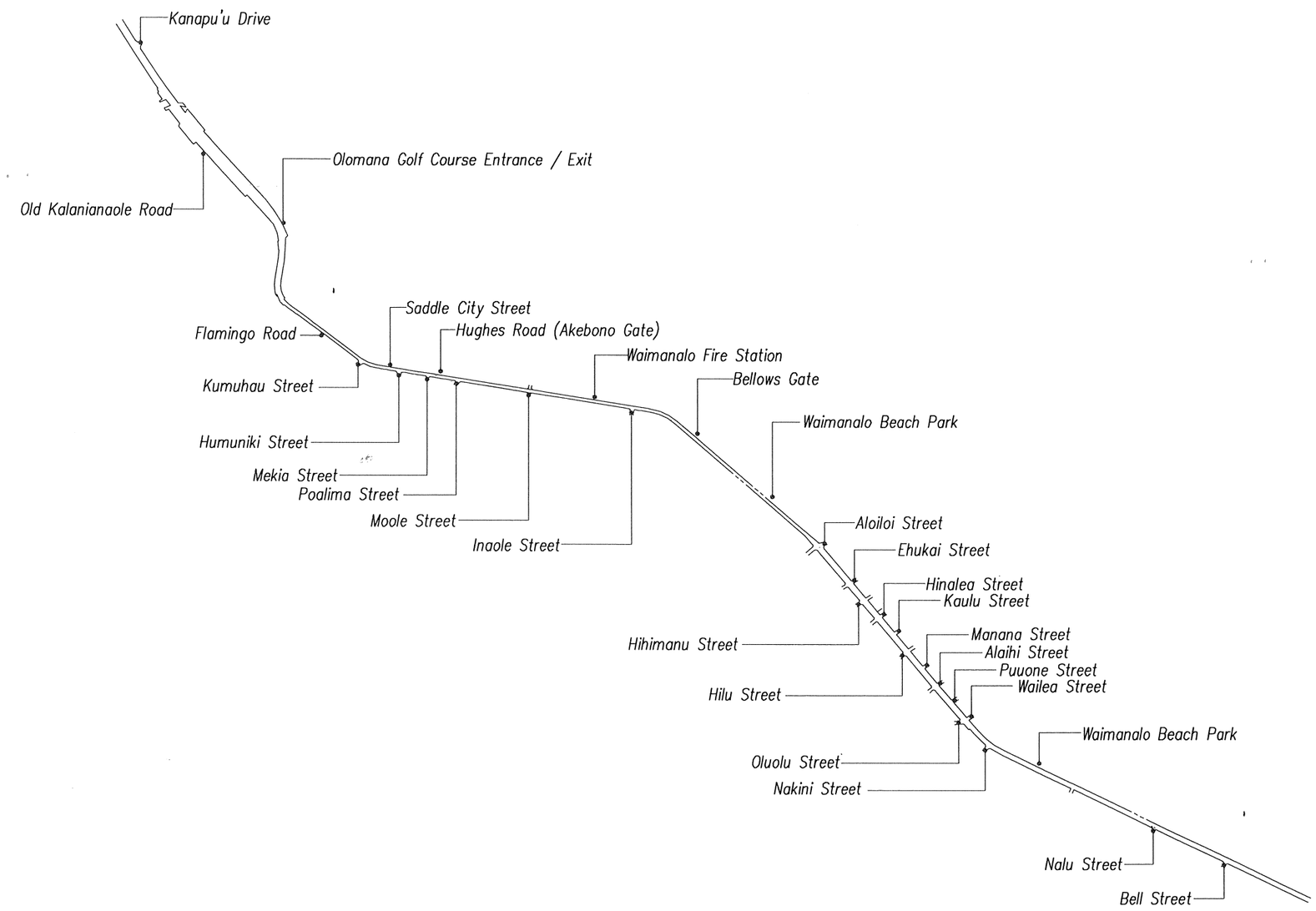
ROADWAY PLAN

STA. 180+00 TO END

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: As Shown Date: July 2005

SHEET NO. 23 OF 23 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	E-1	24



ELECTRICAL SYMBOLS

SYMBOL	DESCRIPTION
	Existing Highway Light Standard, Bracket Arm and Luminaire on Concrete Foundation
	Existing Highway Light Bracket Arm and Luminaire, Mounted on Existing Wood Utility Pole
	Existing Wood Utility Pole and Down Guy
	Existing Traffic Signal Standard on Concrete Base
	Existing Traffic Signal Detector Loop
	Existing Utility Company, Traffic Signal, or Highway Light Concrete Handhole / Pullbox
	Existing Utility Company Concrete Manhole

OVERALL PROJECT LOCATION PLAN

SCALE: 1"=1000'

NORTH

1000'500' 0 1000' 2000' 3000'

SCALE: 1"=1000'

GRAPHIC SCALE

EXHIBIT 7

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

04/30/06

EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

OVERALL PROJECT LOCATION PLAN, ELECTRICAL SYMBOLS

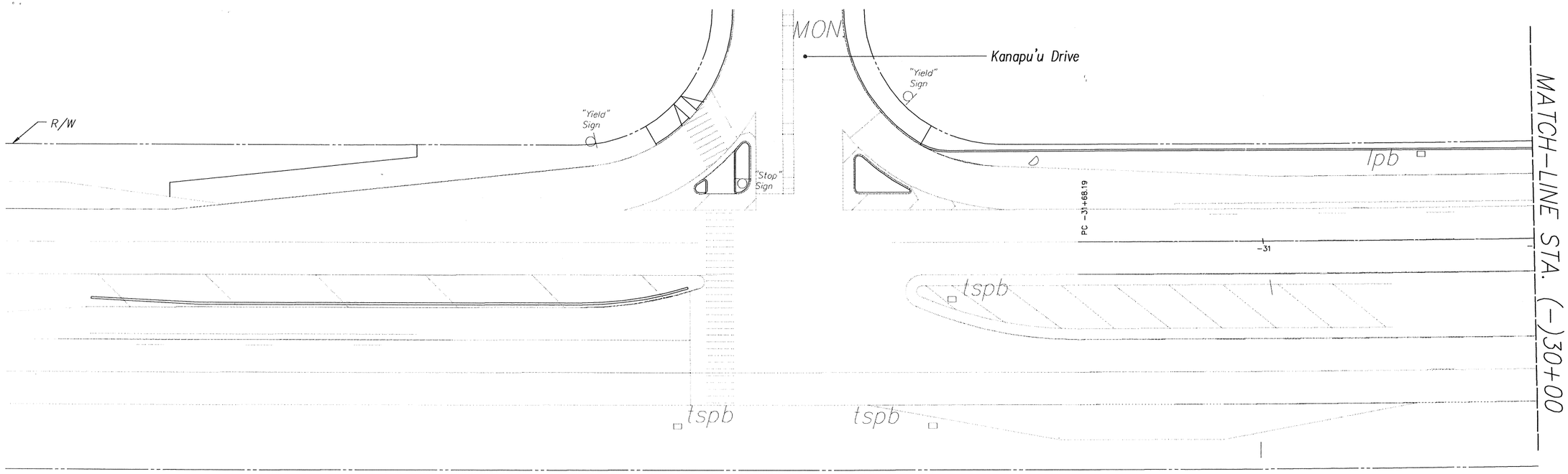
Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: AS NOTED Date: July 2005

SHEET No. E-1 OF 24 SHEETS

ORIGINAL PLAN
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE
NOTE BOOK
No.

LAST SAVE: 12/12/05 @ 15:20:28 BY: JM PLOT SC 1"=0"=1'
Z:\ACAD\PROJECTS\24120\V001_24120_symbols XREFS: NALO_FSTRIPE2=NALO_FSTRIPE3 NALO_FSTRIPE3 NALO_FSTRIPE3 _X24120_SYMBOLS XNALO_FSTRIPE3=RHA WAIMBL OLOMANA_TRADING WAIMANALO BASE OVERSIZE1=\OVERSIZE1 _X24120-ELECALL

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	E-2	24



ROADWAY ELECTRICAL PLAN

SCALE: 1"=20'

NORTH

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

EXHIBIT 7

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

04/30/06

EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY ELECTRICAL PLAN
BEGIN TO STA. (-)30+00

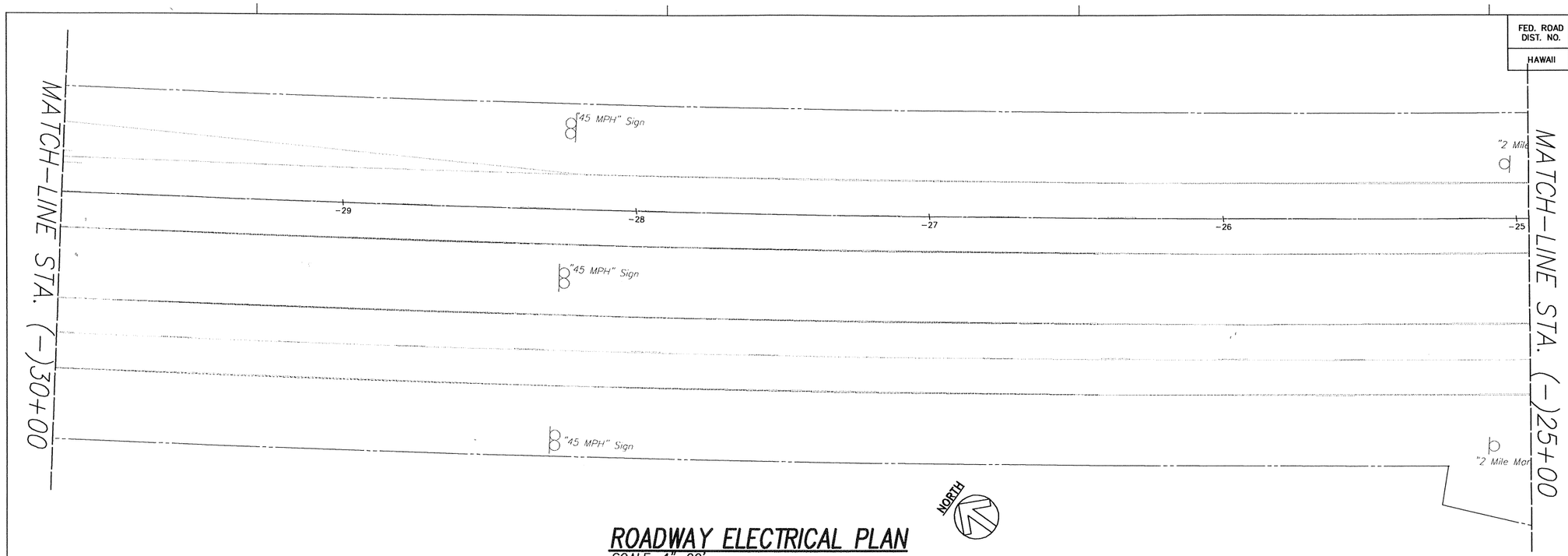
Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: AS NOTED Date: July 2005

SHEET No. E-2 OF 24 SHEETS

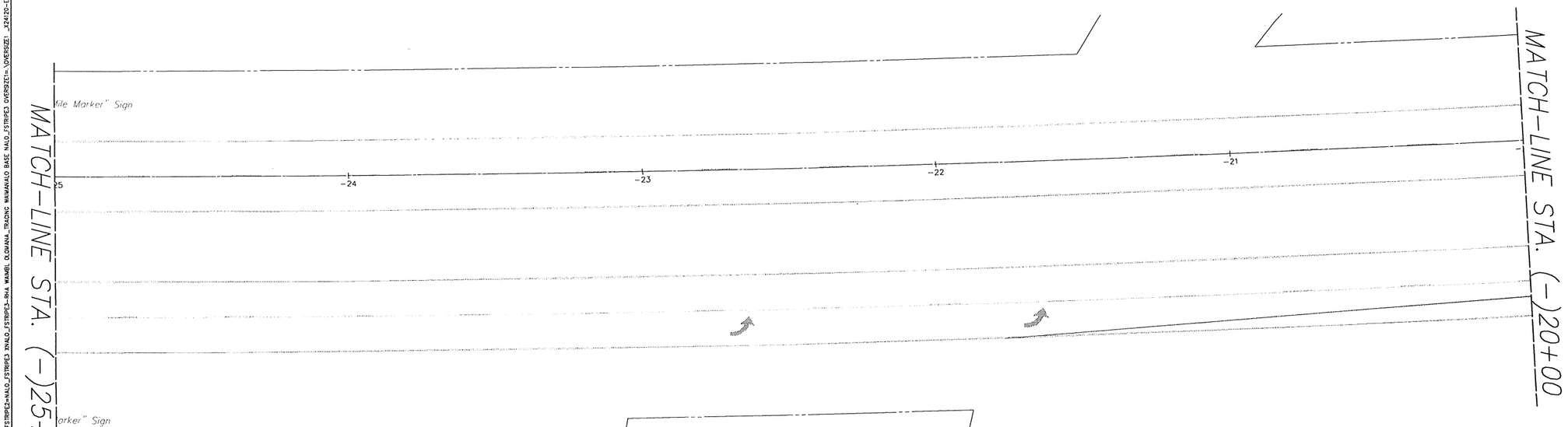
ORIGINAL PLAN
SURVEY PLOTTED BY ____ DATE ____
DRAWN BY ____
NOTE BOOK TRACED BY ____
DESIGNED BY ____
QUANTITIES BY ____
CHECKED BY ____
No. ____

LAST SAVE: 12/12/05 @ 14:03:23 BY: AM PLOT SC: 10"=1'
Z:\ACAD\PROJECTS\24120\DOT_24120-mhn000104 XREFS: NALO_FSTRIPE2=NALO_FSTRIPE2 XNALO_FSTRIPE3 XNALO_FSTRIPE3-RHA WAIMB. OLOMANA_TRACING WAIMANALO BASE NALO_FSTRIPE3 OVERSIZE1=\OVERSIZE1 _X24120-ELECALL

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	E-3	24



ROADWAY ELECTRICAL PLAN
SCALE: 1"=20'



ROADWAY ELECTRICAL PLAN
SCALE: 1"=20'

NORTH

20' 10' 0 20' 40' 60'
SCALE: 1"=20'
GRAPHIC SCALE

EXHIBIT 7

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

04/30/06

EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY ELECTRICAL PLAN
STA. (-)30+00 TO (-)20+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: AS NOTED Date: July 2005

SHEET No. E-3 OF 24 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

LAST SAVE: 12/13/05 @ 14:36:40 PM PDT 96 1"=20'=1'
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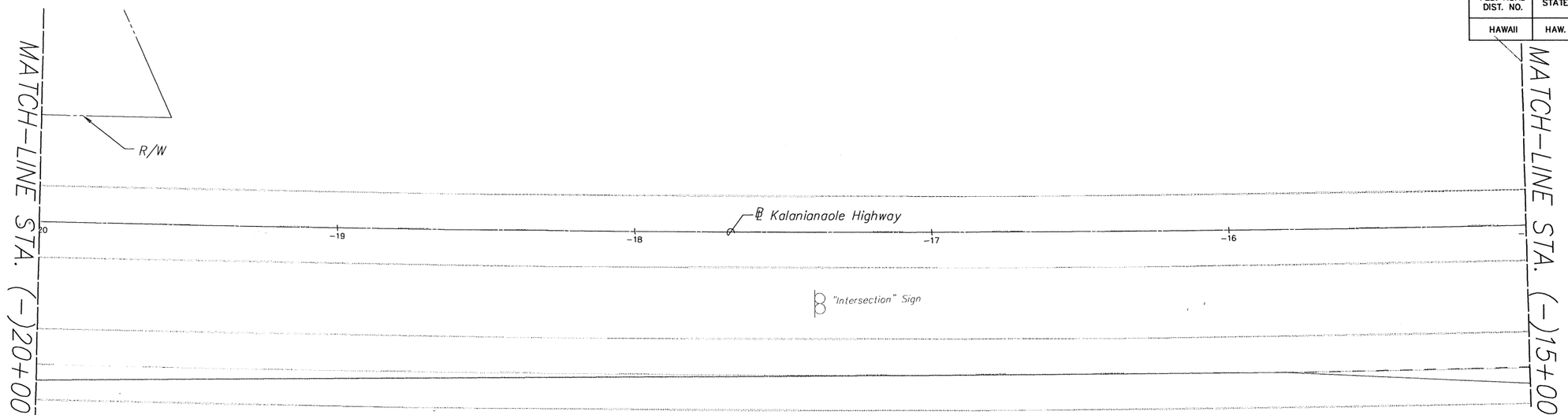
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	E-4	24

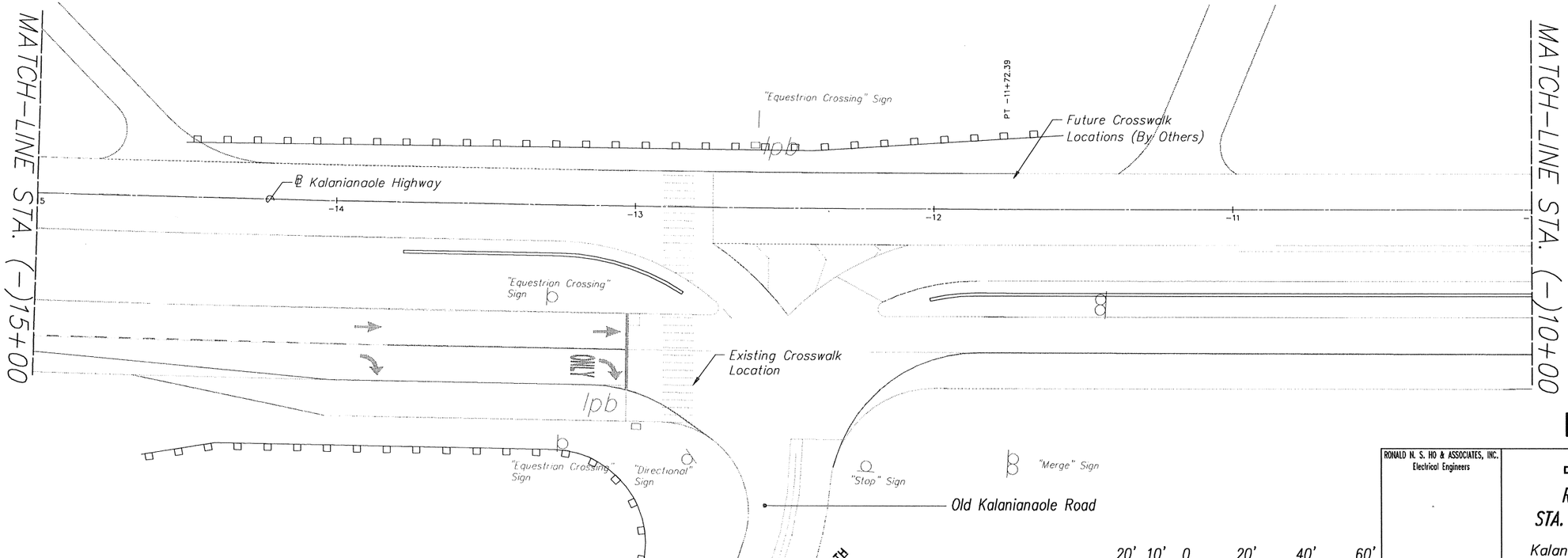


"Merge" Sign

"Intersection" Sign

NORTH

ROADWAY ELECTRICAL PLAN
SCALE: 1"=20'



ROADWAY ELECTRICAL PLAN
SCALE: 1"=20'

NORTH

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

EXHIBIT 7

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

04/30/06

EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY ELECTRICAL PLAN
STA. (-)20+00 TO STA. (-)10+00

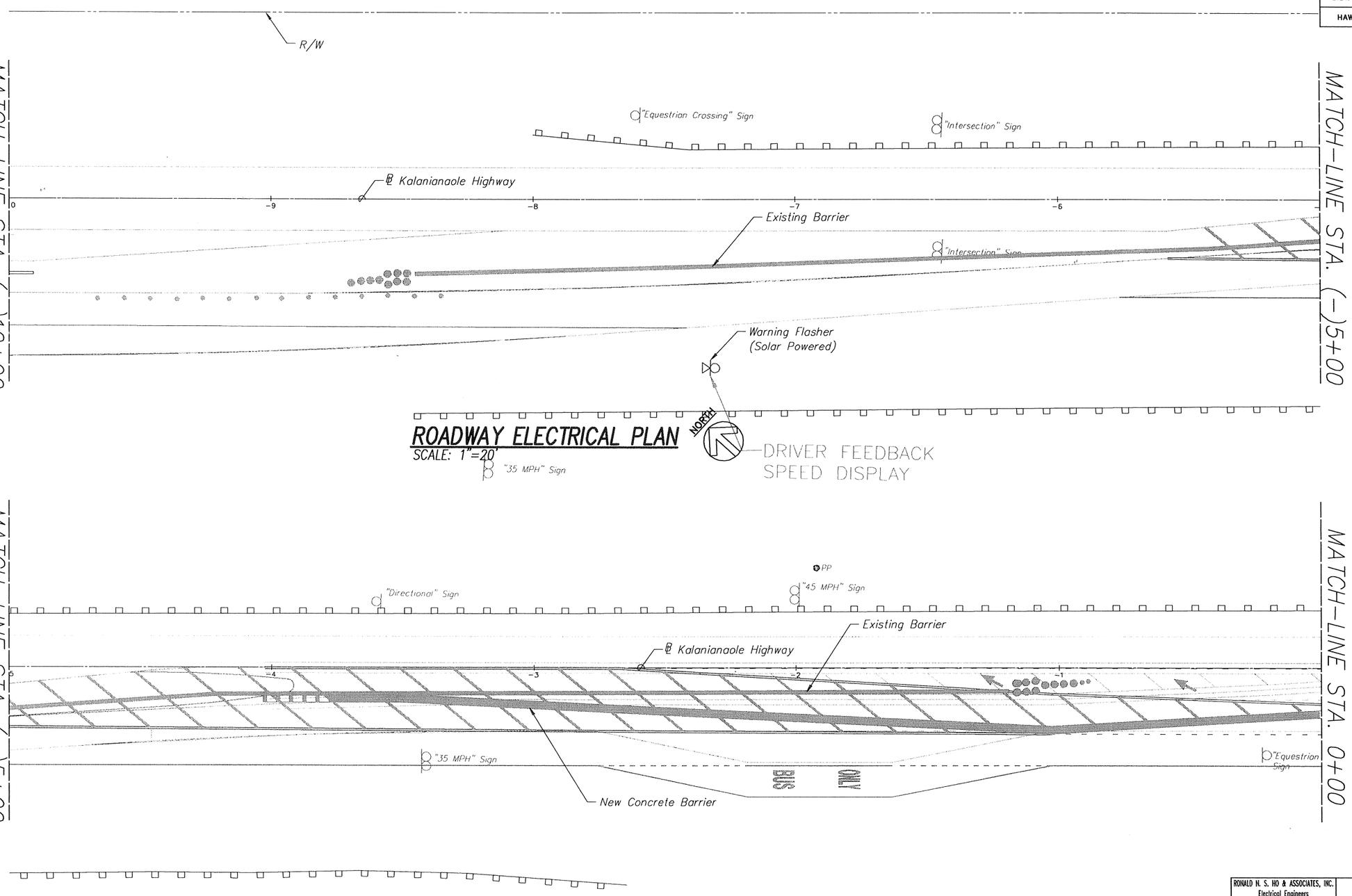
Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: AS NOTED Date: July 2005

SHEET No. E-4 OF 24 SHEETS

ORIGINAL PLAN
NOTE BOOK No.
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

LAST SAVE: 12/13/05 @ 14:06:38 BY: AM PLOT SC 1'-0"=1'
Z:\AUAD\PROJECTS\24120\v00-L_24120-eeh001006.DWG
XREFS: NALO_FSTRIPE2=NALO_FSTRIPE2 XNALO_FSTRIPE3 XNALO_FSTRIPE3-RHA WAMBL OLOMANA_TRACING WAIMANALO BASE NALO_FSTRIPE3 OVERSIZE1=\OVERSIZE1 _X24120-ELECNLL

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	E-5	24



ROADWAY ELECTRICAL PLAN
SCALE: 1"=20'

STA. (-) 5+00 to STA. 0+00:
Alternate 1: New Highway Light Standards
Alternate 2: New Highway Light Standards
Alternate 3: New Highway Light Standards

EXHIBIT 7

ROADWAY ELECTRICAL PLAN
SCALE: 1"=20'

NORTH

20' 10' 0 20' 40' 60'
SCALE: 1"=20'
GRAPHIC SCALE

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
	TRACED BY	
NOTE BOOK	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

LAST SAVE: 12/12/05 @ 14:10:25 BY: AM PLOT SC:1'-0"=1'
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RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
04/30/06
EXPIRATION DATE OF THE LICENSE

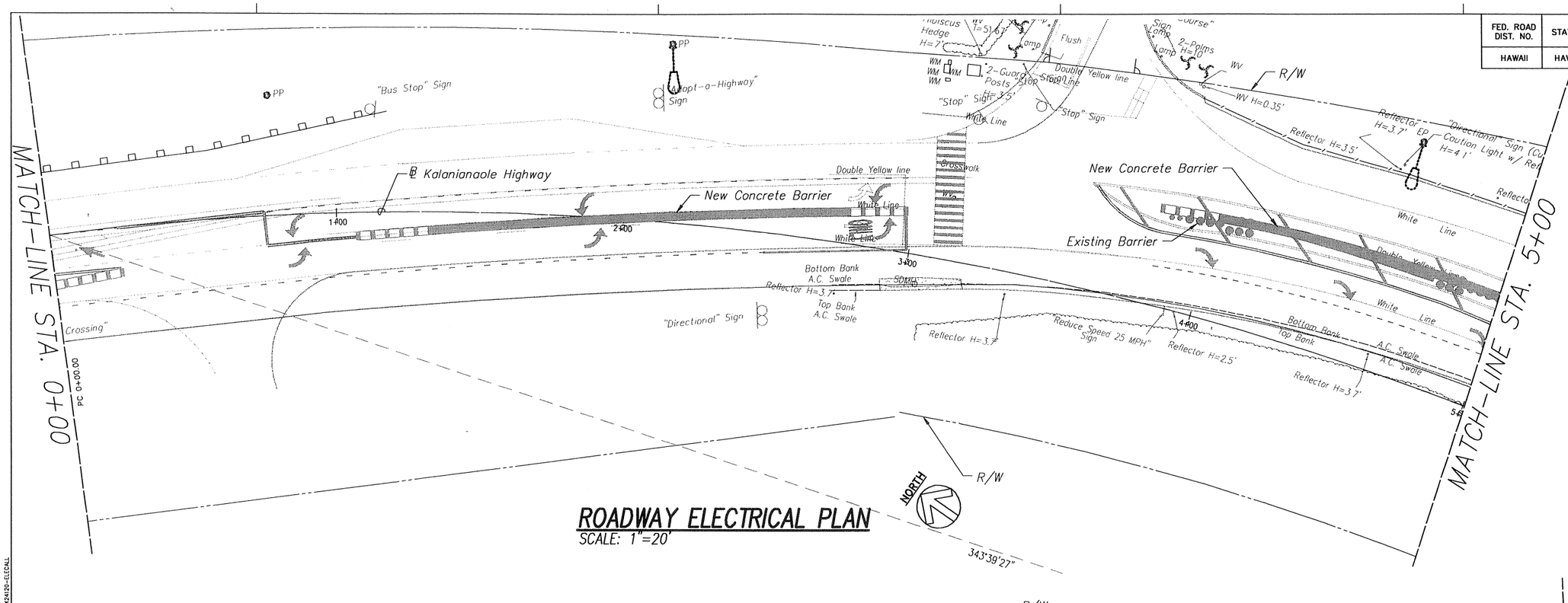
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY ELECTRICAL PLAN
STA. (-)10+00 TO STA. 0+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: AS NOTED Date: July 2005

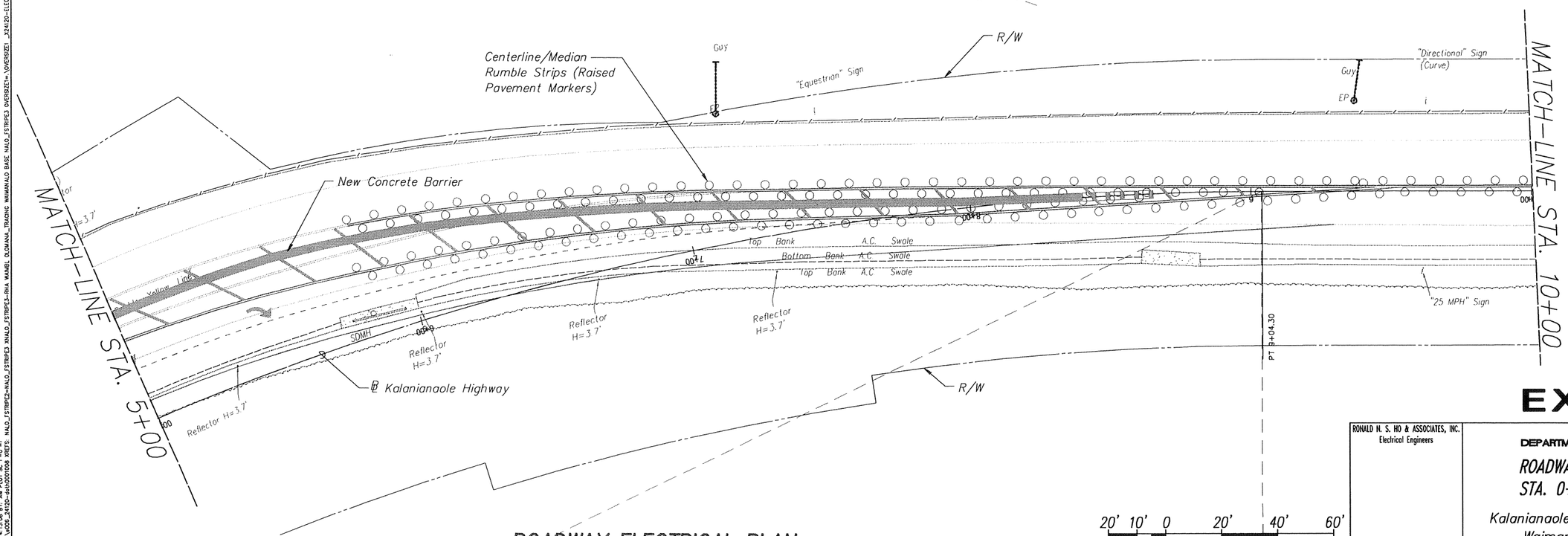
SHEET No. E-5 OF 24 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	E-6	24



ROADWAY ELECTRICAL PLAN
SCALE: 1"=20'

STA. 0+00 to STA. 10+00:
Alternate 1: New Highway Light Standards
Alternate 2: New Highway Light Standards
Alternate 3: New Highway Light Standards



ROADWAY ELECTRICAL PLAN
SCALE: 1"=20'

NORTH

20' 10' 0 20' 40' 60'
SCALE: 1"=20'
GRAPHIC SCALE

EXHIBIT 7

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

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04/30/06
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY ELECTRICAL PLAN
STA. 0+00 TO STA. 10+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: AS NOTED Date: July 2005

SHEET No. E-6 OF 24 SHEETS

ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE
NOTE BOOK No.

LAST SAVE: 12/12/05 @ 14:13:08 BY: AM PLOT SC: 1'=0'=1'
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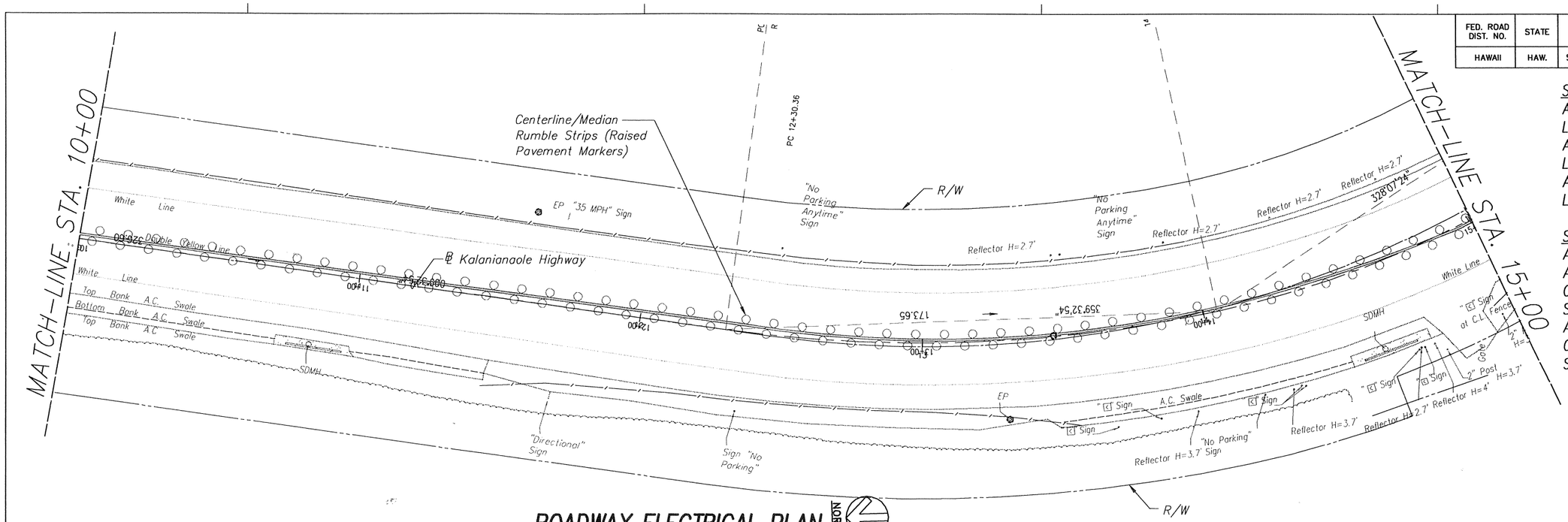
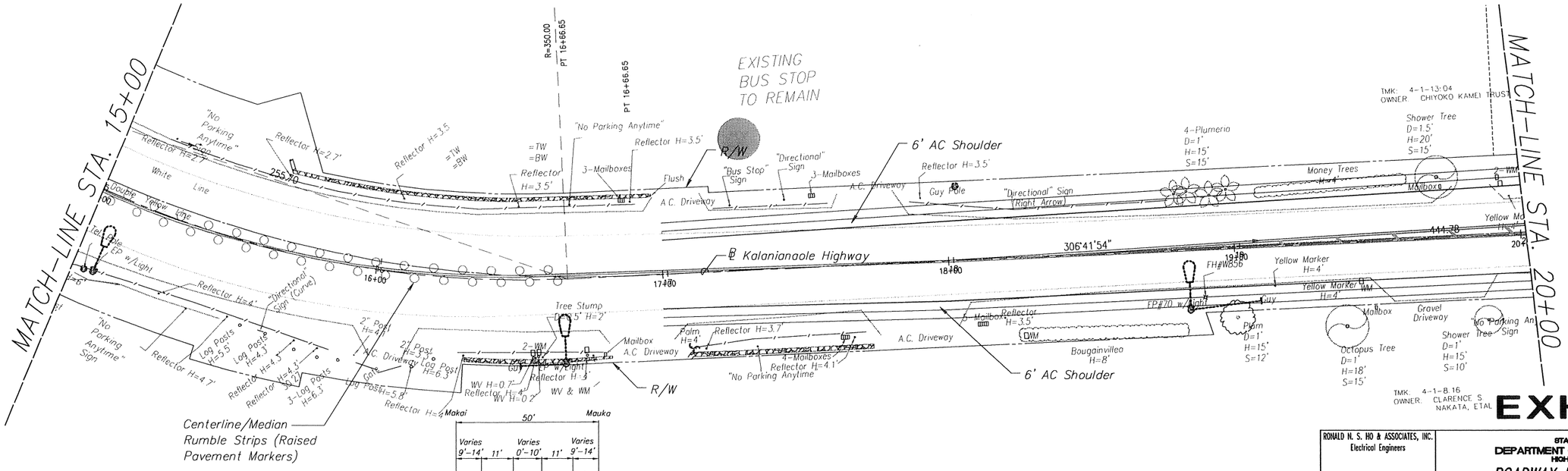
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	E-7	24

STA. 10+00 to STA. 17+00:
Alternate 1: New Highway Light Standards
Alternate 2: New Highway Light Standards
Alternate 3: New Highway Light Standards

STA. 17+00 to STA. 20+00:
Alternate 1: No Work
Alternate 2: OH to UG Utility Conversion; New Highway Light Standards
Alternate 3: OH to UG Utility Conversion; New Highway Light Standards



ROADWAY ELECTRICAL PLAN
SCALE: 1"=20'



ROADWAY ELECTRICAL PLAN
SCALE: 1"=20'

SCALE: 1"=20'
GRAPHIC SCALE
20' 10' 0 20' 40' 60'

EXHIBIT 7

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

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04/30/06

EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY ELECTRICAL PLAN
STA. 10+00 TO STA. 20+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: AS NOTED Date: July 2005

SHEET No. E-7 OF 24 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
No.	CHECKED BY	

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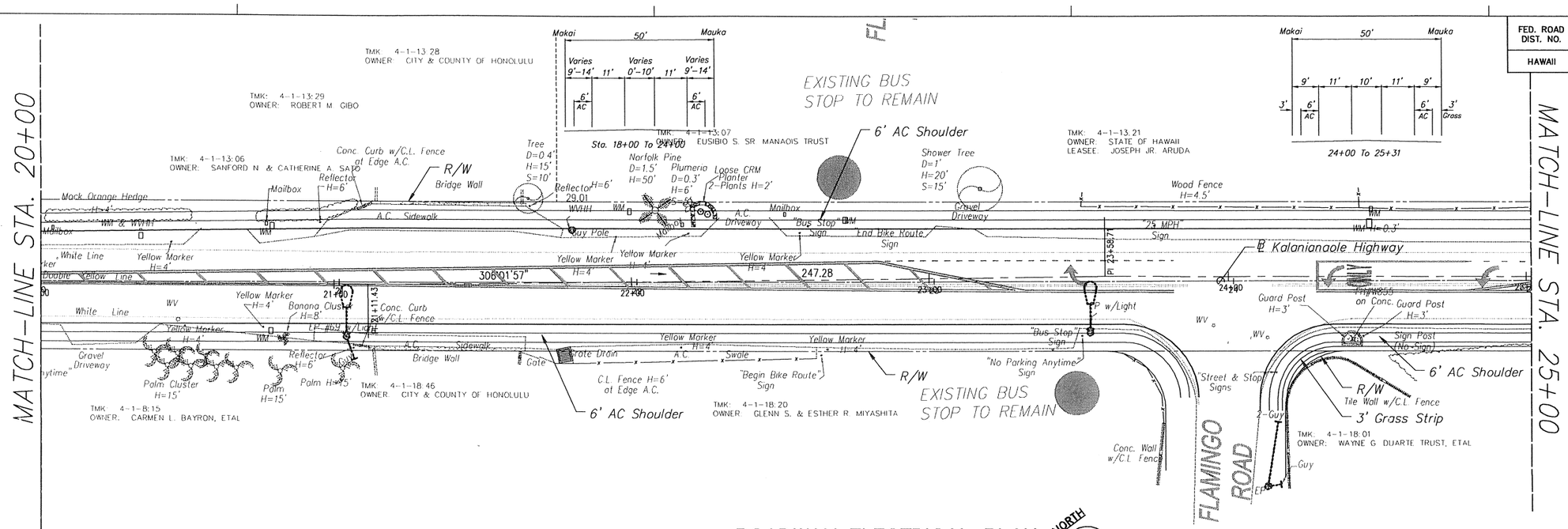
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	E-8	24

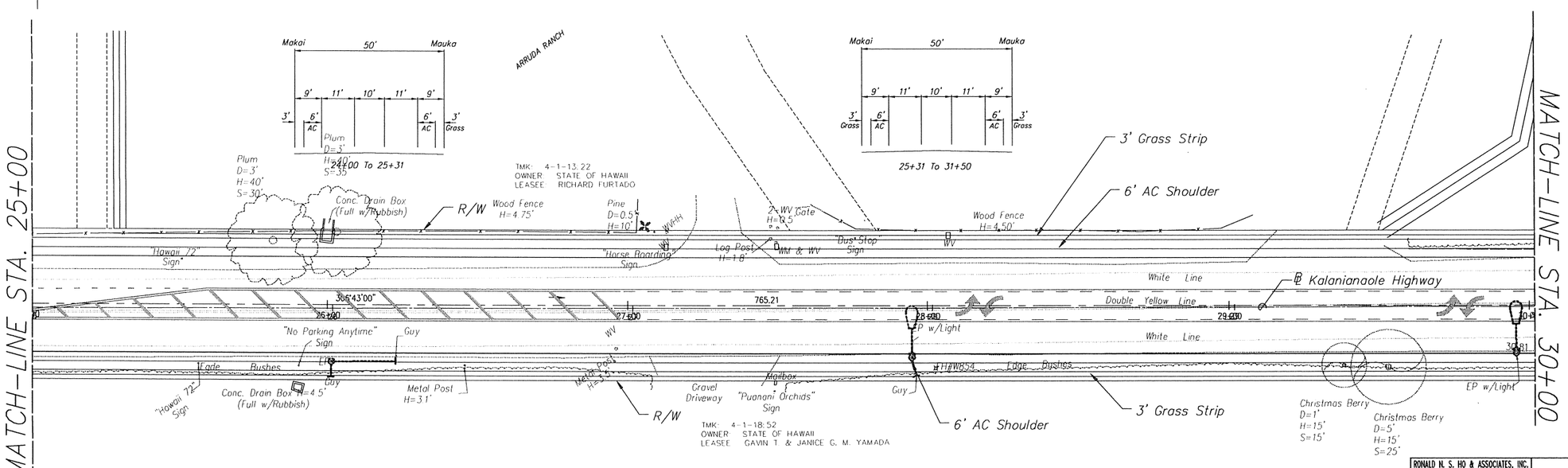
STA. 20+00 to STA. 30+00:
Alternate 1: No Work
Alternate 2: OH to UG Utility Conversion; New Highway Light Standards
Alternate 3: OH to UG Utility Conversion; New Highway Light Standards



ROADWAY ELECTRICAL PLAN

SCALE: 1"=20'

NORTH



ROADWAY ELECTRICAL PLAN

SCALE: 1"=20'

NORTH

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

EXHIBIT 7

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

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04/30/06

EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY ELECTRICAL PLAN
STA. 20+00 TO STA. 30+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: AS NOTED Date: July 2005

SHEET No. E-8 OF 24 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

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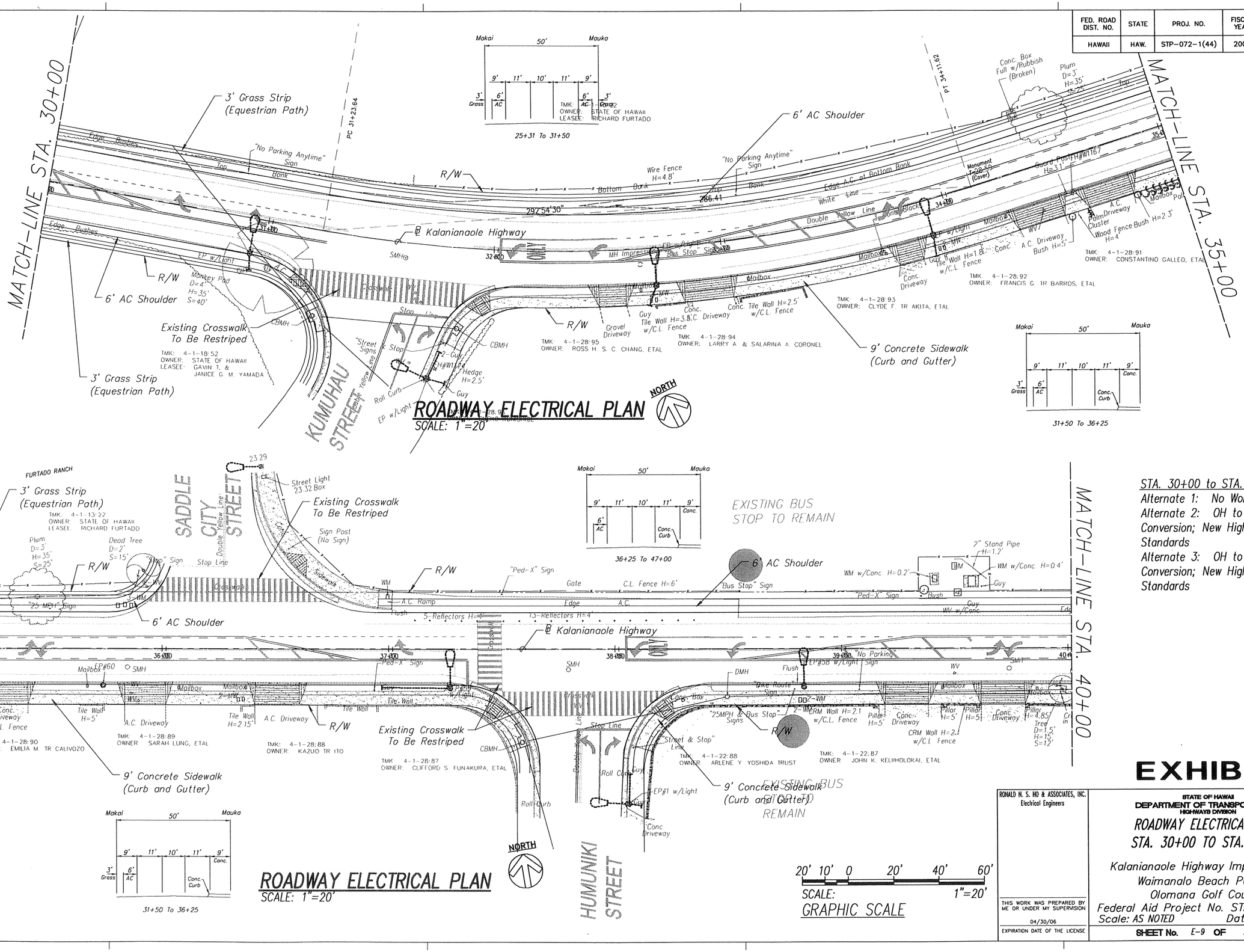
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	E-9	24



STA. 30+00 to STA. 40+00:
Alternate 1: No Work
Alternate 2: OH to UG Utility Conversion; New Highway Light Standards
Alternate 3: OH to UG Utility Conversion; New Highway Light Standards

EXHIBIT 7

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

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04/30/06
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY ELECTRICAL PLAN
STA. 30+00 TO STA. 40+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: AS NOTED Date: July 2005

SHEET No. E-9 OF 24 SHEETS

ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE | NOTE BOOK | No.

LAST SAVE: 12/12/05 @ 11:18:15 BY: JM PLOT SC: 1"=0"=1"
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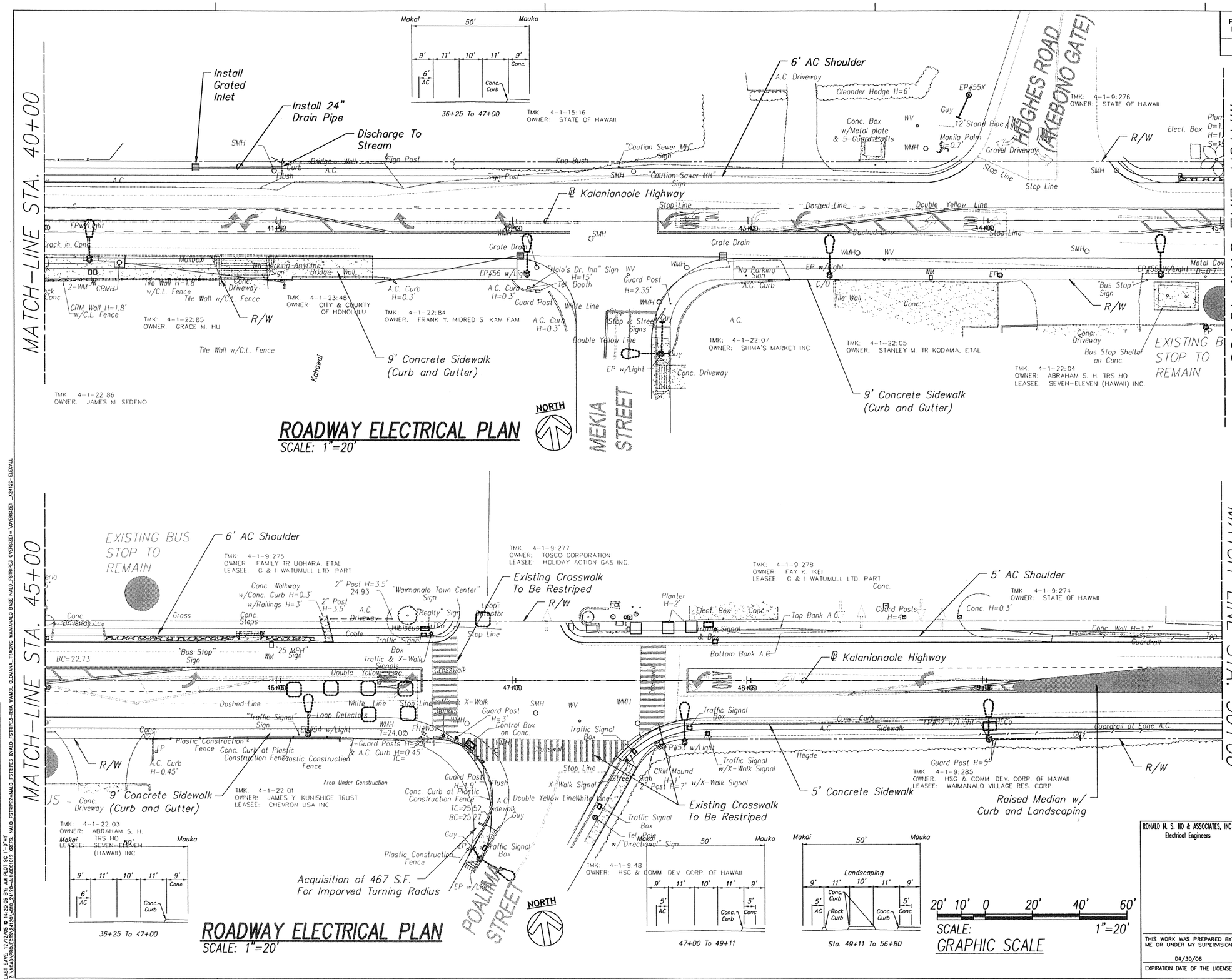
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	E-10	24



ROADWAY ELECTRICAL PLAN
SCALE: 1"=20'

ROADWAY ELECTRICAL PLAN
SCALE: 1"=20'

STA. 40+00 to STA. 42+00:
Alternate 1: OH to OH Utility Relocation; New Highway Light Standards
Alternate 2: OH to UG Utility Conversion; New Highway Light Standards
Alternate 3: OH to UG Utility Conversion; New Highway Light Standards

STA. 42+00 to STA. 50+00:
Alternate 1: No Work
Alternate 2: OH to UG Utility Conversion; New Highway Light Standards
Alternate 3: OH to UG Utility Conversion; New Highway Light Standards

EXHIBIT 7

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

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04/30/06
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY ELECTRICAL PLAN
STA. 40+00 TO STA. 50+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: AS NOTED Date: July 2005

SHEET No. E-10 OF 24 SHEETS

ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE | NOTE BOOK | No.

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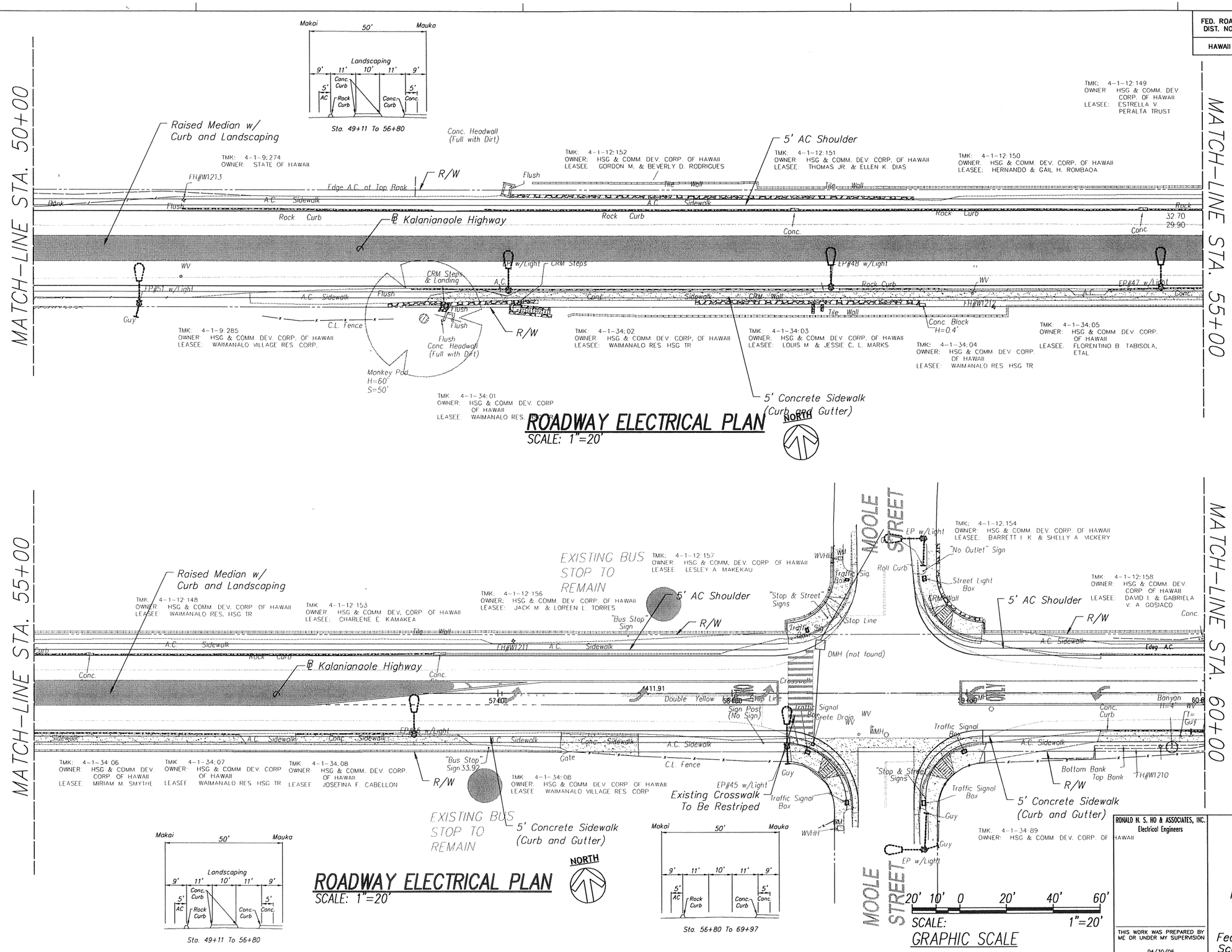
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	E-11	24



STA. 50+00 to STA. 51+00:
Alternate 1: No Work
Alternate 2: OH to UG Utility Conversion; New Highway Light Standards
Alternate 3: OH to UG Utility Conversion; New Highway Light Standards

STA. 51+00 to STA. 60+00:
Alternate 1: OH to OH Utility Relocation; New Highway Light Standards
Alternate 2: OH to UG Utility Conversion; New Highway Light Standards
Alternate 3: OH to UG Utility Conversion; New Highway Light Standards

EXHIBIT 7

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers
HAWAII

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04/30/06
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY ELECTRICAL PLAN
STA. 50+00 TO STA. 60+00

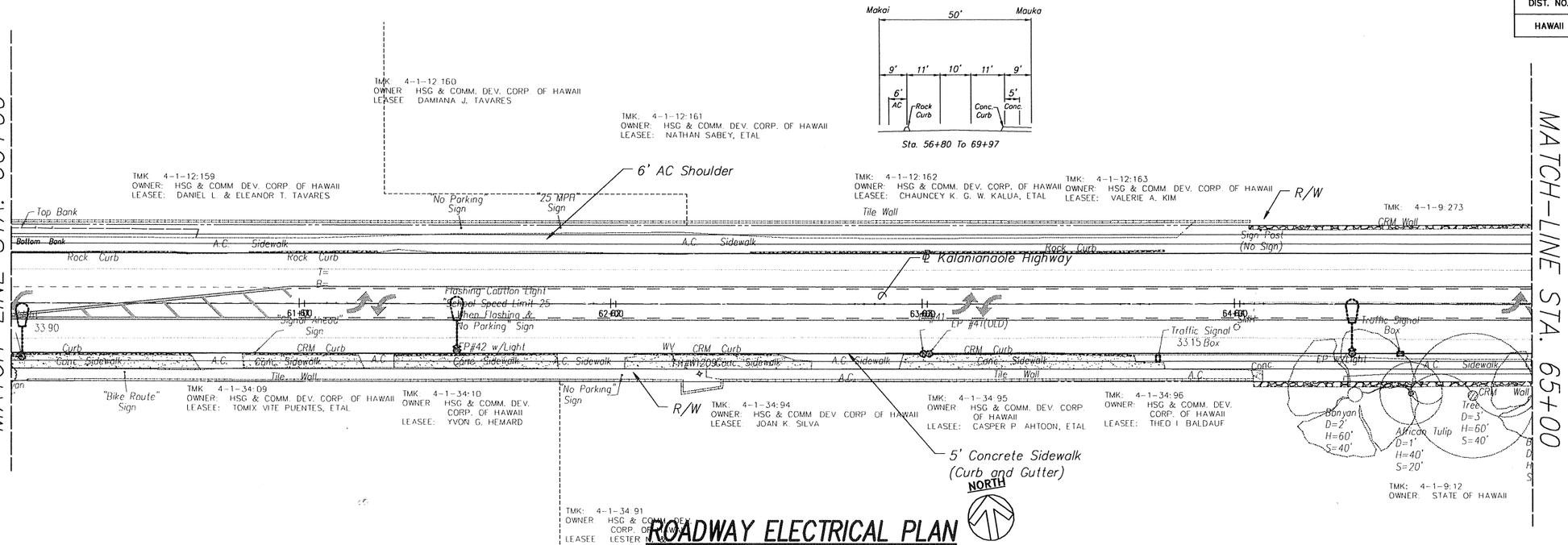
Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: AS NOTED Date: July 2005

SHEET No. E-11 OF 24 SHEETS

ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE
NOTE BOOK No.

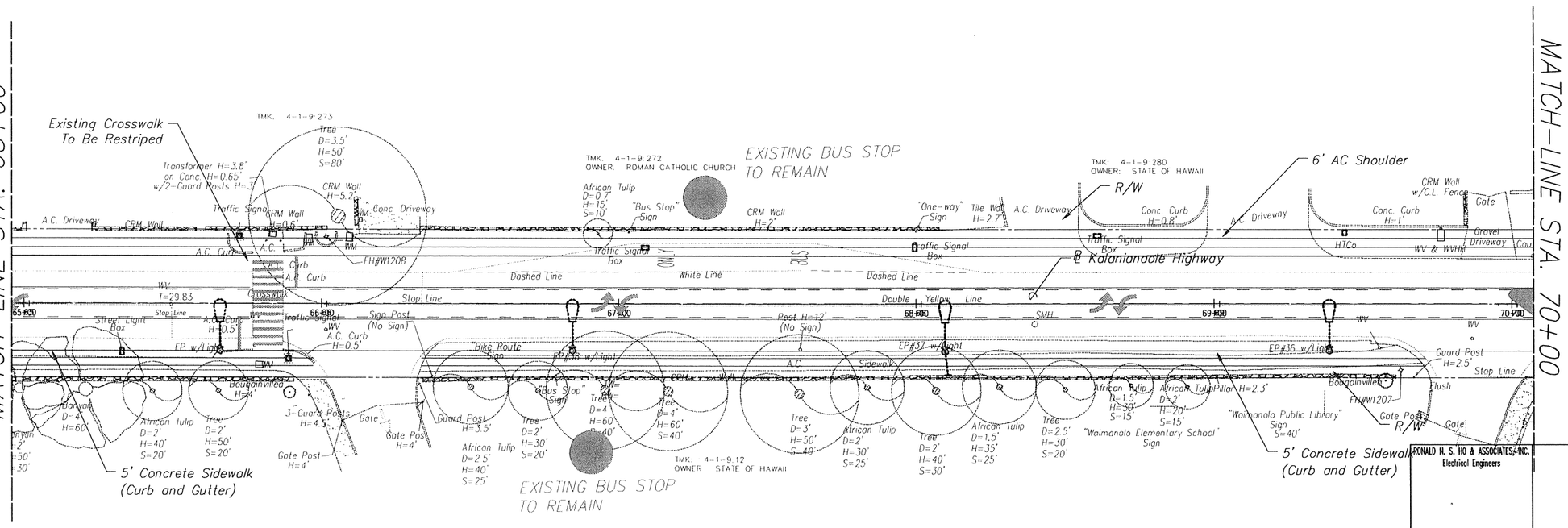
LAST SAVE: 12/12/05 @ 14:21:45 BY: JIM PLOT SC: 1'=0'-1" Z:\ACAD\PROJECTS\24120\dll_24120-eb-h0001013 XREFS: NALO_FSTRIPE2=NALO_FSTRIPE3 XNALO_FSTRIPE3-R4A WANBL OLOMANA_TRACING WAIMANALO BASE NALO_FSTRIPE3 OVERSIZE1=\OVERSIZE1 _X24120-ELECALL

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	E-12	24



ROADWAY ELECTRICAL PLAN
SCALE: 1"=20'

STA. 60+00 to STA. 70+00:
Alternate 1: OH to OH Utility Relocation; New Highway Light Standards
Alternate 2: OH to UG Utility Conversion; New Highway Light Standards
Alternate 3: OH to UG Utility Conversion; New Highway Light Standards



ROADWAY ELECTRICAL PLAN
SCALE: 1"=20'

20' 10' 0 20' 40' 60'
SCALE: 1"=20'
GRAPHIC SCALE

EXHIBIT 7

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

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04/30/06
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY ELECTRICAL PLAN
STA. 60+00 TO STA. 70+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: AS NOTED Date: July 2005

SHEET No. E-12 OF 24 SHEETS

ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE
NOTE BOOK No.

LAST SAVE: 12/12/05 @ 14:23:05 BY: JAY PLOT SC 1=1
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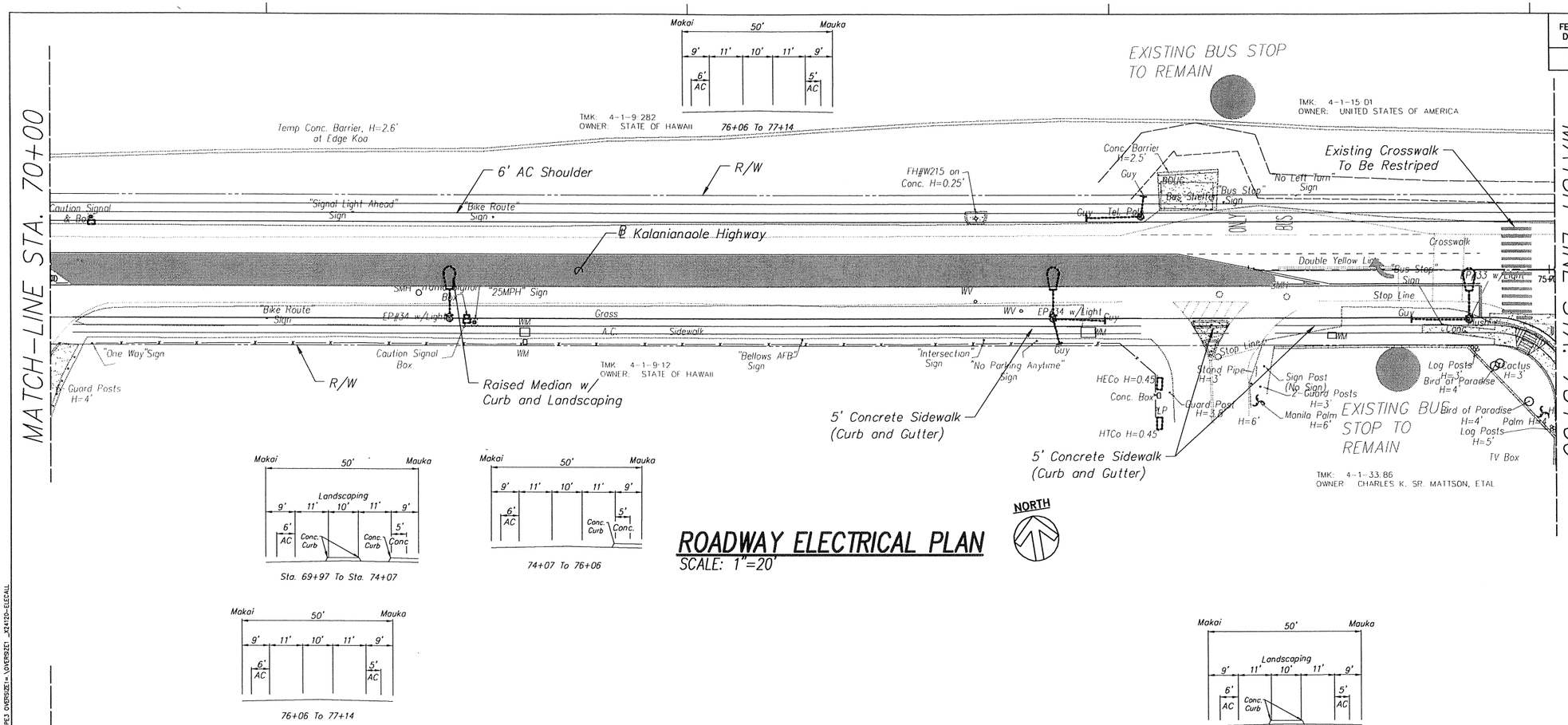
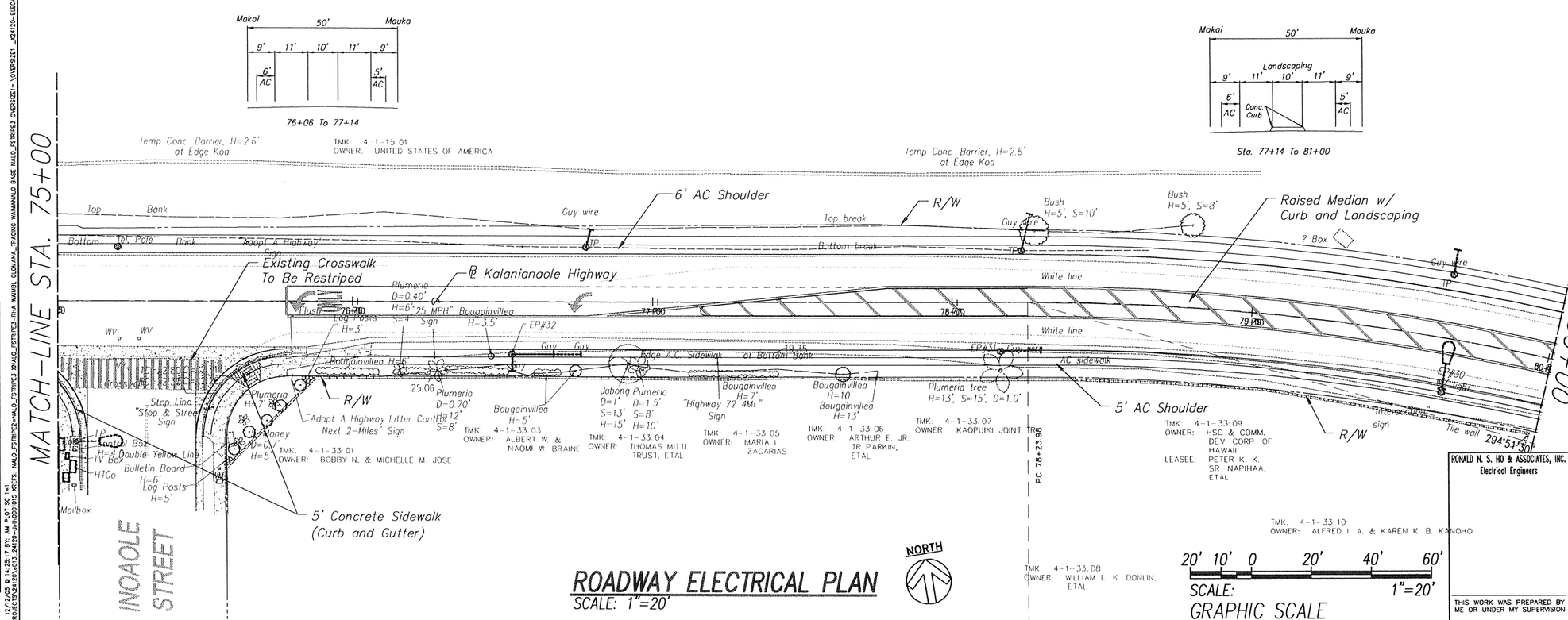
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	E-13	24

STA. 70+00 to STA. 80+00:
Alternate 1: OH to OH Utility Relocation; New Highway Light Standards
Alternate 2: OH to UG Utility Conversion; New Highway Light Standards
Alternate 3: OH to UG Utility Conversion; New Highway Light Standards



ROADWAY ELECTRICAL PLAN
SCALE: 1"=20'



ROADWAY ELECTRICAL PLAN
SCALE: 1"=20'

20' 10' 0 20' 40' 60'
SCALE: 1"=20'
GRAPHIC SCALE

EXHIBIT 7

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

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04/30/06
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY ELECTRICAL PLAN
STA. 70+00 TO STA. 80+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: AS NOTED Date: July 2005

SHEET No. E-13 OF 24 SHEETS

ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE
NOTE BOOK | No.

LAST SAVE: 12/12/05 @ 14:25:17 BY: AM PLOT SC: 1=1
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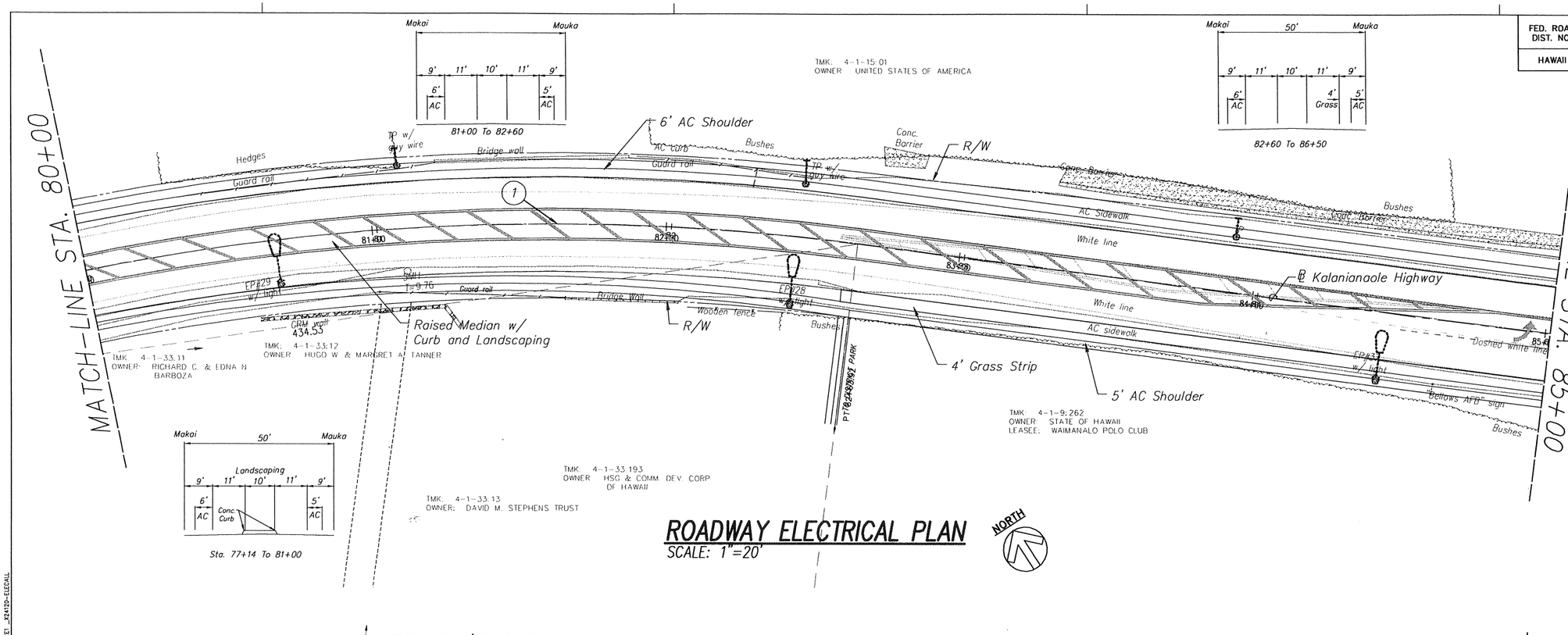
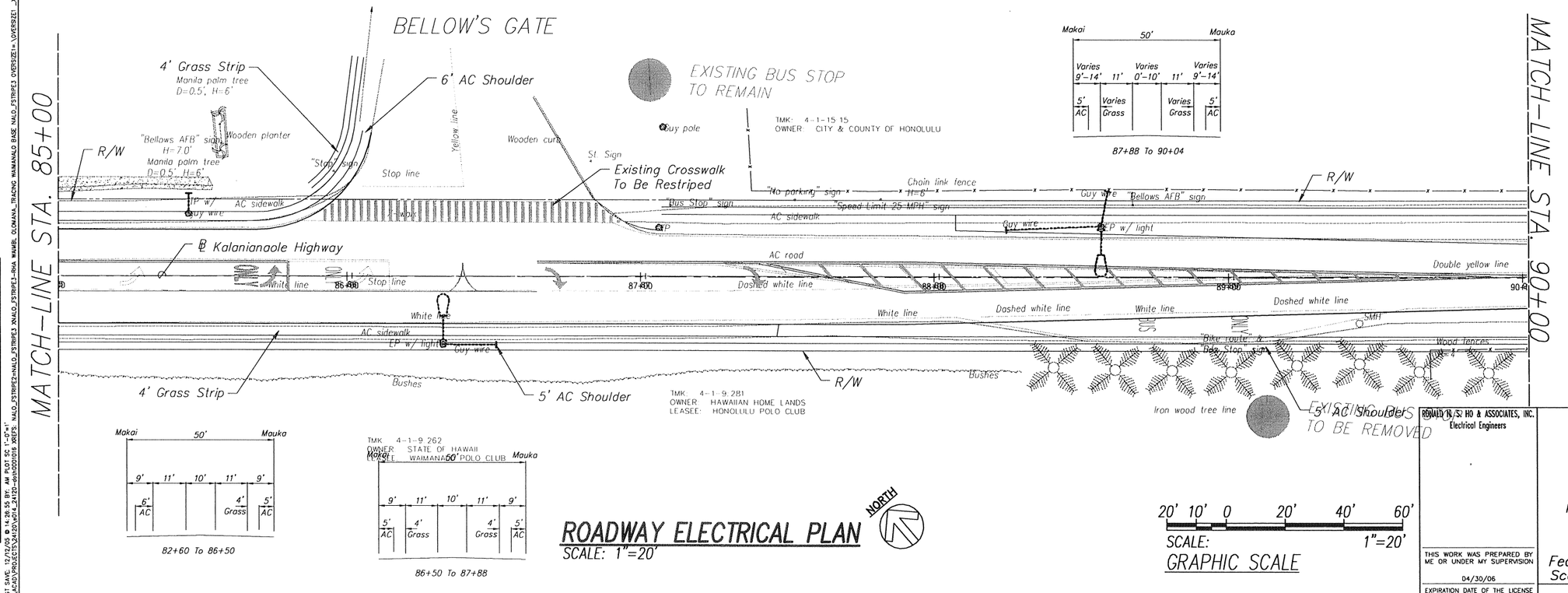
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	E-14	24



ROADWAY ELECTRICAL PLAN
SCALE: 1"=20'

STA. 80+00 to STA. 90+00:
Alternate 1: OH to OH Utility Relocation; New Highway Light Standards
Alternate 2: OH to UG Utility Conversion; New Highway Light Standards
Alternate 3: OH to UG Utility Conversion; New Highway Light Standards



ROADWAY ELECTRICAL PLAN
SCALE: 1"=20'

20' 10' 0 20' 40' 60'
SCALE: 1"=20'
GRAPHIC SCALE

EXHIBIT 7

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROLAND Y.S. HO & ASSOCIATES, INC.
Electrical Engineers

ROADWAY ELECTRICAL PLAN
STA. 80+00 TO STA. 90+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: AS NOTED Date: July 2005

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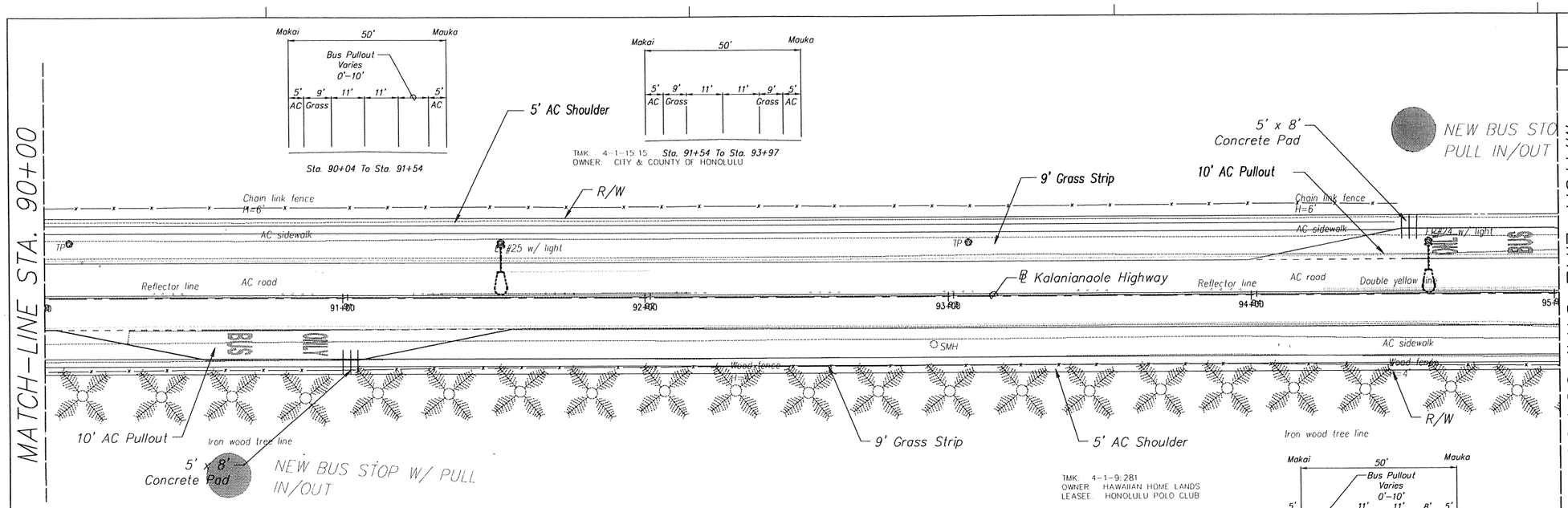
04/30/06
EXPIRATION DATE OF THE LICENSE

SHEET No. E-14 OF 24 SHEETS

ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE
NOTE BOOK No.

LAST SAVE: 12/12/05 @ 14:26:55 BY: AM PLOT SC 1'-0"=1' Z:\ACAD\PROJECTS\24120\sh14_24120-elec001016 XREFS: NALO_FSTRIPE2-NALO_FSTRIPE3 XNALO_FSTRIPE3-RHA WAMB. OLOMANA_TRACING WAIMANALO BASE NALO_FSTRIPE3 OVERSIZE1 OVERSIZE1 _24120-ELECALL

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	E-15	24



ROADWAY ELECTRICAL PLAN

SCALE: 1"=20'

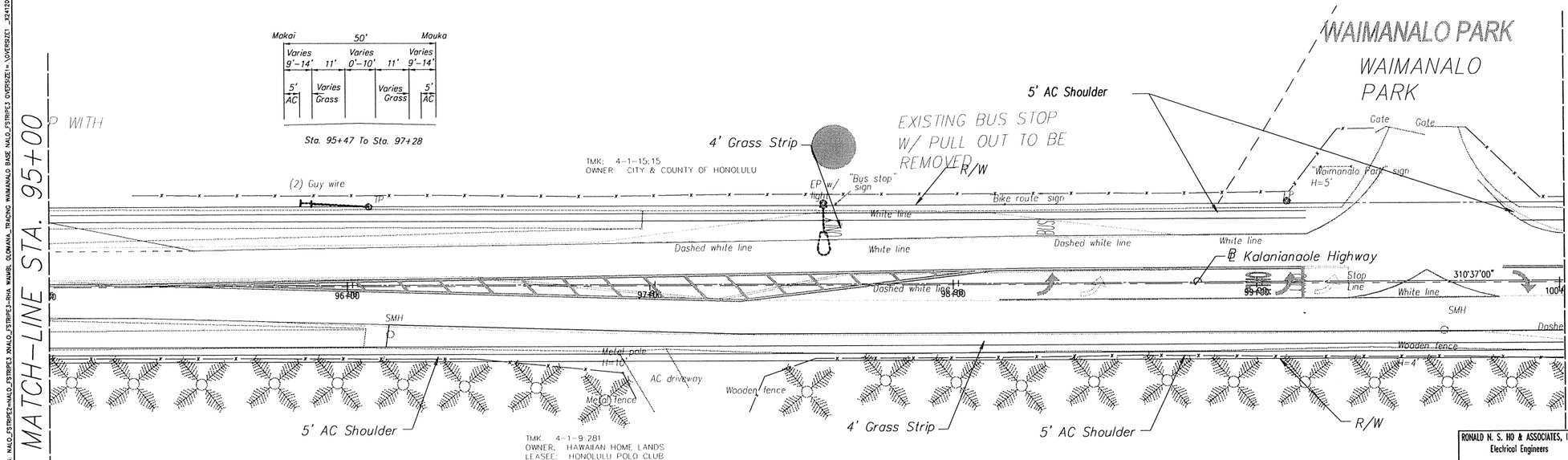
NORTH

STA. 90+00 to STA. 100+00:

Alternate 1: OH to OH Utility Relocation; New Highway Light Standards

Alternate 2: OH to UG Utility Conversion; New Highway Light Standards

Alternate 3: OH to UG Utility Conversion; New Highway Light Standards



ROADWAY ELECTRICAL PLAN

SCALE: 1"=20'

NORTH

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

EXHIBIT 7

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

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04/30/06

EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY ELECTRICAL PLAN
STA. 90+00 TO STA. 100+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: AS NOTED Date: July 2005

SHEET No. E-15 OF 24 SHEETS

ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE

NOTE BOOK No.

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
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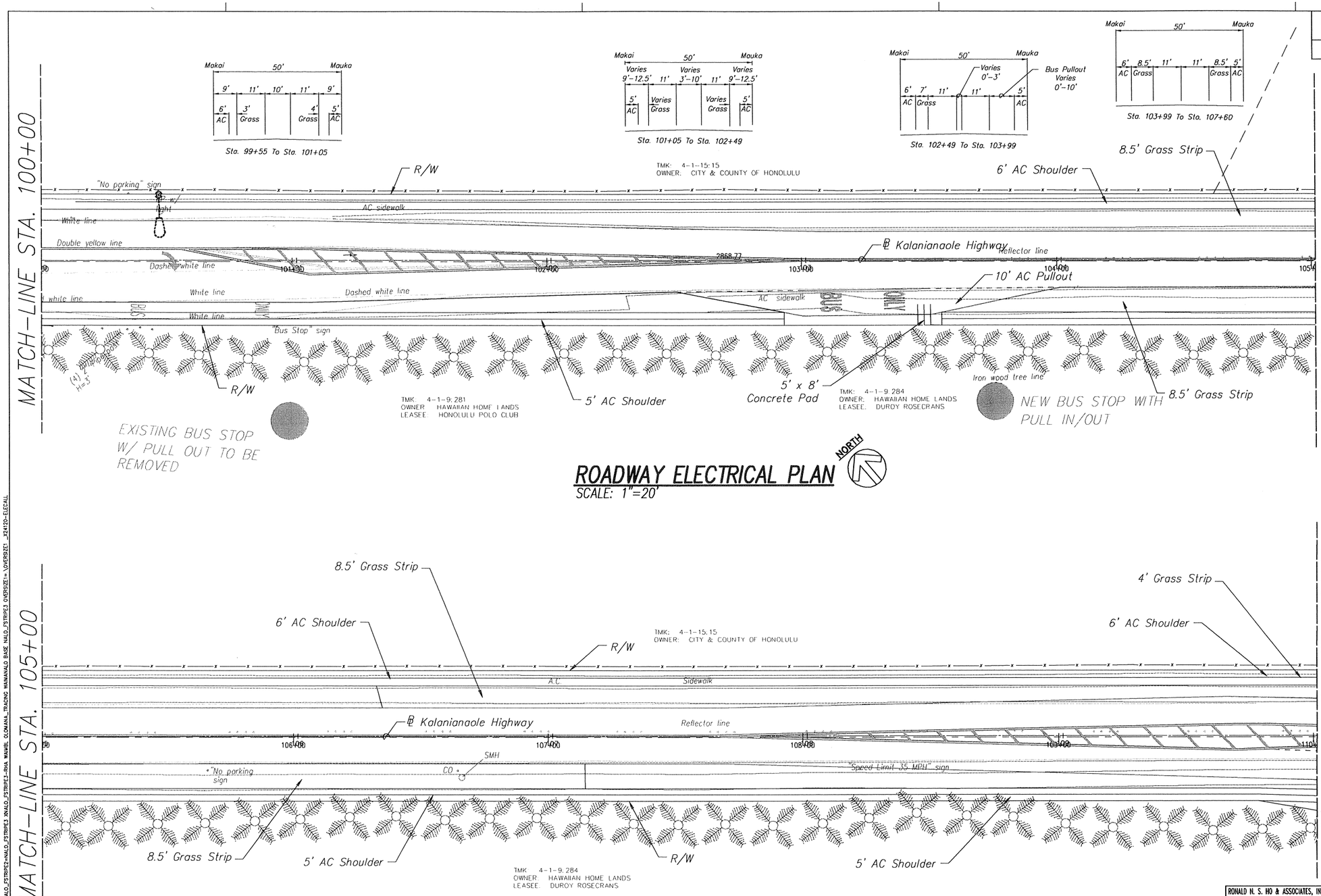

ROADWAY ELECTRICAL PLAN
SCALE: 1"=20'

STA. 100+00 to STA. 110+00:
Alternate 1: No Work
Alternate 2: OH to UG Utility Conversion; New Highway Light Standards
Alternate 3: OH to UG Utility Conversion; New Highway Light Standards

ROADWAY ELECTRICAL PLAN
SCALE: 1"=20'

20' 10' 0 20' 40' 60'
SCALE: 1"=20'
GRAPHIC SCALE

EXHIBIT 7

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

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04/30/06
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY ELECTRICAL PLAN
STA. 100+00 TO STA. 110+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: AS NOTED Date: July 2005

SHEET No. E-16 OF 24 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
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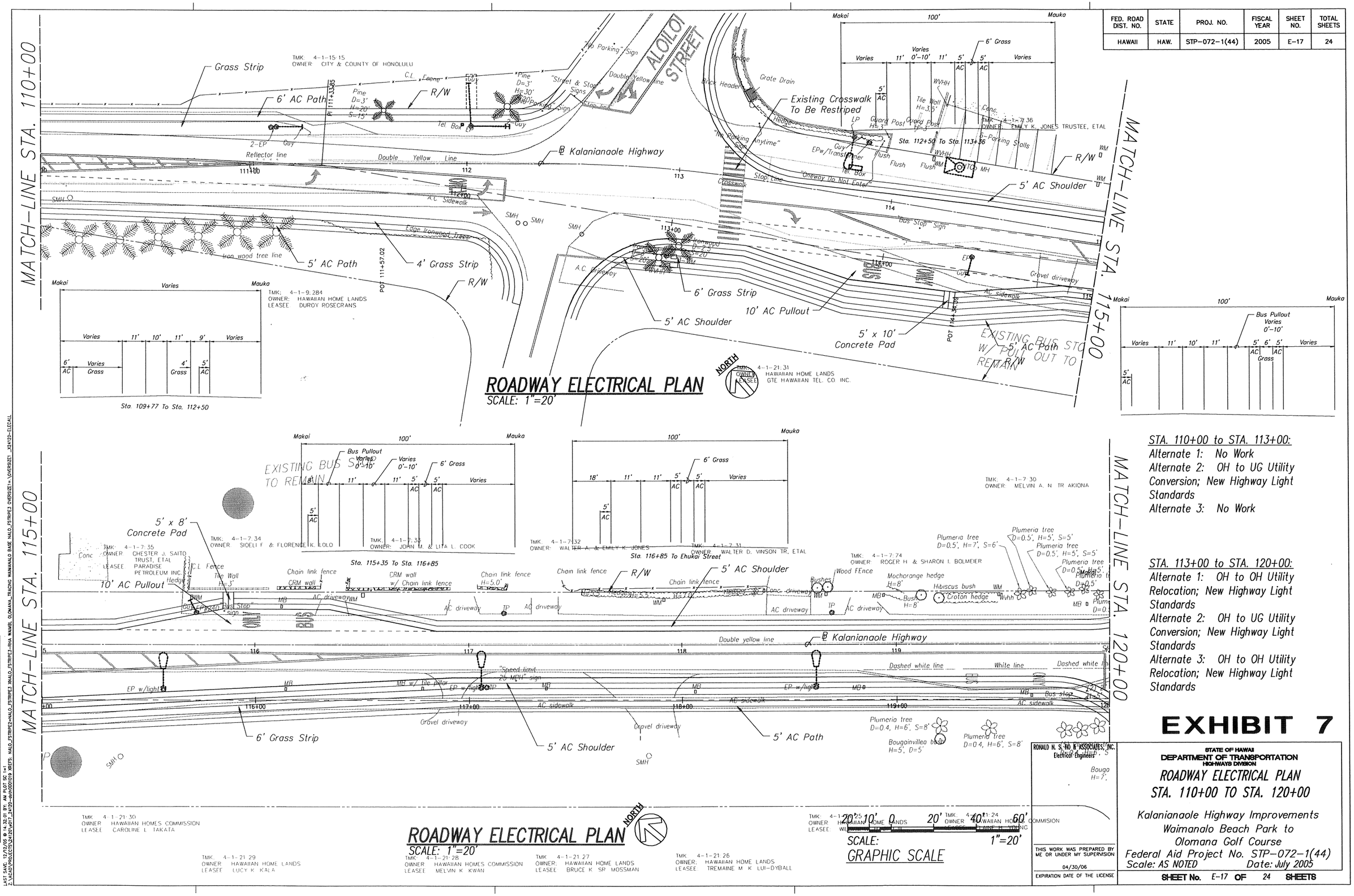

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Alternate 2: OH to UG Utility Conversion; New Highway Light Standards
Alternate 3: No Work

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Alternate 1: OH to OH Utility Relocation; New Highway Light Standards
Alternate 2: OH to UG Utility Conversion; New Highway Light Standards
Alternate 3: OH to OH Utility Relocation; New Highway Light Standards

EXHIBIT 7

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY ELECTRICAL PLAN
STA. 110+00 TO STA. 120+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: AS NOTED Date: July 2005

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SHEET No. E-17 OF 24 SHEETS

ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE
NOTE BOOK | No.

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	E-18	24

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Alternate 2: OH to UG Utility Conversion; New Highway Light Standards
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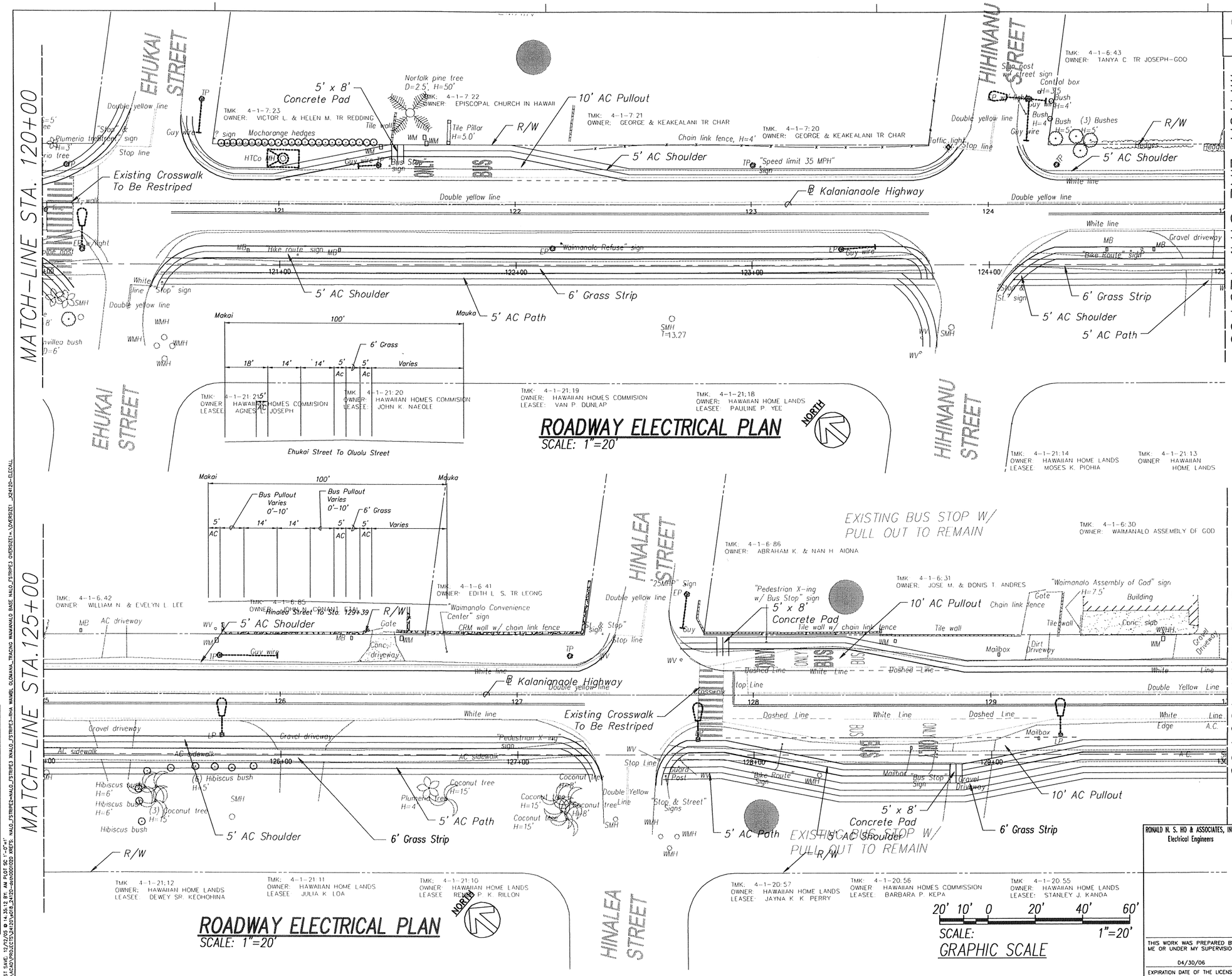

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04/30/06
EXPIRATION DATE OF THE LICENSE

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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY ELECTRICAL PLAN
STA. 120+00 TO STA. 130+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: AS NOTED Date: July 2005

SHEET No. E-18 OF 24 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
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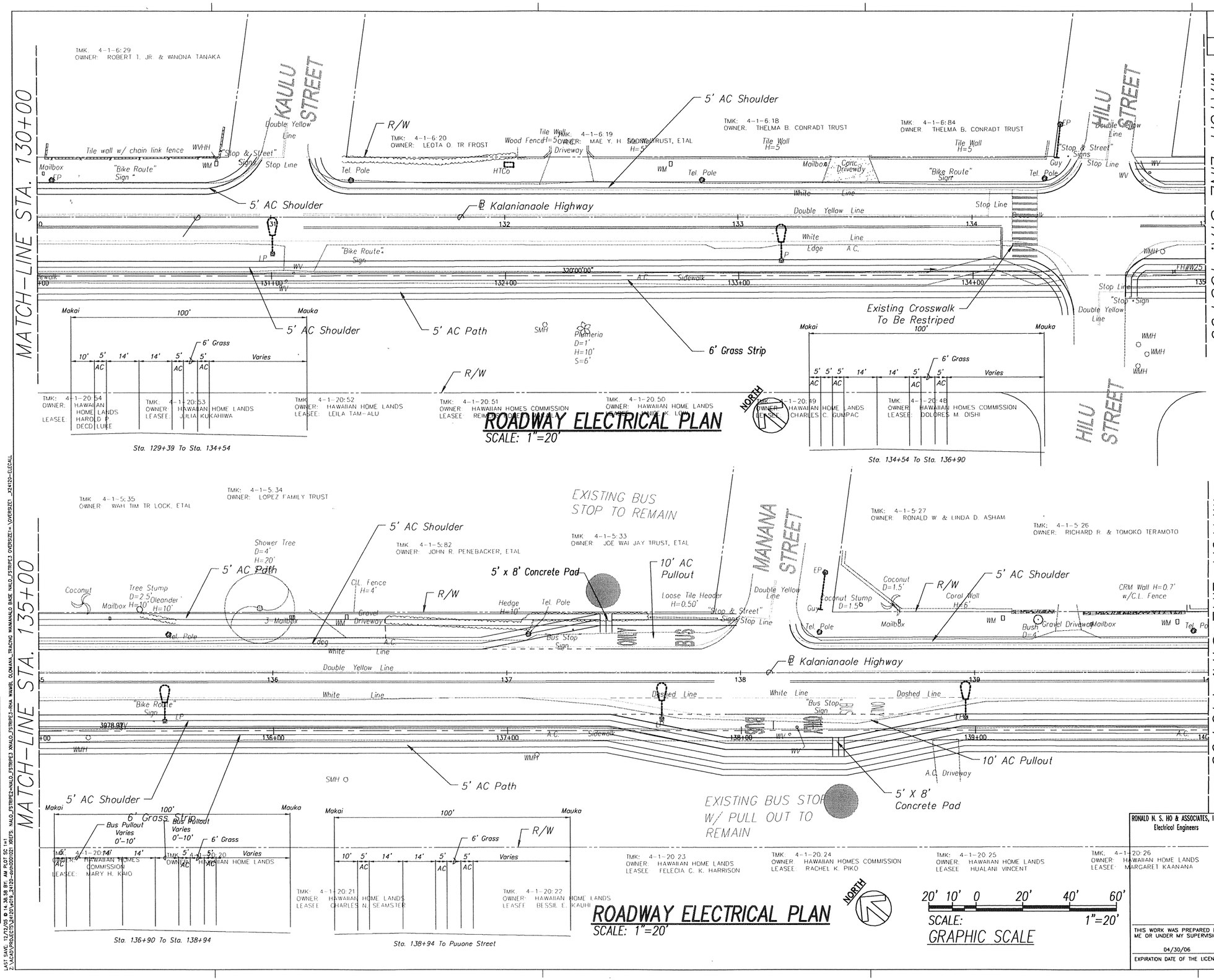

ROADWAY ELECTRICAL PLAN
SCALE: 1"=20'

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Alternate 2: OH to UG Utility Conversion; New Highway Light Standards
Alternate 3: OH to OH Utility Relocation; New Highway Light Standards

20' 10' 0 20' 40' 60'
SCALE: 1"=20'
GRAPHIC SCALE

EXHIBIT 7

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY ELECTRICAL PLAN
STA. 130+00 TO STA. 140+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: AS NOTED Date: July 2005

SHEET No. E-19 OF 24 SHEETS

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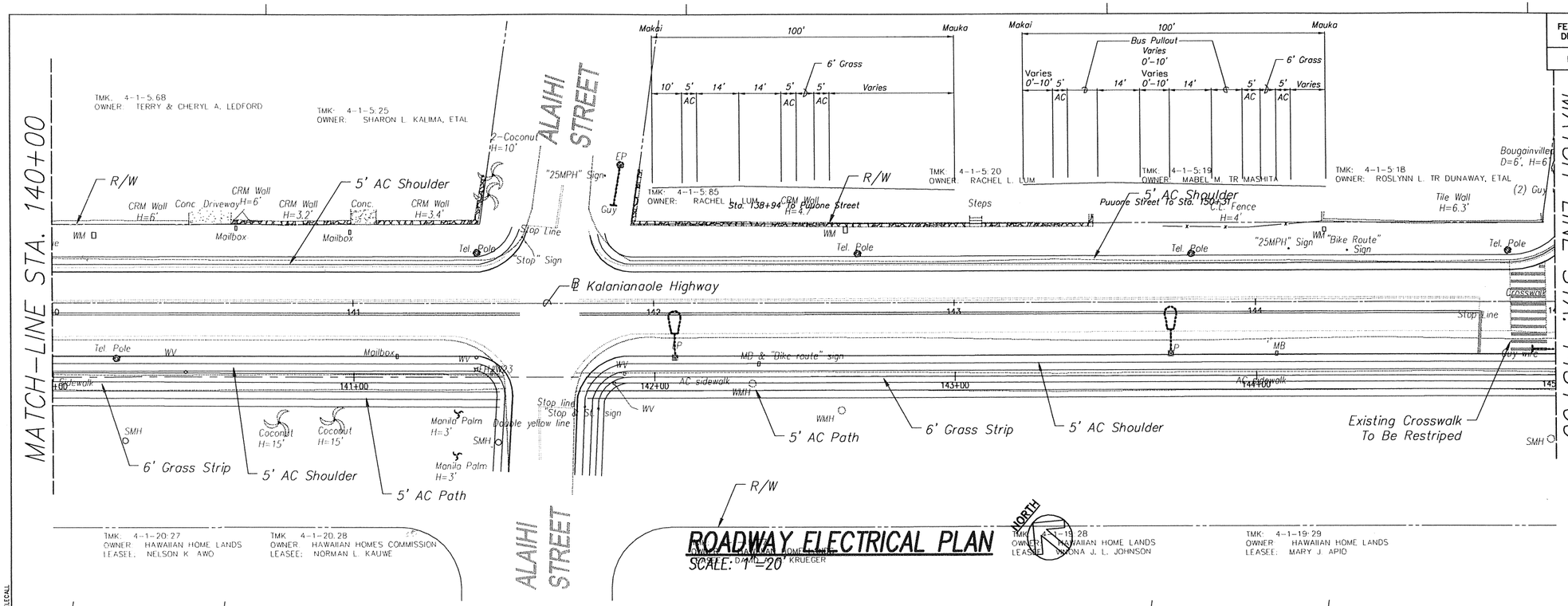
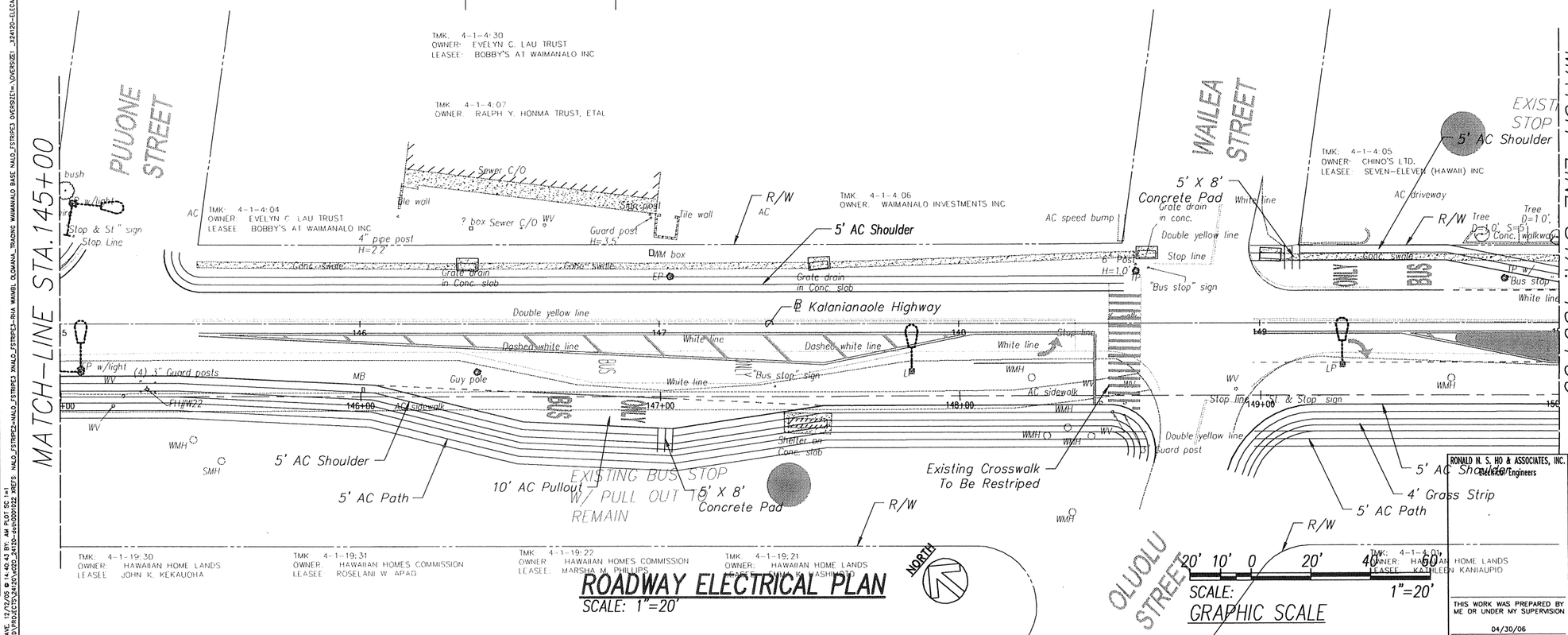
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	E-20	24



ROADWAY ELECTRICAL PLAN



ROADWAY ELECTRICAL PLAN

SCALE: GRAPHIC SCALE 20' 10' 0 20' 40' 60' 1"=20'

STA. 140+00 to STA. 150+00:

Alternate 1: OH to OH Utility Relocation; New Highway Light Standards

Alternate 2: OH to UG Utility Conversion; New Highway Light Standards

Alternate 3: OH to OH Utility Relocation; New Highway Light Standards

EXHIBIT 7

RONALD N. S. HO & ASSOCIATES, INC. Civil Engineers

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY ELECTRICAL PLAN
STA. 140+00 TO STA. 150+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: AS NOTED Date: July 2005

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EXPIRATION DATE OF THE LICENSE

SHEET No. E-20 OF 24 SHEETS

ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE | NOTE BOOK | No.

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	E-21	24

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Alternate 2: OH to UG Utility Conversion; New Highway Light Standards
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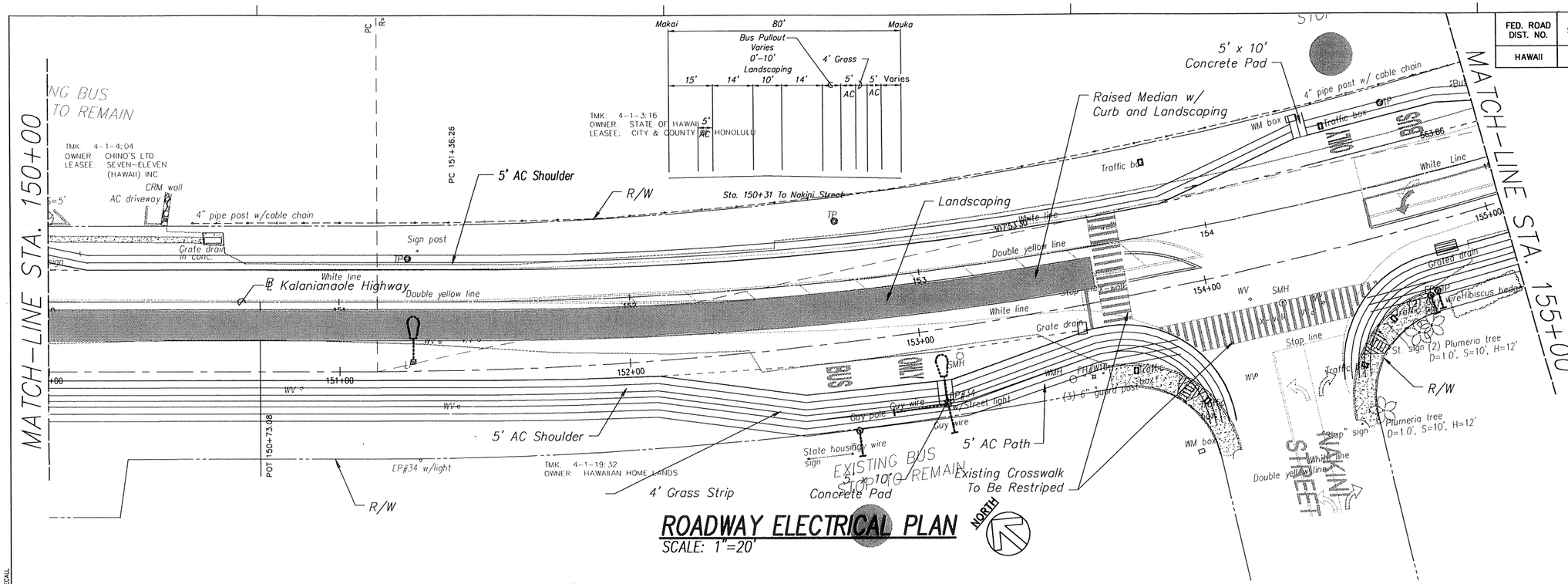

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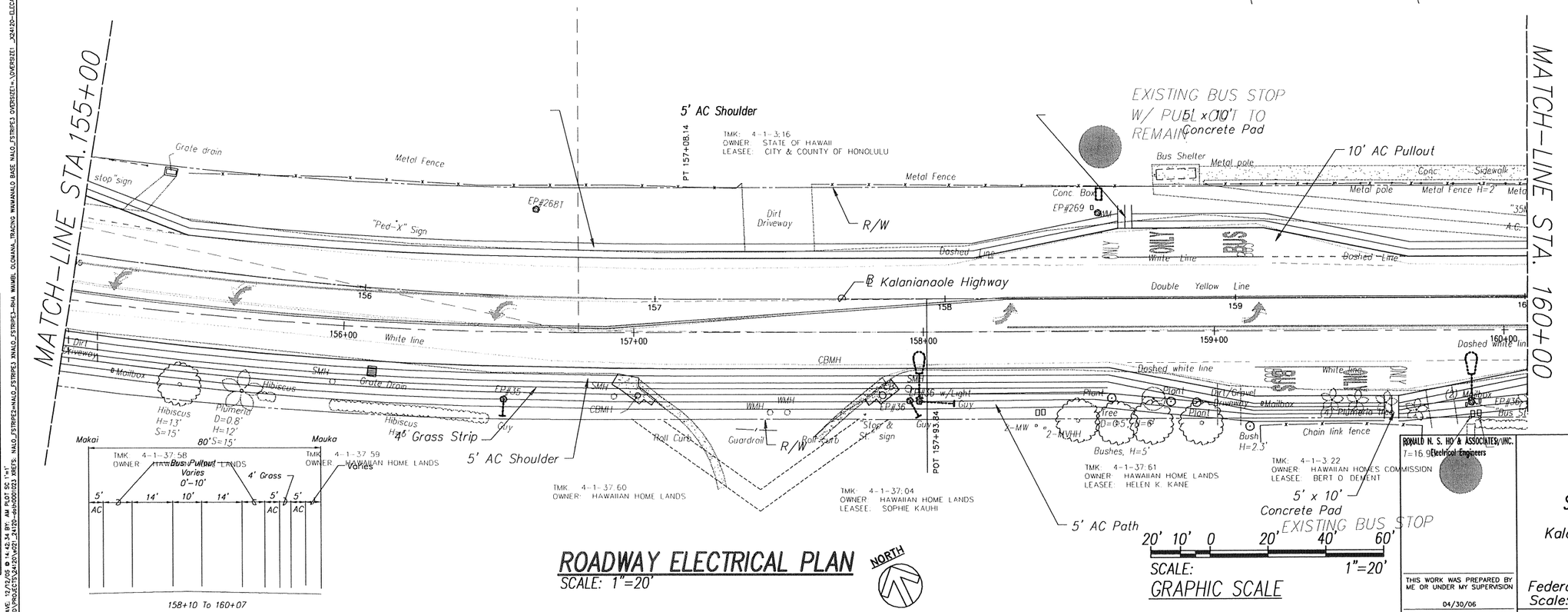
SCALE: 1"=20'



ROADWAY ELECTRICAL PLAN
SCALE: 1"=20'

SCALE: GRAPHIC SCALE 1"=20'

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

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EXPIRATION DATE OF THE LICENSE

ROADWAY ELECTRICAL PLAN
STA. 150+00 TO STA. 160+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: AS NOTED Date: July 2005

SHEET No. E-21 OF 24 SHEETS

ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE
NOTE BOOK | No.

LAST SAVE: 12/12/05 @ 14:03:34 BY: AM PLOT SC: 1"=1'
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	E-22	24

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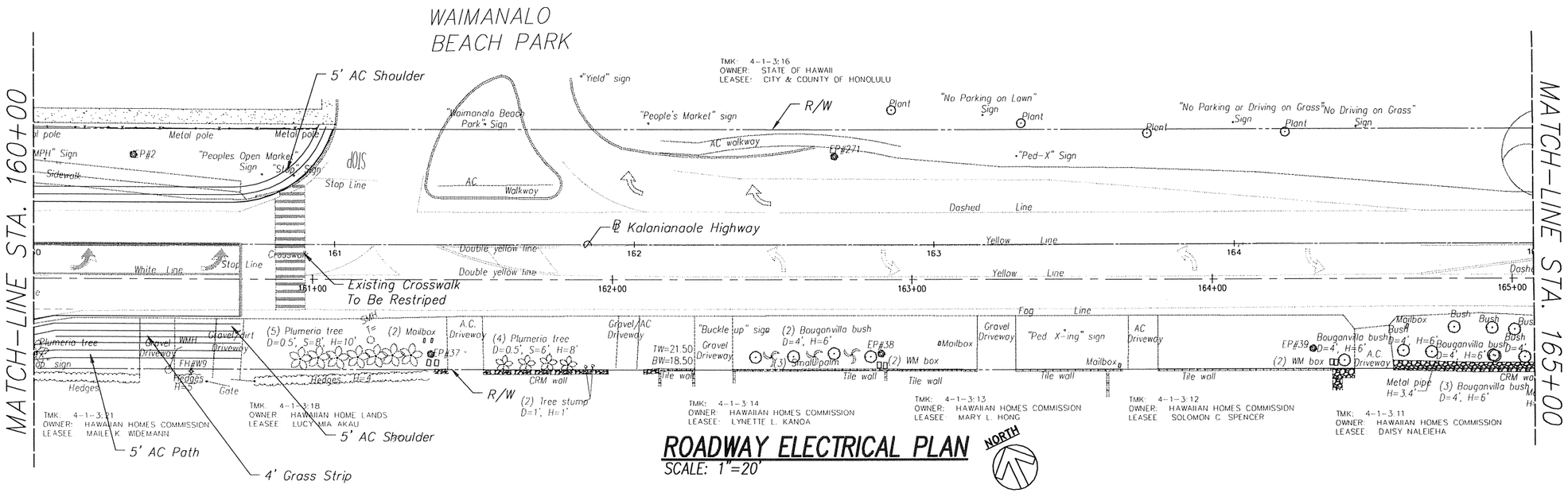
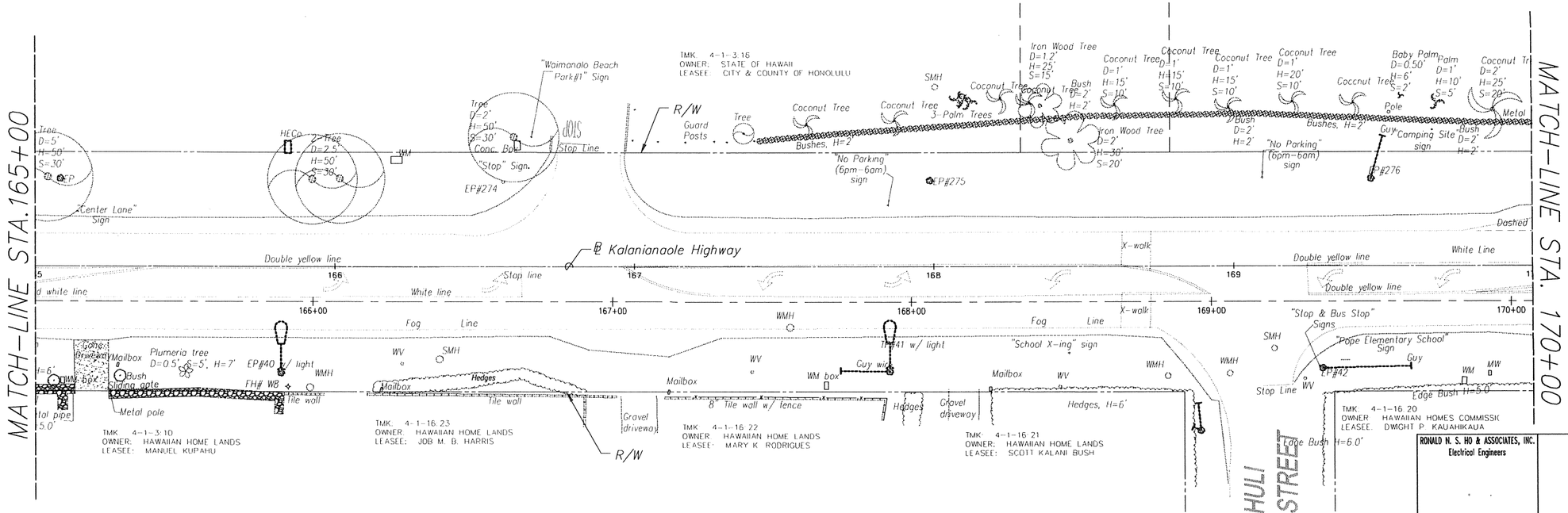
Alternate 3: No Work



ROADWAY ELECTRICAL PLAN
SCALE: 1"=20'



ROADWAY ELECTRICAL PLAN
SCALE: 1"=20'

20' 10' 0 20' 40' 60'
SCALE: 1"=20'
GRAPHIC SCALE

EXHIBIT 7

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

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EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY ELECTRICAL PLAN
STA. 160+00 TO STA. 170+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: AS NOTED Date: July 2005

SHEET No. E-22 OF 24 SHEETS

ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE
NOTE BOOK | No.

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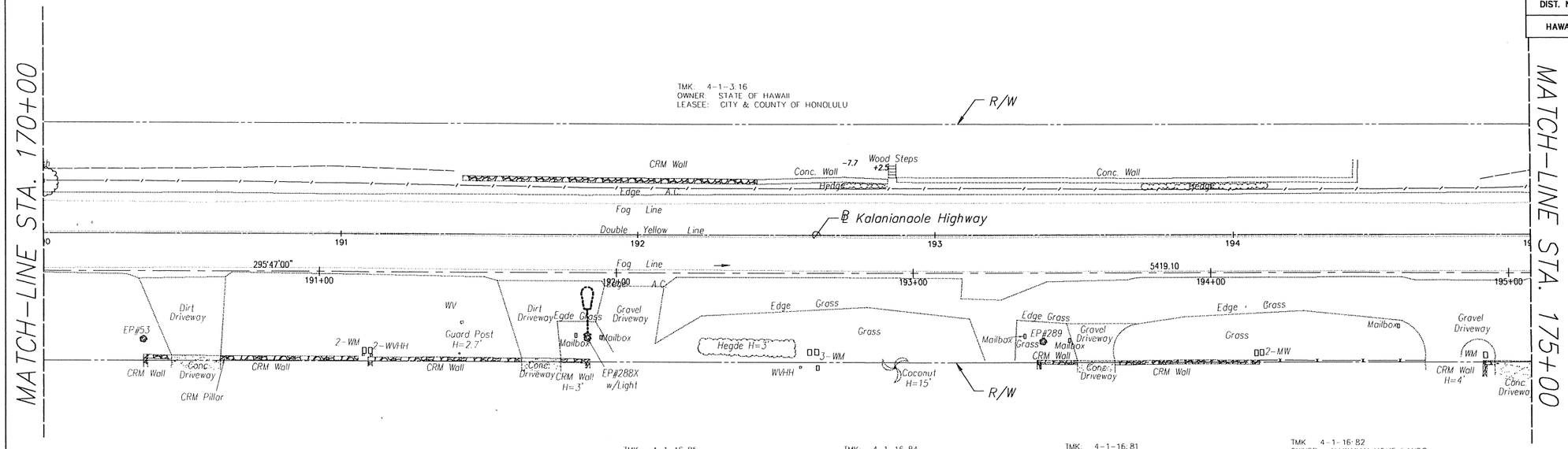
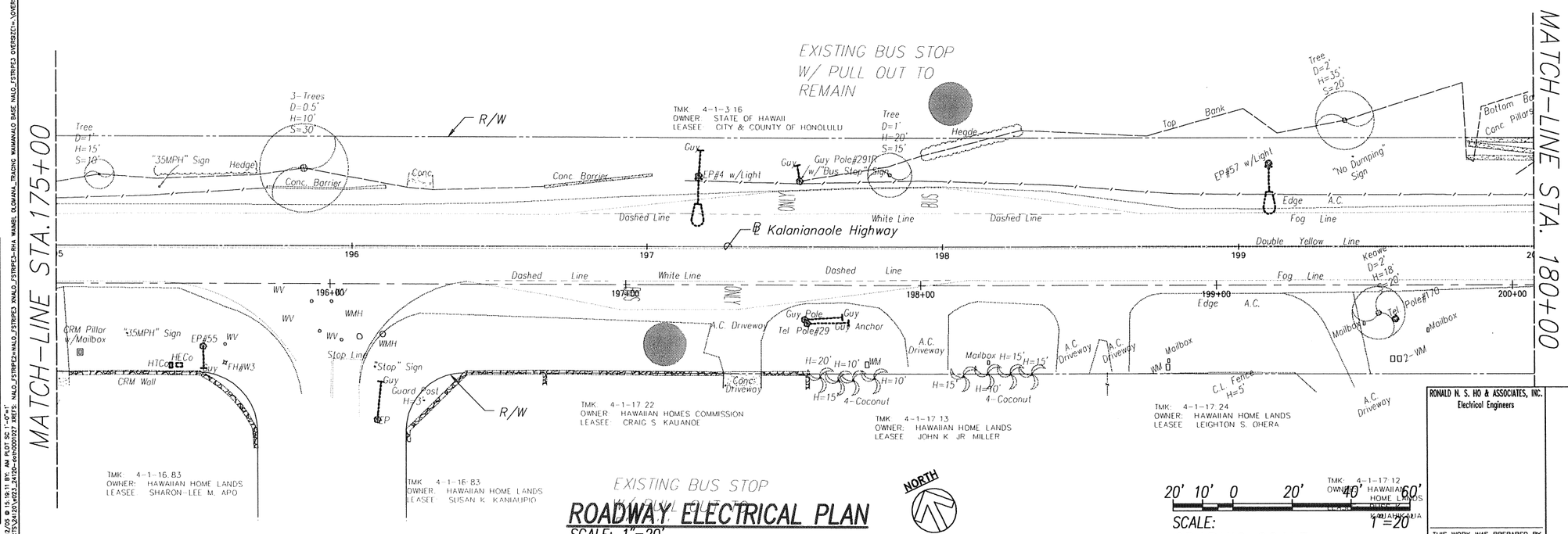
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-072-1(44)	2005	E-23	24



ROADWAY ELECTRICAL PLAN
SCALE: 1"=20'

NORTH



EXISTING BUS STOP
W/ PULL OUT TO REMAIN

ROADWAY ELECTRICAL PLAN
SCALE: 1"=20'

NORTH

20' 10' 0 20' 40' 60'
SCALE: 1"=20'
GRAPHIC SCALE

EXHIBIT 7

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY ELECTRICAL PLAN
STA. 170+00 TO STA. 180+00

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: AS NOTED Date: July 2005

SHEET No. E-23 OF 24 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	
NOTE BOOK		
No.		

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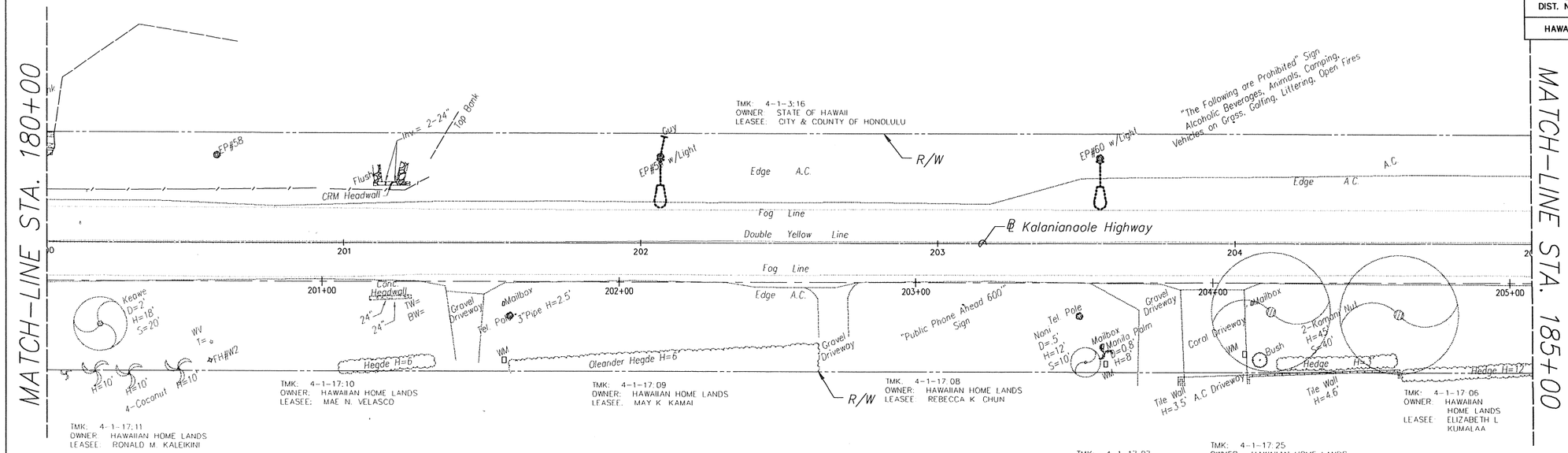
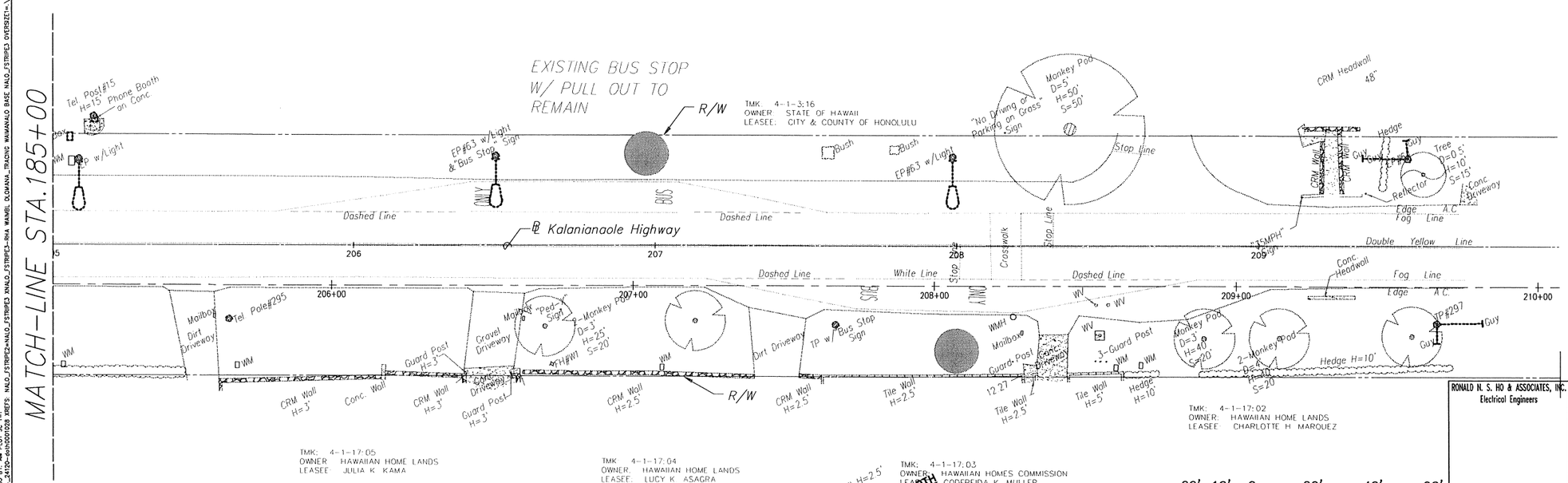


ROADWAY ELECTRICAL PLAN

SCALE: 1"=20'

NORTH



ROADWAY ELECTRICAL PLAN

SCALE: 1"=20'

NORTH

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

EXHIBIT 7

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Electrical Engineers

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY ELECTRICAL PLAN
STA. 180+00 TO END

Kalanianaole Highway Improvements
Waimanalo Beach Park to
Olomana Golf Course
Federal Aid Project No. STP-072-1(44)
Scale: AS NOTED Date: July 2005

SHEET No. E-24 OF 24 SHEETS

ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE | NOTE BOOK | No.

LAST SAVE: 12/06/05 @ 11:11:33 BY: AM PLOT SC: 1=1
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APPENDIX A

SOIL TYPES

The Soils Conservations Soil Survey map of the island (see APPENDIX A - SOILS SURVEY MAP) identified twelve soil types of varying properties. These soil types include:

Papaa clay, 6 to 20 percent soles (PYD)
Papaa clay, 35 to 70 percent slopes (PYF)

The Papaa series consists of well-drained soils on uplands where these soils were formed from colluviums and residuum derived from basalt. They are moderately sloping to very steep, and occur on elevations ranging from nearly sea level to 500 feet. The PYD soil type has a slow to medium runoff and the erosion hazard is slight to moderate. With the PYF soil, the permeability is slow and the runoff is rapid creating a severe erosion hazard.

Alaeloa silty clay, 15 to 35 percent slopes (AeE)

The Alaeloa series consists of well-drained soils on uplands. These soils developed in material weathered from basic igneous rock. They are gently sloping to very steep. Elevations range from 100 to 1,500 feet. Permeability is moderately rapid with a medium runoff. The erosion hazard is moderate.

Kokokahi clay, 6 to 12 percent slopes (KtC)

The Kokokahi series consists of moderately well drained soils on talus slopes and alluvial fans. These soils developed in colluviums and alluvium derived from basic igneous rock. They are moderately sloping to steep. Elevations range from nearly sea level to 125 feet. Permeability is slow to moderately slow. The runoff is medium, and the erosion hazard is slight to moderate.

Kaloko clay, noncalcareous variant (KfB)

The Kaloko series consists of poorly drained soils. These soils developed in alluvium derived from basic igneous rock. They are nearly level, with elevations ranging from sea level to 20 feet. This soil occurs in slight depressions on the coastal plains. It is more acid and grayer than is typical of the Kaloko series, and it is underlain by noncalcareous material. Permeability is slow, runoff is ponded to very slow, and the erosion hazard is none to slight.

Hanalei silty clay, 0 to 2 percent slopes (HnA)

The Hanalei series consists of somewhat poorly drained to poorly drained soils on bottom lands. These soils developed in alluvium derived from basic igneous rock. They are level to gently sloping and elevations range from nearly sea level to 300 feet. This soil is on stream bottoms and flood plains. Permeability is moderate. Runoff is slow, and erosion is no more than slight.

Pohakupu silty clay loam, 0 to 8 percent slopes (PkB)

The Pohakupu series consists of well-drained soils on terraces and alluvial fans. These soils formed in old alluvial derived from basic igneous material. This soil has smooth slopes and occurs on terraces and alluvial fans and slopes are mainly 3 to 8 percent. Permeability is moderately rapid, runoff is slow, and erosion hazard is slight.

Ewa silty clay loam, moderately shallow, 0 to 2 percent slopes (EmA)

The Ewa series consists of well-drained soils in basins and on alluvial fans. These soils developed in alluvial derived from basic igneous rock. They are nearly level to moderately sloping. Elevations range from near sea level to 150 feet. Runoff is very slow, and the erosion hazard is no more than slight.

Coral Outcrop (CR)

Coral outcrop consists of coral or cemented calcareous sand. The coral reefs formed in shallow ocean water during the time the ocean stand was at a higher level. Small areas of coral outcrop are exposed on the ocean shore, on the coastal plains, and at the foot of the uplands. Elevations range from sea level to approximately 100 feet.

Jaucas sand, 0 to 15 percent slopes (JaC)

The Jaucas series consists of excessively drained, calcareous soils that occur as narrow strips on coastal plains, adjacent to the ocean. They developed in wind- and water-deposited sand from coral and seashells. They are nearly level to strongly sloping. Elevations range from sea level to 100 feet. Permeability is rapid, and runoff is very slow to slow. The hazard of water erosion is slight, but wind erosion is a severe hazard where vegetation has been removed.

Mokuleia loam (Ms)

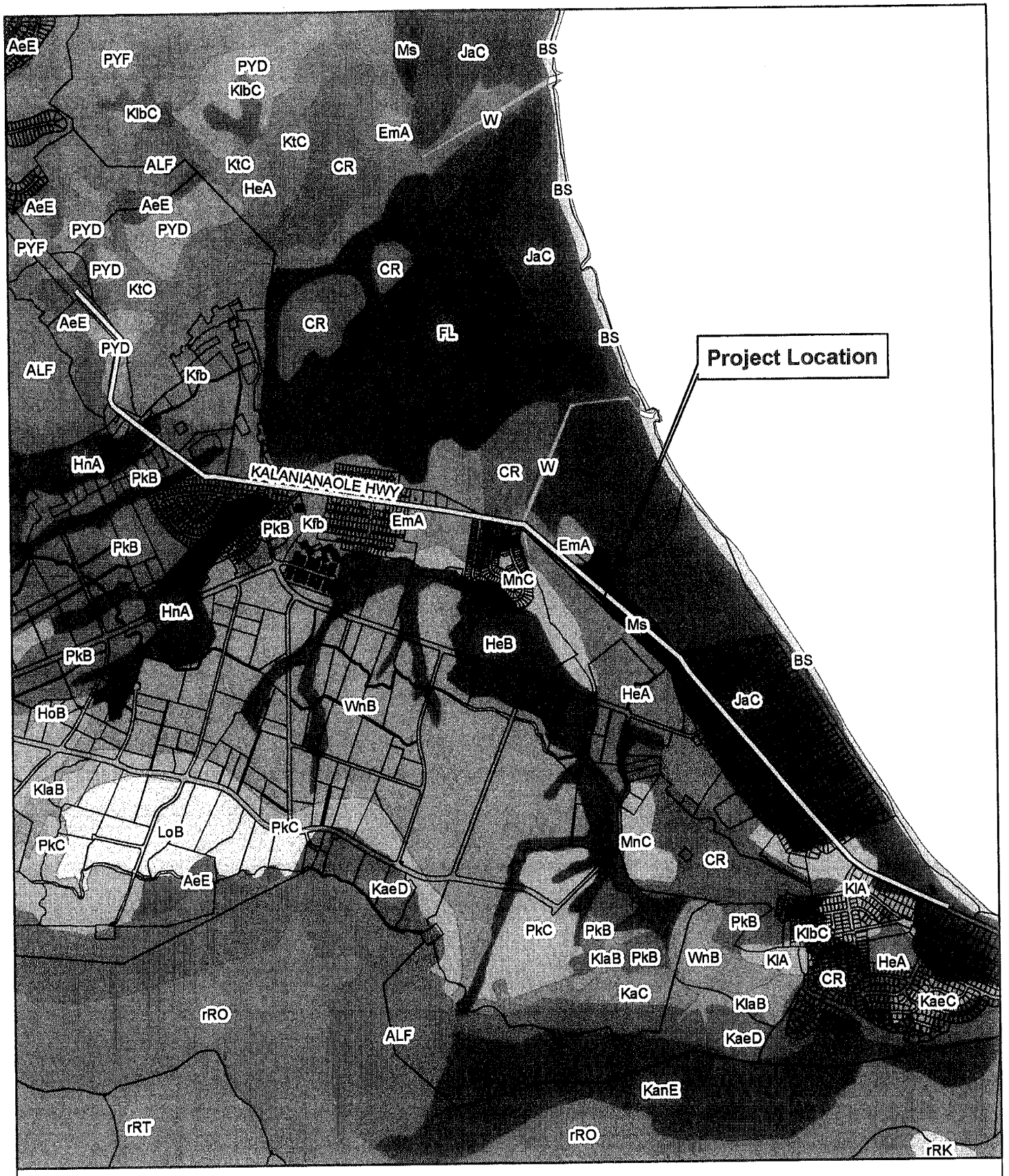
The Mokuleia series consists of well-drained soils along the coastal plains. These soils formed on recent alluvium deposited over coral sand. They are shallow and nearly level. Elevations range from nearly sea level to 100 feet.

Haleiwa silty clay, 0 to 2 percent slopes (HeA)

The Haleiwa series consists of well-drained soils on fans and drainageways along the coastal plains. They developed in alluvium derived from basic igneous material. They are nearly level to strongly sloping. Elevations range from sea level to 250 feet. Permeability is moderate. Runoff is very slow, and the erosion hazard is no more than slight.

Kawaihapai clay loam, 0 to 2 percent slopes (KIA)

The Kawaihapai series consists of well-drained soils in drainageways and on alluvial fans on the coastal plains. These soils formed in alluvium derived from basic igneous rock in humid uplands. They are nearly level to moderately sloping. Elevations range from nearly sea level to 300 feet. Permeability is moderate. Runoff is slow, and the erosion hazard is no more than slight.



0 0.5 1 Miles

Appendix A
Soil Survey Map

Kalanianaole Highway Improvements
Waimanalo Beach Park to Olomana Golf Course
Federal Job No. STP-072-1(41)
Scale: As Shown Date: October 15, 2002

APPENDIX B

TRAFFIC STUDY

FINAL TRAFFIC ENGINEERING REPORT

FOR THE PROPOSED

KALANIANAOLE HIGHWAY IMPROVEMENTS
FLAMINGO ROAD TO ALOILOI STREET

PREPARED FOR

AKINAKA & ASSOCIATES, INC.

PREPARED BY

TMC

THE TRAFFIC MANAGEMENT CONSULTANT

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FINAL
TRAFFIC ENGINEERING REPORT
FOR THE PROPOSED
KALANIANAOLE HIGHWAY IMPROVEMENTS
FLAMINGO ROAD TO ALOILOI STREET

I. Introduction

A. Project Description

The State of Hawaii Department of Transportation (DOT) is planning to improve traffic operations on Kalanianaole Highway between Olomana Golf Course and Waimanalo Beach Park in Waimanalo, Oahu, Hawaii. However, this study analyzes only the following intersections:

1. Flamingo Road
2. Kumuhau Street
3. Humuniki Street
4. Mekia Street
5. Moole Street
6. Inaole Street
7. Aloiloi Street

Figure 1 depicts the vicinity map.

B. Purpose of the Study

The purpose of this study is to analyze the projected traffic operations for the proposed roadway improvements on Kalanianaole Highway between Flamingo Road and Aloiloi Street in Waimanalo, Oahu, Hawaii. This report presents the findings and recommendations of the study.

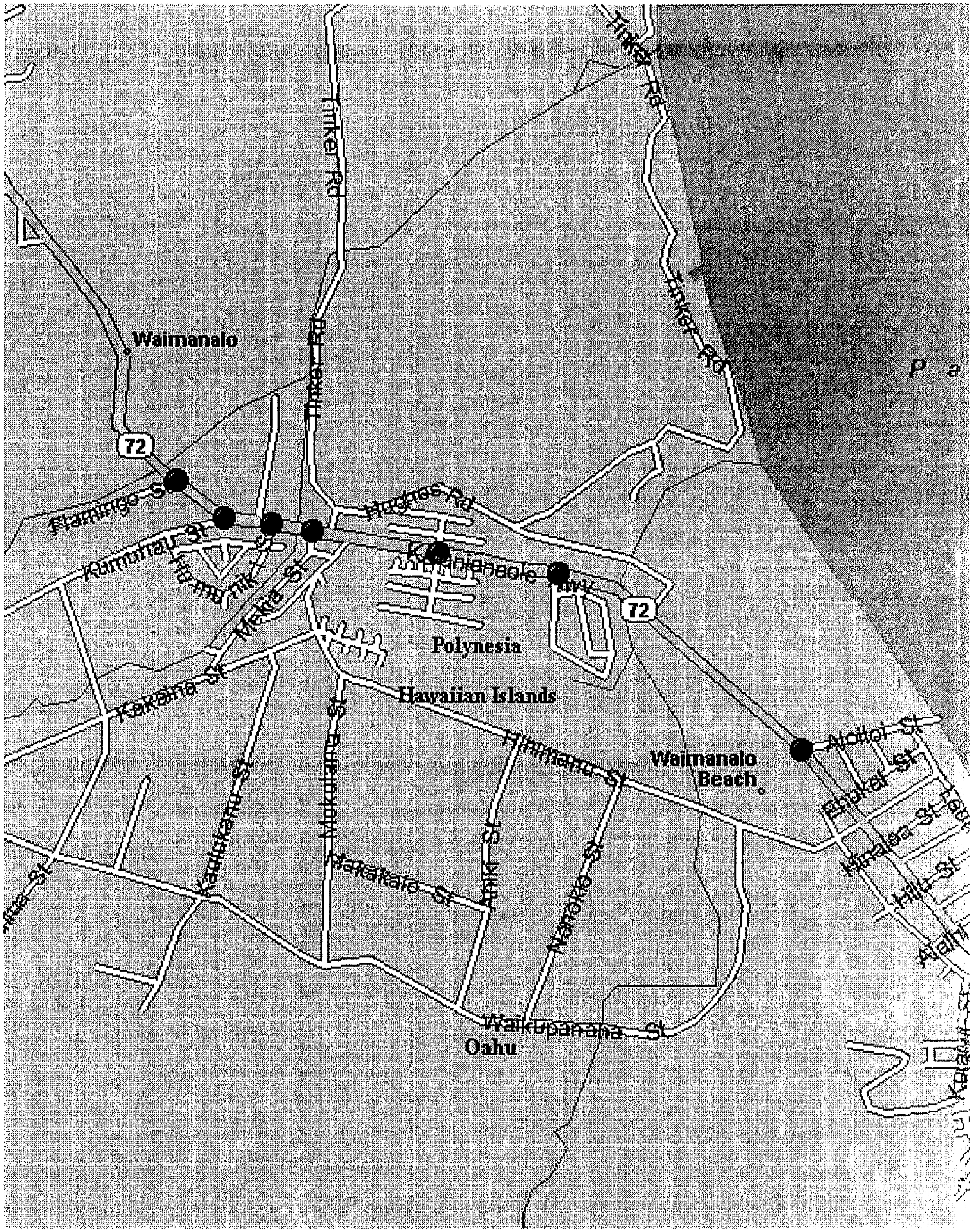

Figure 1. Vicinity Map

C. Scope of the Study

The scope of this study includes:

1. Manual traffic count surveys at the study intersections along Kalanianaole Highway, during the peak periods of traffic.
2. An analysis of the existing peak hour traffic conditions.
3. An analysis of the AM and PM peak hour traffic operations of the intersections along Kalanianaole Highway for the planning horizon year under the proposed improvements.
4. Identification of traffic impacts that may occur as a result of the implementation of the proposed project.
5. Recommendation of traffic and roadway improvements that would mitigate the traffic impacts identified in this study.

D. Proposed Improvements

DOT's proposed traffic improvements include widening the entire length of Kalanianaole Highway, between Flamingo Road and Aloiloi Street, to provide exclusive left-turn lanes and/or median shelter lanes at the study intersections. Widening Kalanianaole Highway also would provide for two-way left-turn lanes and bus bays.

The exclusive left-turn lane would provide storage for vehicles turning left into the side street and reduce the delay to through traffic on Kalanianaole Highway. The median shelter lane would facilitate the left-turn movement from the side street onto Kalanianaole Highway. Left-turn movements would be negotiated in a two-stage process, i.e., motorists turning left would look for a gap in traffic approaching from the left, cross the near side lane, queue in the median shelter lane, and then merge into gaps in traffic approaching from the right. Under the existing conditions, motorists turning left from side streets must wait for a gap in both directions of traffic before turning left onto Kalanianaole Highway.

Similarly, the two-way left-turn median lanes provide storage for vehicles in both directions on Kalanianaole Highway, waiting to turn left into driveways and low-volume roadways. The median lane also provides a shelter lane for vehicles turning left onto Kalanianaole Highway from driveways and low-volume roadways.

The proposed bus bays would permit buses to pull out of the through traffic lanes while loading and unloading passengers, thereby reducing delays to through traffic. The following improvements are proposed at the study intersections:

1. **Flamingo Road Intersection**

   The proposed Kalanianaole Highway widening at Flamingo Road would provide an exclusive left-turn lane and a median shelter lane in the westbound direction. A westbound bus bay also is proposed at the intersection, opposite Flamingo Road. Figure 2 depicts the proposed improvements at the intersection of Kalanianaole Highway and Flamingo Road.

2. **Kumuhau Street Intersection**

   The proposed widening of Kalanianaole Highway at Kumuhau Street would provide an exclusive left-turn lane and a median shelter lane in the westbound direction. The proposed improvements at the intersection of Kalanianaole Highway and Kumuhau Street are depicted on Figure 3.

3. **Humuniki Street Intersection**

   The proposed Kalanianaole Highway widening would provide an exclusive left-turn lane and a median shelter lane at Humuniki Street in the westbound direction. Figure 4 depicts the proposed improvements at the intersection of Kalanianaole Highway and Humuniki Street.

4. **Mekia Street Intersection**

   The proposed Kalanianaole Highway widening at Mekia Street would provide an exclusive left-turn lane and a median shelter lane in the westbound direction. The proposed improvements at the intersection of Kalanianaole Highway and Mekia Street are depicted on Figure 5.

5. **Moole Street Intersection**

   The proposed widening of Kalanianaole Highway at Moole Street would provide an exclusive left-turn lane in both directions. Figure 6 depicts the proposed improvements at the intersection of Kalanianaole Highway and Moole Street.

6. **Inaole Street Intersection**

   The proposed widening of Kalanianaole Highway would provide an exclusive left-turn lane and a median shelter lane at Inaole Street in the westbound direction. Bus bays are proposed on both sides of Kalanianaole Highway, to the west of its intersection with Inaole Street. The proposed improvements at the intersection of Kalanianaole Highway and Inaole Street are depicted on Figure 7.

7. **Aloiloi Street Intersection**

   The proposed Kalanianaole Highway widening would provide an eastbound exclusive left-turn lane at Aloiloi Street. Figure 8 depicts the proposed improvements at the intersection of Kalanianaole Highway and Aloiloi Street.

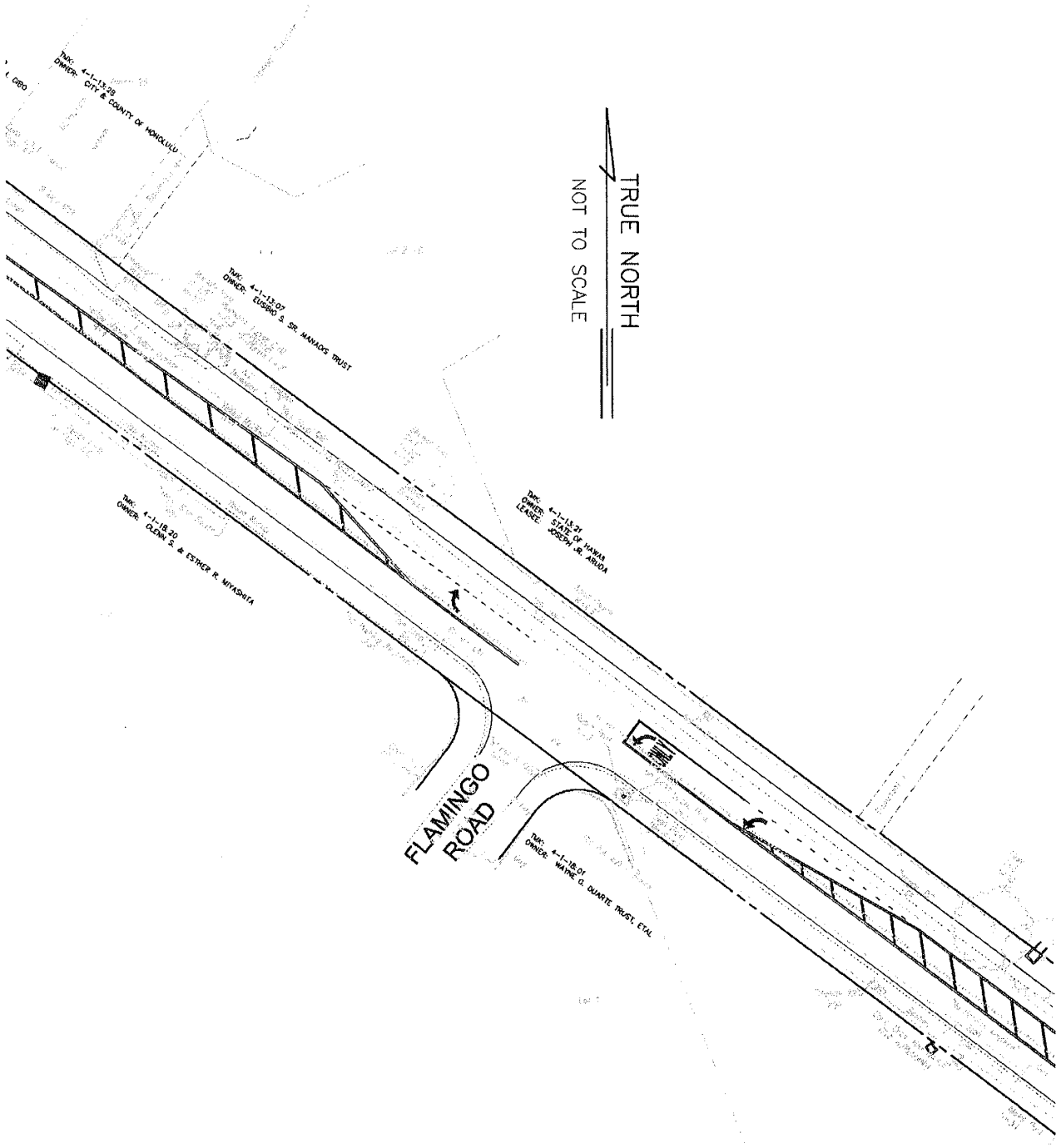

Figure 2. Proposed Flamingo Road Intersection Improvements

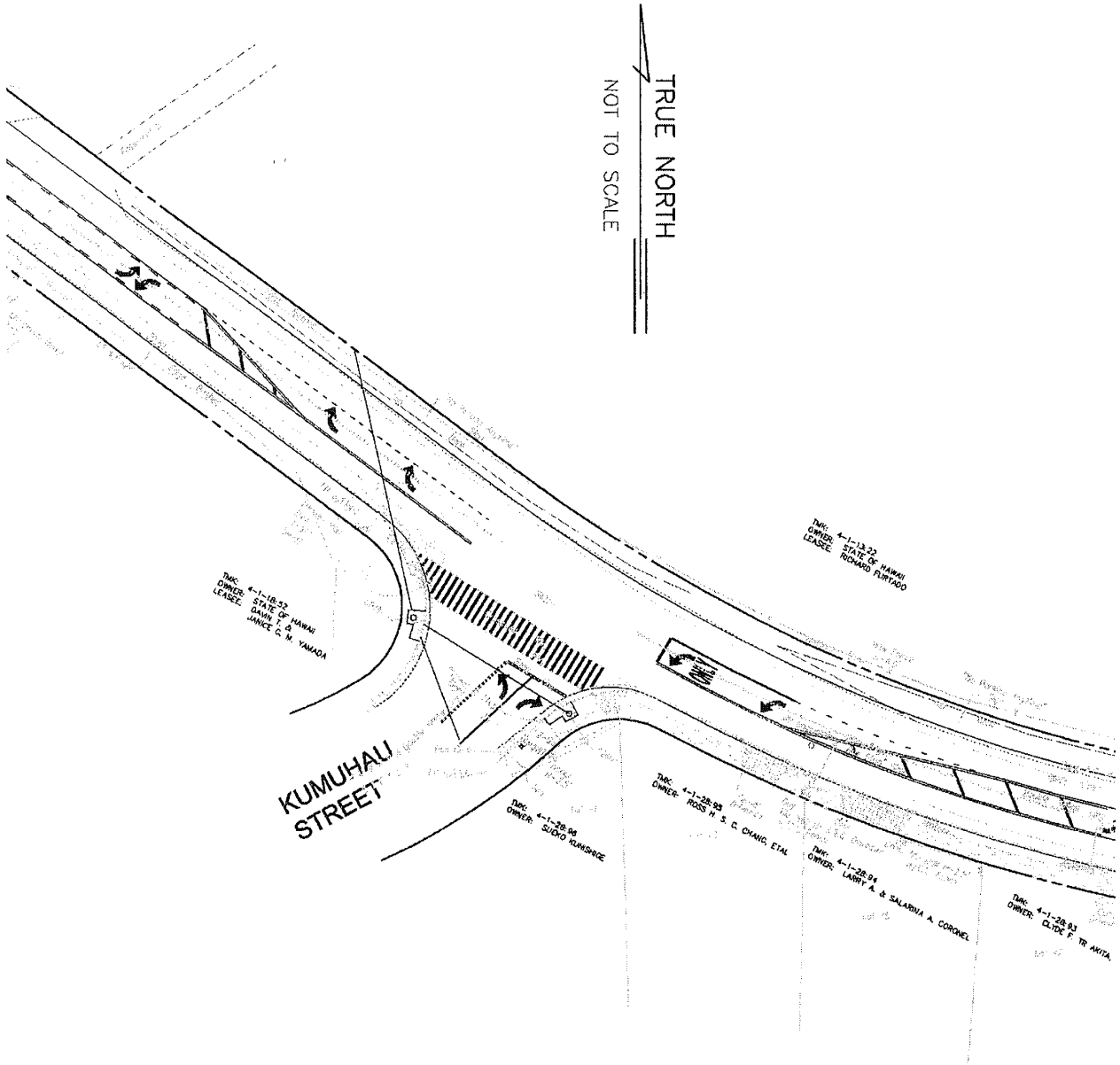

Figure 3. Proposed Kumuhau Street Intersection Improvements

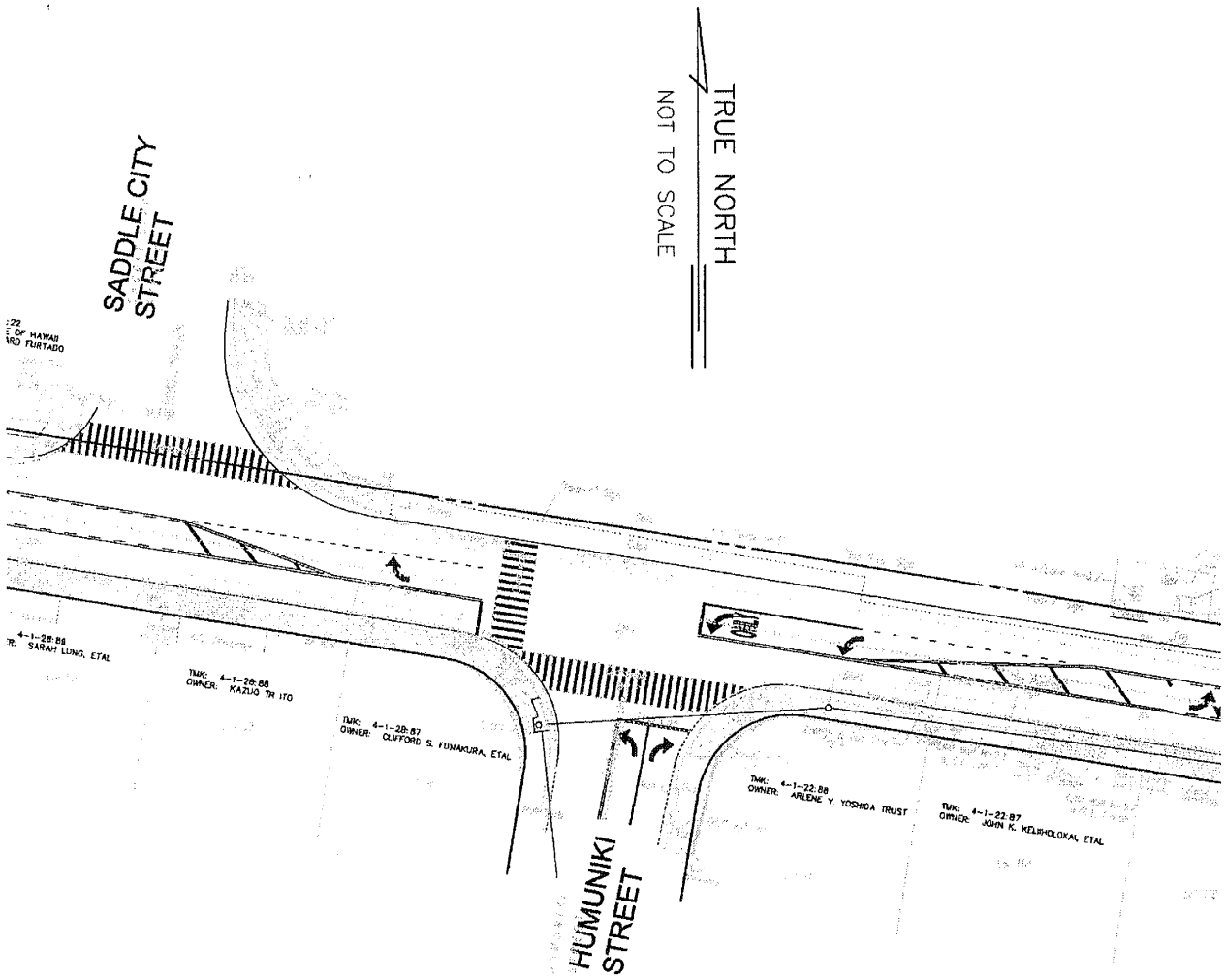

Figure 4. Proposed Humuniki Street Intersection Improvements

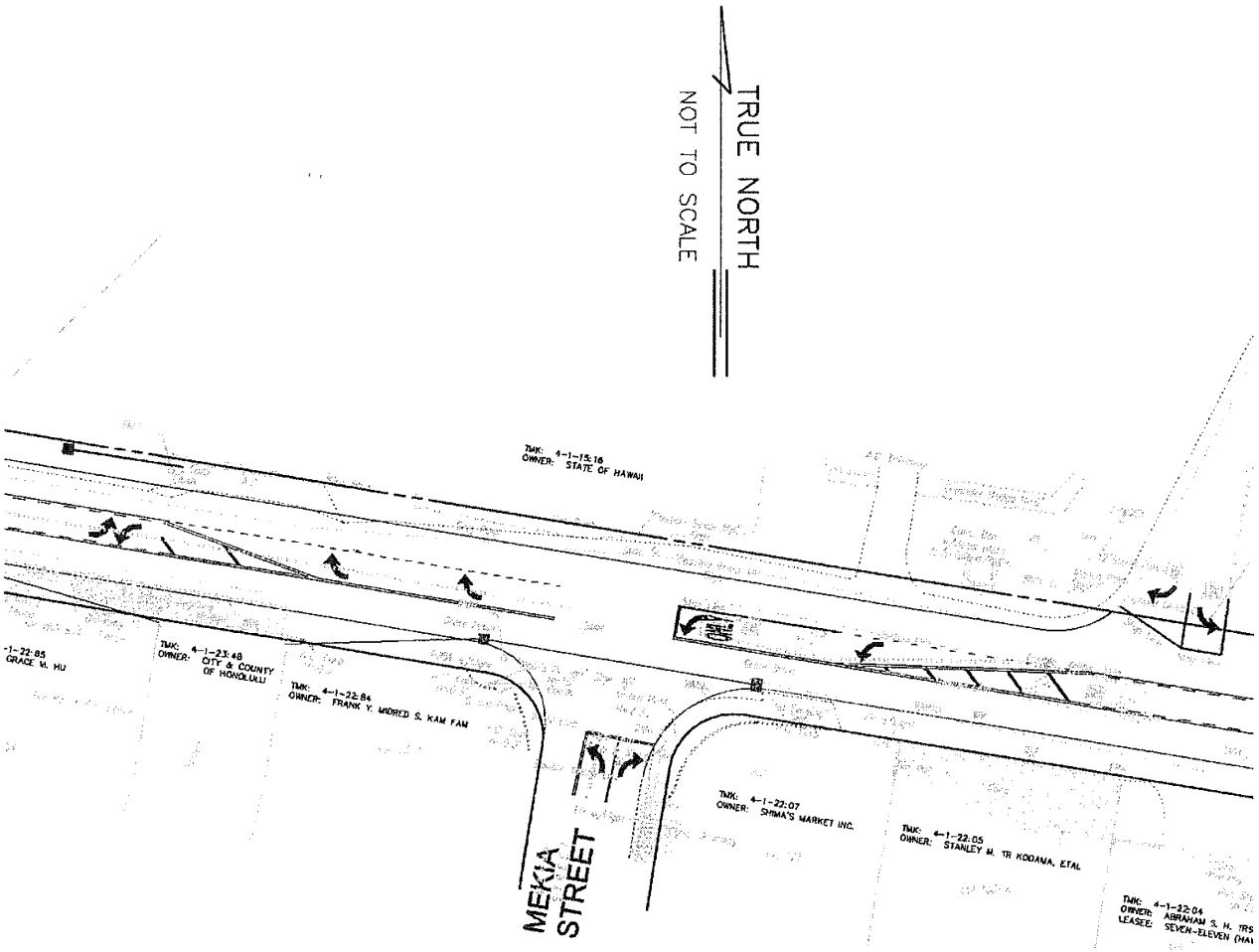

Figure 5. Proposed Mekia Street Intersection Improvements

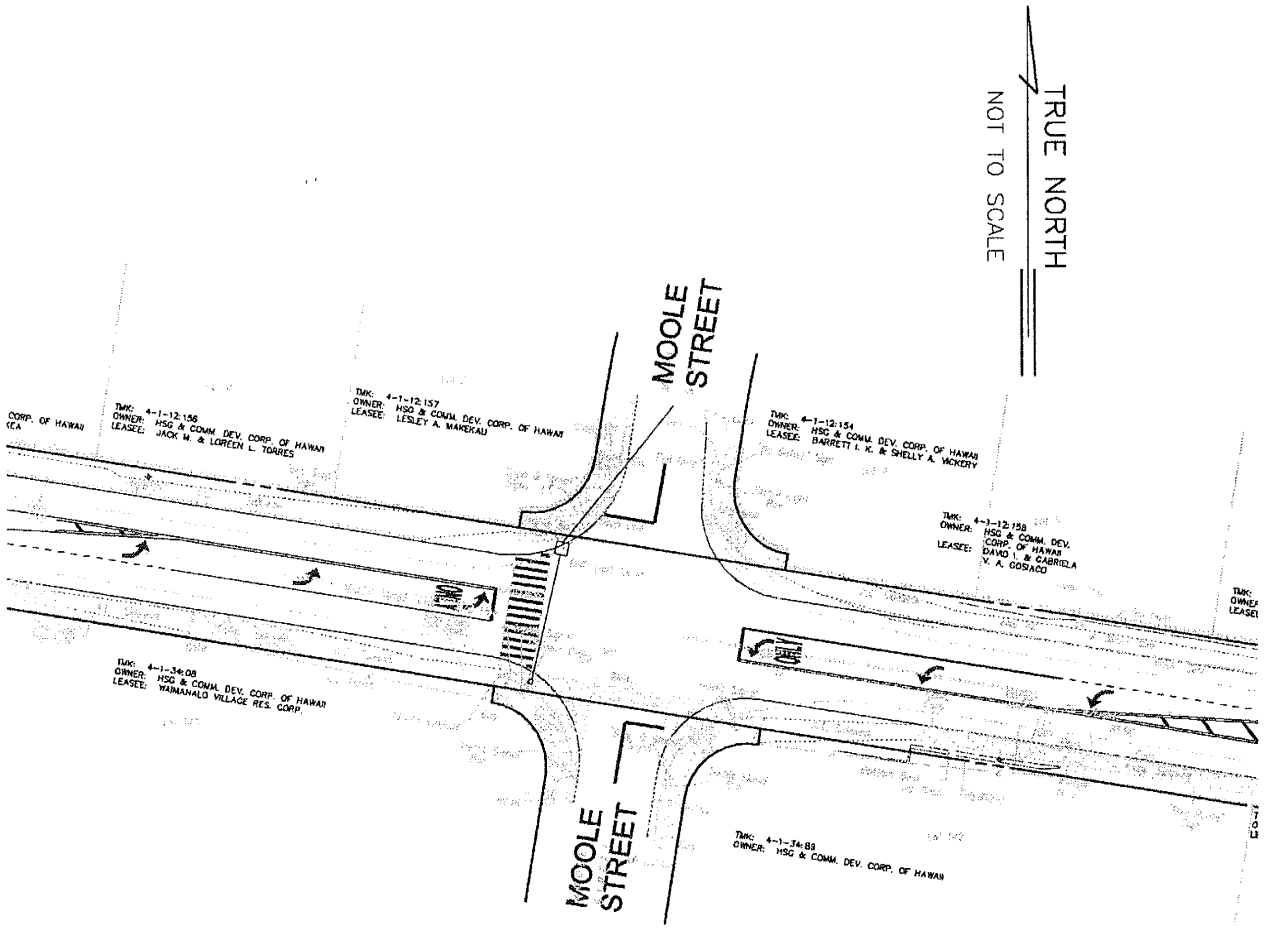

Figure 6. Proposed Moole Street Intersection Improvements

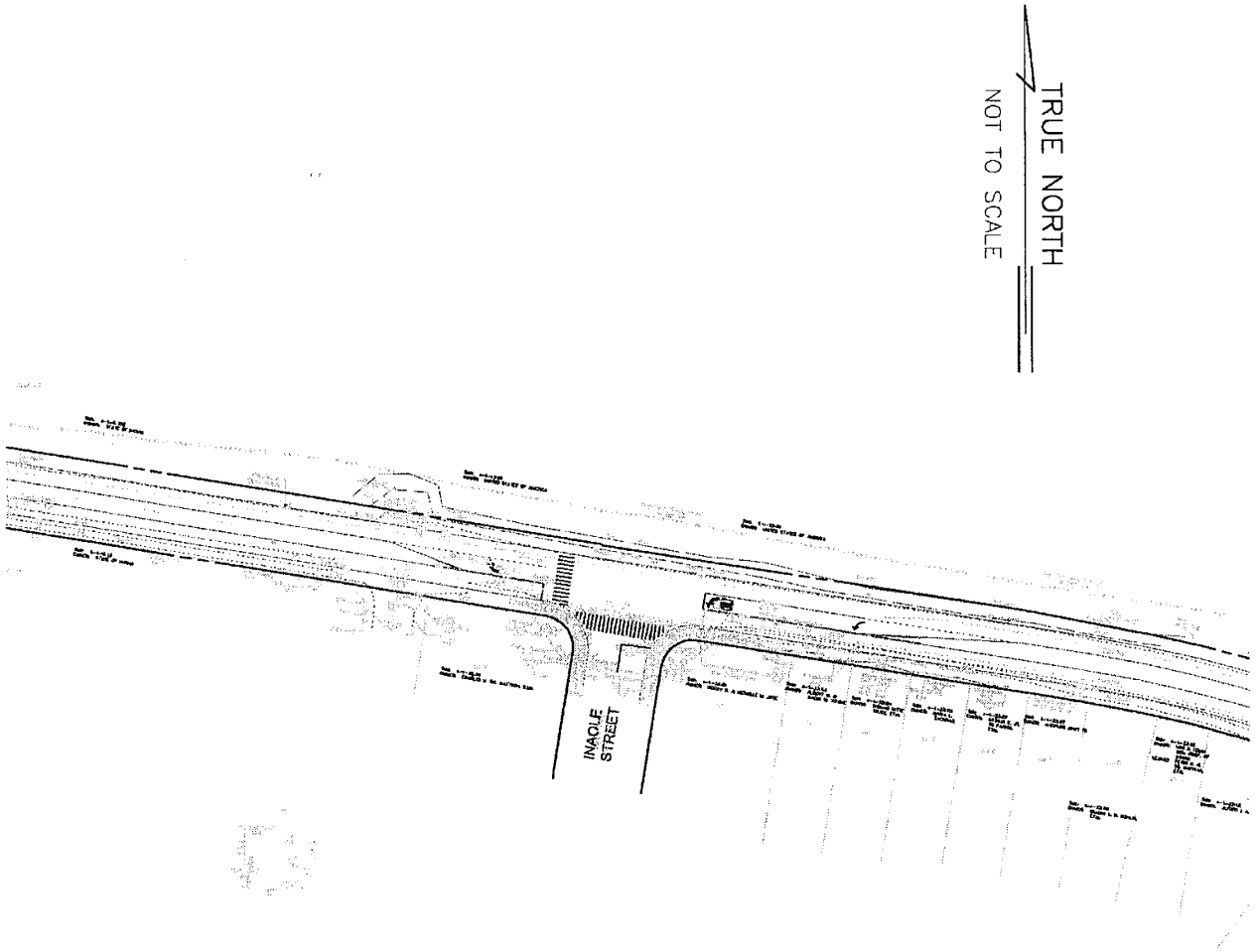

Figure 7. Proposed Inaole Street Intersection Improvements

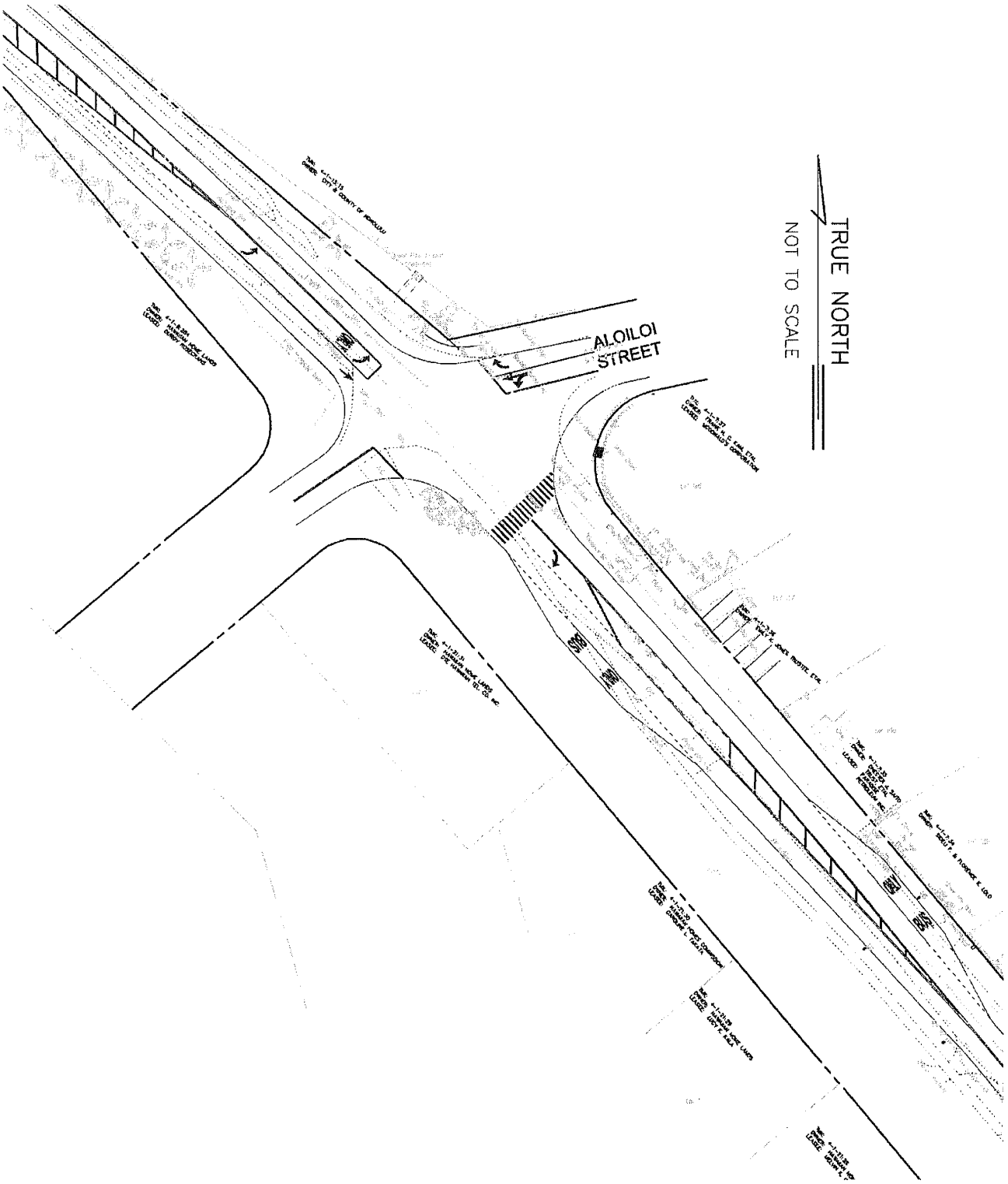

Figure 8. Proposed Aloiloi Street Intersection Improvements

II. Existing Conditions

A. Roadways

Kalanianaole Highway is at two-way, two-lane highway within the Waimanalo area. Kalanianaole Highway is unsignalized at the study intersections. Only the intersection of Kalanianaole Highway and Poalima Street is signalized in the Waimanalo area.

The side streets at the study intersections along Kalanianaole Highway are two-lane, two-way roadways. The side streets are stop-controlled at their intersections with Kalanianaole Highway.

B. Existing Peak Hour Traffic Volumes and Operating Conditions

1. General

a. Field Investigation

Manual traffic count surveys were conducted in February 2002, during the peak periods of traffic – from 6:30 AM to 8:30 AM and from 3:30 PM to 5:30 PM. Traffic count surveys were conducted at the following intersections on Kalanianaole Highway:

- Flamingo Road
- Kumuhau Street
- Humuniki Street
- Mekia Street
- Moole Street
- Inaole Street
- Aloiloi Street

b. Capacity Analysis Methodology

The highway capacity analysis, performed for this study, is based upon procedures presented in the "Highway Capacity Manual" (HCM), Special Report 209, Transportation Research Board, and the "Highway Capacity Software", Federal Highways Administration.

Level of Service (LOS) is defined as "a qualitative measure describing operational conditions within a traffic stream". Several factors are included in determining LOS such as: speed, delay, vehicle density, freedom to maneuver, traffic interruptions, driver comfort, and safety. LOS "A", "B", and "C" are considered satisfactory levels of service. LOS "D" is generally considered a

"desirable minimum" operating level of service. LOS "E" is an undesirable condition and LOS "F" is an unacceptable condition.

C. Existing Peak Hour Traffic

1. Existing AM Peak Hour Traffic

The AM peak hour of traffic occurred between 7:15 AM and 8:15 AM. Kalanianaole Highway carried between 1,300 vehicles per hour (vph) and 1,900 vph, total for both directions, during the AM peak hour of traffic. During the AM peak hour of traffic, the side streets at the study intersections generally operated at unsatisfactory Levels of Service, because of the heavy through traffic on Kalanianaole Highway.

Flamingo Road is a low-volume roadway, which carried less than 20 vph at Kalanianaole Highway, total for both directions, during the AM peak hour of traffic. Flamingo Road operated at LOS "E" at its Tee-intersection with Kalanianaole Highway.

Kumuhau Street carried about 200 vph at Kalanianaole Highway, total for both directions, during the AM peak hour of traffic. Kumuhau Street operated at LOS "F" at its Tee-intersection with Kalanianaole Highway.

Humuniki Street also operated at LOS "F" its Tee-intersection with Kalanianaole Highway, while carrying about 100 vph, total for both directions, during the AM peak hour of traffic.

During the AM peak hour of traffic, Mekia Street carried more than 170 vph, total for both directions, and operated at LOS "F" at its Tee-intersection with Kalanianaole Highway.

Moole Street intersects Kalanianaole Highway at a four-legged intersection. The north (makai) leg carried about 60 vph and the south (mauka) leg carried about 160 vph, total for both directions. Makai bound Moole Street operated at LOS "F" and the mauka bound Moole Street operated at LOS "E" at Kalanianaole Highway, during the AM peak hour of traffic.

Inaole Street carried about 170 vph at Kalanianaole Highway, total for both directions, during the AM peak hour of traffic. Inaole Street operated at LOS "F" at its Tee-intersection with Kalanianaole Highway.

Aloiloi Street is located to the east of Bellows Field. Aloiloi Street intersects Kalanianaole Highway opposite a driveway, which provides access to a sewage pump station and a private residence. Aloiloi Street carried less than 80 vph at Kalanianaole Highway, total for both directions, during the AM peak hour of traffic, operating at LOS "C". Figure 9 depicts the existing AM peak hour traffic volumes and the results of the Level of Service analysis.

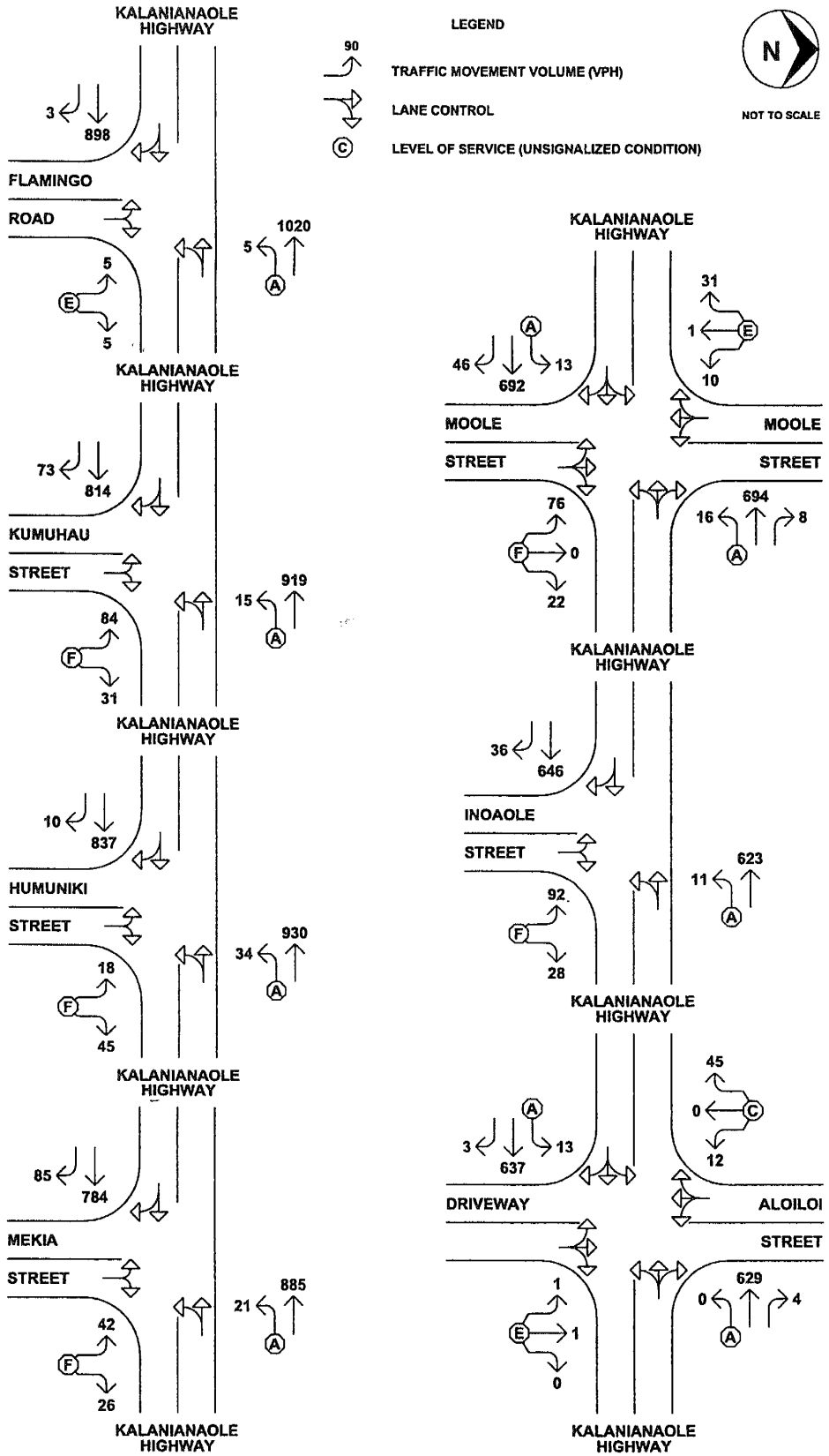

Figure 9. Existing AM Peak Hour Traffic

2. Existing PM Peak Hour Traffic

The PM peak hour of traffic occurred between 3:45 PM and 4:45 PM. Kalanianaole Highway carried between 1,400 vph and 2,000 vph, total for both directions, during the PM peak hour of traffic. The side streets at the study intersections again operated at unsatisfactory Levels of Service, because of the heavy through traffic on Kalanianaole Highway. Long queues were observed in both directions on Kalanianaole Highway, during the PM peak hour of traffic, because of the traffic signal operations at its intersection with Poalima Street. The existing PM peak hour traffic volumes and results of the capacity analysis are depicted on Figure 9.

Flamingo Road carried less than 30 vph at Kalanianaole Highway, total for both directions, during the PM peak hour of traffic. Flamingo Road operated at LOS "F" at its intersection with Kalanianaole Highway.

Kumuhau Street carried less than 220 vph at Kalanianaole Highway, total for both directions, during the PM peak hour of traffic. Kumuhau Street also operated at LOS "F" at its intersection with Kalanianaole Highway.

Humuniki Street operated at LOS "D" at its intersection with Kalanianaole Highway, while carrying about 80 vph, total for both directions, during the PM peak hour of traffic.

During the PM peak hour of traffic, Mekia Street carried about 240 vph, total for both directions, and operated at LOS "F" at its intersection with Kalanianaole Highway.

The makai leg of Moole Street carried about 60 vph and the mauka leg carried about 150 vph, total for both directions. Makai bound Moole Street operated at LOS "F" and the mauka bound Moole Street operated at LOS "E" at its intersection with Kalanianaole Highway, during the PM peak hour of traffic.

Inaole Street carried about 170 vph at Kalanianaole Highway, total for both directions, during the PM peak hour of traffic. Inaole Street operated at LOS "F" at its intersection with Kalanianaole Highway.

Aloiloi Street carried over 100 vph, total for both directions, during the PM peak hour of traffic, and operated at LOS "E" at its intersection with Kalanianaole Highway.

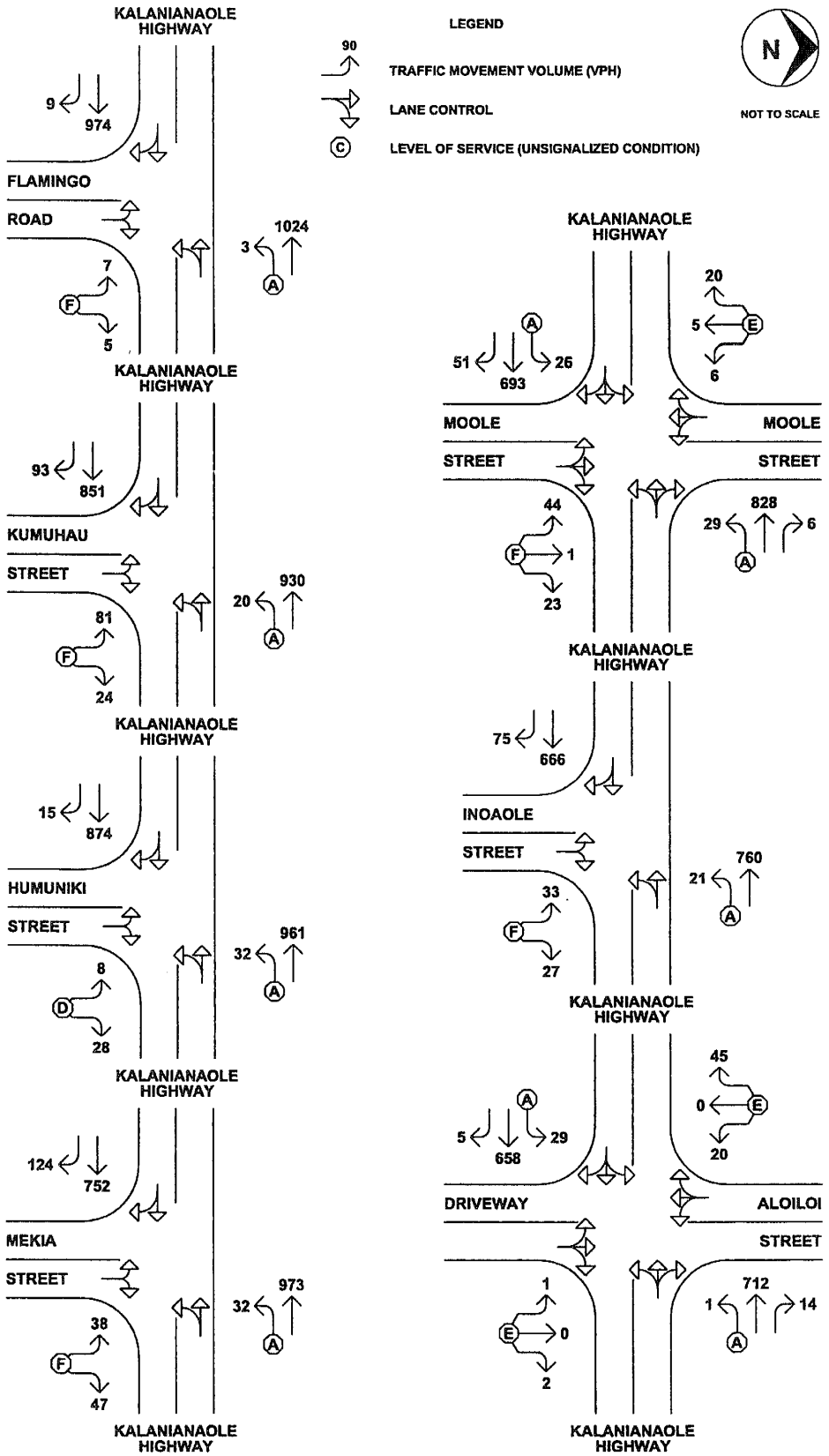

Figure 10. Existing PM Peak Hour Traffic

III. Future Peak Hour Traffic

A. Peak Hour Traffic Forecasts

The Year 2022 was used as the Design Year for the proposed project in this analysis. The Year 2022 traffic forecasts were provided by DOT. Table 1 summarizes the design traffic parameters, which were provided by DOT.

Table 1. Design Traffic

Section	Olomana Golf Course to Bellows Field	Bellows Field to Wailea Street
2001 ADT	21,300	16,500
2002 ADT	21,500	16,700
2022 ADT	25,000	19,500
DHV	2,000	1,600
K	8.0	8.0
D	55/45	50/50
T	4.0	2.0
T24	3.5	3.0

Notes:
ADT = average daily traffic (vehicles per day)
DHV = design hourly volume (vehicles per hour)
K = percentage of ADT occurring during the peak hour of traffic
D = directional distribution of traffic
T = percentage of heavy vehicles during the peak hour of traffic
T24 = percentage of heavy vehicles during a 24-hour period

The Year 2022 ADT forecast represents about 0.8 percent annual growth in traffic. A factor of 1.16 was applied uniformly to the existing traffic conditions to estimate the Year 2022 AM and PM peak hour traffic.

B. Traffic Analysis

1. Year 2022 AM Peak Hour Traffic Analysis

The traffic operations at the study intersections during the Year 2022 AM peak hour of traffic are expected to improve significantly as a result of the proposed widening of Kalanianaole Highway to provide exclusive left-turn lanes and median shelter lanes.

Kumuhau Street, Humuniki Street, and Mekia Street are expected to operate at LOS "D" at Kalanianaole Highway. Both approaches of Moole Street are expected to continue to operate at LOS "F", during the Year 2022 AM peak hour of traffic with the proposed improvements. Figure 12 depicts the Year 2022 AM peak hour traffic and the results of the capacity analysis.

2. Year 2022 PM Peak Hour Traffic Analysis

The traffic operations at the study intersections are expected to improve during the Year 2022 PM peak hour of traffic as a result of the proposed improvements along Kalanianaole Highway.

Kumuhau Street is expected to operate at LOS "F" at its intersection with Kalanianaole Highway. Mekia Street is expected to operate at LOS "D" at Kalanianaole Highway. Both approaches of Moole Street again are expected to operate at LOS "F", during the Year 2022 PM peak hour of traffic with the proposed improvements. Figure 13 depicts the Year 2022 PM peak hour traffic and the results of the capacity analysis.

IV. Recommendations and Conclusions

A. Recommendations

1. Flamingo Road Intersection

a. A minimum storage length of 50 feet is recommended for the proposed left-turn lane on westbound Kalanianaole Highway at Flamingo Road.

b. A minimum storage length of 50 feet is recommended for the proposed median shelter lane on westbound Kalanianaole Highway at Flamingo Road.

c. Consideration should be given to relocating the proposed bus bay away from the intersection of Kalanianaole Highway and Flamingo Road to avoid conflicts between the merging traffic movements from the median shelter lane and from the bus bay.

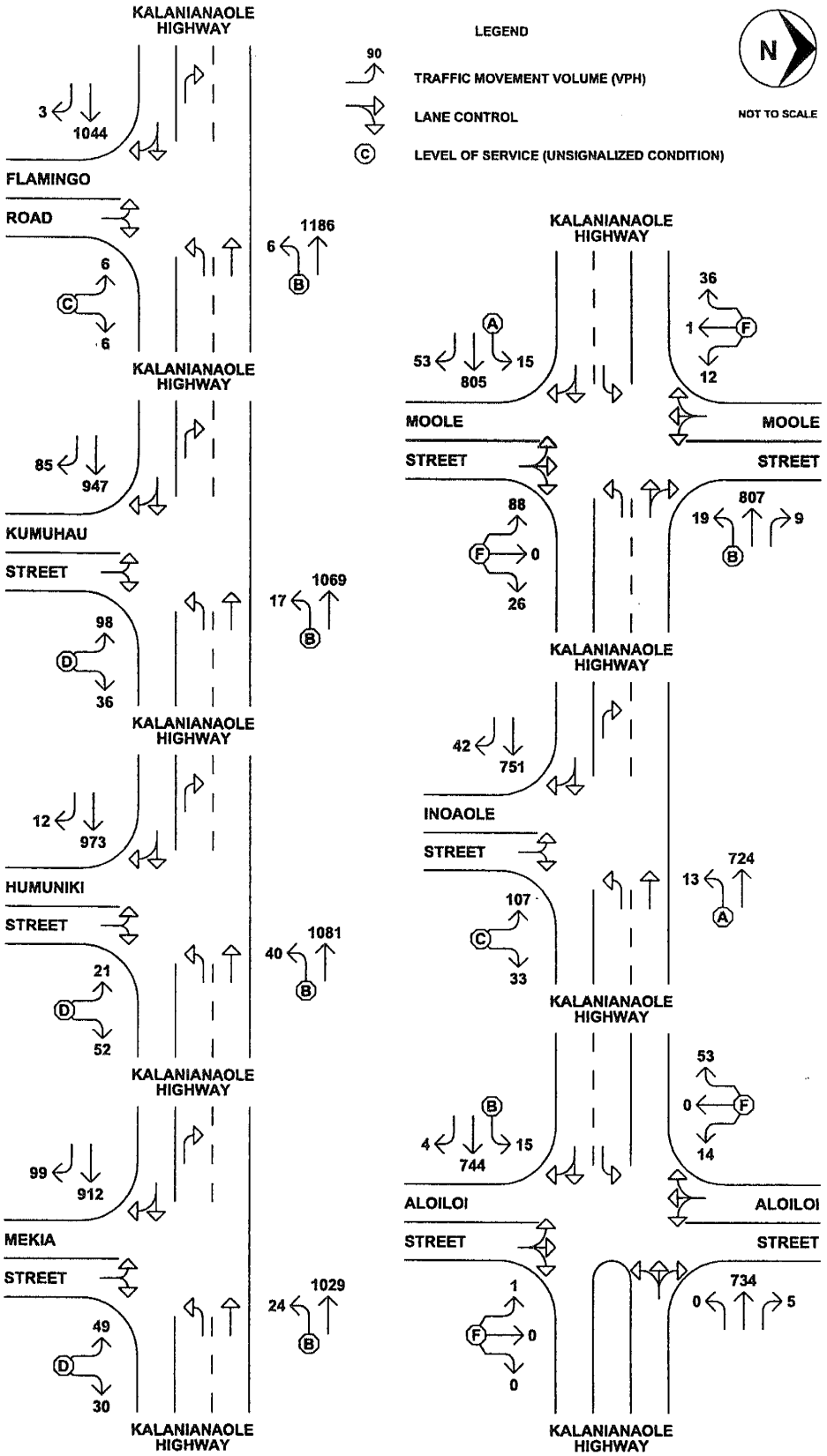

Figure 11. Year 2022 AM Peak Hour Traffic

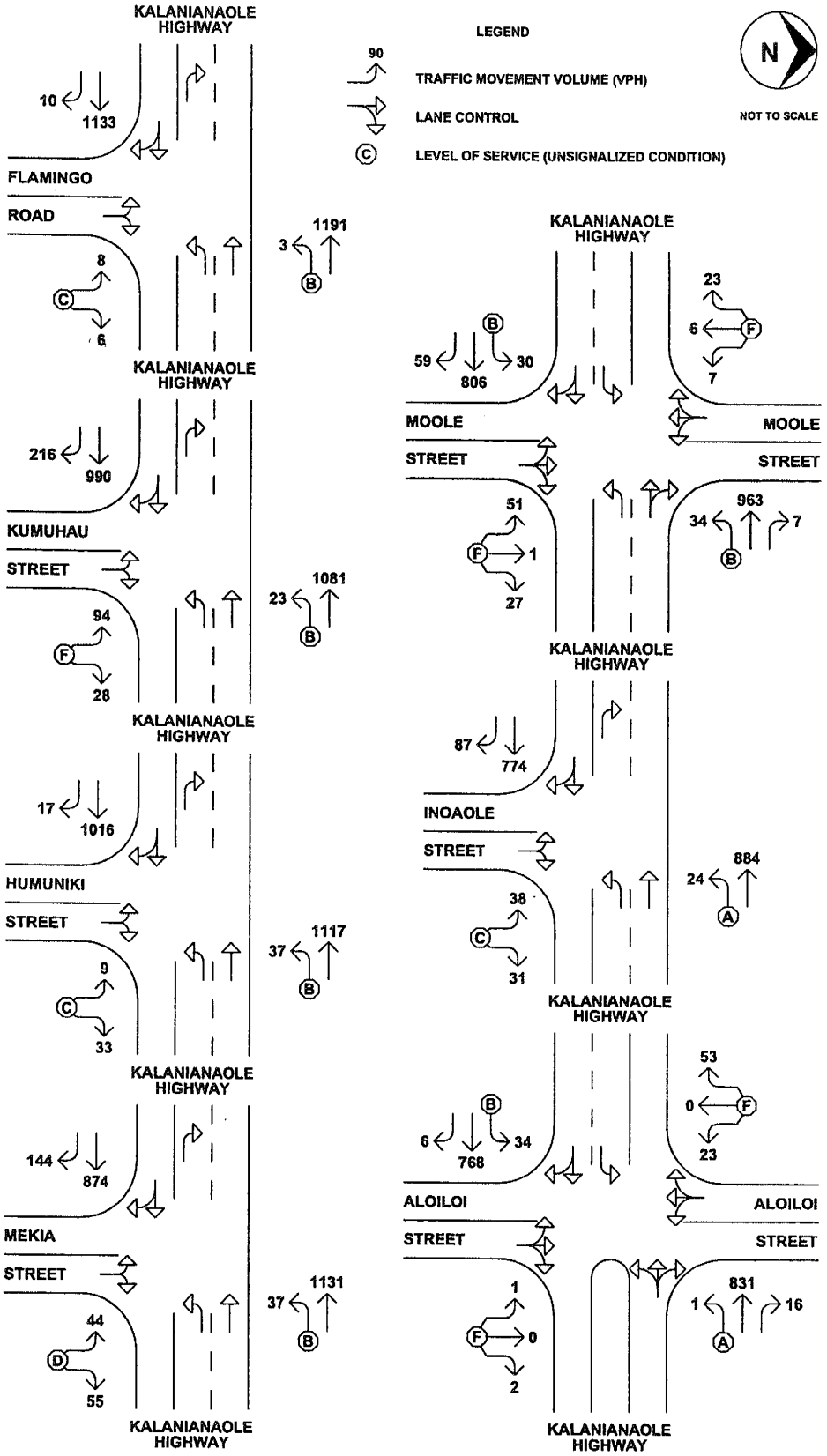

Figure 12. Year 2022 PM Peak Hour Traffic

2. **Kumuhau Street Intersection**

   a. A minimum storage length of 50 feet is recommended for the proposed left-turn lane on westbound Kalanianaole Highway at Kumuhau Street.

   b. A minimum storage length of 75 feet is recommended for the proposed median shelter lane on westbound Kalanianaole Highway at Kumuhau Street. The recommended storage length would improve the left-turn movement operations from Kumuhau Street from LOS "F" to LOS "E", during the PM peak hour of traffic.

   c. Consideration should be given to restriping/widening Kumuhau Street at Kalanianaole Highway to provide separate left-turn and right-turn lanes. The separate turning lanes on Kumuhau Street would improve the right-turn movement operations from LOS "F" to LOS "C", during the PM peak hour of traffic.

3. **Humuniki Street Intersection**

   a. A minimum storage length of 50 feet is recommended for the proposed left-turn lane on westbound Kalanianaole Highway at Humuniki Street.

   b. A minimum storage length of 75 feet is recommended for the proposed median shelter lane on westbound Kalanianaole Highway at Humuniki Street. The recommended storage length would improve the left-turn movement operations from Kumuhau Street from LOS "D" to LOS "C", during the AM peak hour of traffic.

   c. Consideration should be given to restriping/widening Humuniki Street at Kalanianaole Highway to provide separate left-turn and right-turn lanes. The separate turning lanes on Humuniki Street would improve the right-turn movement operations from LOS "D" to LOS "C", during the AM peak hour of traffic.

4. **Mekia Street Intersection**

   a. A minimum storage length of 50 feet is recommended for the proposed left-turn lane on westbound Kalanianaole Highway at Mekia Street.

   b. A minimum storage length of 125 feet is recommended for the proposed median shelter lane on westbound Kalanianaole Highway at Mekia Street. The recommended storage length would improve the left-turn movement operations from Kumuhau Street from LOS "D" to LOS "C", during both the AM and PM peak hours of traffic.

   c. Consideration should be given to restriping/widening Mekia Street at Kalanianaole Highway to provide separate left-turn and right-turn lanes. The separate turning lanes on Mekia Street would improve the right-turn movement

operations from LOS "D" to LOS "C", during both the AM and PM peak hours of traffic.

5. **Moole Street Intersection**

   a. Minimum storage lengths of 50 feet are recommended for the proposed left-turn lanes on Kalanianaole Highway at Moole Street.

   b. Consideration should be given to providing two-way left-turn median lanes on both approaches of Kalanianaole Highway at the Moole Street intersection, instead of the proposed exclusive left-turn lanes. The two-way left-turn median lane could operate as both a left-turn storage lane and a median shelter lane for left-turn movements to and from Moole Street. The northbound left-turn movement operations on Moole Street would improve from LOS "F" to LOS "E", during the AM and PM peak hours of traffic. The southbound left-turn movement operations on Moole Street would improve from LOS "F" to LOS "C", during both peak hours of traffic.

   c. Consideration should be given to restriping/widening Moole Street at Kalanianaole Highway to provide separate a left-turn lane and a shared through/ right-turn lane on both approaches. The separate turning lanes on Moole Street would improve the right-turn movement operations from LOS "F" to LOS "C", during both peak hours of traffic.

6. **Inaole Street Intersection**

   a. A minimum storage length of 50 feet is recommended for the proposed left-turn lane on westbound Kalanianaole Highway at Inaole Street.

   b. A minimum storage length of 50 feet is recommended for the proposed median shelter lane on westbound Kalanianaole Highway at Inaole Street.

7. **Aloiloi Street Intersection**

   a. A minimum storage length of 50 feet is recommended for the proposed left-turn lane on westbound Kalanianaole Highway at Aloiloi Street.

   b. Consideration should be given to providing a minimum 50-foot long median shelter lane on eastbound Kalanianaole Highway at Aloiloi Street. The median shelter lane would improve the left-turn movement operations from southbound Aloiloi Street from LOS "F" to LOS "C", during both peak hours of traffic.

   c. Consideration should be given to restriping/widening Aloiloi Street to provide a shared through/left-turn lane and an exclusive right-turn lane. The exclusive right-turn lane would improve traffic operations to LOS "C", during both peak hours of traffic.

B. Conclusions

The widening of Kalanianaole Highway from two lanes to three lanes is expected to improve the overall traffic operations of the highway facility. The exclusive left-turn lanes, median shelter lanes, two-way left-turn lanes, and bus bays are expected to improve travel times for through traffic. The median shelter lanes and the two-way left-turn lanes also are expected to reduce delays for vehicles turning left onto Kalanianaole Highway from the existing side streets and driveways.

APPENDIX C

TRAFFIC STUDY ADDENDUM

TRAFFIC ENGINEERING REPORT ADDENDUM

FOR THE PROPOSED

KALANIANAOLE HIGHWAY IMPROVEMENTS

OLOMANA GOLF COURSE, KUMUHAU STREET, MOOLE STREET & INTERSECTIONS

PREPARED FOR

AKINAKA & ASSOCIATES, INC.

MARCH 2, 2005

PREPARED BY

THE TRAFFIC MANAGEMENT CONSULTANT

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TRAFFIC ENGINEERING REPORT ADDENDUM
FOR THE PROPOSED
KALANIANAOLE HIGHWAY IMPROVEMENTS
OLOMANA GOLF COURSE, KUMUHAU STREET, MOOLE STREET & INTERSECTIONS

I. Introduction

A. Project Description

The State of Hawaii Department of Transportation (DOT) is planning to improve traffic operations on Kalanianaole Highway between Olomana Golf Course and Waimanalo Beach Park in Waimanalo, Oahu, Hawaii. This report is an addendum to the Final Traffic Engineering Report for the Proposed Kalanianaole Highway Improvements Flamingo Road to Aloiloi Street, dated October 15, 2003, prepared by The Traffic Management Consultant.

B. Purpose of the Study

The purpose of this addendum is threefold:

1. Analyze the DOT-proposed geometric improvements at the intersection of Kalanianaole Highway and Olomana Golf Course Driveway;
2. Analyze the traffic signal warrants at the intersection of Kalanianaole Highway and Kumuhau Street; and
3. Analyze the traffic signal warrants at the intersection of Kalanianaole Highway and Moole Street.

Figure 1 depicts the vicinity map.

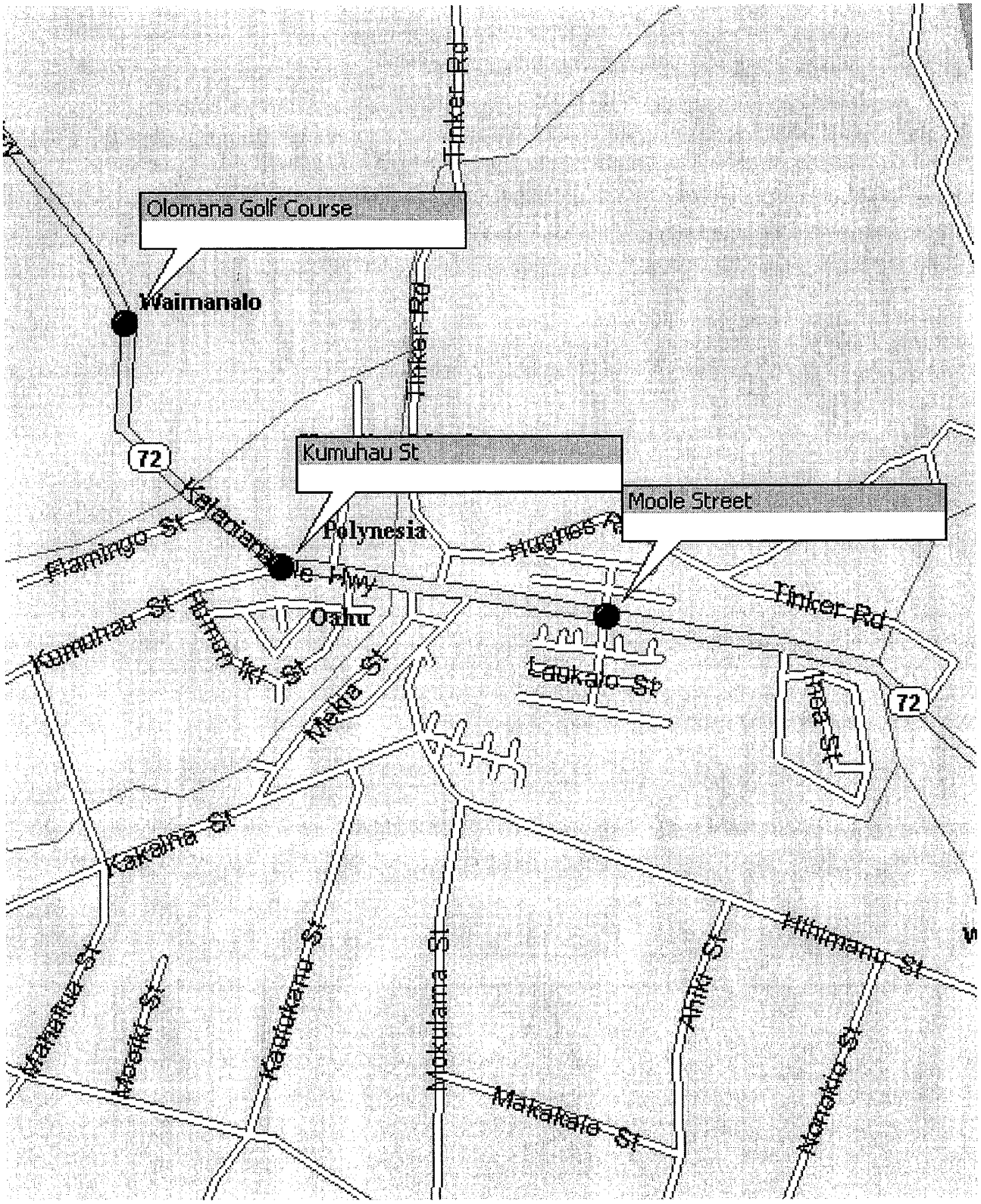


Figure 1. Vicinity Map

C. Scope of the Study

The scope of this study includes:

1. Manual traffic count surveys at the intersection of Kalanianaole Highway and Olomana Golf Course Driveway, during the peak periods of traffic.

2. An analysis of the existing peak hour traffic conditions at the intersection of Kalanianaole Highway and Olomana Golf Course Driveway, during the peak hours of traffic.

3. Twenty-four (24) hour traffic count surveys at the Kalanianaole Highway intersections at Kumuhau Street, and at Moole Street.

4. Peak period pedestrian count surveys at the Kalanianaole Highway intersections at Kumuhau Street, and at Moole Street.

5. Traffic Signal Warrant analyses for the Kalanianaole Highway intersections at Kumuhau Street and at Moole Street in accordance with the standards and guidelines of the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD), Federal Highways Administration, U. S. Department of Transportation.

6. Analysis of the traffic operations of the proposed right-turn lane on northbound Kalanianaole Highway at its intersection with the Olomana Golf Course Driveway.

D. Methodologies

1. Capacity Analysis Methodology

The highway capacity analysis, performed for this study, is based upon procedures presented in the "Highway Capacity Manual" (HCM), Special Report 209, Transportation Research Board, and the "Highway Capacity Software", Federal Highways Administration. The capacity analysis worksheets are attached in the Appendix.

Level of Service (LOS) is defined as "a qualitative measure describing operational conditions within a traffic stream". Several factors are included in determining LOS, such as: speed, delay, vehicle density, freedom to maneuver, traffic interruptions, driver comfort, and safety. LOS "A", "B", and "C" are considered satisfactory levels of service. LOS "D" is generally considered a "desirable minimum" operating level of service. LOS "E" is an undesirable condition and LOS "F" is an unacceptable condition.

2. Traffic Signal Warrant Analysis

The Manual on Uniform Traffic Control Devices provides guidelines to determine the necessity for the installation of traffic signals. Warrants 1, 2, 3, and 4 were analyzed in this study. The MUTCD recommends that "a traffic control signal should

not be installed unless one or more of the factors described herein are met." The MUTCD goes on to recommend that "satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

a. Warrant 1, Eight-Hour Vehicular Volume

Warrant 1 is separated into two conditions. Condition A, Minimum Vehicular Volume, is considered when the volume of intersecting traffic over an eight-hour period is the principal reason to consider traffic signalization. The minimum volumes on the major and minor streets required for Condition A are met when for any 8 hours of an average day, the minimum volumes on the major street are 500 vph on one-lane approaches, total for both directions, and the minimum volumes on the minor street are 150 vph, one direction only.

Condition B, Interruption of Continuous Traffic, is considered when the traffic volume on the major street is so heavy that traffic on the minor street would suffer excessive delay or conflict entering or crossing the major street. The minimum volumes on the major and minor streets required for Condition A are met when for any 8 hours of an average weekday, the minimum volumes on the major street are 750 vph on one-lane approaches, total for both directions, and the minimum volumes on the minor street are 75 vph, one direction only.

Warrant 1 would be satisfied if the minimum vehicular volumes meet the 80 percent levels of both Conditions A and B. The 70 percent level of the minimum vehicular volumes for either Condition A or B is applicable to isolated communities with populations of less than 10,000, or where the major street speed exceeds 40 mph. Neither condition applies to Kalanianaole Highway (25 mph posted speed) in Waimanalo (2000 Census Resident Population = 10,161).

b. Warrant 2, Four-Hour Vehicular Volume

Warrant 2 is considered when the volume of intersecting traffic over a four-hour period is the principal reason to consider traffic signalization. The minimum volumes on the major and minor streets required for Warrant 2 are met when for any 4 hours of an average day, the minimum volume on the major street are 1,100 vph on one-lane approaches, total for both directions, and the minimum volumes on the minor street are 80 vph, one direction only. The 70 percent level of the minimum vehicular volumes is applicable to isolated communities with populations of less than 10,000, or where the major street speed exceeds 40 mph.

c. Warrant 3, Peak Hour

Warrant 3 is considered when during a minimum of one hour in an average day, the minor street would suffer excessive delay or conflict entering or crossing the major street. Warrant 3 is separated into two categories.

Condition A is primarily based upon stopped time delay experienced by traffic on the minor street. Condition A is satisfied when all three conditions are met: the total stop-time delay experienced on the one-lane approach of the minor street exceeds 4 vehicle-hours; and the volume on the same minor street approach exceeds 100 vehicles per hour (vph); and the total volumes entering the intersection exceed 650 vph for a Tee-intersection and 800 vph for a four-legged intersection.

Condition B is based upon intersecting volumes of traffic. The minimum volumes on the major and minor streets required for Condition B are met when for any hour of an average weekday, the minimum volumes on the major street are 1,500 vph on one-lane approaches, total for both directions, and the minimum volumes on the minor street are 100 vph, one direction only.

d. Warrant 4, Pedestrian Volume

Warrant 4 is considered when heavy traffic volumes on the major street result in excessive delays for pedestrians crossing the street. Warrant 4 is met when the pedestrian volume crossing the major street exceeds 190 pedestrians per hour; and there are fewer than 60 gaps per hour in traffic, when pedestrians can safely cross the major street.

3. Traffic Simulation

SimTraffic is a microscopic traffic simulation software, developed by Trafficware Corporation. Microscopic traffic simulation is a stochastic process, which can analyze the interactions of individual vehicles on a roadway network over time. SimTraffic was used to analyze the peak hour delays on the side streets at Kalanianaole Highway.

II. Existing Conditions

A. Roadways

Kalanianaole Highway is at two-way, two-lane highway within the Waimanalo area. Olomana Golf Course Driveway is a two-lane, two-way roadway, which intersects Kalanianaole Highway at a stop-controlled Tee-intersection. Kumuhau Street also is a two-lane, two-way roadway that intersects Kalanianaole Highway at a stop-controlled Tee-intersection. Moole Street is a two-lane, two-way roadway, which intersects Kalanianaole Highway at a stop-controlled four-way intersection.

B. Existing Traffic Volumes and Operating Conditions

1. Field Investigation

Manual traffic count surveys were conducted at the intersection of Kalanianaole Highway and the Olomana Golf Course Driveway in September 2004, during the peak periods of traffic – from 6:30 AM to 8:30 AM and from 3:30 PM to 5:30 PM.

Pedestrian count surveys were conducted at the Kalanianaole Highway intersections at Kumuhau Street and at Moole Street in September 2004. Mechanical traffic count surveys were conducted at the Kalanianaole Highway intersections at Kumuhau Street and at Moole Street in November 2004. The traffic count data are attached in the Appendix.

2. Existing AM Peak Hour Vehicular Traffic

The AM peak hour of traffic occurred between 7:00 AM and 8:00 AM. Kalanianaole Highway carried over 1,900 vehicles per hour (vph), total for both directions, during the AM peak hour of traffic. The Olomana Golf Course Driveway carried 35 vph, total for both directions, during the AM peak hour of traffic. During the AM peak hour of traffic, the Olomana Golf Course Driveway operated at LOS "F", because of the heavy through traffic on Kalanianaole Highway. Figure 2 depicts the existing AM and PM peak hour traffic volumes and the results of the Level of Service analysis.

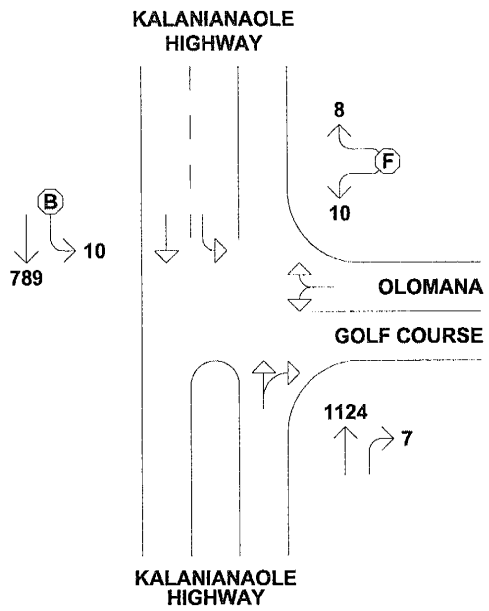
3. Existing PM Peak Hour Vehicular Traffic

The PM peak hour of traffic occurred between 3:45 PM and 4:45 PM. Kalanianaole Highway carried over 2,000 vph, total for both directions, during the PM peak hour of traffic. During the PM peak hour of traffic, the Olomana Golf Course Driveway operated at LOS "E" at Kalanianaole Highway. The Olomana Golf Course Driveway carried 17 vph, total for both directions. Long queues were observed in the southbound direction on Kalanianaole Highway, during the PM peak hour of traffic, because of the existing traffic signals at its intersection with Poalima Street. The existing PM peak hour traffic volumes and results of the capacity analysis are depicted on Figure 2.

4. Existing Peak Hour Pedestrian Traffic

The pedestrian traffic crossing Kalanianaole Highway was minimal, during the AM peak hour of traffic. At Kumuhau Street two (2) pedestrians were observed crossing Kalanianaole Highway. Thirteen (13) pedestrians were observed crossing Kalanianaole Highway, in the vicinity of Moole Street, during the AM peak hour of traffic.

The pedestrian traffic crossing Kalanianaole Highway also was minimal, during the PM peak hour of traffic. No pedestrians were observed crossing Kalanianaole Highway in the vicinity of Kumuhau Street. Eleven (11) pedestrians were observed crossing Kalanianaole Highway, in the vicinity of Moole Street, during the after-school peak hour of traffic.



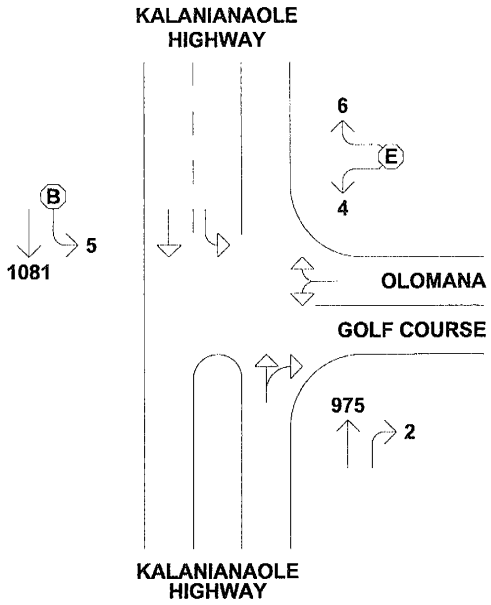
EXISTING AM PEAK HOUR TRAFFIC

LEGEND

90 TRAFFIC MOVEMENT VOLUME (VPH)

LANE CONTROL

C LEVEL OF SERVICE (UNSIGNALIZED)



EXISTING PM PEAK HOUR TRAFFIC

Figure 2. Existing Peak Hour Traffic

5. 24-Hour Vehicular Traffic Data

At Kumuhau Street, Kalanianaole Highway carried over 24,300 vehicles per day (vpd), total for both directions. Kumuhau Street carried over 3,100 vpd, total for both directions.

Kalanianaole Highway carried over 19,900 vpd at Moole Street, total for both directions. The north leg of Moole Street carried over 1,200 vpd, total for both directions, at Kalanianaole Highway. The south leg of Moole Street at Kalanianaole Highway carried over 2,100 vpd, total for both directions.

III. Olomana Golf Course Driveway Intersection Improvements

A. DOT-Proposed Improvements

1. Southbound Kalanianaole Highway is proposed to be widened to provide a minimum 125-foot median shelter lane to facilitate the left-turn movement from the Olomana Golf Course Driveway.

2. Northbound Kalanianaole Highway is proposed to be widened to provide an exclusive right-turn lane to the Olomana Golf Course Driveway.

B. Peak Hour Traffic Forecasts

The Year 2022 was used as the Design Year for the proposed project in this analysis. The Year 2022 traffic forecasts were provided by DOT. Table 1 summarizes the design traffic parameters, which were provided by DOT.

Table 1. Design Traffic - Olomana Golf Course to Bellows Field

2001 Average Daily Traffic (ADT)	21,300 vehicles/day
2002 Average Daily Traffic	21,500 vehicles/day
2022 Average Daily Traffic	25,000 vehicles/day
Design Hourly Volume	2,000 vehicles/hour
% of ADT occurring during the peak hour (K)	8.0%
Directional Distribution of Traffic (D)	55/45
% of Heavy Vehicles During the Peak hour (T)	4.0%
% of Heavy Vehicles During a 24-Hour Period (T_{24})	3.5%

The Year 2022 ADT forecast represents about 0.8 percent annual growth in traffic. A factor of 1.144 was applied uniformly to the existing traffic conditions to estimate the Year 2022 AM and PM peak hour traffic.

C. Year 2022 AM Peak Hour Traffic Analysis

The Olomana Golf Course Driveway is expected to operate at LOS "D", during the Year 2022 AM peak hour of traffic, with the construction of the median shelter lane. The proposed exclusive right-turn lane is not expected to significantly improve traffic operations at the intersection. Figure 3 depicts the Year 2022 AM and PM peak hour traffic and the results of the capacity analysis, without construction of the exclusive right-turn deceleration lane. Figure 4 depicts the Year 2022 AM and PM peak hour capacity analysis, with the construction of the exclusive right-turn deceleration lane.

D. Year 2022 PM Peak Hour Traffic Analysis

During the Year 2022 AM peak hour of traffic, the Olomana Golf Course Driveway is expected to operate at LOS "C", with the construction of the median shelter lane. The proposed exclusive right-turn lane is not expected to improve traffic operations at the intersection.

IV. Traffic Signal Warrant Analysis

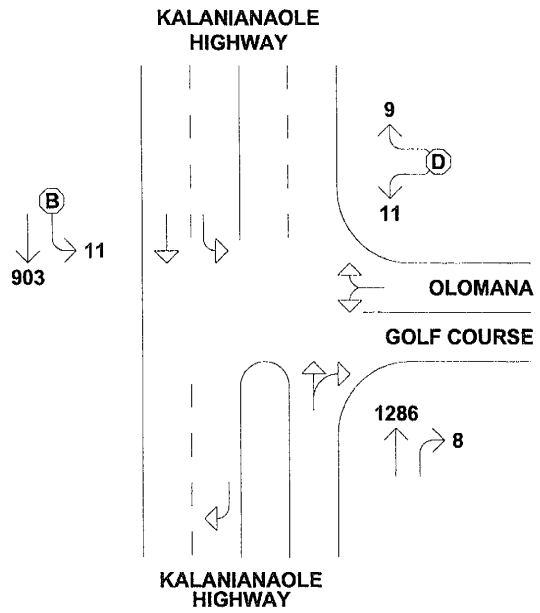
A. Kumuhau Street Intersection

The existing eight-hour vehicular volumes at the intersection of Kalanianaole Highway and Kumuhau Street do <u>not</u> satisfy Warrant 1, Minimum Vehicular Volume. Warrant 2 – Four-Hour Volume is satisfied. Warrant 3 – Peak Hour is satisfied for both delay and minimum vehicular volume. The pedestrian traffic crossing Kalanianaole Highway at Kumuhau Street is too low to satisfy Warrant 4 – Pedestrian Traffic. The traffic signal warrant worksheet for the intersection of Kalanianaole Highway and Kumuhau Street is attached in the Appendix.

State DOT conducted an investigation of Warrant 7, Crash Experience. Their investigation concluded that the intersection of Kalanianaole Highway with Kumuhau Street did not meet the minimum criteria to satisfy Warrant 7.

B. Moole Street Intersection

Warrant 1, Minimum Vehicular Volume and Warrant 2 – Four-Hour Volume are <u>not</u> satisfied by the respective existing eight-hour and four-hour traffic volumes at the Kalanianaole Highway intersection at Moole Street. Warrant 3 – Peak Hour is satisfied for minimum vehicular volume, during the existing AM peak hour of traffic. The pedestrian traffic crossing Kalanianaole Highway at Moole Street again is too low to satisfy Warrant 4 – Pedestrian Traffic. The traffic signal warrant worksheet for the intersection of Kalanianaole Highway and Moole Street is attached in the Appendix.



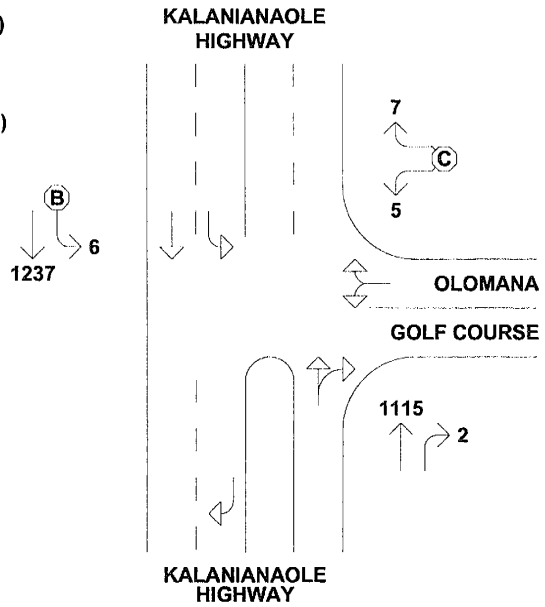
2022 AM PEAK HOUR TRAFFIC W/O DECEL LANE

LEGEND

90 — TRAFFIC MOVEMENT VOLUME (VPH)

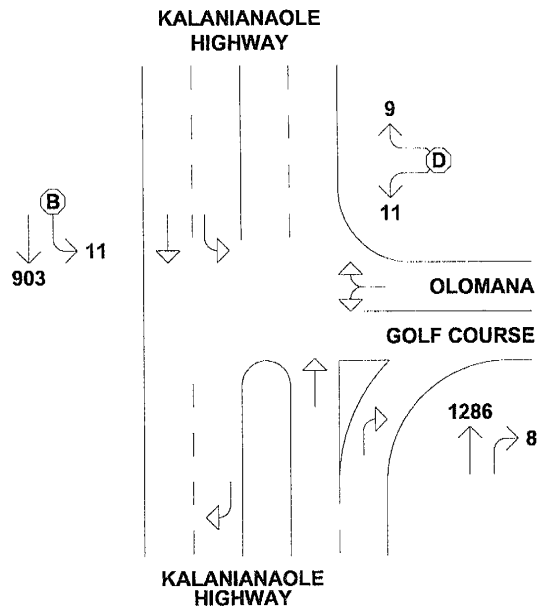
LANE CONTROL

C — LEVEL OF SERVICE (UNSIGNALIZED)



2022 PM PEAK HOUR TRAFFIC W/O DECEL LANE

Figure 3. Year 2022 Peak Hour Traffic Without the Proposed Deceleration Lane



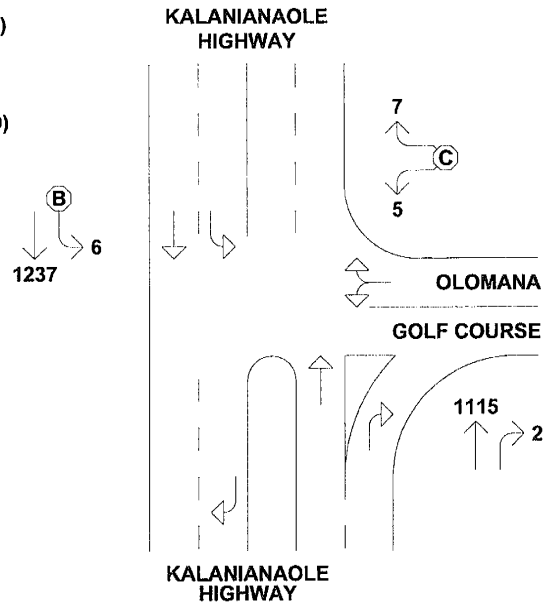
2022 AM PEAK HOUR TRAFFIC WITH DECEL LANE

LEGEND

90 **TRAFFIC MOVEMENT VOLUME (VPH)**

LANE CONTROL

C **LEVEL OF SERVICE (UNSIGNALIZED)**



2022 PM PEAK HOUR TRAFFIC WITH DECEL LANE

Figure 4. Year 2022 Peak Hour Traffic With the Proposed Deceleration Lane

State DOT conducted an investigation of Warrant 7, Crash Experience. Their investigation concluded that the intersection of Kalanianaole Highway with Moole Street did not meet the minimum criteria to satisfy Warrant 7.

V. Recommendations and Conclusions

A. Recommendations

1. Olomana Golf Course Driveway Intersection

a. A minimum storage length of 125 feet is recommended for the proposed median shelter lane on southbound Kalanianaole Highway at the Olomana Golf Course Driveway.

b. An exclusive right-turn lane on northbound Kalanianaole Highway is not recommended at the Olomana Golf Course Driveway at this time.

2. Kumuhau Street Intersection

a. The signalization of the intersection of Kalanianaole Highway and Kumuhau Street is not recommended at this time. The proposed median shelter lane should improve the existing condition to Level of Service "C".

b. Underground conduits should be installed as part of the roadway improvements to accommodate future traffic signalization at the intersection.

3. Moole Street Intersection

a. The signalization of the intersection of Kalanianaole Highway and Moole Street is not recommended at this time.

b. Underground conduits should be installed as part of the roadway improvements to accommodate future traffic signalization at the intersection.

B. Conclusions

Queuing on southbound Kalanianaole Highway extends from the existing traffic signals at Poalima Street, across Kumuhau Street to the Olomana Golf Course Driveway, during the existing PM peak period of traffic. At Moole Street, queuing on Kalanianaole Highway extended in both directions from adjacent signalized intersections at Poalima Street and at Waimanalo Elementary and Middle Schools, during the existing PM peak period.

The proposed median shelter lane on southbound Kalanianaole Highway is expected to improve the left-turn movement from the Olomana Golf Course Driveway. The exclusive right-turn lane on northbound Kalanianaole Highway at the Olomana Golf Course Driveway is not expected to improve intersection operations.

The intersection of Kalanianaole Highway and Kumuhau Street meets Warrants 2 and 3, in accordance with the standards and guidelines of the latest edition of the Manual on Uniform Traffic Control Devices, Federal Highway Administration, U. S. Department of Transportation. Traffic signalization at the intersection of Kalanianaole Highway and Kumuhau Street is not recommended at this time, because the proposed median shelter lane, recommended in the Final Traffic Engineering Report for the Proposed Kalanianaole Highway Improvements Flamingo Road to Aloiloi Street, dated October 15, 2003, is expected to improve existing peak hour conditions to LOS "C".

The intersection of Kalanianaole Highway and Moole Street meets only Warrant 3 of the MUTCD. Traffic signalization at the intersection of Kalanianaole Highway is not recommended at this time. In the opinion of this writer, more than one warrant should be satisfied before considering the installation of traffic signal controls.

TRAFFIC ENGINEERING REPORT ADDENDUM

FOR THE PROPOSED

KALANIANAOLE HIGHWAY IMPROVEMENTS

OLOMANA GOLF COURSE, KUMUHAU STREET, & MOOLE STREET INTERSECTIONS

APPENDIX A

TRAFFIC COUNT DATA

TRAFFIC COUNT DATA **FILE NAME: Kal Hwy Olomana** Sec 3

PROJECT: Kalanianaole Hwy Improvements
LOCATION: Waimanalo
E-W STREETOlomana Golf Course
N-S STREET:Kalanianaole Hwy

PERIOD: AM Peak
NORTH:
TECHNICIAN: KO
DATE: 9/13/04

		Olomana Golf Course						Kalanianaole Hwy							
TIME		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	TOTAL	HRLY
6:30	6:45	0	0	0	0	0	1	0	183	0	0	140	0	324	
6:45	7:00	0	0	0	0	0	0	0	181	0	0	156	0	337	
7:00	7:15	0	0	0	3	0	1	0	264	0	1	206	0	475	
7:15	7:30	0	0	0	0	0	1	0	273	2	3	178	0	457	1593
7:30	7:45	0	0	0	5	0	4	0	327	2	4	193	0	**535**	1804
7:45	8:00	0	0	0	2	0	2	0	260	3	2	212	0	481	**1948**
8:00	8:15	0	0	0	0	0	4	0	249	1	1	211	0	466	1939
8:15	8:30	0	0	0	0	0	2	0	181	0	0	164	0	347	1829
AM PEAK HOUR															
7:00	**8:00**	**0**	**0**	**0**	**10**	**0**	**8**	**0**	**1124**	**7**	**10**	**789**	**0**	**1948**	**1948**
PHF					**0.50**		**0.50**		**0.86**	**0.88**	**0.63**	**1.02**			
PHF						0.50			0.86			1.01		**0.91**	**PHF**

TRAFFIC COUNT DATA **FILE NAME: Kal Hwy Olomana** Sec 3

PROJECT: Kalanianaole Hwy Improvements
LOCATION: Waimanalo
E-W STREETOlomana Golf Course
N-S STREET Kalanianaole Hwy

PERIOD: PM Peak
NORTH:
TECHNICIAN: KO
DATE: 9/13/04

		Olomana Golf Course						Kalanianaole Hwy							
TIME		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	TOTAL	HRLY
3:00	3:15	0	0	0	2	0	3	0	188	1	5	204	0	403	
3:15	3:30	0	0	0	3	0	3	0	222	0	3	235	0	466	
3:30	3:45	0	0	0	3	0	3	0	253	2	4	224	0	489	
3:45	4:00	0	0	0	0	0	0	0	274	1	0	257	0	**532**	1890
4:00	4:15	0	0	0	3	0	2	0	238	0	1	279	0	523	2010
4:15	4:30	0	0	0	0	0	3	0	225	1	3	278	0	510	2054
4:30	**4:45**	0	0	0	1	0	1	0	238	0	1	267	0	508	**2073**
4:45	5:00	0	0	0	1	0	1	0	224	0	1	241	0	468	2009
5:00	5:15	0	0	0	2	0	2	0	215	0	2	249	0	470	1956
5:15	5:30	0	0	0	2	0	1	0	209	0	1	198	0	411	1857
PM PEAK HOUR															
3:45	**4:45**	**0**	**0**	**0**	**4**	**0**	**6**	**0**	**975**	**2**	**5**	**1081**	**0**	**2073**	**2073**
PHF									**0.89**	**0.50**		**1.05**			

TRAFFIC COUNT DATA **FILE NAME: Kal Hwy Kumuhau** Sec 3

PROJECT: Kalanianaole Hwy Improvements
LOCATION: Waimanalo
E-W STREET Kalanianaole Hwy
N-S STREET: Kumuhau Street

PERIOD: AM Peak
NORTH:
TECHNICIAN: Richard
DATE: 2/7/02

		Kalanianaole Hwy						Kumuhau Street							
TIME		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	TOTAL	HRLY
6:30	6:45	0	112	8	1	123	0	21	0	9	0	0	0	274	
6:45	7:00	0	123	5	0	147	0	13	0	9	0	0	0	297	
7:00	7:15	0	132	10	3	159	0	12	0	12	0	0	0	328	
7:15	7:30	0	193	9	4	235	0	17	0	12	0	0	0	470	1369
7:30	7:45	0	211	12	4	244	0	23	0	4	0	0	0	498	1593
7:45	8:00	0	211	26	4	237	0	17	0	6	0	0	0	**501**	1797
8:00	**8:15**	0	199	26	3	203	0	27	0	9	0	0	0	467	**1936**
8:15	8:30	0	153	13	2	171	0	16	0	8	0	0	0	363	1829
AM PEAK HOUR															
7:15	**8:15**	**0**	**814**	**73**	**15**	**919**	**0**	**84**	**0**	**31**	**0**	**0**	**0**	**1936**	**1936**
PHF		**#####**	**0.96**	**0.70**	**0.94**	**0.97**	**#####**	**1.24**	**#####**	**1.29**	**#####**	**#####**	**#####**		
PHF			0.94			0.97			1.25			**#####**		**0.97**	**PHF**

TRAFFIC COUNT DATA **FILE NAME: Kal Hwy Kumuhau** Sec 3

PROJECT: Kalanianaole Hwy Improvements
LOCATION: Waimanalo
E-W STREET Kalanianaole Hwy
N-S STREET Kumuhau Street

PERIOD: Midday
NORTH:
TECHNICIAN: Richard
DATE: 2/6/02

		Kalanianaole Hwy						Kumuhau Street							
TIME		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	TOTAL	
3:00	3:15	0	180	10	5	177	0	14	0	9	0	0	0	395	
3:15	3:30	0	228	18	1	205	0	24	0	4	0	0	0	480	
3:30	3:45	0	212	20	5	230	0	20	0	5	0	0	0	492	
3:45	4:00	0	222	19	8	239	0	9	0	8	0	0	0	505	1872
4:00	4:15	0	212	29	4	241	0	32	0	5	0	0	0	**523**	2000
4:15	4:30	0	206	24	4	199	0	15	0	5	0	0	0	453	1973
4:30	**4:45**	0	211	24	4	251	0	25	0	6	0	0	0	521	**2002**
4:45	5:00	0	178	28	5	199	0	11	0	6	0	0	0	427	1924
5:00	5:15	0	211	25	8	205	0	14	0	4	0	0	0	467	1868
5:15	5:30	0	196	23	6	206	0	18	0	8	0	0	0	457	1872
PM PEAK HOUR															
3:45	**4:45**	**0**	**851**	**96**	**20**	**930**	**0**	**81**	**0**	**24**	**0**	**0**	**0**	**2002**	**2002**
PHF			**1.00**	**0.83**	**1.25**	**0.96**		**0.63**		**1.20**					

TRAFFIC COUNT DATA **FILE NAME: Kal Hwy Moole** Sec 3

PROJECT: Kalanianaole Hwy Improvements
LOCATION: Waimanalo
E-W STREETKalanianaole Highway
N-S STREET:Moole Street

PERIOD: AM Peak
NORTH:
TECHNICIAN: Kiyo
DATE: 2/8/02

		Kalanianaole Highway						Moole Street							
TIME		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	TOTAL	HRLY
6:30	6:45	1	115	3	1	116	1	12	0	4	2	0	4	259	
6:45	7:00	2	80	1	3	118	0	11	0	2	2	0	3	222	
7:00	7:15	0	133	10	3	154	0	12	0	5	0	0	6	323	
7:15	7:30	2	152	14	3	185	1	17	0	3	4	1	3	385	1189
7:30	7:45	3	192	9	4	183	4	28	0	4	6	0	14	**447**	1377
7:45	8:00	5	170	14	5	186	2	20	0	5	0	0	12	419	1574
8:00	**8:15**	3	178	9	4	140	1	11	0	10	0	0	2	358	**1609**
8:15	8:30	4	159	9	2	118	2	5	0	0	3	0	5	307	1531
AM PEAK HOUR															
7:15	**8:15**	**13**	**692**	**46**	**16**	**694**	**8**	**76**	**0**	**22**	**10**	**1**	**31**	**1609**	**1609**
PHF		**1.08**	**0.90**	**1.28**	**1.00**	**0.95**	**0.50**	**0.68**	**#####**	**1.38**	**0.42**	**#####**	**0.55**		
PHF			0.92			0.94			0.77			0.53		**0.90**	**PHF**

TRAFFIC COUNT DATA **FILE NAME: Kal Hwy Moole** Sec 3

PROJECT: Kalanianaole Hwy Improvements
LOCATION: Waimanalo
E-W STREETKalanianaole Highway
N-S STREET Moole Street

PERIOD: Midday
NORTH:
TECHNICIAN: RSO
DATE: 2/6/02

		Kalanianaole Highway						Moole Street							
TIME		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	TOTAL	
3:00	3:15	6	138	7	5	159	3	5	1	5	1	1	1	332	
3:15	3:30	2	178	10	2	176	4	10	1	3	2	1	3	392	
3:30	3:45	8	184	10	4	223	4	6	0	4	0	1	3	447	
3:45	4:00	2	171	8	8	208	2	6	1	6	3	2	4	421	1592
4:00	4:15	8	180	16	6	215	3	16	0	4	2	1	3	**454**	1714
4:15	4:30	13	161	14	9	186	0	9	0	5	1	1	9	408	1730
4:30	**4:45**	3	181	13	6	219	1	13	0	8	0	1	4	449	**1732**
4:45	5:00	9	181	8	8	169	1	6	0	6	6	0	5	399	1710
5:00	5:15	12	178	17	8	178	4	14	0	4	4	1	8	428	1684
5:15	5:30	3	190	13	4	167	8	15	0	8	2	0	4	414	1690
PM PEAK HOUR															
3:45	**4:45**	**26**	**693**	**51**	**29**	**828**	**6**	**44**	**1**	**23**	**6**	**5**	**20**	**1732**	**1732**
PHF		**0.81**	**0.96**	**0.80**	**1.21**	**0.96**	**0.50**	**0.69**	**#####**	**1.44**	**0.75**	**1.25**	**1.67**		
PHF			0.94			0.96			0.85			1.29		**0.95**	**PHF**

The Traffic Management Consultant

Site: Kalanianaole Hwy at Kumuhau Street
Approaches: Kalanianaole Highway - Eastbound + Westbound

* Wednesday, November 17, 2004=1917, 15 minute drops

Time	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
Hrly															1,564	1,824	2,000	1,711	1,421	788	662	585	403	226
:00															407	430	463	**481**	392	208	171	163	117	62
:15															392	449	**513**	423	364	223	168	150	104	68
:30															382	464	**513**	428	351	185	171	136	104	55
:45															383	481	**511**	379	314	172	152	136	78	41

PM Peak Hr 16:15 17:15 2,018 PHF= 0.983

* Thursday, November 18, 2004=12414, 15 minute drops

Time	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	**24 Hr**
Hrly	128	91	73	115	223	717	1,244	1,997	1,471	1,274	1,218	1,312	1,276	1,449	1,648	1,879	2,131	1,942	1,420	816	684	614	400	228	24,350
:00	34	19	20	28	35	122	292	**435**	404	290	293	331	307	354	414	466	479	**549**	393	249	166	157	120	75	**8 Hr**
:15	40	26	22	29	36	133	290	**496**	391	306	306	306	334	356	367	415	**548**	485	382	223	173	138	98	52	12,855
:30	27	17	16	19	68	205	307	**576**	354	347	332	345	306	358	451	514	**561**	521	334	167	156	182	103	50	**4 Hr**
:45	27	29	15	39	84	257	355	**490**	322	331	287	330	329	381	416	484	**543**	387	311	177	189	137	79	51	7,600

AM Peak Hr 7:00 8:00 1,997 PHF= 0.867 PM Peak Hr 16:15 17:15 2,201 PHF= 0.981

* Friday, November 19, 2004=6916 (Incomplete) , 15 minute drops

Time	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
Hrly	132	88	69	119	217	685	1,168	1,854	1,500	1,227	1,335	1,300	1,367	1,493	192									
:00	38	27	20	27	25	102	260	381	**424**	282	312	317	343	384	190									
:15	38	17	17	21	41	134	283	**519**	406	306	320	332	314	386	2									
:30	28	19	17	39	64	210	310	**479**	337	329	352	295	355	382	0									
:45	28	25	15	32	87	239	315	**475**	333	310	351	356	355	341	0									

AM Peak Hr 7:15 8:15 1,897 PHF= 0.914

The Traffic Management Consultant
Event Counts

Site: Kalanianaole Hwy at Moole St
Approaches: Kalanianaole Hwy Eastbound + Westbound

* Monday, November 15, 2004=319 (Incomplete) , 15 minute drops

Time	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
Hrly																1,647	1,735	1,395	1,179	688	545	461	299	173
:00																374	**495**	377	345	167	130	139	84	46
:15																370	**455**	341	299	204	159	115	84	44
:30																409	**420**	331	274	151	124	102	79	47
:45																**494**	365	346	261	166	132	105	52	36

PM Peak Hr 15:45 16:45 1,864 PHF= 0.941

* Tuesday, November 16, 2004=486, 15 minute drops

Time	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24 Hr
Hrly	92	67	70	71	172	463	917	1,683	1,198	1,039	1,059	1,074	1,042	1,211	1,451	1,548	1,820	1,439	1,199	692	560	471	361	209	19,908
:00	21	20	17	20	25	82	203	**371**	356	283	270	255	264	251	365	341	**530**	382	356	200	133	120	104	55	
:15	29	16	18	19	36	96	188	**433**	320	228	262	252	285	298	380	357	**452**	356	320	175	154	114	94	61	
:30	22	12	18	15	38	121	253	**471**	256	259	284	292	233	311	334	385	**473**	341	283	167	140	123	92	48	
:45	20	19	17	17	73	164	273	**408**	266	269	243	275	260	351	372	**465**	365	360	240	150	133	114	71	45	

AM Peak Hr 7:00 8:00 1,683 PHF= 0.893

PM Peak Hr 15:45 16:45 1,920 PHF= 0.906

* Wednesday, November 17, 2004=146, 15 minute drops

Time	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
Hrly	135	85	49	76	170	521	908	1,620	1,208	992	972	1,004												
:00	35	25	19	15	19	83	211	**372**	360	241	245	266												
:15	41	19	6	20	41	108	197	**451**	314	248	244	267												
:30	27	21	8	22	51	139	238	**393**	272	256	261	256												
:45	32	20	16	19	59	191	262	**404**	262	247	222	199												

AM Peak Hr 7:00 8:00 1,620 PHF= 0.898

The Traffic Management Consultant
Site: Kalanianaole Highway at Moole St/Kumuhau St
Approach: South Leg - Northbound

* Monday, November 15, 2004=716 (Incomplete) , 15 minute drops

Time	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
Hrly	-	-	-	-	-	-	-	-	-	-	-	-		87	98	96	96	75	88	56	50	42	16	12
:00	-	-	-	-	-	-	-	-	-	-	-	-		20	24	16	**26**	18	25	18	15	17	0	3
:15	-	-	-	-	-	-	-	-	-	-	-	-		11	34	31	**24**	17	16	14	11	7	5	8
:30	-	-	-	-	-	-	-	-	-	-	-	-		36	22	22	**24**	19	19	10	12	10	4	0
:45	-	-	-	-	-	-	-	-	-	-	-	-		20	18	**27**	22	21	28	14	12	8	7	1

PM Peak 1330 - 1430 (114), PM PHF=0.79 PM Peak Hr 15:15 16:15 101 PHF= 0.815

* Tuesday, November 16, 2004=1209, 15 minute drops

Time	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24 Hr
Hrly	4	6	3	2	15	61	88	130	100	48	64	51	53	74	75	81	70	69	53	43	42	33	30	14	1,209
:00	0	1	0	0	0	8	20	**30**	25	8	15	13	13	17	28	22	12	19	14	14	13	7	9	8	
:15	0	2	0	0	5	11	29	**34**	20	16	17	18	14	12	9	19	19	11	15	11	9	8	7	2	
:30	3	2	2	0	4	17	25	**32**	30	12	13	14	9	23	14	16	19	20	11	10	10	6	7	2	
:45	1	1	1	2	6	25	14	**34**	25	12	19	6	17	22	24	24	20	19	13	8	10	12	7	2	

AM Peak Hr 7:00 8:00 130 PHF= 0.956 PM Peak Hr 15:00 16:00 81 PHF= 0.844

* Wednesday, November 17, 2004=1131, 15 minute drops

Time	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
Hrly	5	2	5	1	14	59	73	90	50	46	45													
:00	1	1	0	0	2	6	24	12	**16**	16	8													
:15	3	1	1	0	3	19	18	**26**	11	8	13													
:30	1	0	3	-1	3	10	21	**32**	13	15	13													
:45	0	0	1	2	6	24	10	**20**	10	7	11													

AM Peak Hr 7:15 8:15 94 PHF= 0.734

The Traffic Management Consultant

Site: Kalanianaole Highway at Moole Street
Approach: North Leg - Southbound

* Monday, November 15, 2004=352 (Incomplete) , 15 minute drops

Time	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
Hrly	-	-	-	-	-	-	-	-	-	-	-	-			36	44	47	49	48	49	15	22	17	4
:00	-	-	-	-	-	-	-	-	-	-	-	-			16	10	15	**14**	14	10	3	8	3	1
:15	-	-	-	-	-	-	-	-	-	-	-	-			10	13	4	**15**	12	14	4	4	9	2
:30	-	-	-	-	-	-	-	-	-	-	-	-			3	11	**13**	9	12	12	3	4	2	1
:45	-	-	-	-	-	-	-	-	-	-	-	-			7	10	**15**	11	10	13	5	6	3	0

PM Peak Hr 16:30 17:30 57 PHF= 0.95

* Tuesday, November 16, 2004=761, 15 minute drops

Time	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24 Hr
Hrly	5	4	5	1	11	38	41	54	58	47	37	36	44	36	50	50	57	43	41	35	26	14	13	15	761
:00	4	0	0	0	3	9	9	16	**13**	12	12	7	9	3	11	16	8	**9**	13	4	9	4	3	8	
:15	0	0	4	1	2	5	11	13	**16**	16	7	6	11	10	17	13	**20**	5	10	13	1	4	7	0	
:30	1	4	1	0	0	10	11	18	**10**	9	8	11	8	12	14	7	**16**	15	12	7	6	2	2	7	
:45	0	0	0	0	6	14	10	7	**19**	10	10	12	16	11	8	14	**13**	14	6	11	10	4	1	0	

AM Peak Hr 8:00 9:00 58 PHF= 0.763

PM Peak Hr 16:15 17:15 58 PHF= 0.725

* Wednesday, November 17, 2004=339, 15 minute drops

Time	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
Hrly	7	5	3	4	14	31	41	55	53	38	34	40												
:00	3	0	1	0	1	4	9	7	**18**	9	8	9												
:15	3	3	0	0	2	7	10	**20**	17	13	10	10												
:30	0	2	1	0	6	9	14	**22**	10	3	7	11												
:45	1	0	1	4	5	11	8	**6**	8	13	9	10												

AM Peak Hr 7:15 8:15 66 PHF= 0.75

TRAFFIC ENGINEERING REPORT ADDENDUM

FOR THE PROPOSED

KALANIANAOLE HIGHWAY IMPROVEMENTS

OLOMANA GOLF COURSE, KUMUHAU STREET, & MOOLE STREET INTERSECTIONS

APPENDIX B

CAPACITY ANALYSIS WORKSHEETS

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	10	8	1124	7	10	789
Peak Hour Factor	0.50	0.50	0.86	0.88	0.63	1.00
Hourly flow rate (vph)	20	16	1307	8	16	789
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2132	1311			1315	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2132	1311			1315	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	62	92			97	
cM capacity (veh/h)	52	192			519	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	36	1315	16	789
Volume Left	20	0	16	0
Volume Right	16	8	0	0
cSH	77	1700	519	1700
Volume to Capacity	0.47	0.77	0.03	0.46
Queue Length 95th (ft)	48	0	2	0
Control Delay (s)	87.5	0.0	12.2	0.0
Lane LOS	F		B	
Approach Delay (s)	87.5	0.0	0.2	
Approach LOS	F			

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	4	6	975	2	5	1081
Peak Hour Factor	0.92	0.92	0.89	0.50	0.92	1.00
Hourly flow rate (vph)	4	7	1096	4	5	1081
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2189	1098			1100	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2189	1098			1100	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	97			99	
cM capacity (veh/h)	49	257			627	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	11	1100	5	1081
Volume Left	4	0	5	0
Volume Right	7	4	0	0
cSH	95	1700	627	1700
Volume to Capacity	0.11	0.65	0.01	0.64
Queue Length 95th (ft)	9	0	1	0
Control Delay (s)	47.7	0.0	10.8	0.0
Lane LOS	E		B	
Approach Delay (s)	47.7	0.0	0.1	
Approach LOS	E			

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	814	73	15	919	84	31
Peak Hour Factor	0.96	0.70	0.94	0.97	1.00	1.00
Hourly flow rate (vph)	848	104	16	947	84	31
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			952		1879	900
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			952		1879	900
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		0	91
cM capacity (veh/h)			722		77	337

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	952	963	115
Volume Left	0	16	84
Volume Right	104	0	31
cSH	1700	722	97
Volume to Capacity	0.56	0.02	1.19
Queue Length 95th (ft)	0	2	195
Control Delay (s)	0.0	0.7	232.1
Lane LOS		A	F
Approach Delay (s)	0.0	0.7	232.1
Approach LOS			F

Intersection Summary			
Average Delay	13.5		
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	1072	121	20	918	127	38
Peak Hour Factor	1.00	0.83	1.00	0.96	0.63	1.00
Hourly flow rate (vph)	1072	146	20	956	202	38
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1218		2141	1145
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1218		2141	1145
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		0	84
cM capacity (veh/h)			573		52	243

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1218	976	240
Volume Left	0	20	202
Volume Right	146	0	38
cSH	1700	573	59
Volume to Capacity	0.72	0.03	4.05
Queue Length 95th (ft)	0	3	Err
Control Delay (s)	0.0	1.1	Err
Lane LOS		A	F
Approach Delay (s)	0.0	1.1	Err
Approach LOS			F

Intersection Summary			
Average Delay	984.8		
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	13	667	44	21	927	11	104	0	30	13	1	42
Peak Hour Factor	1.00	0.90	1.00	1.00	0.95	0.50	0.68	1.00	1.00	0.42	1.00	0.55
Hourly flow rate (vph)	13	741	44	21	976	22	153	0	30	31	1	76
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	998			785			1895	1829	763	1848	1840	987
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	998			785			1895	1829	763	1848	1840	987
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			97			0	100	93	40	99	75
cM capacity (veh/h)	694			834			38	73	404	51	72	300

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	798	1019	183	108
Volume Left	13	21	153	31
Volume Right	44	22	30	76
cSH	694	834	44	124
Volume to Capacity	0.02	0.03	4.12	0.87
Queue Length 95th (ft)	1	2	Err	137
Control Delay (s)	0.5	0.8	Err	115.9
Lane LOS	A	A	F	F
Approach Delay (s)	0.5	0.8	Err	115.9
Approach LOS			F	F

Intersection Summary			
Average Delay	874.2		
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	27	726	53	25	713	5	52	1	27	10	8	32
Peak Hour Factor	0.81	0.96	0.80	1.00	0.96	0.50	0.69	1.00	1.00	0.75	1.00	1.00
Hourly flow rate (vph)	33	756	66	25	743	10	75	1	27	13	8	32
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	753			822			1690	1659	789	1681	1687	748
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	753			822			1690	1659	789	1681	1687	748
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			97			0	99	93	80	91	92
cM capacity (veh/h)	857			807			60	91	390	66	87	413

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	856	778	103	53
Volume Left	33	25	75	13
Volume Right	66	10	27	32
cSH	857	807	78	143
Volume to Capacity	0.04	0.03	1.33	0.37
Queue Length 95th (ft)	3	2	201	39
Control Delay (s)	1.0	0.8	309.3	44.4
Lane LOS	A	A	F	E
Approach Delay (s)	1.0	0.8	309.3	44.4
Approach LOS			F	E

Intersection Summary			
Average Delay	20.0		
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	10	8	1124	7	10	789
Peak Hour Factor	0.50	0.50	0.86	0.88	0.63	1.00
Hourly flow rate (vph)	23	18	1490	9	18	899
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL					
Median storage veh)	5					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2430	1494			1499	
vC1, stage 1 conf vol	1494					
vC2, stage 2 conf vol	936					
vCu, unblocked vol	2430	1494			1499	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	88			96	
cM capacity (veh/h)	200	149			441	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	41	1499	18	899
Volume Left	23	0	18	0
Volume Right	18	9	0	0
cSH	174	1700	441	1700
Volume to Capacity	0.24	0.88	0.04	0.53
Queue Length 95th (ft)	22	0	3	0
Control Delay (s)	32.0	0.0	13.5	0.0
Lane LOS	D		B	
Approach Delay (s)	32.0	0.0	0.3	
Approach LOS	D			

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	77.9%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	4	6	975	2	5	1081
Peak Hour Factor	0.92	0.92	0.89	0.50	0.92	1.00
Hourly flow rate (vph)	5	7	1249	5	6	1232
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL					
Median storage veh)	5					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2496	1251			1253	
vC1, stage 1 conf vol	1251					
vC2, stage 2 conf vol	1245					
vCu, unblocked vol	2496	1251			1253	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	96			99	
cM capacity (veh/h)	227	208			548	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	12	1253	6	1232
Volume Left	5	0	6	0
Volume Right	7	5	0	0
cSH	216	1700	548	1700
Volume to Capacity	0.06	0.74	0.01	0.72
Queue Length 95th (ft)	5	0	1	0
Control Delay (s)	22.7	0.0	11.6	0.0
Lane LOS	C		B	
Approach Delay (s)	22.7	0.0	0.1	
Approach LOS	C			

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	10	8	1124	7	10	789
Peak Hour Factor	0.50	0.50	0.86	0.88	0.63	1.00
Hourly flow rate (vph)	23	18	1490	9	18	899
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL					
Median storage veh)	5					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2426	1490			1490	
vC1, stage 1 conf vol	1490					
vC2, stage 2 conf vol	936					
vCu, unblocked vol	2426	1490			1490	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	88			96	
cM capacity (veh/h)	201	150			445	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	41	1490	9	18	899
Volume Left	23	0	0	18	0
Volume Right	18	0	9	0	0
cSH	175	1700	1700	445	1700
Volume to Capacity	0.23	0.88	0.01	0.04	0.53
Queue Length 95th (ft)	22	0	0	3	0
Control Delay (s)	31.8	0.0	0.0	13.4	0.0
Lane LOS	D			B	
Approach Delay (s)	31.8	0.0		0.3	
Approach LOS	D				

Intersection Summary

Average Delay	0.6		
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	4	6	975	2	5	1081
Peak Hour Factor	0.92	0.92	0.89	0.50	0.92	1.00
Hourly flow rate (vph)	5	7	1249	5	6	1232
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL					
Median storage veh)	5					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2494	1249			1249	
vC1, stage 1 conf vol	1249					
vC2, stage 2 conf vol	1245					
vCu, unblocked vol	2494	1249			1249	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	96			99	
cM capacity (veh/h)	227	209			550	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	12	1249	5	6	1232
Volume Left	5	0	0	6	0
Volume Right	7	0	5	0	0
cSH	216	1700	1700	550	1700
Volume to Capacity	0.06	0.73	0.00	0.01	0.72
Queue Length 95th (ft)	5	0	0	1	0
Control Delay (s)	22.7	0.0	0.0	11.6	0.0
Lane LOS	C			B	
Approach Delay (s)	22.7	0.0		0.1	
Approach LOS	C				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		

TRAFFIC ENGINEERING REPORT ADDENDUM

FOR THE PROPOSED

KALANIANAOLE HIGHWAY IMPROVEMENTS

OLOMANA GOLF COURSE, KUMUHAU STREET, & MOOLE STREET INTERSECTIONS

APPENDIX C

TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

TRAFFIC SIGNAL WARRANTS

Project: Kalanianaole Highway Improvements
Prepared By: The Traffic Management Consultant

Major Street: Kalanianaole Highway — Critical Approach Speed 25 mph — No. of Lanes 1
Minor Street: Kumuhau Street — Critical Approach Speed 25 mph — No. of Lanes 1

Critical speed on major street (mph)	≥	40	☐
			or
Population in built up area of isolated community	≤	10,000	☐

WARRANT 1 - Eight-Hour Vehicular Volume

Condition A - Minimum Vehicular Volume

(Ref.: MUTCD, Table 4C-1)

100% Satisfied	**YES** ☐	**NO** ☑
80% Satisfied	**YES** ☐	**NO** ☑
70% Satisfied	**YES** ☐	**NO** ☑

	Minimum Vehicular Volume			Hourly Vehicular Volumes							
STREET-APPROACH LANES	100%	80%	70%	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM
Major Street- 1 Lane (Both Approaches)	500	400	350	1,312	1,276	1,449	1,648	1,879	2,131	1,942	1,420
Minor Street-1 Lane (One Direction Only)	150	120	105	80	70	99	138	112	165	154	129

Condition B - Interruption of Continuous Traffic

(Ref.: MUTCD, Table 4C-1)

100% Satisfied	**YES** ☐	**NO** ☑
80% Satisfied	**YES** ☐	**NO** ☑
70% Satisfied	**YES** ☐	**NO** ☑

	Minimum Vehicular Volume			Hourly Vehicular Volumes							
STREET-APPROACH LANES	100%	80%	70%	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM
Major Street- 1 Lane (Both Approaches)	750	600	525	1312	1276	1449	1648	1879	2131	1942	1420
Minor Street-1 Lane (One Direction Only)	75	60	53	80	70	99	138	112	165	154	129

WARRANT 2 - Four Hour Volume

(Ref.: MUTCD, Figures 4C-1 & 4C-2)

100% Satisfied	**YES** ☑	**NO** ☐
70% Satisfied	**YES** ☑	**NO** ☐

	Minimum Volume		Hourly Vehicular Volumes			
STREET - APPROACH LANES	100%	70%	2:00 PM	3:00 PM	4:00 PM	5:00 PM
Major Street - 1 Lanes (Both Approaches)	1100	770	1,648	1,879	2,131	1,942
Minor Street - 1 Lanes (One Direction Only)	80	60	138	112	165	154

TRAFFIC SIGNAL WARRANTS
Major Street: **Kalanianaole Highway**
Minor Street: **Kumuhau Street**

WARRANT 3 - Peak Hour

Category A - Peak Hour Delay **Satisfied (PM)** **YES** ☑ **NO** ☐

1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds four (4) vehicle-hours (veh-hrs) for one-lane approach; and — Approach Delay (veh-hrs) = 4.2 YES ☑ NO ☐

2. The volume on the same minor street approach equals or exceeds 100 vph for one moving lane of traffic; and — Approach Volume (vph) = 112 YES ☑ NO ☐

3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches — Entering Volume (vph) = 1,840 YES ☑ NO ☐

Category B - Vehicular Volume **100% Satisfied** **YES** ☑ **NO** ☐
(Ref.: MUTCD, Figures 4C-3 & 4C-4) **70% Satisfied** **YES** ☑ **NO** ☐

	Minimum Volume		Hourly Volumes
STREET - APPROACH LANES	100%	70%	3:00 PM
Major Street - 1 Lane (Both Approaches)	1500	1000	1,879
Minor Street - 1 Lane (One Direction Only)	100	75	112

WARRANT 4 - Pedestrian Traffic

Satisfied **YES** ☐ **NO** ☑

1. The pedestrian volume exceed 190 pedestrians per hour (ped/hr); and — Pedestrian Volume (ped/hr) = 2 YES ☐ NO ☑

2. There are fewer than 60 gaps per hour adequate for pedestrian crossings. — Gaps per hour = 12 YES ☑ NO ☐

Source: Figure 14-11, pp.270-272, Manual of Transportation Studies, ITE, H. Douglas Robertson, et al, Modified in accordance with the Manual on Uniform Traffic Control Devices, Millenium Edition, Federal Highways Administration, U.S. Department of Transportation

TRAFFIC SIGNAL WARRANTS

Project: Kalanianaole Highway Improvements
Prepared By: The Traffic Management Consultant

Major Street: Kalanianaole Highway — Critical Approach Speed 25 mph — No. of Lanes 1
Minor Street: Moole Street — Critical Approach Speed 25 mph — No. of Lanes 1

Critical speed on major street (mph)	≥	40	☐
		or	
Population in built up area of isolated community	≤	10,000	☐

WARRANT 1 - Eight-Hour Vehicular Volume

Condition A - Minimum Vehicular Volume

(Ref.: MUTCD, Table 4C-1)

100% Satisfied	**YES** ☐	**NO** ☑
80% Satisfied	**YES** ☐	**NO** ☑
70% Satisfied	**YES** ☐	**NO** ☑

	Minimum Vehicular Volume			Hourly Vehicular Volumes							
STREET-APPROACH LANES	100%	80%	70%	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM
Major Street- 1 Lane (Both Approaches)	500	400	350	1,074	1,042	1,211	1,451	1,548	1,820	1,439	1,199
Minor Street-1 Lane (One Direction Only)	150	120	105	51	53	74	75	81	70	69	53

Condition B - Interruption of Continuous Traffic

(Ref.: MUTCD, Table 4C-1)

100% Satisfied	**YES** ☐	**NO** ☑
80% Satisfied	**YES** ☐	**NO** ☑
70% Satisfied	**YES** ☐	**NO** ☑

	Minimum Vehicular Volume			Hourly Vehicular Volumes							
STREET-APPROACH LANES	100%	80%	70%	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM
Major Street- 1 Lane (Both Approaches)	750	600	525	1074	1042	1211	1451	1548	1820	1439	1199
Minor Street-1 Lane (One Direction Only)	75	60	53	51	53	74	75	81	70	69	53

WARRANT 2 - Four Hour Volume

(Ref.: MUTCD, Figures 4C-1 & 4C-2)

100% Satisfied	**YES** ☐	**NO** ☑
70% Satisfied	**YES** ☑	**NO** ☐

	Minimum Volume		Hourly Vehicular Volumes			
STREET - APPROACH LANES	100%	70%	1:00 PM	2:00 PM	3:00 PM	4:00 PM
Major Street - 1 Lanes (Both Approaches)	1100	770	1,211	1,451	1,548	1,820
Minor Street - 1 Lanes (One Direction Only)	80	60	74	75	81	70

TRAFFIC SIGNAL WARRANTS
Major Street: Kalanianaole Highway
Minor Street: Moole Street

WARRANT 3 - Peak Hour

Category A - Peak Hour Delay (2002 Data) **Satisfied** YES ☐ NO ☑

1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds four (4) vehicle-hours for one-lane approach; and — Approach Delay (veh-hrs) = 0.7 — YES ☐ NO ☑

2. The volume on the same minor street approach equals or exceeds 100 vph for one moving lane of traffic; and — Approach Volume (vph) = 96 — YES ☐ NO ☑

3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches — Entering Volume (vph) = 1,462 — YES ☑ NO ☐

Category B - Vehicular Volume (2004 Data) **100% Satisfied** YES ☑ NO ☐
(Ref.: MUTCD, Figures 4C-3 & 4C-4) **70% Satisfied** YES ☑ NO ☐

	Minimum Volume		Hourly Volumes
STREET - APPROACH LANES	100%	70%	7:00 AM
Major Street - 1 Lane (Both Approaches)	1500	1000	1,683
Minor Street - 1 Lane (One Direction Only)	100	75	130

WARRANT 4 - Pedestrian Traffic

Satisfied YES ☐ NO ☑

1. The pedestrian volume exceed 190 pedestrians per hour (ped/hr); and — Pedestrian Volume (ped/hr) = 11 — YES ☐ NO ☑

2. There are fewer than 60 gaps per hour adequate for pedestrian crossings. — Gaps per hour = 15 — YES ☑ NO ☐

Source: Figure 14-11, pp.270-272, Manual of Transportation Studies, ITE, H. Douglas Robertson, et al, Modified in accordance with the Manual on Uniform Traffic Control Devices, Millenium Edition, Federal Highways Administration, U.S. Department of Transportation

APPENDIX D

HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP)

(Rev. 11/68)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
MEMORANDUM

HWY-TS 2.2426

TO: HWY-DS **DATE:** November 14, 2003

ATTN: SCOT URADA

FROM: HWY-T

SUBJECT: TRAFFIC ACCIDENT ANALYSIS FOR KALANIANAOLE HIGHWAY, MP 2.2 – 2.8

We have conducted a traffic accident analysis for Kalanianaole Highway, MP 2.2 – 2.8 as part of the Highway Safety Improvement Program (HSIP) under Title 23, United States Code, Section 152, and have identified no high hazard locations within the limits of the project.

Although accident history is not significant, improving the roadway alignment would mitigate the types of accidents occurring.

If there are any questions, please call the Traffic Safety Section at 692-7685.

JH:ss

(Rev. 11/68)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
MEMORANDUM

HWY-TS 2.5175

TO: HWY-DS **DATE:** August 18, 2004

ATTN: VINCENT LLORIN

FROM: HWY-T A. Yalui

SUBJECT: TRAFFIC ACCIDENT ANALYSIS FOR KALANIANAOLE HIGHWAY IMPROVEMENTS, WAIMANALO BEACH PARK TO OLOMANA GOLF COURSE.

The Traffic Branch has conducted a traffic safety analysis for the subject project under its Highway Safety Improvement Program (HSIP) of Title 23, United States Code, Section 152. This traffic safety analysis is protected under Title 23, U.S.C., Sections 402(k) and 409, and is intended for highway safety and educational purposes only. No potential areas of concern have been identified within the limits of the project.

Although accident history is not significant, we recommend the following improvements:

1) We noticed a number of single vehicle, run-off the road collisions. To address this, we recommend reviewing all roadside features throughout the limits of the project.

2) Intersection ahead signs should be installed at appropriate locations throughout the limits of the project to warn motorists of approaching intersections and the possibility of turning or entering traffic.

3) A two-way left-turn lane (TWLTL) would assist the left-turning vehicles to and from intersections and driveways. A TWLTL would also reduce the number of vehicles congesting the through lanes and discourage motorists from driving on the shoulders illegally to pass the turning vehicles. Acceleration and deceleration lanes should also be considered to reduce driver error when making turns.

If there are any questions, please call the Traffic Safety Section at 692-7685.

JH:ss

c: HWY-TD

(Rev. 11/68)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
MEMORANDUM

HWY-TS 2.7743

TO: HWY-DS **DATE:** May 20, 2005

ATTN: VINCENT LLORIN

FROM: HWY-T G. Jalbert

SUBJECT: KALANIANAOLE HIGHWAY IMPROVEMENTS, OLOMANA GOLF COURSE AREA AND POLO FIELDS.

The Traffic Branch has conducted a traffic safety study for the subject area under its Highway Safety Improvement Program (HSIP) of Title 23, United States Code, Section 152. This traffic safety study is protected under Title 23, U.S.C., Sections 402(k) and 409, and is intended for highway safety and educational purposes only.

We have studied the two locations on Kalanianaole Highway at Olomana Golf Course and the Polo Fields utilizing accident data from the 3 most recent years of data available and have found the following:

1. Olomana Golf Course Area (Milepost 2.2 – 2.6) -
   Night to day accident rate is higher than statewide average.
   Majority of the accidents that occurred at this location were recorded on the accident report forms as having lit-spot or lit-continuous conditions at the time of the accident. If these conditions are true, the night to day accident rate should not be considered in the warrant for areas where lighting already exists.

2. Polo Fields Area (Milepost 3.9 – 4 .6) -
   Night to day accident rate is lower than statewide average.

Please note that this study alone does not warrant any highway lighting. This study was conducted to contribute to the factors necessary to determine if highway lighting is warranted. We recommend a full study be completed to determine the validity of the warrant.

If there are any questions, please call the Traffic Safety Section at 692-7685.

APPENDIX E

HIGHWAY ILLUMINATION CALCULATIONS

Kalanianaole Highway Improvements
Waimanalo Beach Park to Olomana Golf Course

Federal Aid Project No. STP-072-1(41)

8-Dec-05 24120/A

Roadway Illumination Calculations Summary

Roadway Illumination Requirements:

Classification:	**Major / Residential**
Average Maintained fc:	**0.8**
Avg to Min Uniformity ratio:	**3:1**

Roadway Locations	Optimized Calculation Layout File Name	Max. Pole Spacing (ft) (located 4'-0" from edge of travelway)	(One Side spacing) 30' luminaire mounting height, 8' bracket arm Photometric Data M-C-II, GE 1005				
			footcandles			**uniformity ratio**	
			average	maximum	minimum	max / min	**avg / min**
Two 11'-0" travel lanes (no left turn lane)	Layout 1A	**154.0**	**0.97**	2.20	0.40	5.50	**2.43**
Inbound 11'-0" travel lane (with left turn lane)	Layout 1	**155.0**	**0.97**	2.20	0.40	5.50	**2.43**
Left turn lane, 10'-0"	Layout 2	**168.0**	**0.95**	2.10	0.40	5.25	**2.38**
Outbound 11'0" travfel lane (with left turn lane)	Layout 3	**138.0**	**0.80**	1.20	0.60	2.00	**1.33**

For Report, used average spacing of approximately 140'-0" (taking into account possible pole spacing distances between intersections)

Roadway Optimizer - Layout #1A

two 11'-0" travel lanes (no left turn lane)

Luminaire Label: GE1005
Luminaire Description: (not specific to a single catalog number)
File Name: GE1005.IES
Luminaire Arrangement: SINGLE
Arm Length = 8 Ft
Lumens Per Lamp = 16000
Number Of Lamps = 1
Total Light Loss Factor = 0.76

Layout Information:

R-Table: R3 (Slightly Specular), Q0=0.07
Calculation Method: IES

Layout Type: One Row, Near Side; 1RNS
Luminaire Spacing (Within Row) = 154 Ft
Roadway Width = 11 Ft
Setback = 4 Ft
Lanes Per Roadway = 2

Luminaire Location Summary:
Coordinates in Ft

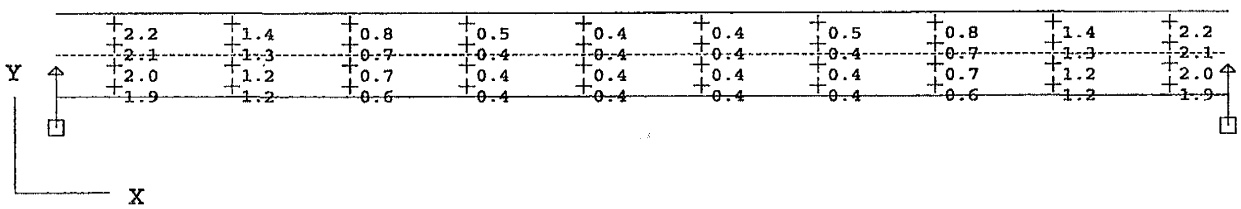
X-Coord	Y-Coord	Z-Coord	Orient	Tilt
-154	-4	30	90	0
0	-4	30	90	0
154	-4	30	90	0
308	-4	30	90	0
462	-4	30	90	0

Total Number of locations = 5
Average Tilted Lamp Correction Factor Applied = 1

AGI32/Roadway Optimizer - copyright 1999-2004 by Lighting Analysts, Inc.

Roadway Optimizer - Layout #1A

Illuminance Grid:



Numerical Summary:
Luminaire Spacing (Within Row) = 154 Ft
Grid begins at: X = 7.7 Y = 1.375 Z = 0
Point Spacing Left-To-Right = 15.4 Ft
Point Spacing Top-To-Bottom = 2.75 Ft
Values in Fc

Average = 0.97 Maximum = 2.2 Minimum = 0.4
Avg/Min = 2.43
Max/Min = 5.50

Longitudinal Uniformity (Min/Max) per row starting with top row:
0.18 0.19 0.2 0.16

AGI32/Roadway Optimizer - copyright 1999-2004 by Lighting Analysts, Inc.

Roadway Optimizer - Layout #1

inbound 11' travel lane

Luminaire Label: GE1005
Luminaire Description: (not specific to a single catalog number)
File Name: GE1005.IES
Luminaire Arrangement: SINGLE
Arm Length = 8 Ft
Lumens Per Lamp = 16000
Number Of Lamps = 1
Total Light Loss Factor = 0.76

Layout Information:

R-Table: R3 (Slightly Specular), Q0=0.07
Calculation Method: IES

Layout Type: One Row, Near Side; 1RNS
Luminaire Spacing (Within Row) = 155 Ft
Roadway Width = 11 Ft
Setback = 4 Ft
Lanes Per Roadway = 1

Luminaire Location Summary:
Coordinates in Ft

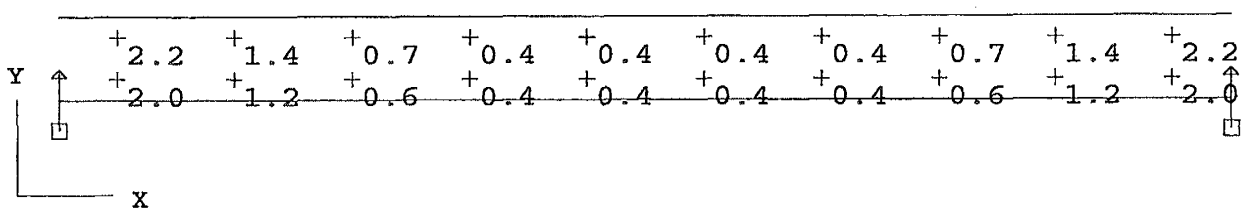
X-Coord	Y-Coord	Z-Coord	Orient	Tilt
-155	-4	30	90	0
0	-4	30	90	0
155	-4	30	90	0
310	-4	30	90	0
465	-4	30	90	0

Total Number of locations = 5
Average Tilted Lamp Correction Factor Applied = 1

AGI32/Roadway Optimizer - copyright 1999-2004 by Lighting Analysts, Inc.

Roadway Optimizer - Layout #1

Illuminance Grid:



Numerical Summary:
Luminaire Spacing (Within Row) = 155 Ft
Grid begins at: X = 7.75 Y = 2.75 Z = 0
Point Spacing Left-To-Right = 15.5 Ft
Point Spacing Top-To-Bottom = 5.5 Ft
Values in Fc

Average = 0.97 Maximum = 2.2 Minimum = 0.4
Avg/Min = 2.43
Max/Min = 5.50

Longitudinal Uniformity (Min/Max) per row starting with top row:
0.18 0.2

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Roadway Optimizer - Layout #2

10' left turn lane

Luminaire Label: GE1005
Luminaire Description: (not specific to a single catalog number)
File Name: GE1005.IES
Luminaire Arrangement: SINGLE
Arm Length = 8 Ft
Lumens Per Lamp = 16000
Number Of Lamps = 1
Total Light Loss Factor = 0.76

Layout Information:

R-Table: R3 (Slightly Specular), Q0=0.07
Calculation Method: IES

Layout Type: One Row, Near Side; 1RNS
Luminaire Spacing (Within Row) = 168 Ft
Roadway Width = 10 Ft
Setback = 15 Ft
Lanes Per Roadway = 1

Luminaire Location Summary:
Coordinates in Ft

X-Coord	Y-Coord	Z-Coord	Orient	Tilt
-168	-15	30	90	0
0	-15	30	90	0
168	-15	30	90	0
336	-15	30	90	0
504	-15	30	90	0

Total Number of locations = 5
Average Tilted Lamp Correction Factor Applied = 1

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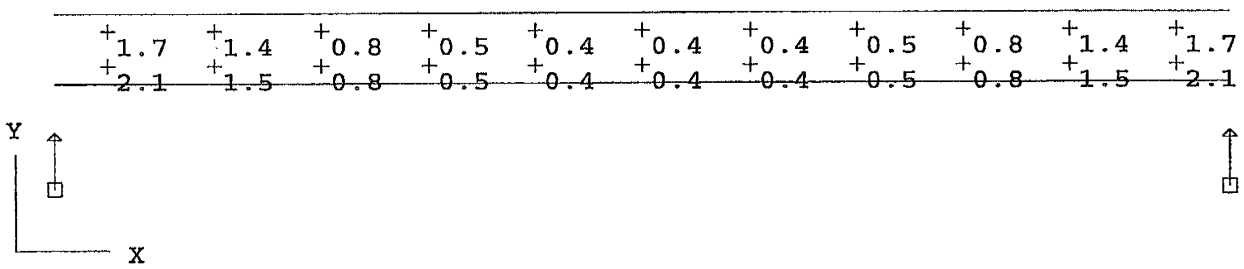
Roadway Optimizer - Layout #2

Illuminance Grid:



Numerical Summary:
Luminaire Spacing (Within Row) = 168 Ft
Grid begins at: X = 7.6365 Y = 2.5 Z = 0
Point Spacing Left-To-Right = 15.273 Ft
Point Spacing Top-To-Bottom = 5 Ft
Values in Fc

Average = 0.95 Maximum = 2.1 Minimum = 0.4
Avg/Min = 2.38
Max/Min = 5.25

Longitudinal Uniformity (Min/Max) per row starting with top row:
0.24 0.19

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Roadway Optimizer - Layout #3

outbound 11' travel lane

Luminaire Label: GE1005
Luminaire Description: (not specific to a single catalog number)
File Name: GE1005.IES
Luminaire Arrangement: SINGLE
Arm Length = 8 Ft
Lumens Per Lamp = 16000
Number Of Lamps = 1
Total Light Loss Factor = 0.76

Layout Information:

R-Table: R3 (Slightly Specular), Q0=0.07
Calculation Method: IES

Layout Type: One Row, Near Side; 1RNS
Luminaire Spacing (Within Row) = 138 Ft
Roadway Width = 11 Ft
Setback = 26 Ft
Lanes Per Roadway = 1

Luminaire Location Summary:
Coordinates in Ft

X-Coord	Y-Coord	Z-Coord	Orient	Tilt
-138	-26	30	90	0
0	-26	30	90	0
138	-26	30	90	0
276	-26	30	90	0
414	-26	30	90	0

Total Number of locations = 5
Average Tilted Lamp Correction Factor Applied = 1

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Roadway Optimizer - Layout #3

Illuminance Grid:

0.8	0.8	0.7	0.6	0.6	0.6	0.6	0.7	0.8	0.8
1.2	1.2	0.8	0.7	0.6	0.6	0.7	0.8	1.2	1.2

Numerical Summary:
Luminaire Spacing (Within Row) = 138 Ft
Grid begins at: X = 6.9 Y = 2.75 Z = 0
Point Spacing Left-To-Right = 13.8 Ft
Point Spacing Top-To-Bottom = 5.5 Ft
Values in Fc

Average = 0.8 Maximum = 1.2 Minimum = 0.6
Avg/Min = 1.33
Max/Min = 2.00

Longitudinal Uniformity (Min/Max) per row starting with top row:
0.75 0.5

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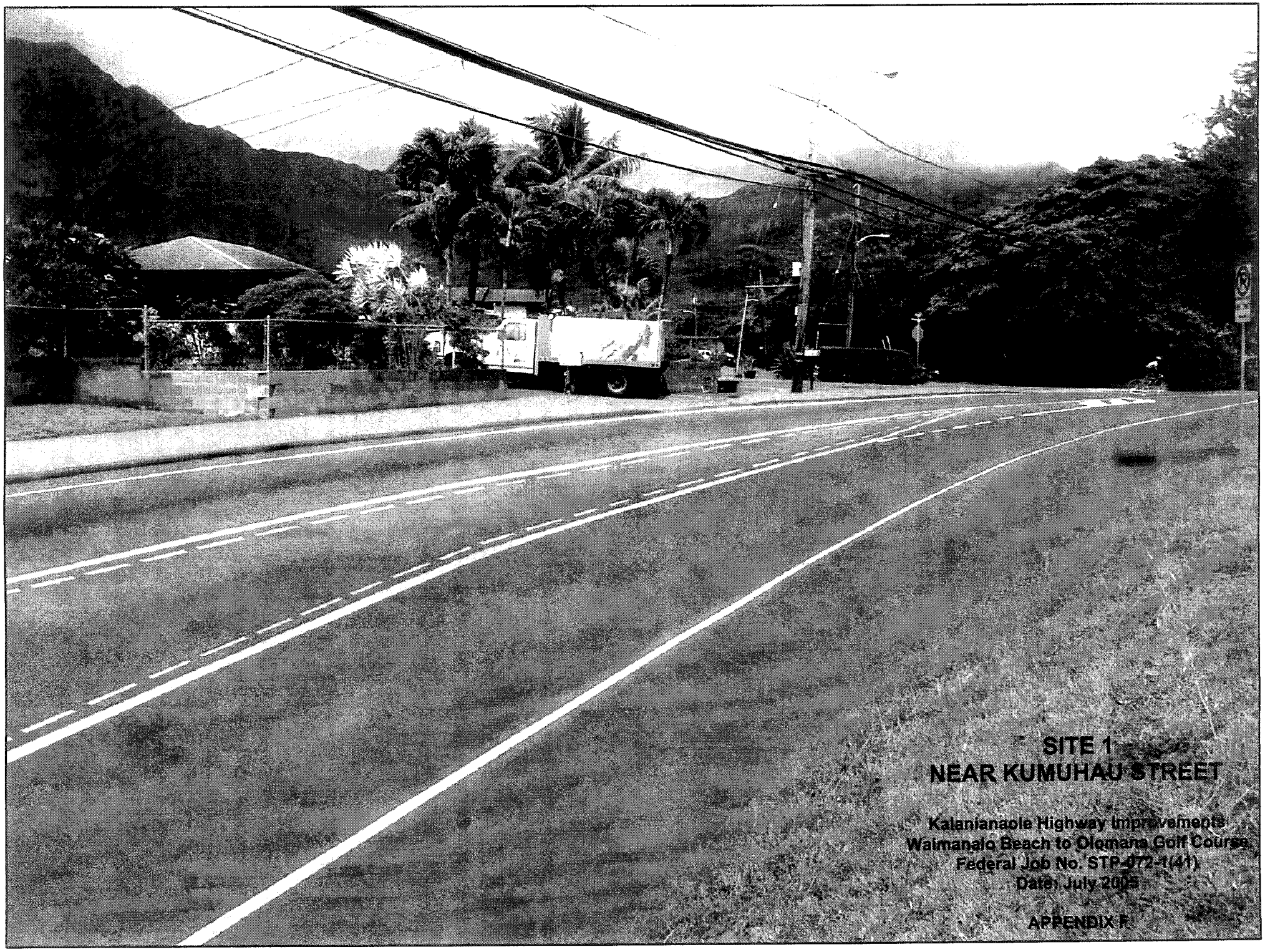
APPENDIX F

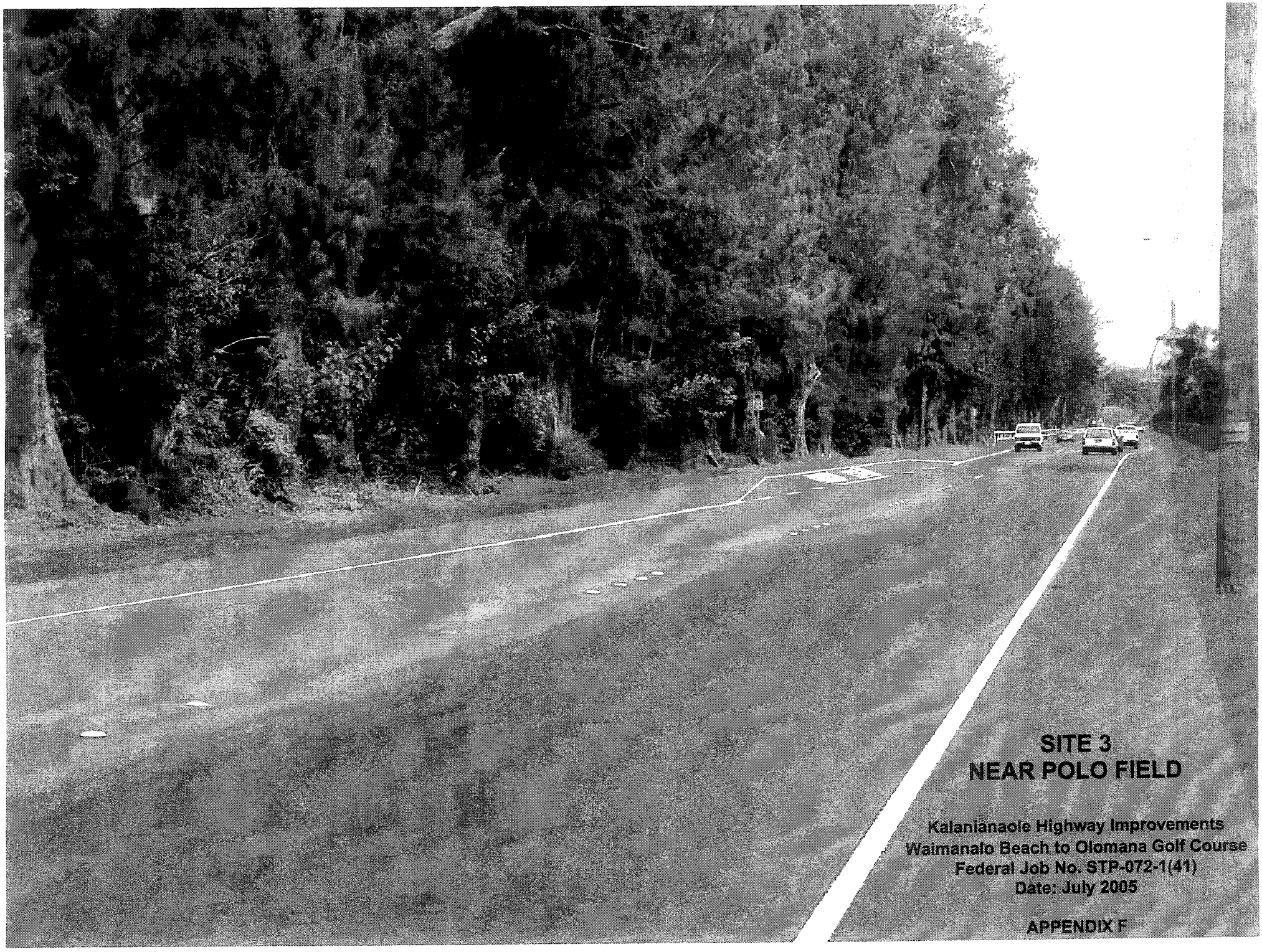
RENDERINGS


SITE 1
NEAR KUMUHAU STREET
Kalanianaole Highway Improvements
Waimanalo Beach to Olomana Golf Course
Federal Job No. STP-072-1(41)
Date: July 2005
APPENDIX F

SITE 2
NEAR WAIMANALO ELEMENTARY SCHOOL

Kalanianaole Highway Improvements
Waimanalo Beach to Olomana Golf Course
Federal Job No. STP-072-1(41)
Date: July 2005

APPENDIX F



SITE 3
NEAR POLO FIELD

Kalanianaole Highway Improvements
Waimanalo Beach to Olomana Golf Course
Federal Job No. STP-072-1(41)
Date: July 2005

APPENDIX F

SITE 4
NEAR HINALEA STREET
Kalanianaole Highway Improvements
Waimanalo Beach to Olomana Golf Course
Federal Job No. STP-072-1(41)
Date: July 2005
APPENDIX F

APPENDIX D

Environmental Noise Assessment Report

D. L. ADAMS ASSOCIATES, LTD.
Consultants in Acoustics and Performing Arts Technologies

Project No. 03-68

ENVIRONMENTAL NOISE ASSESSMENT REPORT
KALANIANIOLE HIGHWAY IMPROVEMENTS
KALANIANIOLE HIGHWAY
WAIMANALO, O'AHU, HAWAII

April 2004

Prepared for
Mountain Edge Environmental, Inc.
Kaaawa, Hawaii

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4.0	Existing Acoustical Environment	3
5.0	Potential Noise Impact Due to the Project and Noise Mitigation	4
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3	Graph of Noise Measurements at Location 1
4	Graph of Noise Measurements at Location 2
5	Graph of Noise Measurements at Location 3
6	Typical Sound Levels From Construction Equipment

1.0 EXECUTIVE SUMMARY

1.1 The Kalanianiole Highway Improvements project is proposed to add functionality and safety to the existing highway. Left turn pockets, a shared center lane, bus pull-outs, and sidewalks are some of the proposed improvements. The number of vehicle lanes will remain the same, at two.

1.2 At a distance of 15 feet from the edge-of-pavement of Kalanianiole Highway, the existing noise levels range from approximately 70 dBA during the daytime hours to approximately 60 dBA during the night. Any residence within 60 feet of the Kalanianiole Highway currently exceeds the FHWA guidelines of 67 dBA (maximum) at the exterior of a residence. The dominant noise source is vehicular traffic on Kalanianiole Highway, but other noises include wind, birds, and an occasional small aircraft flyover.

1.3 The dominant noise sources during project construction will probably be earth moving equipment, such as bulldozers and diesel powered trucks. Typical road construction equipment, such as asphalt paving machines will also be required. Noise from construction activities will occur on the project site. Noise from construction activities should be short term and must comply with State Department of Health noise regulations.

1.4 Traffic and traffic noise on Kalanianiole Highway is not expected to increase or decrease as a result of the highway improvements project. Therefore, noise mitigation for traffic noise should not be required.

2.0 PROJECT DESCRIPTION

The Kalanianiole Highway Improvements project proposes to improve the existing Kalanianiole Highway near Waimanalo, Hawaii. The proposed project stretches from the Olomana Golf Course to the east end of Wainanalo Beach Park. The proposed project will not increase the number of vehicle lanes, but will include left turn pockets, a shared center lane, bus pull-outs, sidewalks, and other improvements.

Although vehicular traffic on the Kalanianiole Highway will be modified during construction of the new road, an alternate detour route is not planned. During parts of the construction only one lane of traffic may be open, so traffic will have to stop and obey traffic signals. The speed of traffic through the construction site will be slower than the existing traffic speeds.

Typical road construction equipment will be on-site throughout the construction of the new road. The proposed road will be wider than the existing road and will carry a total of two vehicular traffic lanes, one shared lane, and a sidewalk (each direction).

3.0 NOISE STANDARDS

Various local and federal agencies have established guidelines and standards for assessing environmental noise impacts and set noise limits as a function of land use. A brief description of common acoustic terminology used in these guidelines and standards is presented in Appendix A.

3.1 State of Hawaii, Department of Health, Community Noise Control

The State of Hawaii Department of Health Community Noise Control Statute [Reference 1] defines three classes of zoning districts and specifies corresponding maximum permissible sound levels due to stationary noise sources such as air-conditioning units, exhaust systems, generators, compressors, pumps, etc., and equipment related to agricultural, construction, and industrial activities. These levels are enforced by the State Department of Health (DOH) for any location at or beyond the property line and shall not be exceeded for more than 10% of the time during any 20-minute period. The specified noise limits which apply are a function of the zoning and time of day as shown in Figure 2. With respect to mixed zoning districts, the statute specifies that the primary land use designation shall be used to determine the applicable zoning district class and the maximum permissible sound level.

3.2 U.S. Environmental Protection Agency (EPA)

The U.S. EPA has identified a range of yearly day-night equivalent sound levels, L_{dn}, sufficient to protect public health and welfare from the effects of environmental noise [Reference 2]. The EPA has established a goal to reduce exterior environmental noise to an L_{dn} not exceeding 65 dBA and a future goal to further reduce exterior environmental noise to an L_{dn} not exceeding 55 dBA. Additionally, the EPA states that these goals are not intended as regulations as it has no authority to regulate noise levels, but rather they are intended to be viewed as levels below which the general population will not be at risk from any of the identified effects of noise.

3.3 U.S. Federal Highway Administration (FHWA)

The FHWA defines four land use categories and assigns corresponding maximum hourly equivalent sound levels, L_{eq}, for traffic noise exposure [Reference 3], which are listed in Table 1. For example, Category B, defined as picnic and recreation areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals, has a corresponding maximum exterior L_{eq} of 67dBA and a maximum interior L_{eq} of 52 dBA. These limits are viewed as design goals, and all projects meeting these limits are deemed in conformance with FHWA noise standards.

3.4 Hawaii Department of Transportation (HDOT)

The HDOT has adopted FHWA's design goals for traffic noise exposure in its noise analysis and abatement policy [Reference 4]. According to the policy, a traffic noise impact occurs when the predicted traffic noise levels "approach" or exceed FHWA's design goals or when the predicted traffic noise levels "substantially exceed the existing noise levels." The policy also states that "approach" means at least 1 dB less than FHWA's design goals and "substantially exceed the existing noise levels" means an increase of at least 15 dB.

4.0 EXISTING ACOUSTICAL ENVIRONMENT

Ambient noise level measurements were conducted from April 7, 2004 to April 11, 2004. Noise measurement data taken from June 26, 2000 to June 28, 2000 is also included in this study. The approximate measurement locations are shown in Figure 1. Locations 1 and 2 are approximately 45 feet from the edge-of-pavement of Kalanianiole Highway, and Location 3 is approximately 15 feet from the edge-of-pavement of Kalanianiole Highway. These measurements assess the existing acoustical environment at the proposed project site. These measurements at Locations 1 and 2 were taken using a Larson-Davis Laboratories, Model 700, Type-2 Sound Level Meter. The measurements at Location 3 were taken using a Larson-Davis Laboratories, Model 820, Type-1 Sound Level Meter together with a Larson-Davis, Model 2560 Type-1 Microphone.

The results are graphically presented in Figures 3 through 5, which show the measured equivalent sound levels, L_{eq}, in A-weighted decibels (dBA). At 15 feet from the road, Figure 5 shows the sound levels range from approximately 70 dBA during the daytime hours to approximately 60 dBA during the night. Therefore, the existing daytime noise levels exceed the FHWA guidelines of 67 dBA (maximum) at the exterior of the nearest residences. Our noise predictions indicate that any residence within 60 feet of the edge of Kalanianiole Highway currently exceeds the FHWA guidelines.

Weather conditions can adversely affect noise measurements. Periods of rain and high winds are typical factors that can skew the noise measurement results. Printouts of the weather conditions reported from the Kaneohe Bay MCBH are available upon request, or can be downloaded from the www.wunderground.com website. The Kaneohe Bay MCBH is approximately 10 miles northwest of the project site. During the measurements at Location 3, there were some periods of rain. The most noticeable was during the morning and afternoon hours on April 8th. The periods of potential rain are shown in "gray" on the graph in Figure 5.

Presently, traffic is the dominant noise source at the measurement locations. Other noise sources include wind, birds, and small aircrafts.

5.0 POTENTIAL NOISE IMPACT DUE TO THE PROJECT AND NOISE MITIGATION

5.1 Project Construction Noise & On-Site Equipment

Development of project areas will involve excavation, grading, and construction of the new road. The various construction phases of the project may generate significant amounts of noise. The surrounding residential properties may be impacted by the project construction noise due to their proximity. The actual noise levels produced during construction will be a function of the methods employed during each stage of the construction process. Typical ranges of construction equipment noise are shown in Figure 6.

In cases where construction noise exceeds, or is expected to exceed the State's "maximum permissible" property line noise levels [Reference 1], a permit must be obtained from the Hawaii DOH to allow the operation of vehicles, cranes, construction equipment, power tools, etc., which emit noise levels in excess of the "maximum permissible" levels.

In order for the Hawaii DOH to issue a construction noise permit, the Contractor must submit a noise permit application to the DOH, which describes the construction activities for the project. Prior to issuing the noise permit, the Hawaii DOH may require action by the Contractor to incorporate noise mitigation into the construction plan. The DOH may also require the Contractor to conduct

noise monitoring or community meetings inviting the neighboring residences and business to discuss construction noise. The Contractor should use reasonable and standard practices to mitigate noise, such as using mufflers on diesel and gasoline engine machines, using properly tuned and balanced machines, etc. However, the State DOH may require additional noise mitigation treatments, such as a temporary barrier around a generator.

In the State of Hawaii, noise permits are required for construction projects. Specific permit restrictions for construction activities are:

> "No permit shall allow any construction activities which emit noise in excess of the maximum permissible sound levels ... before 7:00 a.m. and after 6:00 p.m. of the same day, Monday through Friday."
>
> "No permit shall allow any construction activities which emit noise in excess of the maximum permissible sound levels... before 9:00 a.m. and after 6:00 p.m. on Saturday."
>
> "No permit shall allow any construction activities which emit noise in excess of the maximum permissible sound levels on Sundays and on holidays."

The use of hoe rams and jack hammers 25 lbs. or larger, high pressure sprayers, and chain saws may be restricted to 9:00 a.m. to 5:30 p.m., Monday through Friday.

The DOH noise permit does not limit the noise level generated at the construction site, but rather the *times* at which noisy construction can take place. Therefore, noise mitigation for construction activities should be addressed using project management to ensure that the time constraints within the DOH permit are followed.

5.2 Project Generated Traffic Noise

Measured traffic noise levels along with traffic volume and vehicle mix counts obtained during the measurements were used to calibrate the FHWA's Traffic Noise Prediction Model [Reference 5]. The provided traffic counts were taken on February 7, 2002. Although the traffic patterns and flow will be altered during construction, the traffic counts will not change after construction of the new road is completed.

The proposed new left turn pockets, shared center lane, and bus pull-outs will all help improve the traffic flow along the highway. The improved flow of traffic will help reduce some noise but increase other noises. Noises that are likely to

increase are noises caused by more vehicles traveling at the posted speed limits. Vehicles won't need to slow, or even stop, to wait for turning vehicles. However, noises that are likely to *decrease* are noises caused by vehicles accelerating after being slowed or stopped. Engine noise from vehicles accelerating can be significant. These opposing effects on noise are likely to result in no, or relatively low, net change in the hourly averaged noise levels. Therefore, the predicted noise levels after the project is completed should be the same, or within 1 dB of the existing noise levels prior to construction.

Another consideration for a change in noise level is due to the fact of widening the road. The shared center lane will separate the traveling lanes by approximately 12 feet versus the existing condition with the lanes separated only by the yellow passing lines. For each resident along the highway, the near traffic lane will become closer and the far lane will become farther away. Considering the change in traffic lane positions and the AM and PM peak traffic hours, an approximate 1 dB change in noise level can be expected. This means that residences on the makai side of the highway may see a 1 dB increase in noise level during the PM peak traffic hour and a 1 dB decrease during the AM peak traffic hour. The mauka side of the highway may have similar changes in noise level at opposite times of day, because of the dominant direction of "rush hour" traffic.

Since the existing traffic noise at the project site currently exceeds FHWA guidelines for residences within 60 feet of Kalanianiole Highway, the traffic noise after the new road is complete will also likely exceed the FHWA guidelines. However, the impact of the project on traffic noise is not considered significant because the change in noise level due to the project is approximately 1 to 2 dB. Changes in noise level less than 3 dB are often considered insignificant because a 3 dB change is not perceptible to most listeners. Noise mitigation of traffic noise to the residences should not be required for the Kalanianiole Highway Improvements project because this project should not change the existing traffic noise levels after construction of the new road is complete.

5.3 Overnight On-Site Equipment

Most construction equipment falls under the terms and conditions of the Hawaii DOH issued noise permit. This permit allows noisy construction activities to take place during the daytime hours (see the specific hours reference in Section 5.1 above). However, any activities that require overnight operation or operation outside of the permit hours, such as a water pump or electric generator for lights, must meet the State's maximum permissible sound limits according the applicable zoning district class. Temporary enclosures or barrier walls may be required to adequately mitigate noise from this equipment. If it is not feasible or practical to meet the State's noise limits, the Contractor may apply for a noise variance with the Hawaii DOH.

6.0 REFERENCES:

1. Chapter 46, *Community Noise Control*, Department of Health, State of Hawaii, Administrative Rules, Title 11, September 23, 1996.

2. *Toward a National Strategy for Noise Control*, U.S. Environmental Protection Agency, April 1977.

3. *Department of Transportation, Federal Highway Administration Procedures for Abatement of Highway Traffic Noise,* Title 23, CFR, Chapter 1, Subchapter J, Part 772, 38 FR 15953, June 19, 1973; Revised at 47 FR 29654, July 8, 1982.

4. *Noise Analysis and Abatement Policy,* Department of Transportation, Highways Division, State of Hawaii, June 1977.

5. *Federal Highway Administration's Traffic Noise Model,* FHWA-RD-77-108; U.S. Department of Transportation, December 1978

APPENDIX A

ACOUSTICAL TERMINOLOGY

Sound Pressure Level

Sound or noise consists of minute fluctuations in atmospheric pressure capable of evoking the sense of hearing. It is measured in terms of decibels (dB) using precision instruments known as sound level meters. Noise is defined as "unwanted" sound.

Technically, sound pressure level (SPL) is defined as:

$$SPL = 20 \log (P/Pref) \text{ dB}$$

where P is the sound pressure fluctuation (above or below atmospheric pressure) and Pref is the reference pressure, 20 micropascals, which is approximately the lowest sound pressure that can be detected by the human ear. For example, if P is 20 micropascals, then SPL = 0 dB, or if P is 200 micropascals, then SPL = 20 dB. The relation between sound pressure in micropascals and sound pressure level in decibels (dB) is shown in Figure A-1.

The sound pressure level that results from a combination of noise sources is not the arithmetic sum of the individual sound levels, but rather the logarithmic sum. For example, two sound levels of 50 dB produce a combined level of 53 dB, not 100 dB; two sound levels of 40 and 50 dB produce a combined level of 50.4 dB.

Human sensitivity to changes in sound pressure level is highly individualized. Sensitivity to sound depends on frequency content, time of occurrence, duration, and psychological factors such as emotions and expectations. However, in general, a change of 1 or 2 dB in the level of a sound is difficult for most people to detect. A 3 dB change is commonly taken as the smallest perceptible change and a 5 dB change corresponds to a noticeable change in loudness. A 10 dB increase or decrease in sound level corresponds to an approximate doubling or halving of loudness, respectively.

A-Weighted Sound Level

The human ear is more sensitive to sound in the frequency range of 250 Hertz (Hz) and higher, than in frequencies below 250 Hz. Due to this type of frequency response, a frequency weighting system, was developed to emulate the frequency response of the human ear. This system expresses sound levels in units of A-weighted decibels (dBA). A-weighted sound levels de-emphasizes the low frequency portion of the spectrum of a signal. The A-weighted level of a sound is a good measure of the loudness of that sound. Different sounds having the same A-weighted sound level are perceived as being about equally loud. Typical values of the A-weighted sound level of various noise sources are shown in Figure A-1.

Statistical Sound Levels

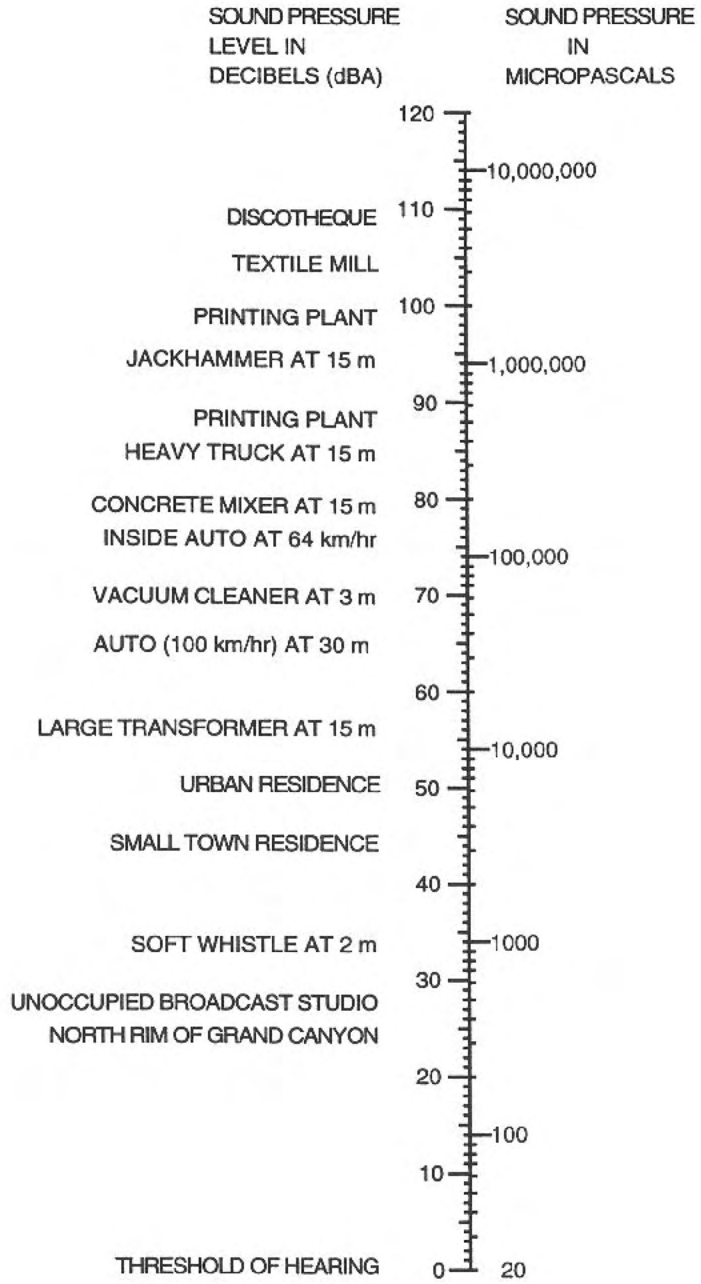
The sound levels of long-term noise producing activities, such as traffic movement, aircraft operations, etc., can vary considerably with time. In order to obtain a single number rating of such a noise source, a statistically-based method of expressing sound or noise levels developed. It is known as the Exceedence Level, L_n. The Exceedence Level, L_n, represents the sound level which is exceeded for n% of the measurement time period. For example, L_{10} = 60 dBA indicates that for the duration at the measurement period, the sound level exceeded 60 dBA 10% of the time. Commonly used Exceedence Levels include L_1, L_{10}, L_{50}, and L_{90}, which are widely used to assess community and environmental noise. Figure A-2 illustrates the relationship between selected statistical noise levels.

Equivalent Sound Level

The Equivalent Sound Level, L_{eq}, represents a constant level of sound having the same total acoustic energy as that contained in the actual time-varying sound being measured over a specific time period. L_{eq} is commonly used to describe community noise, traffic noise, and hearing damage potential. It has units of dBA and is illustrated in Figure A-2.

Day-Night Equivalent Sound Level

The Day-Night Equivalent Sound Level, L_{dn}, is the Equivalent Sound Level, L_{eq}, measured over a 24-hour period. However, a 10 dB penalty is added to the noise levels recorded between 10 pm and 7 am to account for people's higher sensitivity to noise at night when the background noise level is typically lower. The L_{dn} is a commonly used noise descriptor in assessing land use compatibility, and is widely used by federal and local agencies and standards organizations. Qualitative descriptions, as well as local examples of L_{dn}, are shown in Figure A-3.



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(808)254-3318 FAX: (808)254-5295 EMAIL: hawaii@dlaa.com

FIGURE A-1 - THE RELATION BETWEEN SOUND PRESSURE, P, AND SOUND PRESSURE LEVEL, SPL. ALSO SHOWN ARE TYPICAL VALUES OF A-WEIGHTED SOUND LEVELS OF VARIOUS NOISE SOURCES.

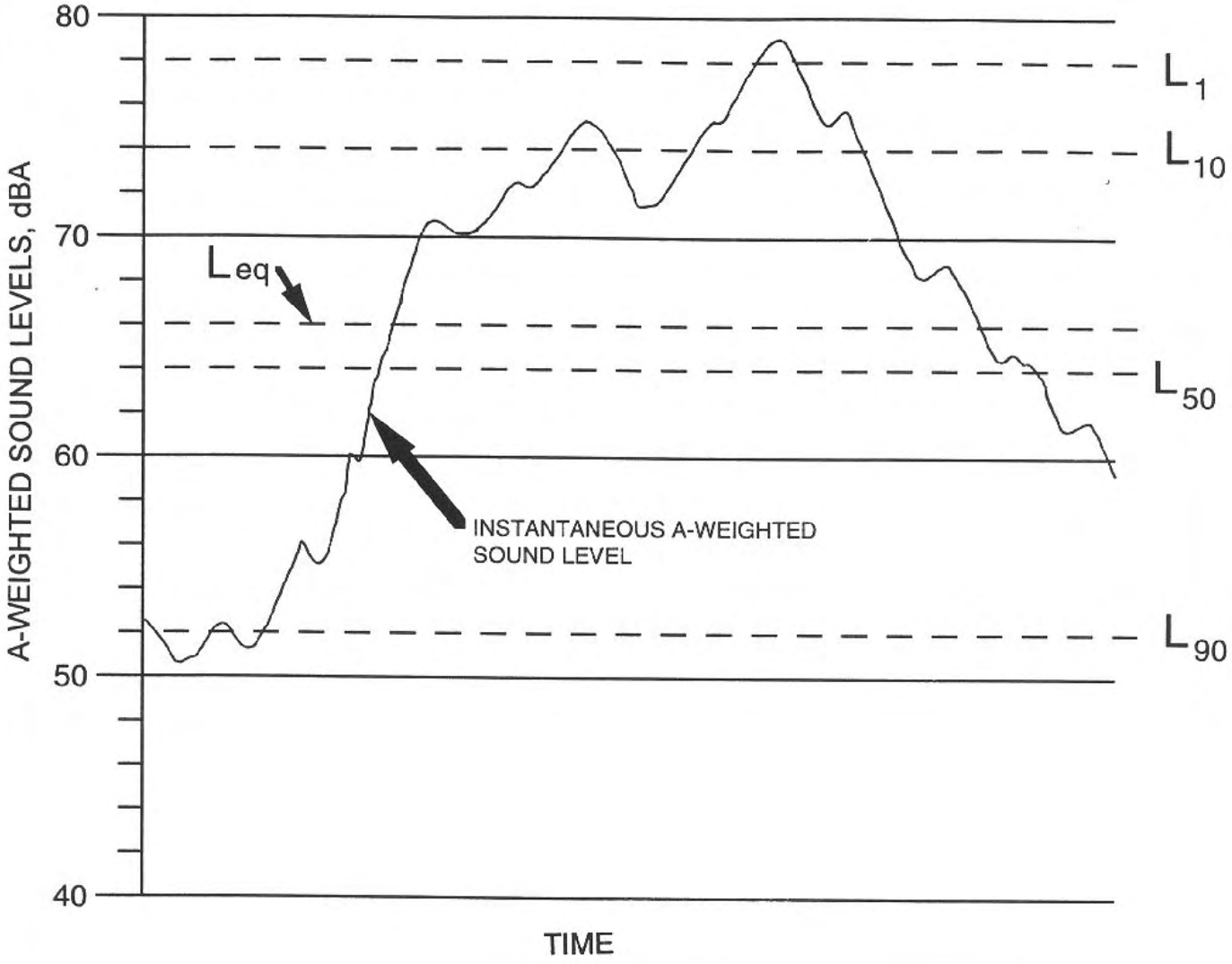

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FIGURE A-2 - COMPARISON OF AN INSTANTANEOUS SOUND LEVEL AND THE CORRESPONDING STATISTICAL SOUND LEVELS

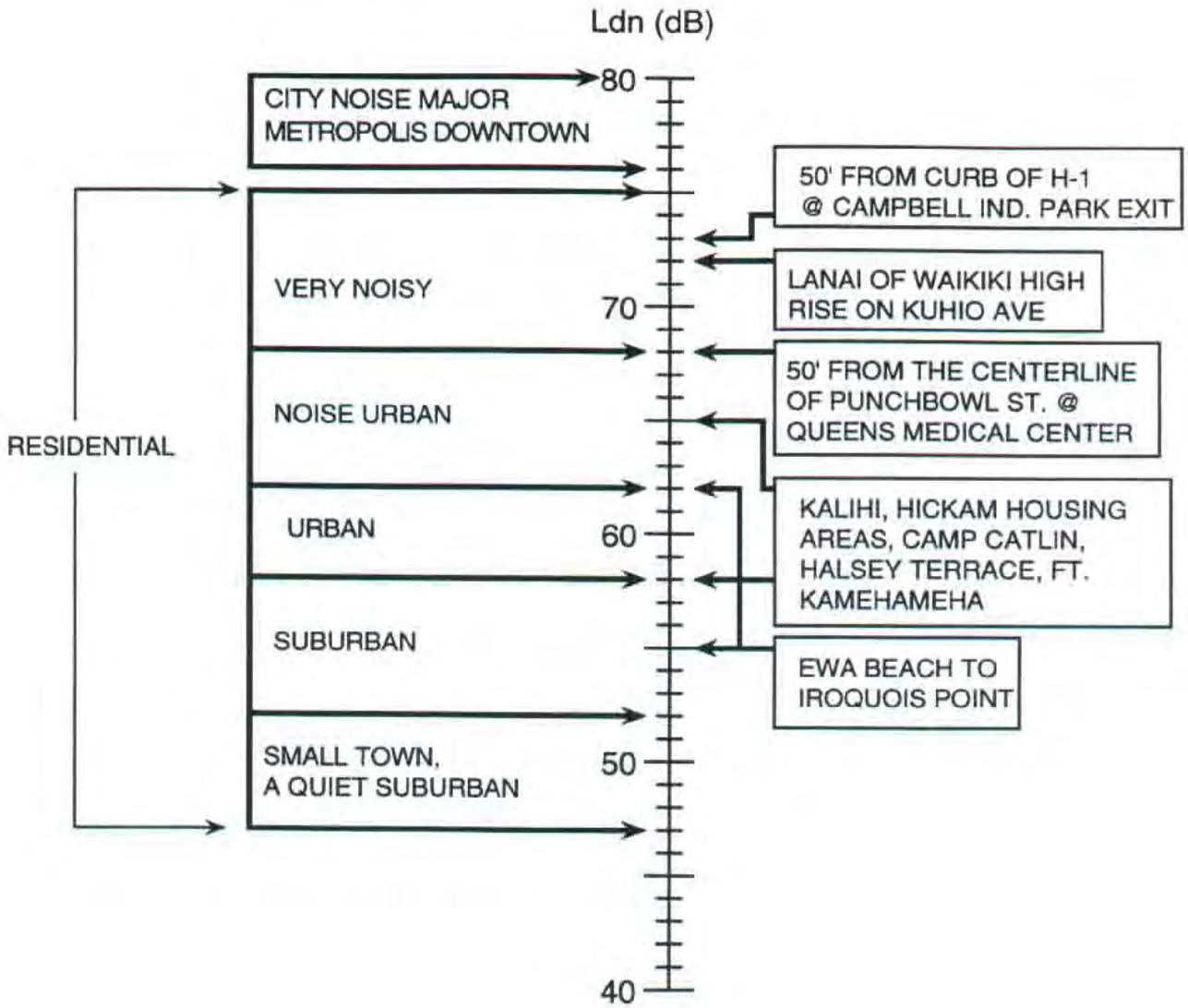

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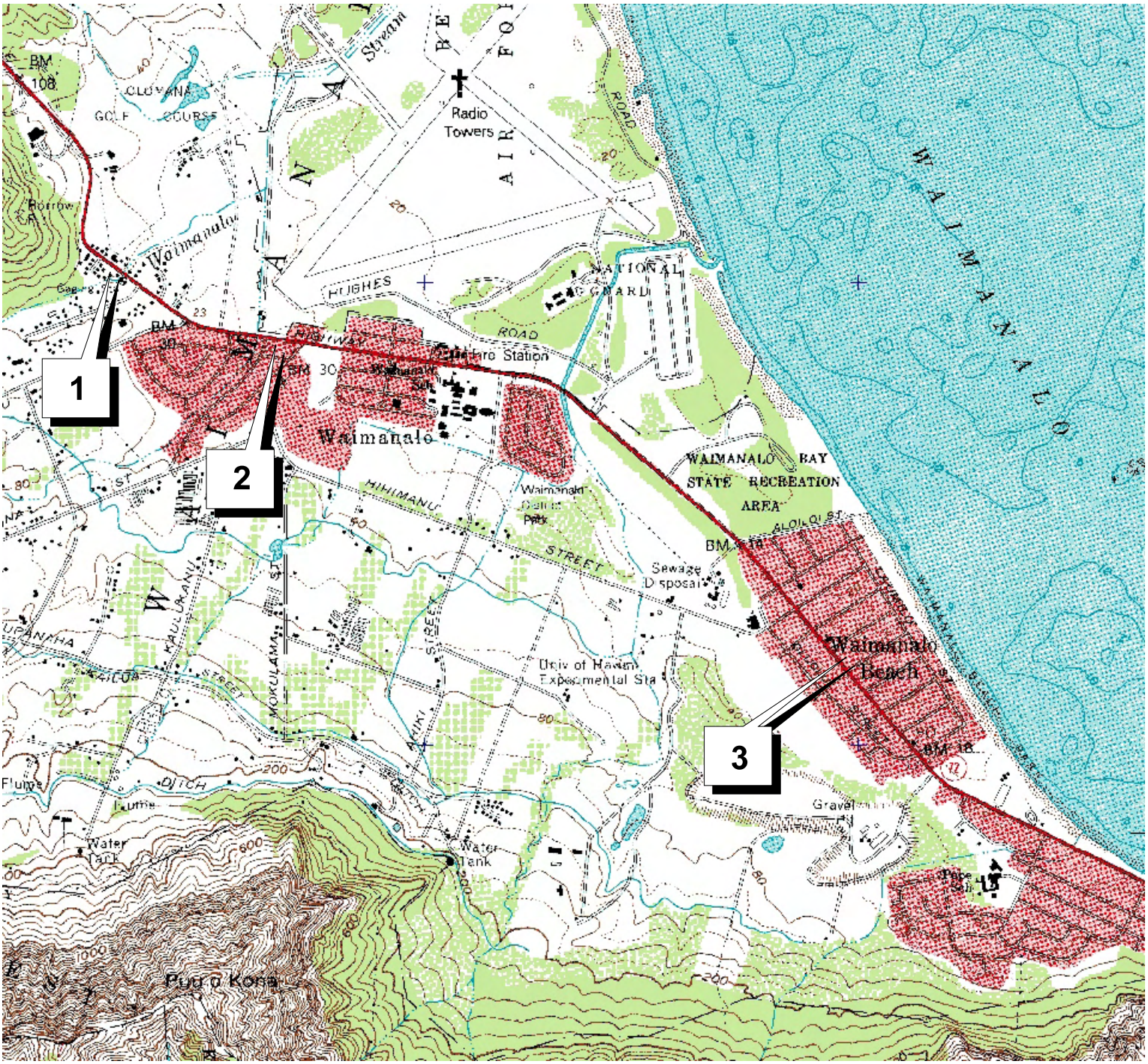
FIGURE A-3 - QUALITATIVE DESCRIPTION OF THE DAY-NIGHT EQUIVALENT SOUND LEVELS (Ldn) AND EXAMPLE Ldn's AT SELECTED LOCATIONS ON OAHU

TABLE 1
Federal Highways Administration Recommended Equivalent Hourly Sound Levels Based On Land Use [Reference 3]

Activity Category	$L_{eq(h)}$	Noise Reduction Exterior-to-Interior
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sport areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	---	Undeveloped Land
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.



1 **Measurement Location**

Reference: 3-D TopoQuads, Delorme, 1999

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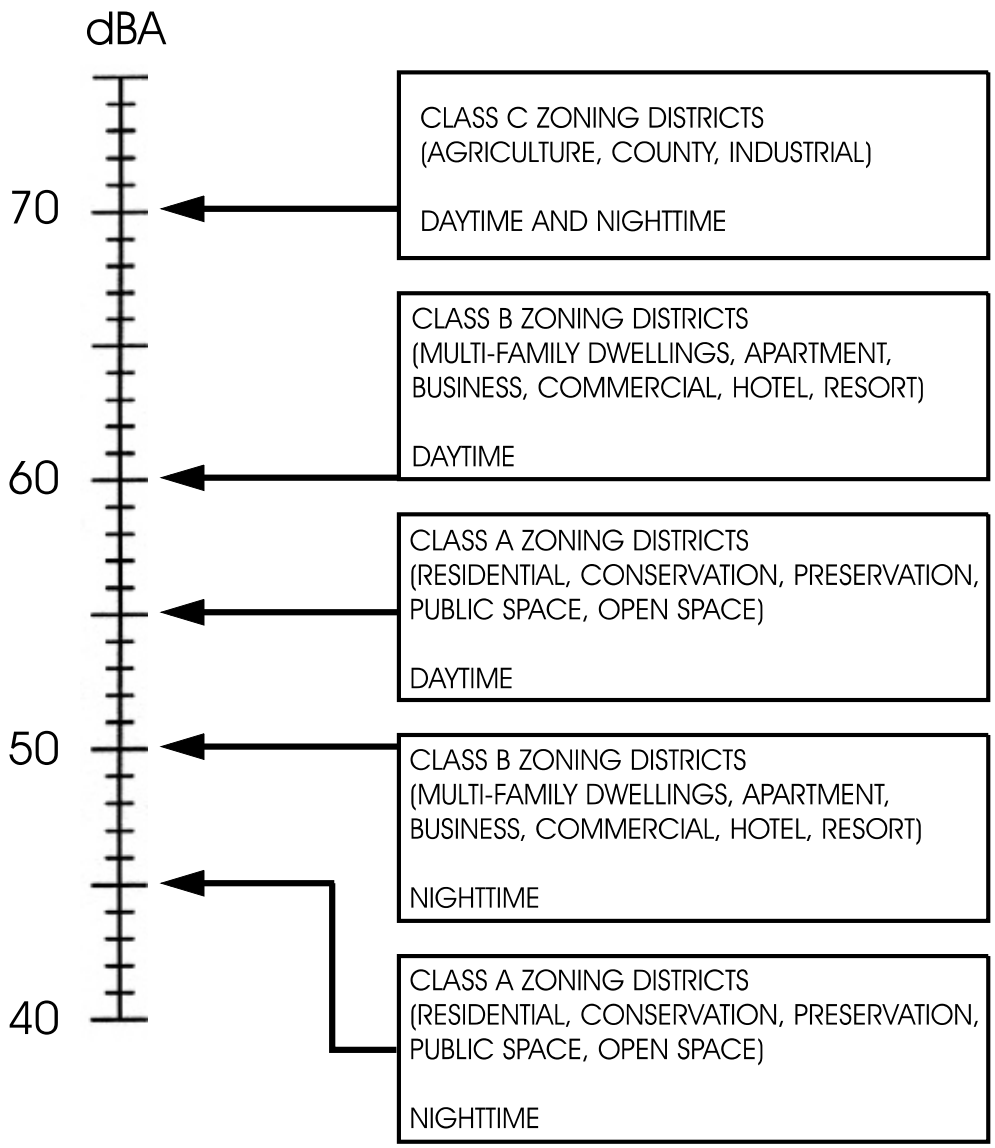
Map of Project Location			
Kalanianaole Highway Improvements			Figure No. 1
not to scale			
Date April 2004		Drawn By trb	



NOTE: SOUND LEVELS INDICATED BY ZONING DISTRICT ARE THE "MAXIMUM PERMISSIBLE" SOUND LEVELS DUE TO EXCESSIVE NOISE SOURCES SUCH AS STATIONARY MECHANICAL EQUIPMENT AND EQUIPMENT RELATED TO AGRICULTURAL, CONSTRUCTION AND INDUSTRIAL ACTIVITIES THAT SHALL NOT BE EXCEEDED FOR MORE THAN 10% OF THE TIME WITHIN ANY 20-MINUTE PERIOD DURING THE TIME PERIOD SHOWN.

(DAYTIME: 7:00 A.M. TO 10:00 P.M., NIGHTTIME: 10:00 P.M. TO 7:00 A.M.)

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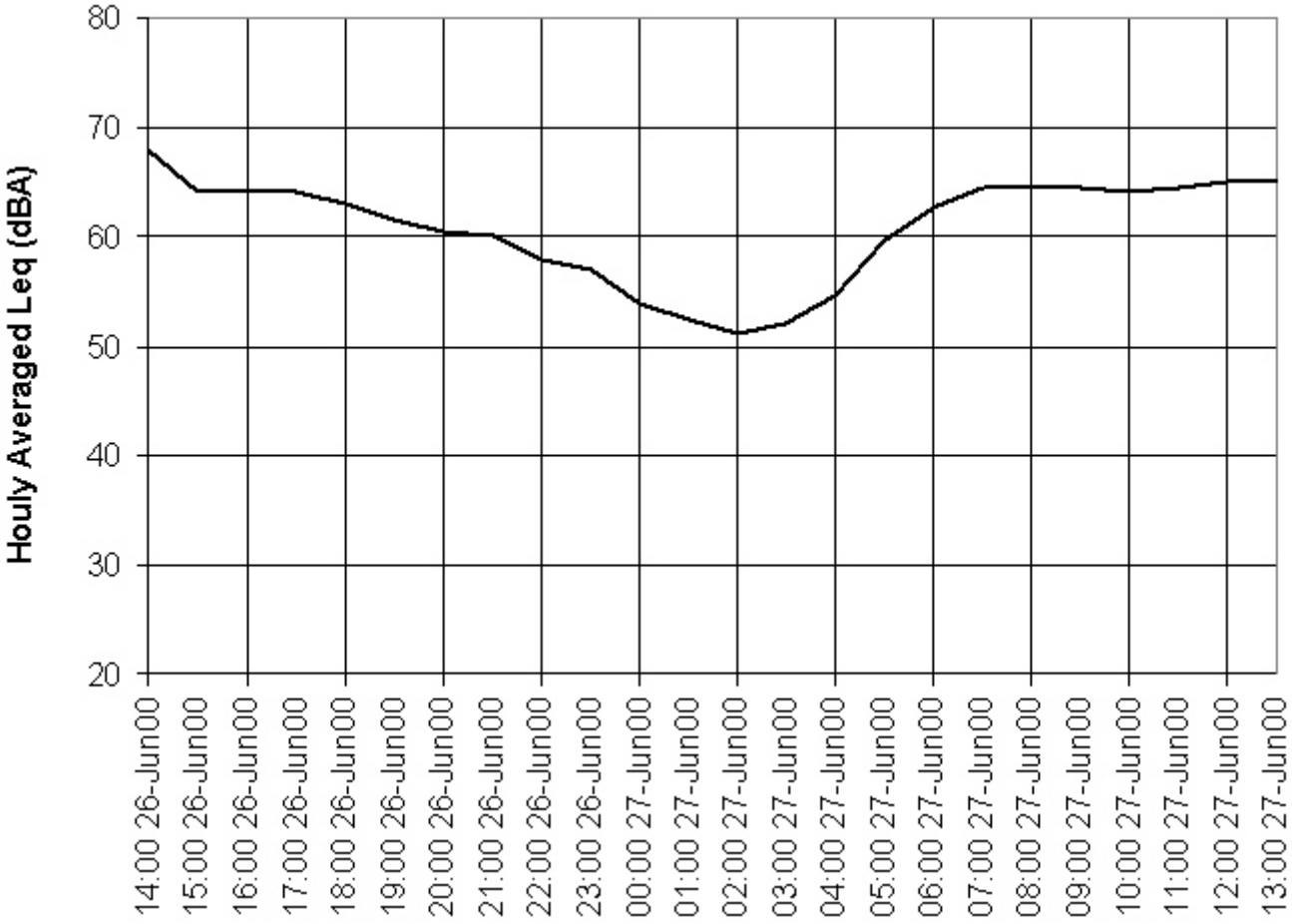
State of Hawaii Maximum Permissible Sound Levels for Various Zoning Districts			
Kalanianaole Highway Improvements			**Figure No. 2**
not to scale			
Date April 2004		**Drawn By trb**	



Location 1 - 45' from the edge-of-pavement of Kalanianiole Highway

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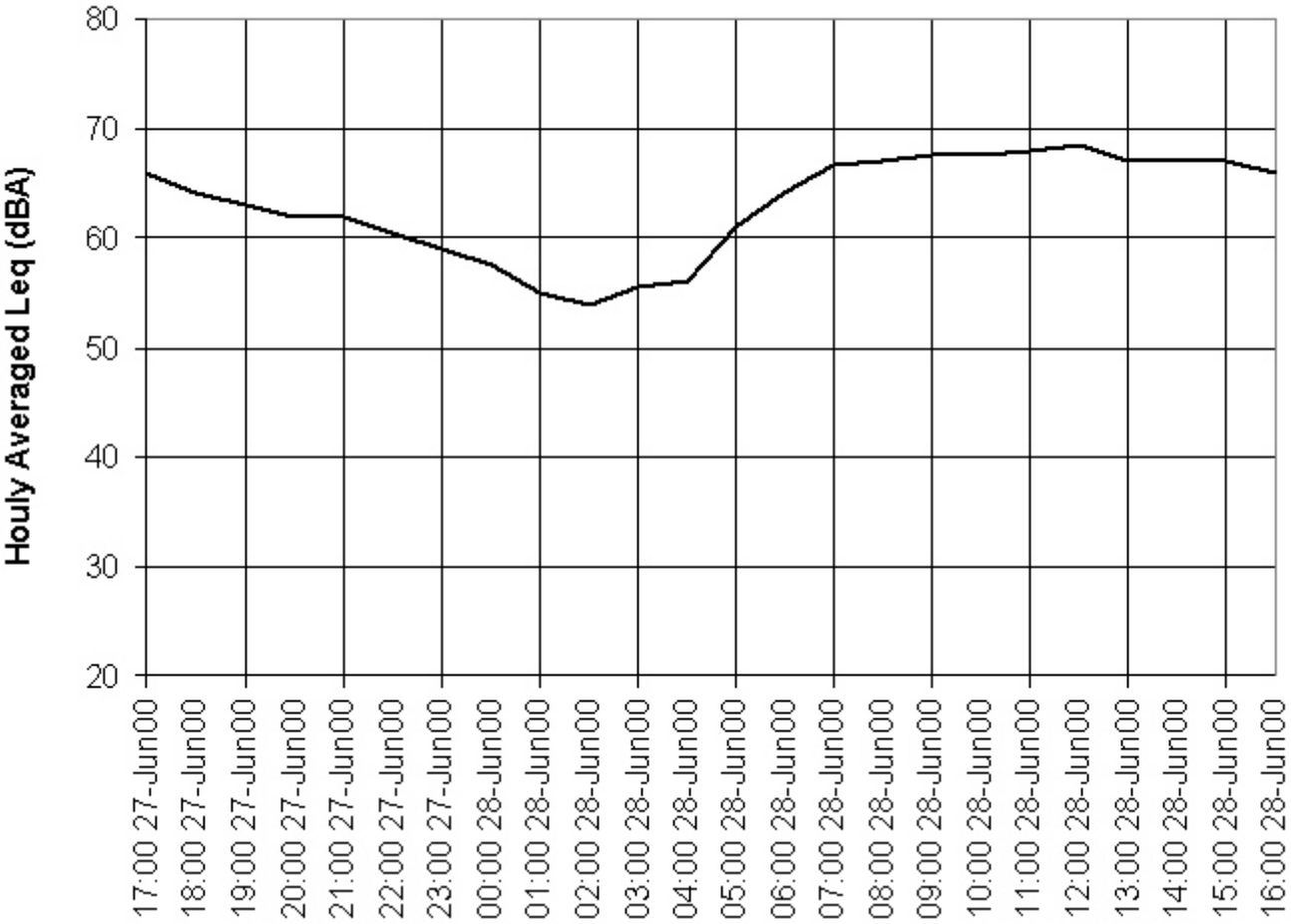
Location 1 - Measured Sound Levels			
Kalanianiole Highway Improvements			Figure No. 3
no scale			
Date April 2004		Drawn By trb	



Location 2 - 45' from the edge-of-pavement of Kalanianiole Highway

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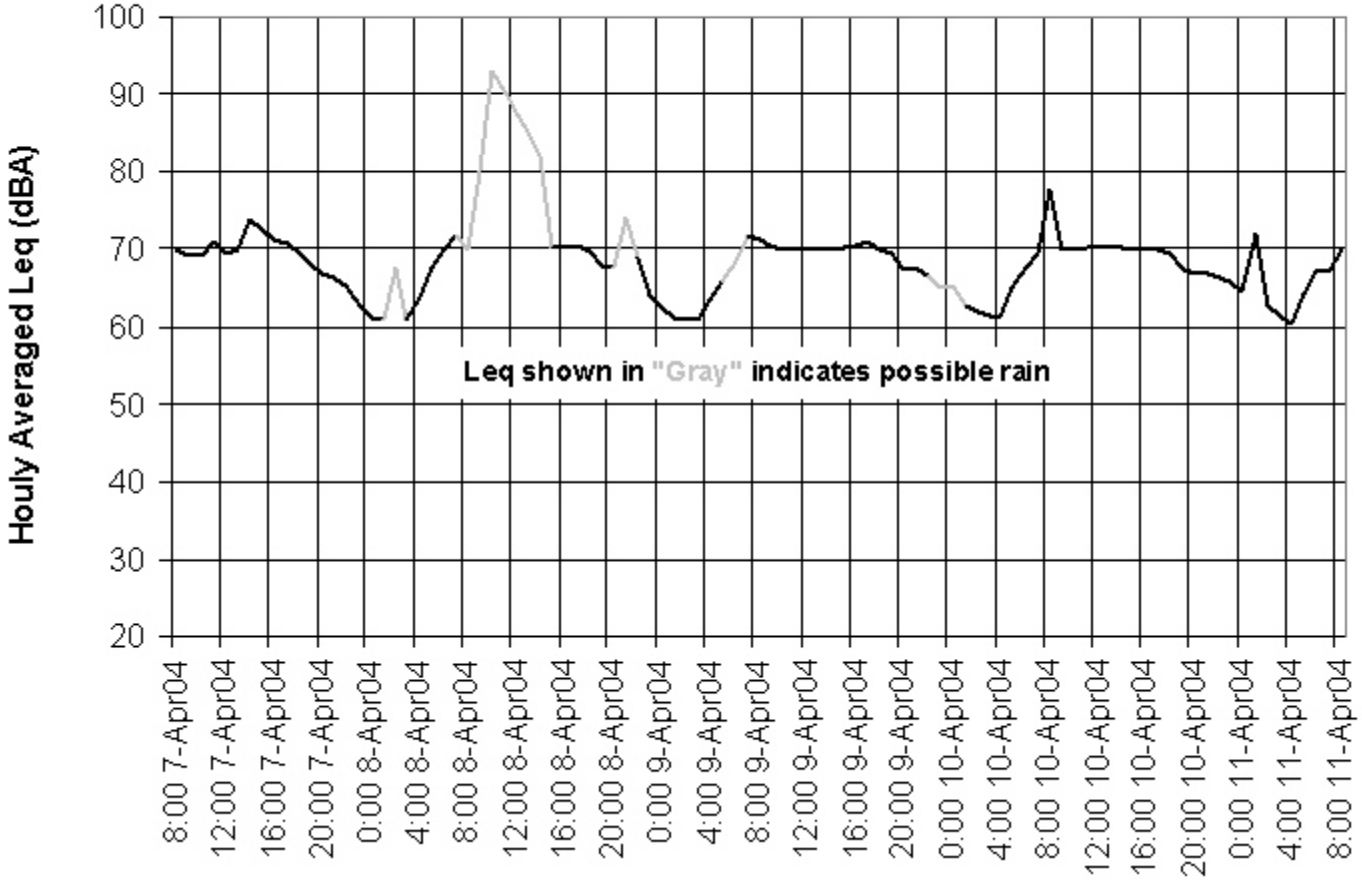
Location 2 - Measured Sound Levels			
Kalanianaole Highway Improvements			**Figure No.**
no scale			**4**
Date April 2004		**Drawn By** trb	



Location 3 - 15' from the edge-of-pavement of Kalanianiole Highway

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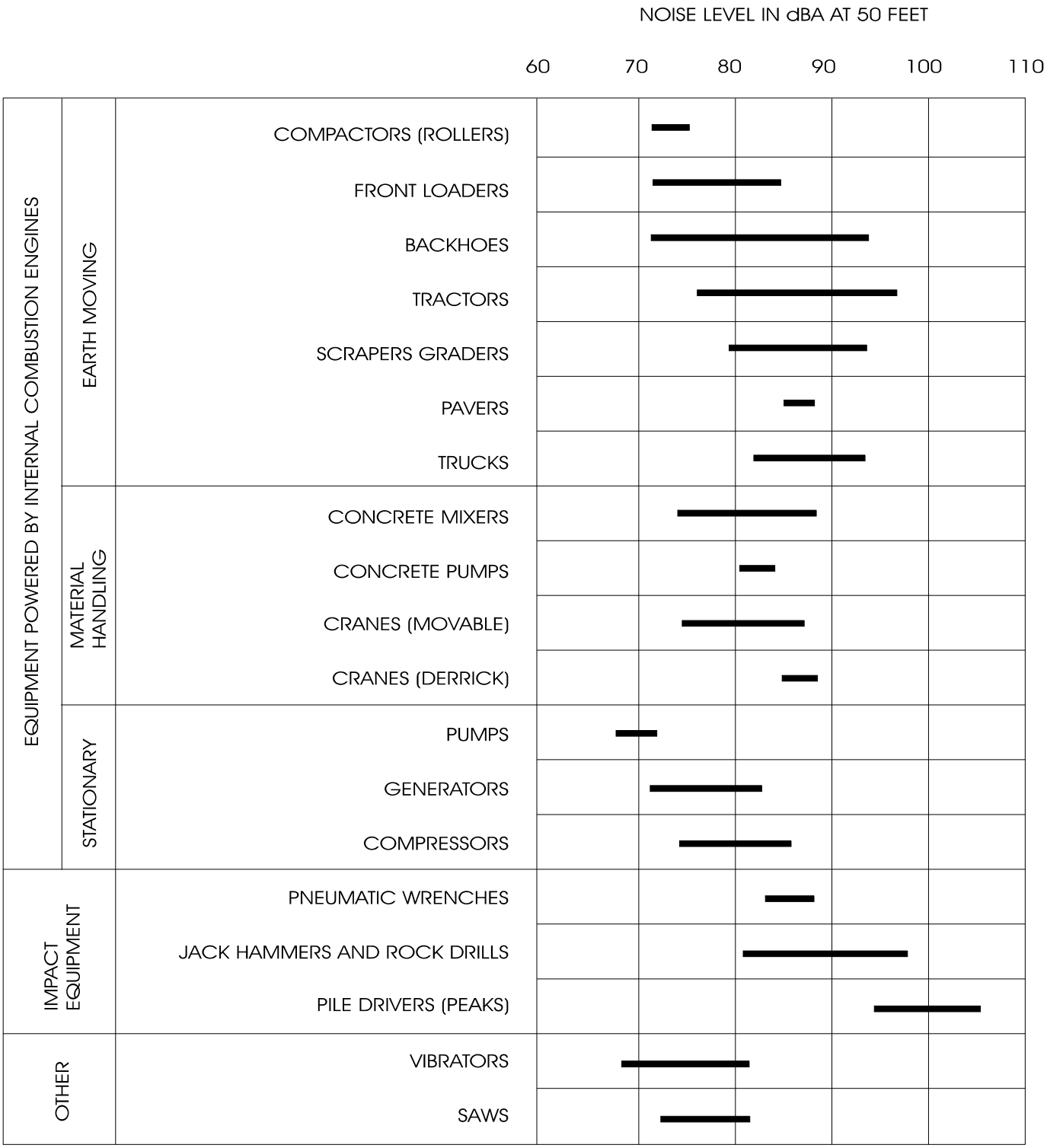
Location 3 - Measured Sound Levels			
Kalanianaole Highway Improvements			Figure No. 5
no scale			
Date April 2004		Drawn By trb	



NOTE: BASED ON LIMITED AVAILABLE DATA SAMPLES

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Typical Sound Levels from Construction Equipment			
Kalanianaole Highway Improvements			Figure No. 6
no scale			
Date April 2004		Drawn By trb	

APPENDIX E

Botanical Resources Assessment Study

BOTANICAL RESOURCES ASSESSMENT STUDY
KALANIANA‘OLE HIGHWAY IMPROVEMENTS
OLOMANA GOLF COURSE TO WAIMANALO BEACH PARK
WAIMANALO, O‘AHU

by

Winona P. Char

Char & Associates
Botanical Consultants
Honolulu, Hawai‘i

Prepared for: **MOUNTAIN EDGE ENVIRONMENTAL, INC.**

February 2004

BOTANICAL RESOURCES ASSESSMENT STUDY
KALANIANA‘OLE HIGHWAY IMPROVEMENTS
OLOMANA GOLF COURSE TO WAIMANALO BEACH PARK
WAIMANALO, O‘AHU

INTRODUCTION

The State Department of Transportation (DOT) is planning to improve traffic operations on Kalaniana`ole Highway between Olomana Golf Course and Waimanalo Beach Park by making improvements within the existing highway easements. The planned improvements include widening the entire length of Kalaniana‘ole Highway between Flamingo Road and ‘Alo‘ilo‘i Street, and providing exclusive left-turn lanes and/or median shelter lanes at the intersections. The road widening would also provide two-way left-turn lanes and bus bays. Various shoulder improvements, such as sidewalks and curbs in some areas, are also part of the planned improvements.

Field studies to assess the botanical resources within the existing highway easements were conducted on 20 December 2003. The primary objectives of the field survey were to:

1) provide a general description of the vegetation along the highway corridor;
2) search for threatened and endangered species as well as species of concern; and
3) identify areas of potentail environmental problems or concerns and propose appropriate mitigation measures.

Prior to the field survey, the project location map and project plans were examined to familiarize the principal investigator with the study area. The plant names used in this report follow Wagner et al. (1990) and Wagner and Herbst (1999). The few recent name changes are those reported in the Hawaii Biological Survey series (Evenhuis and Eldredge, eds. 1999-2002).

DESCRIPTION OF THE VEGETATION

From Olomana Golf Course to just before Waimanalo Stream Bridge, the vegetation along the highway consists primarily of mowed grassy strips of Guinea grass (Panicum maximum) and green panicgrass (Panicum maximum var. trichoglume). On the golf course side of the highway, there is a narrow band of scattered, short koa haole shrubs (Leucaena eucocephala) and tall clumps of Guinea grass. On the steeper slopes bordering the west (mauka) side of the highway, there are scattered stands of ‘opiuma (Pithecellobium dulce), Java plum (Syzygium cumini), and Formosan koa (Acacia confusa) trees. Koa haole shrubs and Guinea grass are abundant in this area.

From about the Waimanalo Stream Bridge to Inoa‘ole Street, the highway easements pass through a residential area. In places, there are asphalt or concrete sidewalks and grassy mowed strips line the highway. A few weedy species such as green panicgrass, Chinese violet (Asystasia gangetica), puahilahila or sleeping grass (Mimosa pudica), and coatbuttons (Tridax procumbens) can also be found along the highway. A few lots along the highway are not developed. These support koa haole scrub with scattered Java plum

trees and sourbush shrubs (Pluchea carolinensis); Guinea grass, elephant grass (Pennisetum purpureum), and lumpy mats of California grass (Brachiaria mutica) are common. On the northwest side of Kahawai Stream is a planting of native plants which include pohinahina (Vitex rotundifolia), ‘a‘ali‘i (Dodonaea viscosa), naio (Myoporum sandwicense), hala (Pandanus tectorius), and ma‘o (Gossypium tomentosum).

Where the highway passes next to Bellows Air Force Base, Waimanalo Bay State Recreation Area, and the Waimanalo Polo Club, there is an asphalt sidewalk and mowed grassy strips of green panicgrass, Bermuda grass or manienie (Cynodon dactylon), and weedy, mostly herbaceous species. Large, tall ironwood trees (Casuarina equisetifolia) line the highway in this area. On the mauka side of Inoa‘ole Stream Bridge, there is another planting of native plants. A small wetland is found within the stream channel on the mauka side of the highway (Char 2000b). California grass lines the banks of the stream along with honohono (Commelina diffusa) and false daisy (Eclipta prostrata). Pools of water contain duckweed (Lemna minor) and green algae.

From ‘Alo‘ilo‘i Street to the project’s terminus at Waimanalo Beach Park, the Highway passes through a residential area. Grassy areas along the highway are periodically maintained and support Bermuda grass, buffelgrass (Cenchrus ciliaris), pitted beardgrass (Bothriochloa pertusa), and smaller patches of wiregrass (Eleusine indica). Along the park boundary, the vegetation consists of Bermuda grass lawns with weedy species such as Chinese violet, creeping indigo (Indigofera hendecaphylla), Calyptocarpus vialis, Boerhavia coccinea, and coatbuttons. A row of ironwood trees also lines the beach park in some places.

DISCUSSION AND RECOMMENDATIONS

The existing highway easements support vegetation which is periodically maintained for the most part. Grassy mowed strips characterize the vegetation along most of the highway, especially in the residential areas. Koa haole scrub with Guinea grass and a few scattered trees are found on undeveloped areas bordering the highway easements.

No threatened and endangered species (U.S. Fish and Wildlife Service 1999b) occur within the highway easements. The ma‘o which is found along Kahawai and Inoa‘ole streams is considered a species of concern (U.S. Fish and Wildlife Service 1999a; Wagner et al. 1999). However, the plants represent planted, horticulturally obtained material and not a naturally occurring population (Char 2000a). No sensitive native plant-dominated communities occur. within the highway easements. No Exceptional Trees protected by City and County of Honolulu Ordinance 78-91 and 81-32 occur within the highway easements.

Given these findings, the proposed Kalaniana‘ole Highway improvements, from Olomana Golf Course to Waimanalo Beach Park, are not expected to have a significant negative impact on the botanical resources. If the sites with the native plants are disturbed by the highway improvements, then the plants should be transplanted to another location or repotted and set aside. After construction is completed, the potted plants or new plants can be set out at the Kahawai and Inoa‘ole sites. Additional native plantings along the highway

should also be considered. In 1991, the Hawai‘i legislature passed Act 73 which mandates that projects developed with State funds incorporate native plants wherever and whenever possible.

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Wildlife Survey
Kalanianaole Highway Widening
Olomana Golf Course to Waimanalo Beach Park
Waimanalo, Oahu, Hawaii

Prepared for:
Mountain Edge Environmental, Inc.
P.O. Box 237
Kaaawa, Hawaii 96730

Prepared by:
Tim J. Ohashi
Certified Wildlife Biologist
P.O. Box 786
Volcano, Hawaii 96785

February 28, 2004

1.0 Introduction

A field survey was conducted on December 13, 2003 to assess the wildlife resources found along the proposed route of a road widening project along Kalanianaole Highway, from Olomana Golf Course to Waimanalo Beach Park in Waimanalo, Oahu, Hawaii. The objectives of the survey were to provide a record of wildlife along the proposed construction route and determine whether the project would adversely impact any important wildlife resources in the area.

2.0 Study Area

The proposed road widening project was approximately 3.13 miles long, through a highly urbanized section of Waimanalo, on the southeast coastline of Oahu, Hawaii. The Hawaii Department of Transportation is planning to make improvements to Kalanianaole Highway from Olomana Golf Course to Waimanalo Beach Park within the existing highway easements. The road widening would provide exclusive left-turn lanes and/or median shelter lanes at intersections, two-way left hand turn lanes and bus bays, and various shoulder improvements such as sidewalks and curbs. The project would entail earth work but conducted within the highway easements and would be limited to moving utility poles and removing/constructing paved surfaces and bus stops (Hernando and Staron 2003).

The section of Kalanaianaole Highway being planned for widening crosses over three streams, Waimanalo, Kahawai and Inoaole. It also passes by a flooded wetland adjacent to the east side of the parking lot of Waimanalo Shopping Center. All streams are channelized for flood control. A portion of the mauka portion of Waimanalo and Kahawai streams is concrete lined before going under Kalanianaole Highway. The makai sections of all the streams were not of concrete but the vegetation along the banks is being maintained to provide an open channel.

The elevation ranges from 3 to 33 ft above mean sea level. There is no native vegetation along the proposed route. Introduced trees and shrubs were present as landscaping in single family residential and apartment yards, nurseries, commercial establishments, public parks and along the roads. Chinese banyan, Java plum, and monkey pod were the most noticeable naturalized tree species. Haole koa and Christmas berry were the most common naturalized shrub. California and Guinea grass were dominant along the banks of all stream channels. Phragmites occurred in the flooded wetland next to Waimanalo Shopping Center.

3.0 Methods

Nine bird count stations were established at selected points along the section of Kalanianaole Highway proposed for widening. The first station was at the Waimanalo Beach Park parking lot across Huli Road. Station 2 was behind the backstop of the ball field next to 7/11. Station 3 was next to Naturally Hawaiian Gallery. Station 4 was the entrance of Waimanalo Bay Recreation Area. Station 5 was at Inoaole Stream. Station 6 was at the east end of Waimanalo Shopping Center. Station 7 was at Kahawai Stream. Station 8 was at Waimanalo Stream. Station 9 was at the Olomana Golf Course entrance across Town and County Stables. All birds seen and heard within 3 minutes were recorded for each station. Incidental observations were made between stations. Except for the native birds, there was no attempt to determine the per station abundance of each introduced bird species, however the frequency that each species was encountered at each of the 9 stations was determined.

4.0 Results and Discussions

The usual complement of introduced birds common to the lowlands of Oahu were found along the proposed route. The common myna was observed at 7 stations. Red-vented bulbuls were found at 5 stations. The following species were observed during the December 13, 2004 survey on station counts and are listed in order of frequency of occurrence for the 8 stations.

Common myna (*Acridotheres tristis*)
Red vented bulbul (*Pnycnonotus cafer*)
Red crested cardinals (*Paroaria coronata*)
Spotted dove (*Streptopelia chinensis*)
Cattle egret (*Bubulcus ibis*)
Zebra dove (*Geopelia striata*)
English sparrow (*Passer domesticus*)
Pacific golden plover (*Pluvialis dominica*)
House finch (*Carpodacus mexicanus*)
Japanese white eye (*Zosterops japonicus*)
Northern cardinal (*Cardinalis cardinalis*)
Rock dove (*Columba livia*)
Wandering tattler (*Heteroscelus incanus*)
Red footed booby (Sula sula)
Common moorhen (*Gallinula chloropus sandvicensis*)

The federally listed endangered common moorhen was observed at Kahawai Streeam. A red footed booby was seen flying offshore in front of Waimanalo Beach Park.

Although not encountered during the current survey, the following birds were found during a survey conducted earlier in 2000 (Ohashi 2000).

Chestnut mannikin (*Lonchura malacca*)
Java sparrow (*Padda oryzivora*)
Common waxbills (*Estrilda astrild*)
Nutmeg mannikin (*Lonchura punctulata*)
Peafowl (*Pavo critata*)

During the same survey, Ohashi (2000) found the federally listed endangered koloa or Hawaiian duck (*Anas wyvilliana*) in Kahawai Stream. A pair were seen foraging along the concrete portion of the stream mauka of the highway and another was seen in the stream channel on the makai side. A native black-crowned night heron (*Nycticorax nycticorax hoactli*) was also seen in Kahawai Stream.

One mongoose (*Herpestes auropunctatus*) was observed along Hihimanu Street by Ohashi (2000). No mammals were seen during this survey, although there are probably feral cats (*Felis cattus*), rats (*Rattus* spp) and mice (*Mus musculus*) in the area.

5.0 Conclusion and Summary

The terrestrial habitat is not suitable for native birds with the exception of the migratory Pacific golden plover which occurred on lawns and in parks. The proposed widening project will affect an area immediately within the highway easements among residential and commercial properties, which are already highly disturbed. As long as the construction does not affect the stream channel, there will be no effect on the endangered moorhen or koloa Construction activities may cause temporary disturbance to foraging opportunities immediately adjacent to Kalanianaole Highway, but these species seemed to be habituated to the highly modified stream channel, the close proximity of residences and the heavy traffic on the bridges.

6.0 Bibliography

Hawaii Audubon Society. 1989. Hawaii's birds. Honolulu, HI.

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7.0 Appendix

Appendix 1. Description of Count Stations, December 13, 2003, Kalanianaole Highway, Waimanalo, Oahu, Hawaii

Station	Location along Kalanianaole Highway	Latitude	Longitude	Elevation
STA 1	Waimanalo Beach Park parking lot across Huli Road	N21º19.826’	W157º41.596’	20’
STA 2	Ball Field next to 7/11	N21º19.931’	W157º41.818’	20’
STA 3	Naturally Hawaiian Gallery	N21º20.418’	W157º42.236’	10’
STA 4	Entrance of Waimanalo Bay Recreation Area	N21º20.594’	W157º42.439’	10’
STA 5	Inoaole Stream	N21º20.765’	W157º42.671’	3’
STA 6	East end of Waimanalo Shopping Center	N21º20.875’	W157º43.243’	24’
STA 7	Kahawai Stream	N21º20.894’	W157º43.395’	20’
STA 8	Waimanalo Stream	N21º21.025’	W157º43.699’	20’
STA 9	Olomana Golf Course Entrance	N21º21.283’	W157º43.781’	30’

Appendix 2. Presence of bird species on nine survey stations, December 13, 2004, Kalanianaole Highway, Waimanalo, Oahu, Hawaii

SPECIES	STA 1	STA 2	STA 3	STA 4	STA 5	STA 6	STA 7	STA 8	STA 9	FREQ
Common myna	•	•	•	•	•	•			•	7
Red-vented bulbul					•	•	•	•	•	5
English sparrow	•	•	•			•				4
Zebra dove	•	•		•			•			4
Spotted dove	•				•				•	3
Cattle egret							•	•	•	3
Rock dove		•	•							2
Pacific golden plover				•				•		2
House finch							•			1
Japanese white-eye								•		1
Northern cardinal	•									1
Wandering tattler								•		1
Common noorhen							•			1
Red footed booby	•									1
Domestic chicken									•	1
Red crested cardinal		•								1

Appendix 3 Map of Survey Stations, December 13, 2003, Waimanalo, Oahu, Hawaii

APPENDIX G

Correspondence with U.S. Fish and Wildlife Service

HWY-DS 2.5909

NOV 1 2004

U. S. Fish and Wildlife Service
Refugees and Wildlife
300 Ala Moana Boulevard, Room 5-231
Honolulu, Hawai'i 96813

Subject: Request for Determination Letter
Threatened and Endangered Species
Proposed Kalaniana'ole Highway Improvements
Waimānalo, O'ahu, Hawai'i

Ladies and Gentlemen:

The State of Hawaii, Department of Transportation, Highways Division is proposing improvements to Kalaniana'ole Highway in the Waimānalo area to improve traffic operations on the highway. The improvements will be made between Olomana Golf Course and Waimānalo Beach Park within the existing highway right-of-way. Improving the highway will make the highway operate more efficiently and also make it safer and friendlier to pedestrians and other highway users.

Proposed improvements to the highway include left turning lanes at Flamingo Road, Kumuhau Street, Humuniki Street, Mekia Street, Mō'ole Street (both directions), Inoa'ole Street, and 'Alo'ilo'i Street. The left turning lanes will improve the through traffic along Kalanian'aole Highway and provide for safer conditions. Shelter lanes are proposed for left turning vehicles entering Kalaniana'ole Highway from side streets to make it safer for those drivers and to help improve traffic flow along Kalaniana'ole Highway. Where space is available, bus pullouts are proposed to alleviate queuing and improve traffic flow. The bus pullouts will also allow vehicles to pass by the bus instead of going around the bus and crossing double yellow solid pavement markings.

The plans also call for the existing concrete sidewalk on the mauka-side of the highway from Kumuhau Street to Inoa'ole Street to be reconstructed with a new ADA (Americans with Disabilities Act) accessible concrete sidewalk. The replacement will also include new ADA accessible driveways and curb ramps. This portion of the highway has been designated by the community as being one of the primary routes used by school children traveling to and from the Waimānalo Elementary and Intermediate Schools. Remaining areas along Kalaniana'ole Highway that do not have concrete sidewalks will have an asphalt concrete paved shoulder. Also, in locations identified by the community, a shared use grassed path (where available) is proposed to allow equestrian riders to traverse along Kalaniana'ole Highway to designated locations along the project.

We are currently working with the State Historic Preservation Officer (SHPO) regarding archaeological resources in the area and have identified the area of potential effect (APE) for the project. The APE is the existing highway right-of-way from Olomana Golf Course to Waimānalo Beach Park. Throughout this stretch of Kalaniana'ole Highway, the existing highway right-of-way varies in width from a minimum of

approximately 50 feet to a maximum of approximately 280 feet, although the majority of the highway right-of-way is approximately 50 to 100 feet wide.

We have conducted a botanical resources assessment study and a wildlife survey for the project. Copies of these documents are enclosed. The botanical resources assessment study concludes that no threatened and endangered species occur within the highway easements. The study stated that the ma'o which is found along Kahawai and Inoa'ole streams is considered a species of concern; however, the plants represent planted, horticulturally obtained material and not a naturally occurring population. No sensitive native plant-dominated communities were found to occur within the highway easements. In addition, no Exceptional Trees protected by City and County of Honolulu Ordinance 78-91 and 81-32 were found to occur within the highway easements.

The botanical resources assessment study stated that the existing highway easements support vegetation which is periodically maintained for the most part. Grassy mowed strips characterize the vegetation along most of the highway, especially in the residential areas. Koa haole scrub with Guinea grass and a few scattered trees are found on undeveloped areas bordering the highway easements. Given these findings, the botanical resources assessment study concludes that the proposed Kalaniana'ole Highway improvements, from Olomana Golf Course to Waimanalo Beach Park, are not expected to have a significant negative impact on the botanical resources.

The wildlife survey found the usual complement of introduced birds common to the lowlands of Oahu along the proposed route. No mammals were seen during the survey, although feral cats (*Felis cattus*), mongoose (*Herpestes auropunctatus*), rats (*Rattus* spp), and mice (*Mus musculus*) were stated as likely present in the area. During the wildlife survey, the federally listed endangered common moorhen was observed at Kahawai Stream, and a red footed booby was seen flying offshore in front of Waimanalo Beach Park.

Although not encountered during the current wildlife survey, the federally listed endangered koloa or Hawaiian duck (*Anas wyvilliana*) was found in Kahawai Stream during a survey conducted earlier in 2000. A pair was seen foraging along the concrete portion of the stream mauka of the highway and another was seen in the stream channel on the makai side. A native black-crowned night heron (*Nycticorax nycticorax hoactli*) was also seen in Kahawai Stream.

The wildlife survey concluded that the terrestrial habitat is not suitable for native birds with the exception of the migratory Pacific golden plover which occurred on lawns and in parks. The wildlife survey further concluded that the proposed widening project will affect an area immediately within the highway easements among residential and commercial properties, which are already highly disturbed. As long as the construction does not affect the stream channel, the wildlife survey concluded that there will be no effect on the endangered moorhen or koloa. The proposed project does not involve construction in the stream channel. According to the wildlife survey, construction activities may cause temporary disturbance to foraging opportunities immediately adjacent to Kalanianaole Highway, but these species seemed to be habituated to the highly modified stream channel, the close proximity of residences and the heavy traffic on the bridges.

Please review the enclosed documents and issue a determination letter of "no effect" anticipation to the following agency:

State of Hawai'i, Department of Transportation
Highways Division, Design Branch
601 Kamokila Boulevard, Room 688
Kapolei, Hawaii 96707
Attention: Mr. Vincent Llorin

Should you have any questions about this undertaking, please contact Mr. Vincent Llorin of the State of Hawai'i, Department of Transportation, Highways Division, Design Branch, Technical Design Services Office at 692-7568.

Very truly yours,

RODNEY K. HARAGA
Director of Transportation

Enclosures: (1) *Botanical Resources Assessment Study, Kalaniana'ole Highway Improvements, Olomana Golf Course to Waimanalo Beach Park, Waimanalo, O'ahu*, Prepared by Winona P. Char, Char & Associates Botanical Consultants, February 2004.

(2) *Wildlife Survey, Kalanianaole Highway Widening, Olomana Golf Course to Waimanalo Beach Park, Waimanalo, Oahu, Hawaii*, Prepared by Tim J. Ohashi, Certified Wildlife Biologist, February 28, 2004.

c: FHWA (C. Chew) w/ enclosures
Akinaka & Assoc. (B. Muranaka) w/o enclosures, Mountain Edge Environmental (J. Hernando) w/o enclosures

bc: HWY-DS (VL)

VL:vl

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122, Box 50088
Honolulu, Hawaii 96850

In Reply Refer To:
1-2-2005-I-069

DEC 7 2004

Mr. Vincent Llorin
Hawaii Department of Transportation, Highways Division, Design Branch
601 Kamokila Boulevard, Room 688
Kapolei, Hawaii 96707

Dear Mr. Llorin:

Thank you for your letter dated November 1, 2004, requesting our concurrence with your no effect determination for your proposed federally (Federal Highway Administration)-funded project to improve the Kalanianaole Highway in the Waimanalo area between the Olomana Golf Course and Waimanalo Beach Park within the highway right-of-way. Highway improvements include adding left turn lanes, bus pullouts, and shelter lanes for turning vehicles. We received your letter on November 5, 2004.

Based on our review of the information contained in your letter and in our files, including data compiled by the Hawaii Natural Heritage Program, the endangered Hawaiian moorhen or gallinule (*Gallinula chloropus sandvicensis*), Hawaiian duck (*Anas wyvilliana*), and the threatened Newell's shearwater (*Puffinus auricularis newelli*), may occur within the project area. We agree that the proposed project may cause minimal temporary disturbance to foraging opportunities for the Hawaiian duck and moorhen. In addition, Newell's shearwaters may become confused by bright lights at night and may circle around the lights until they become exhausted and fall to the ground where they are injured or killed by vehicles or predators. If the project is constructed during the daytime (i.e., no use of bright lights at night) in the nesting season (mid-April through November), we believe the proposed project may avoid impacting this species. There is no critical habitat in the vicinity of the proposed project. Because there may be minimal temporary impact to the Hawaiian duck and moorhen, we would concur that this project is not likely to adversely affect those species. Also, if the project is not conducted at night during the Newell's shearwater nesting season, we would concur that this project is not likely to adversely affect Newell's shearwaters.

We appreciate your efforts to conserve endangered species. If you have any questions, please contact Elizabeth Sharpe, Fish and Wildlife Biologist (phone: 808/792-9400; fax: 808/792-9580).

Sincerely,

for Gina M. Shultz
Acting Field Supervisor

cc: Clifford Chew, Federal Highway Administration

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APPENDIX H

Cultural Impact Assessment

Cultural Impact Assessment

For the Kalaniana‘ole Improvement Project,

Waimānalo Ahupua‘a, Ko‘olaupoko District, Island of O‘ahu

Por. TMK: 4-1-03 through 09, 12, 13, 15, 16, 18, 19, 20, 21, 22, 28, 33, 34

by

Auli‘i Mitchell, B.A.
and
Hallett H. Hammatt, PhD

Prepared for
Mountain Edge Environmental Inc.
P.O. Box 237
Ka‘a‘awa, HI. 96730

by
Cultural Surveys Hawai‘i, Inc.
June 2005

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I. INTRODUCTION

A. Project Background

Cultural Surveys Hawai‘i, Inc. was contracted to prepare a Cultural Impact Assessment for the Kalaniana‘ole Highway Improvement Project. The purpose of the project is to improve traffic operations on Kalaniana‘ole Highway between Olomana Golf Course and Waimānalo Beach Park in Waimānalo, O‘ahu, Hawai‘i (Figures 1-3).

The Department of Transportation is planning to improve traffic operations on Kalaniana‘ole Highway between Olomana Golf Course and Waimānalo Beach Park by making improvements within the existing highway right-of-way. Improving the highway will make the highway operate more efficiently and also make it safer and friendlier to pedestrians and other highway users.

Proposed improvements of the highway include left turning lanes at Flamingo Road, Kumuhau Street, Humuniki Street, Mekia Street, Moole Street (both directions), Ino‘a‘ole Street, and Aloiloi Street. The left turning lanes will improve the through traffic along Kalaniana‘ole Highway and provide for safer conditions. Shelter lanes are proposed for left turning vehicles entering Kalaniana‘ole Highway from side streets to make it safer for those drivers and to help improve traffic flow along Kalaniana‘ole Highway. Where space if available, bus pullouts are proposed to alleviate queuing and improve traffic flow. he bus pullouts will also allow vehicles to pass by the bus instead of going around the bus and crossing double yellow solid pavement markings.

The plans also call for the existing concrete sidewalk on the *mauka* or upland side of the highway from Kumuhau Street to Ino‘a‘ole Street to be reconstructed with a new ADA (Americans with Disabilities Act) accessible concrete sidewalk. The replacement will also include new ADA accessible driveways and curb ramps. This portion of the highway has been designated by the community as being one of the primary routes used by school children traveling to and from the Waimānalo Elementary and Intermediate School. Remaining areas along Kalaniana‘ole Highway that do not have concrete sidewalks will have an asphalt concrete paved shoulder. Also, in locations identified by the community, a shared use grassed path (where available) is proposed to allow equestrian riders to traverse along Kalaniana‘ole Highway to designated locations along the project.

The function of this Cultural Impact Assessment is to document and evaluate the effects the planned redevelopment may have on native Hawaiians or any other concerned ethnic group in terms of their culture and their rights to practice traditional customs. The State Constitution, state laws and courts “require government agencies to promote and preserve cultural beliefs, practices, and resources of native Hawaiians and other ethnic groups” (in Office of Environmental Quality Control, *Guidelines for Assessing Cultural Impacts*, Adopted by the Environmental Council, State of Hawai‘i, November 19, 1997).

Under Act 50, Chapter 343, Hawai‘i Revised Statutes, 2000, the following protocols are encouraged when preparing a Cultural Impact Assessment.

- Identify and consult with individuals and organizations with expertise concerning the types of cultural resources, practices and beliefs found within the broad geographical area, e.g., district or *ahupua‘a* or land division;

- Identify and consult with individuals and organizations with knowledge of the area potentially affected by the proposed action;
- Receive information from or conduct ethnographic interviews and oral histories with persons having knowledge of the potentially affected area;
- Conduct ethnographic, historical, anthropological, sociological, and other culturally related documentary research;
- Identify and describe the cultural resources, practices and beliefs located within the potentially affected area; and
- Assess the impact of the proposed action, alternatives to the proposed action, and mitigation measures, on the cultural resources, practices and beliefs identified.

B. Scope of Work

This study is meant to satisfy requirements related to Cultural Impact Assessments (CIAs). The scope of work is summarized as follows:

1) Examination of historical documents, Land Commission Awards, historic maps, with the specific purpose of identifying traditional Hawaiian activities including gathering of plant, animal and other resources or agricultural pursuits as may be indicated in the historic record.

2) A review of the existing archaeological information pertaining to the sites on the property as they may allow us to reconstruct traditional land use activities and identify and describe the cultural resources, practices and beliefs associated with the parcel and identify present uses, if appropriate.

3) Conduct scoping, consultations and informal oral interviews with persons knowledgeable about the historic and traditional practices in the project area and region.

4) Preparation of a report on items 1-3 summarizing the information gathered related to traditional practices and land use. The report will assess the impact of the proposed action on the cultural practices and features identified.

C. Methods

Historical documents, maps and existing archaeological information pertaining to historical properties in the vicinity of this project were researched at the State Historic Preservation Division library, Cultural Surveys Hawai‘i Library, Asian Pacific Digital Library of Kapi‘olani Community College, and the University of Hawai‘i’s Hamilton Library. The Office of Hawaiian Affairs, O‘ahu Island Burial Council, Hui Mālama O Nā Kūpuna, and members of other community organizations were contacted in order to identify potentially knowledgeable individuals with cultural expertise and or knowledge of the study area and the surrounding vicinity. A discussion of the consultation process can be found in the section on “Community Consultations.” Please refer to Table 2 for a complete list of individuals and organizations contacted. Five informal interviews were conducted for this assessment.

D. Project Description Area

The project area is located on the windward side of the Island of O‘ahu, in the district of Ko‘olaupoko within the *ahupua‘a* of Waimānalo. Waimānalo is a broad amphitheater-shaped valley with a relatively level floor composed of moderately sloping alluvial fans. It is in the “late mature to old Age” stage of erosional development (MacDonald et al. 1983:217). The subject property is located in central Waimānalo on the “Waimānalo Plain" (Armstrong, et al. 1973:30) along Kalaniana‘ole Highway. The project area extends from Olomana Golf Course to the east end of Waimānalo Beach Park (Figures 1-3). Elevations within the project area range from approximately 5 feet AMSL at the southern boundary to 80 feet at the north. Annual rainfall averages between 1000 and 1500 mm (40 to 60 inches) per year (Giambelluca et al. 1986:73).

There are twelve soil types of varying properties within the project area. The southeast half of the project area consists of Jaucas sand with some Kawaihapai clay loam 0-2% slopes, Mokulē‘ia loam, Ewa silty clay loam 0-2% slopes, Haleiwa silty clay 0-2% slopes, and coral outcrop. The northwestern half of the project area consists of Ewa silty clay loam 0-2% slopes, Kokokahi clasy 6-12% slopes, Pōhākupu silty clay loam 0-8% slopes, Kaloko clay, noncalcareous variant, Hanalei silty clay 0-2% slopes, Alaeloa silty clay 15-35% slopes, Papaa clay 6-20 % slopes, and Papaa clay 35-70% slopes. The soil survey of O‘ahu indicates that portions of the present project area are underlain by Jaucas Sand deposits which may contain traditional Hawaiian sites such as cultural layers and/or human burials.

Vegetation in these lower elevations of Waimānalo is overwhelmingly exotic (introduced), including *koa haole*, Christmas-berry, lantana, guava, and a variety of exotic weeds, but landscape plantings predominate in this area.

Figure 1. Portion of 1999 USGS Koko Head Quad Map showing location of project area

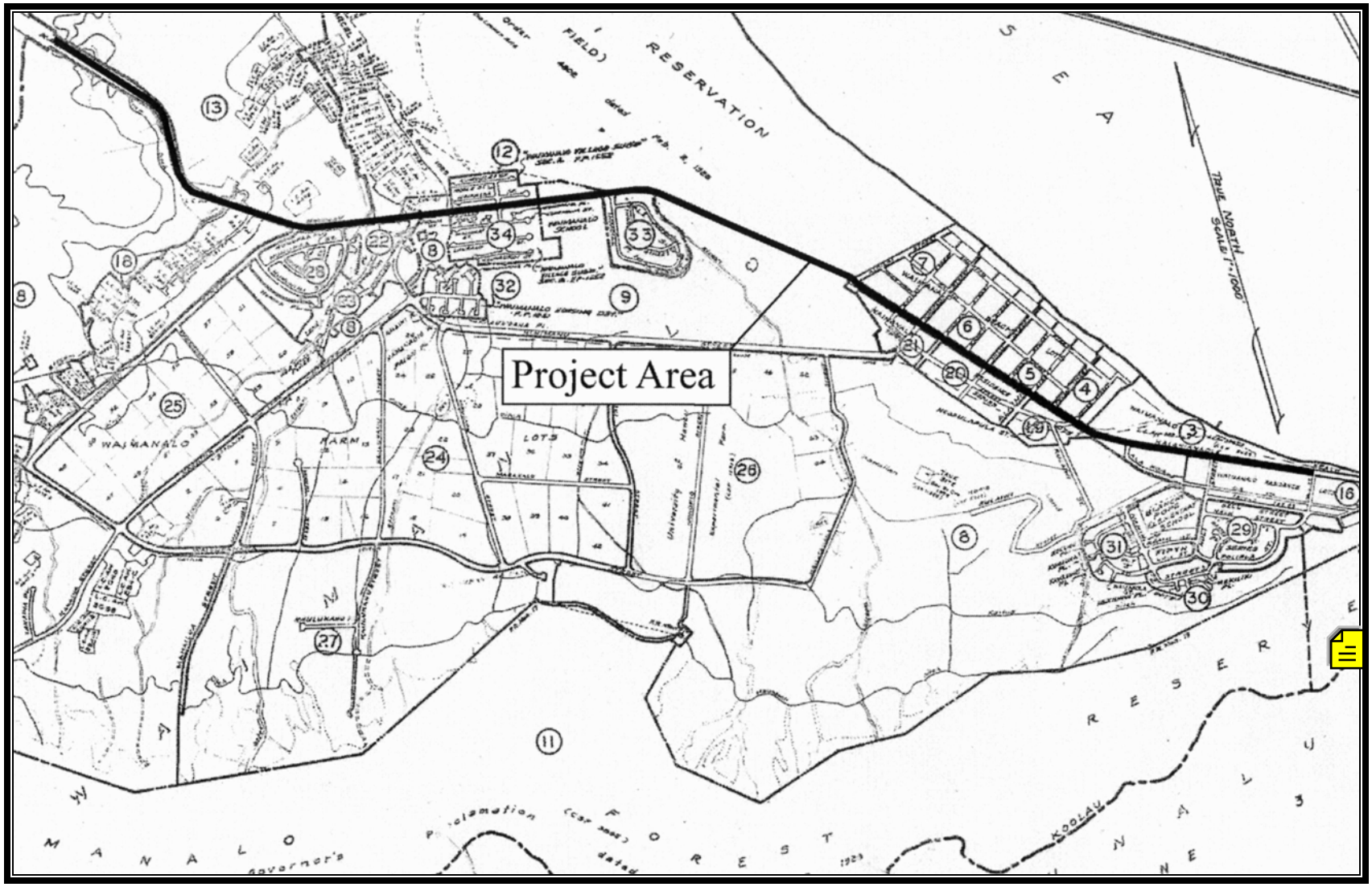

Figure 2. Portion of TMK 4-1 showing project area

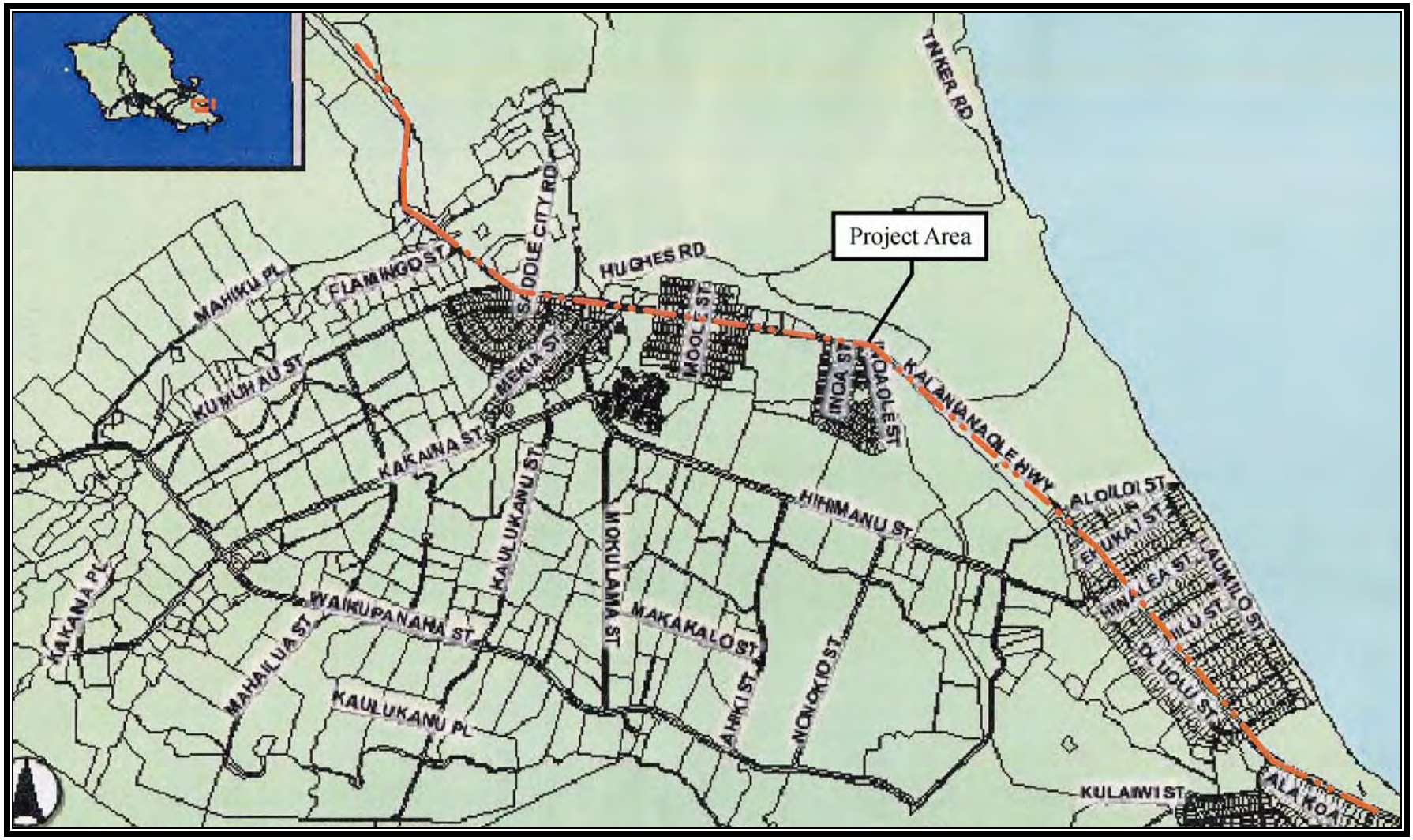

Figure 3. Project area map showing surrounding street names

II. MYTHOLOGICAL AND TRADITIONAL ACCOUNTS

Traditional accounts present some generally recurring themes about Waimānalo. The themes include the scarcity of water except for small springs and Waimānalo Stream: the abundance of food crops along Waimānalo; and the somewhat isolated nature of Waimānalo, especially in terms of land routes, but with a sandy beach frontage slowing easy access by sea.

A. Place Names

The studyof place names often yields insights into prior land use and available resources. Place names identified in the project area are summarized below:

1. Waimānalo

"Potable water" (Pukui, et al. 225:1974), is a large *ahupua‘a* located in the district of Ko‘olaupoko, O‘ahu. “Ahupua‘a” refers to the traditional land divisions that were basic units of social, economic, and political life in pre-contact Hawai‘i.

2. ‘Āpuakea

Rain name associated with Ko‘olaupoko, O‘ahu, said to be named for a beautiful woman, ‘Āpuakea, changed to rain by Hi‘iaka (Pukui 1986:28).

3. Ka Lua O Pele

Above Puhā is an old crater called Ka Lua O Pele (Pele’s Pit). Pele dug here long ago and gave it up when she came to water. Much *pālolo* clay was found here and Alona remembered seeing the women come to get it to rub into their scalps before going to the sea. The clay was washed out in sea water. The scalps were very clean, free of dandruff and the hair grew long and thick (Sterling and Summers 1978:243-255).

Alona, Charles, Informant, Sept. 22, 1939 Waimānalo, O‘ahu Place Names

4. Pu‘u Kilo i‘a

East of Puhā in Waimānalo, beyond a long pine tree on the shore is Pu‘u Kilo i‘a. Here a person stood to see whether a school of fish could be seen and from here he signaled to the men of the canoes where to go in order to surround the schools with a net (Sterling and Summers 1978:243-255).

Alona, Charles, Informant, Sept. 22, 1939 Waimānalo, O‘ahu Place Names

5. Puhā (hollow) River (Sport of Pu‘ewai)

In 1875 Queen Emma made a three-day stop in Waimānalo during a tour of O‘ahu and was given a welcome befitting a queen. All sort of festivities had been planned for this very special occasion. Emma, the queen, was coming to Waimānalo, and no expense or effort was being spared. Excitement was high; the resident of the area had prepared food, lodging and entertainment for this queen, the widow of King Kamehameha IV, Alexander Liholiho (Silva 1998:12).

John Cummins had a gang of men at work preparing to open the bar at the mouth of Puhā River. The bar or dam had accumulated for some years and much water was backed up. He had seen this open on a former occasion, and the sports of the natives in swimming the raging waters (*pu'ewai*), and determined to give her Majesty (Queen Emma) and a party a view of the ancient sport…an opening of 20 feet or more having been made in the dam the water rushed out at the rate of 30 knots or more. The bore or surge caused was very high, and only two men and two women dared to play on this water-surf called Pu'e Wai (1875) (Sterling and Summers 1978:243-255). Cummins, John A. Around O'ahu in Days of Old *The Mid-Pacific Magazine*, Sept. 1913, p. 235

6. Wai Kūpanaha (Amazing waters)

There is a spring called Wai Kūpanaha (*kūpaianaha*) in the valley *mauka* of the sugar mill, surrounded by tall taro plants, banana trees and fragrant white gingers. According to Charles Alona, the Wai kūpanaha on the west side of Mr. Castle's place was a *lele* (part of a lot of land belonging to an '*ili*), or a part of this *kuleana*, so both were given the same name. The upland piece was for taro growing and the piece near the sea was for fishing. The former owners of Wai kūpunaha went inland to raise taro and then to their land by the shore to fish. Both places had water but today only the upland Wai kūpanaha had water.

This Wai kūpanaha could not be tampered with but left as nature made. Japanese used a pipe to draw water from the spring to the house and the water ceased to flow. Then Alona asked him to remove his pipe and as soon as they did so, the water flowed again in abundance. It still feeds some taro patches below as it did in former times (Sterling and Summers 1978:243-255).

Alona, Charles, Informant, Sept. 22, 1939 Waimānalo, O'ahu Place Names

7. Kupunakāne and Kupunawahine Springs

There are two peculiar springs at Waimānalo, Ko'olaupoko. The one called Kunpunakāne is away up the mountains. The spring called Kupunawahine is a spring way down on the level land. The strange, strange thing about these ponds was that on calm, sunny days they begin to cry out to each other. Their voices were soft and sounded very much like a woman mourning her husband. On days that were over cast with clouds in the sky, the water of the mountain spring changed. The water of the mountain spring became warm and when you drank the water in the lowland spring it was cool, according to their legend.

8. Pu'u o Molokai (Hill of Molokai)

Across from the Waimānalo Park, surround by a cane field are two low hills. The smaller of the two is Pu'u o Molokai.

Long ago a Molokai man came here and went to live on a low hill not far from Muliwaiolena. The reason for his coming from Molokai to O'ahu was forgottin long ago but others followed and dwelt with him. This hill was called Pu'u o Molokai or Molokai's Hill. The newcomers made their homes on the hill itself and kept very much to themselves. When a boy married one of the girls of Waimānalo, he had to leave his own people to dwell with his wife's. If a girl married a Waimānalo man she too left her own people. Gradually the Molokai people were absorbed by those of Waimānalo. Alona's great granddaughter was one of those who belonged to the Molokai group (Sterling and Summers 1978:243-255).

Alona, Charles, Informant, Sept. 14, 1939 Waimānalo, Oʻahu Place Names

9. Muliwaiʻōlena (Tumeric River or Yellow River)

It is right here in Koʻolau, at Waimānalo, and is there this day, by a village called Kapua, belonging to an ancient chief, Lupe (Sterling and Summers 1978:243-255).

When Kauholokahiki, sister or Kānehunamoku, came ashore from Ulukaa she landed at Ulupau in Mōkapu. There she built a shrine on which to lay her offerings, and there she was found by some women who went to gather sea weeds on the shore and made friends with her. The native women admired the beauty of the stranger who was covered only by a skirt of green *pahapaha* seed weeds. One of the women removed her own body covering and draped it around the hips of the stranger and invited her to her home. Her beauty glowd like a light in the house and many people came with gifts of *tapa*, skirts, dogs, hogs, and *poi*. One day the chief Ilauhoe took Kauholokahiki, the stranger, to be his wife. She was so beautiful that even the palms of her hands were lovely. When the chief Ilauhoe married her, the chief wanted her to go bathing with him but she answered, "I am *kapu* and can bathe in no other water unless you go yourself and fetch my bathing water from Muliwaiʻōlena." The husband said, "It may be in Kahiki and is too far. We do not know where this water is." She replied, "If you love me, O Chief, go yourself for my bathing water that I mentioned. It is in Waimānalo, at Kapua, a village belonging to the chief Lupe. It is the stream with the yellow water that runs quietly. This is the one." The chief ran at once with a container and in no time he dipped up the water a retuned. It was indeed yellowish color and that was the first time that it was known that this was Muliwaiʻōlena. It is there to this day……

Uaua, W. H., Mulilwaiʻōlena, *Ke au Okoa*, Dec. *, 1870

At the little white bridge we gazed into the yellowish green water of Muliwaiʻōlena…The water never has dried up and is not fed from the mountains except when it rains heavily.

Alona, Charles, Informant, Sept. 14, 1939 Oʻahu Name Places

10. Pāhonu (Pond)

Pāhonu, an enclosure for turtles that was once located back of Mrs. Wall's present home (Sterling and Summers 1978:243-255).

> There was once a chief who was so fond of turtle meat that he ordered a sea wall built to keep captured turtles from escaping. Every turtle caught by a fisherman was put into this enclosure. No one else was allowed to partake of turtle meat under penalty of death. No one dared to eat turtle as long as the old chief lived.
>
> Next to Pāhonu is Kaakaupapa. The old saying of this place was, "*Papa ke kānaka, papa nā mea a pau*"—"Multitudes of people, multitudes of gods, all in multitudes."
>
> Alona, Charles, Informant, Sept. 14, 1939 Waimānalo, Oʻahu Name Places

11. Kini

Above the road, a little to the west (of the Castle gate), lies a large rock, Kini. It is a female rock that attracted the *akule (Trachurops crumenophthalmus)* and *ʻōʻio(Albula vulpes)* fish to this place. It used to be lower down but when the road was put through, it was tossed up there.

The road workers had a time moving it for it moved this way and that until at least the men succeeded in throwing it up there. It now lies on its side with top toward the hill. There is a slight depression on it where *awa (Piper methysticum)* used to be poured before the fishermen went to fish. Thie first fish caught was always laid on it when they returned. The last man to put *akule* fish on the stone was Kaalele, a man from Maui who came here to live.

Often the perfume of flowers would be borne by the wind from this stone to the homes of the natives. There would be the smell of ginger, *hala (Pandanus odoratissimus)* or *maile* (*Alyxia olivaeformi*) vines. The people who caught the fragrance would say, "The old lady has been some where to visit, we smell the fragrance of her leis."

Note: Castle gate – 41051 Kalaniana‘ole Hwy.

Alona, Charles, Informant, Sept. 22, 1939 Waimānalo, O‘ahu Name Place

B. Myths and Legends Associated with Waimānalo

1. Pele and Hi‘iaka

Mythological references to Waimānalo, occurs in the Pele and Hi‘iaka epic: "As they traveled on, Makapu‘u and its neighbor hills passed out of sight. Arriving at Ka-ala-pueo, they caught view of the desolate hill Pōhaku-loa, faint, famished, forlorn…" (Emerson 1915:89). Hi‘iaka is moved to chant a chant of Hawai‘i Island on the theme of privation including the line:

Puanaiea ke kanaka,	Man faints,
Ke hele I ka li‘u-lā,	If he travels to far,
I Kohola-pehu, I ke kaha O Hāwī, e.	In the outer wilds of Kohala, in the barren lands of Hawi
Wī‘ai ‘ole, make I ka i‘a ‘ole, e.	It's famine, privation of bread, of meat. (Emerson 1915:89)

Emerson's (1915:89) account goes on to relate regarding eastern Waimānalo: "It is indeed a barren land. Fish is the only food it produces. Our vegetables come from Waimānalo. When the people of that district bring down bundles of food we barter for it our fish."

Another theme associated with Hi‘iaka's traverse of Waimānalo is her interactions with the local beauty ‘Āpuakea..Fornander (1916: Vol. VI:343, "Philological and Miscellaneous Notes") relates: "At Kapu in Ko‘olau Muiwai‘ōlena and her daughter ‘Āpuakea were killed because the latter compared herself to Hi‘iaka's beauty." A fuller account is given in a rendition of the story of Hi‘iaka-i-ka-poli -o-Pele in the Hawaiian language newspaper *Ka Leo o Ka Lāhui:*

> They traveled past Kuhui (Kukui?) And Pāhonu where the people shouted at the beauty of Hi‘iaka. The news reached the ears of ‘Āpuakea and she said to her mother, Muliwaiolena, "Oh, Muiwaiolena, go and take a look at the women whose

> beauty the people are shouting about and see if they are as beautiful as I am." Muliwaiolena came out and looked. Never had she seen anything on O‘ahu to equal the beauty of these women. Turning to ‘Āpuakea she said, "Daughter, your beauty does not compare with their great beauty. You are like the soels of their feet." Hearing this the expression on ‘Āpuakea's face changed and she fainted away.
>
> Hi‘iaka overheard to words of the woman to her daughter and she uttered this chant:
>
> O ‘Āpuakea-nui, you beautiful woman,
>
> Comparisons have been made of your charms,
>
> You are beautiful, beautiful indeed.
>
> Muliwaiolena then called out to Hi‘iaka and her friend, "Come in, eat and drink and when you are full then continue on your long journey." But the travelers did not accept as they did not like the embarrassing comparison that had been made between themselves and the young girl, ‘Āpuakea.
>
> As the travelers went off Muliwai‘ōlena suddenly feell dead. Shortly afterwards ‘Āpuakea died… (*Ka Leo o Ka Lāhui* March 14, 15, 1893.)

It is said, "that the people named the place [‘Āpuakea, by the coast, central Waimānalo] for her and for her fair skin" (Alona Sept. 22, 1939 O‘ahu Place Names)

2. The *Kupua* Malei

The *kupua* (supernatural being) Malei in the epics of Pele and Hi‘iaka was a female kupua who assumed various bodily forms. Offerings were necessary, not for her physical but for her spiritual sustenance. The burnt offering was not merely pleasing for its sweet smelling savour, it was an ailment necessary to the creature's continued existence. For the same or a parallel reason, songs of praise and adulation (*kanaenae*) were equally acceptable and equally efficacious. Cut off the flowers of speech as well as the offerings of its worshippers, and a *kupua* would soon dwindle into nothingness (Emerson 1915:88-89).

Emerson (1915:89) later speaks again of the *kupua* Malei, that he was told by a Hawaiian woman on entering a certain cave in the region of Waimānalo, found herself confronted with a stone figure, from which flowed like burning coals a group of eight flaming eyes, being set in deep sockets in the stone. This rare object was soon recognized as the bodily dwelling of the *kupua* Malei. This little monolith at a later time came into the possession of Mr. John Cummins of Waimānalo.

3. Luhia, The *mookāne* of Waimānalo

Luhia was a *mo‘o kāne* (male *mo‘o*) who lived in Waimānalo not far from a stream. He used to visit around while people were eating and ask what they were having. One day he found some people who had cooked *‘o‘opu (Quisquillius eugenius)* in ti leaf bundles. He called to his people,

these *'o'opu* (body of *mo'o*), and they came streaming out of the bundles in the form of live lizards.

Hence the saying, "Puka ma ka apua"-"out of the handle of the ti leaf bundle" when a person gets away scot free from *pilikia* (trouble).

Mary Kawena Pukui, Informant, June 2, 1953

III. HISTORICAL BACKGROUND

A number of historical sketches of the Waimānalo area have been done, notably, the mythological and archaeological material on Waimānalo found in *Sites of O'ahu* (Sterling and Summers, 1978), "A General Plan for Waimānalo Valley, Island of Oahu (Harold Bartholomew and Associates, 1959), and the "Historical Documentary Research" of Waimānalo with specific reference(s) to Bellows Air Force Station by Carol L. Silva (Rosendahl, ARA 20-020781, 1981). The following brief synopsis owes much to these works and credit must be given the authors for the bulk of the research.

A. Early Historic Period

Two early foreign visitors, both missionaries, were generally unimpressed with Waimānalo. Their descriptions of the area, however, are of interest. Levi Chamberlain in 1828 comments on Waimānalo being a "considerable settlement" and while there, stayed in a native house, "a miserable place for the abode of human beings and presented a motley group of children and women, dogs, hogs and fowls" (Chamberlain 1856:80-1, in Silva 1981:A-20). In 1830, Edwin Hall writes, "we could not however, but notice, that most of the inhabitants on the eastern end of the island were much more degraded, and exhibited far less evidence of improvement than any we saw on other parts of the island; a fact calling for our sympathy and pity, and for our endeavors to enlighten and elevate them" (Hall 1939:111; in Silva 1981: A-21).

B. Mid to Late 1800s

The *ahupua'a* of Waimānalo was awarded to Victoria Kamāmalu, subject to the *kuleana* claims of the commoners. She received the third largest share of lands among the *ali'i nui* of the Kingdom of Hawai'i including 47 other *ahupua'a*-sized parcels in addition to Waimānalo. Approximately 113 *kuleana* Land Commission Award claims were awarded in Waimānalo. Nearly all of these *kuleana* were along Waimānalo Stream or its upper tributaries in the west portion of the *ahupua'a* (Figure 4). There appear to have been only two Land Commission Awards in all of central and east Waimānalo, both located on the coast in east Waimānalo. While it seems highly probable that the Hawaiian population of Waimānalo was much larger and more dispersed in pre-contact times, it nevertheless appears highly likely that the traditional Hawaiian population of Waimānalo was always very much focused along Waimānalo Stream and its upper tributaries.

C. Ranching Period

In 1828 an Englishman, Thomas Cummins, arrived in Hawai'i and soon after married the High Chiefess Kaumakaokane, who was related to Kamehameha I. This marriage provided Cummins with connections to the throne. Cummins received a Royal Patent to an estate of crown lands in Waimānalo in 1842 (Dorrence 1995:1), and in 1850 Kamehameha III leased the entire Waimānalo Ahupua'a (except for the *kuleana*) to Thomas Cummins. The original deed is dated Feb. 12, 1850 and was for a period of 50 years for 6,970 acres at $350.00 per annum. However, there was confusion over the land title. Alexander Liholiho Kamehameha IV, "deeded" Waimānalo to a Wm. Webster in 1855 for $1. Wm. Webster mortgaged the land for some $2,000 with the mortgage being released in 1857. The same thing happened again in 1857 with the mortgage clearing by April 1858. These deeds and mortgages did not actually cause the control

of lands to change, as Thomas Cummins retained his lease, but they apparently served as security for loans made to Alexander Liholiho.

Thomas Cummins and his son John A. Cummins turned Waimānalo into a large cattle and horse ranch. The Cummins Estate, "Mauna Rose" was known for its lavish parties. Cummins was also host to American and British officers on warships visiting in Hawaiian waters.

Documentation of such as visit is written in *The Echo of Our Song Chants & Poems of the Hawaiians,* translated & edited by Mary Kawena Pukui & Alfons L. Korn:

> The following chant commemorates a visit of Queen Kapiʻolani to Rose Mount (Mauna Loke), the residence and sugar plantation owned by John A. Cummins at Waimānalo, Oʻahu. According to oral tradition, the chants were presented to the queen, along with accompanying feather leis, early in 1883, the year when King David Kalākaua and the queen were crowned on February 12.
>
> However, Kapiʻolani undoubtedly visited the plantation and Cummins'flower gardens and grounds on a number of occasions, such as when on her birthday, December 31, 1885, she and "quite a number of ladies and gentlemen had been invited from Honolulu, some of whom went by the steamer Waimānalo, leaving early in the morning, and other took the overland route later in the day" ("Sugar History," here and following quoted passages). The sea was reported smooth and the journey as a whole was in no way strenuous: "The distance from the landing to Mr. Cummin's residence, over two miles, through sugar cane in all stages of growth, was traveled by the rail.
>
> Only a generation before it became a sugar plantation, the Cummins ranch at Waimānalo had been crown land first leased by Kamehameha III in the 1840s to Thomas A. Cummins, an English settler. The region at that time was still one of heavy forests and small farms, mainly breadfruit, mountain apple, *kukui*, and coconut trees, with scores of taro patches, sweet potato gardens, and fields of native sugarcane grown solely for domestic use. Grass houses abounded by the hundreds. Fishing was good along the shore. After the arrival of Cummings, small *kuleana*, customary holdings of old native families, were sold or abandoned and much of the land was given over to raising livestock: "Taro patches were trodden down, edible cane and ti were disturbed, the large trees died because lack of moisture for their roots, and the whole valley became a cast cattle ranch."
>
> Under the management of Thomas's son, John A. Cummins, an amiably enterprising part-Hawaiian who was a good friend of King Kalākaua, sugar became the dominant crop in place of sheep, cattle and horses; pasture land "gave way to cane field and the Reciprocity Treaty in 1875 quickly made sugar profitable, and by 1879 the plantation was a going commercial concern featuring many modern

improvements. In addition to increasing irrigation facilities, John A. Cummins imported from Scotland a two-roller, eight ton mill with a capacity of producing from eight to ten tons of sugar a day. By January of 1881 grinding had started, and it must have been these "grinders that falter not at their grinding" that Kapiʻolani beheld for the first time shortly before her birthday on December 31, 1882. Financial control of the plantation and mill passed into the hands of W. G. Irwin, a very large-scale operator, in 1885. Cummins continued as local manager. Gradually Chinese and other Oriental laborers replaced the native population as the major source of labor supply.

Clearly the pace of change and modernization in Hawaiʻi, especially as measured by the introduction of machines, increased in the 1880s. On January 27, 1883, the *Pacific Commerical Advertiser* noted that "the railway [at Waimānalo] is now finished form the mill to the beach and everything is in first rate order for growing and securing each season's crop."

He Mele Hulu nō Kapiʻolani I Waimānalo

Aia i Waimānalo kō nuʻa hulu,

Ehaku ia mai la e Mololani.

Nohoʻokalani hano i ka nani,

I ka lawe haʻaheo a Moku-lua.

Hoʻohihi ka manaʻo e ʻike aku,

E kilohi i ka nani o Moku-manu.

Pōhani a ka manu I ka lewa lani,

Kīkahakaha mai I ka ʻili kai.

Welo haʻaheo kō hae kalaunu,

ʻIke mai ʻo Mālei ke kupua.

O ia kai kapu la ua noa,

Ua hehi kū ia aku e kalani.

Nāu i ʻōlali hoʻohie aku,

O ia mau ʻale hānupanupa.

ʻIniki welawela, a ke ʻehu kai,

Lamalama ʻula i ka lani aliʻi.

Li'li'I nā hana a ke kelepona,

Ha'iha'i 'ōlelo me ka huapala.

E Kapi'olani la e ō mai,

Ka wahine nona ke lei ho'oheno.

A Feather Chant for Kapi'olani at Waimānalo

Now at Waimānalo your heap of feathers and our offering,

gifts fashioned for you by the people of Mololani.

She sits, the beautiful Chiefess,

in her place of honor journeying onward to Moku-lua.

Entrancing thoughts fill the mind,

when eyes mirror Moku-manu's charm.

Birds circle about the sky, poise

in dipping flight over the waves.

Proudly the royal flag flies acknowledged

greeted by Mālei, guardian goddess of this shore.

Now the sacred *kapu* of the sea is lifted,

made free by the Chiefess in her journey.

It is she who glides in beauty,

over billows of the ever-surging sea.

Cold spray pierces, the skin of the Chiefess

warms within from its own ruddy glow.

Now that the telephone makes work such a trifle,

how easy to converse with the best beloved!

O Kapi'olani, answer to out call!

You are the woman we praise, this lei of affection is yours.

[Mary Kawena Pukui & Alfons L. Korn 1973:156-162]

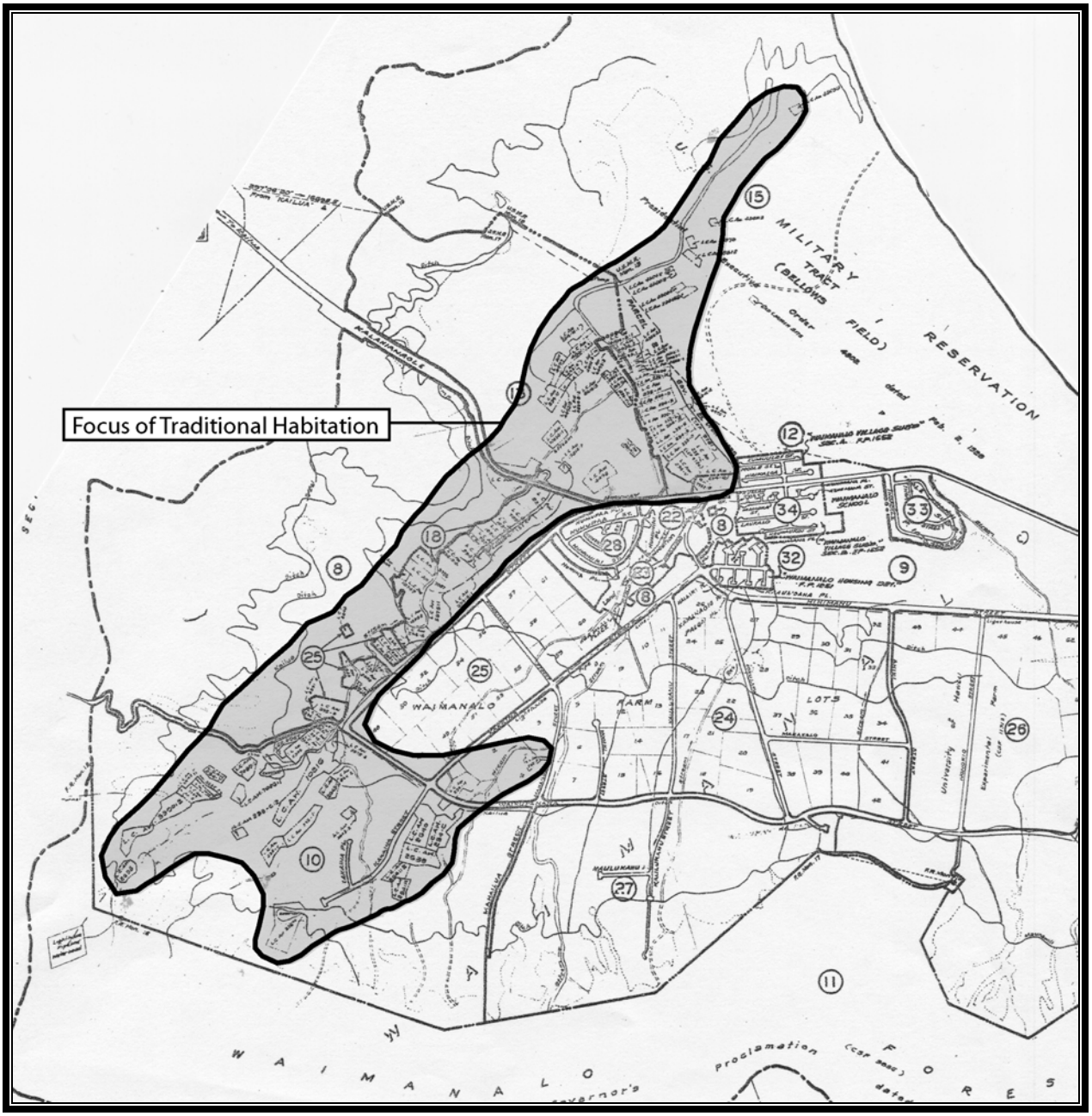

Figure 4. Map showing the location of the aggregation of *kuleana* Land Commission Awards along Waimānalo (Puhā) Stream in West Waimānalo

D. Late 1800s to 1900s

The Kamehamehas, King Kalākaua and Queen Lili‘uokalani all made this part of the island their home, and they spent a great part of their time at the Cummins Estate" (Star Bulletin 6/22/1935:9; in Silva 1981:A-22). However, it appears as if not all were enthusiastic about the cattle ranching.

> At the time, it seemed that the valley was filled with breadfruit, mountain apples, *kukui* and coconut trees. There were taro patches, with banks covered with ti and *wauke* plants. Grass houses occupied the dry lands, a hundred of them here and sweet potatoes and sugar cane were much grown. It was a great help toward their livelihood... The whole ahupua‘a of Waimānalo was leased to white men except the native *kuleana* and because the cattle wandered over them, they were compelled to build fences for protection. The taro patches that were neatly built in the time when chiefs ruled over the people and the land were broken up. The sugar cane, ti and *wauke* plants were destroyed. The big trees that grew in those days, died because the roots could not get moisture. The valley became a place for animals (*Kuokoa*, Oct. 26, 1906; in Sterling and Summers 1973:244).

E. The Waimanalo Sugar Company

The Cummins Estate eventually began to buy up the *kuleana* of the native farmers, gaining some 200 acres in fee. By the early 1870’s Chinese rice farmers were using some of these lands under agreement with John A. Cummins. In 1876 the Hawaiian Kingdom entered into a Reciprocity Treaty with the United States. This allowed the growing Hawaiian sugar industry a free market and the potential for great profits. A *mele* or chant was written when his majesty King David Kalākaua gave Pearl Harbor to the United States in the Reciprocity Treaty in exchange for allowing sugar from Hawai‘i to enter the United States duty free:

Aia o Kalani i Maleka	The Heavenly one has gone to America
Ike kuikahi panai like	To seek a reciprocity treaty
I ola nou e Hawaii	To give life to you Hawai‘i
No ke au ho‘oulu lahui	For at this time of increasing population
Ke ui a‘e nei ka manao	The idea has entered the mind
E hui Hawaii me Maleka	To have Hawai‘i and America unite
I mau oe ika ihikapu	That you may continue with your sacred duties
Ika uluwehi o Hale-alii’	In the beautiful surroundings of the palace
He alii nui no Kawika	David is a great ruler
Ua kau ika Noho Kalaunu	He sits upon the throne
Haina ka puana i lohe ia	This is the end of praise, let all hear
O Kalani Kawika he inoa	The name of King David

[Chants of old Hawai‘i, n.d. Charles Kahiwahiwa Cash]

Translation by Auli‘i Mitchell

One of the Chinese rice farmers, Tai Lee, began sugar cultivation on Cummins' land. Eventually Tai Lee and other Chinese farmers cultivated up to 1,200 acres of cane in Waimānalo.

John A. Cummins saw the potential of sugar production at Waimānalo and in 1880 started construction of a sugar mill. The Waimānalo Landing pier is understood to date from c. 1883 (Marine Option Program 1999:12). In 1890, J. A. Cummins renegotiates his father's lease for an additional 30 years and "sub-lets the lands of Waimānalo to the Waimanalo Sugar Company (W.S.C.) which he then controlled" (Bartholomew and Ass., 1959:14). The plantation continued to buy sugar from the Chinese farmers until around 1900, when W. S. C. did most of its own cultivation.

During this time, sugar and most goods were transported between Honolulu and Waimānalo by steamer. The Cummins Estate was still renowned for its extravagant hospitality. Lavish week-long luaus were given for Hawaiian Royalty. King Kalākaua came and rode on the newly built railroad in 1882 and in 1885 Cummins was host in celebrating Queen Kapiʻolani's birthday. The second steam engine Cummins bought in 1883 for his Waimānalo plantation, later named the "Olomana," is today in the Smithsonian Institution in Washington D.C. as a reminder of this period of history (Williams 1996:B1). The present project area (Kalanianaʻole Highway) lies along the railway route established in this era. (Figure 5, 7-8).

The Waimanalo Sugar Co. continued to grow and business was good. More lands were being put under cultivation. New tracks were being laid and another locomotive was ordered. Interest in W. S. C. grew, and in 1885 W.G. Irwin of the W.G. Irwin & Co., agents for W. S. C., gained control with J. A. Cummins staying on as overseer. In 1894, J. A. Cummins sold the majority of shares in W. S. C. to two California men and a Kohala sugar planter Robert. R. Hind, with George Chalmers taking over duties as plantation manager. J. A. Cummins died in 1913 and his estate sold the remaining fee simple lands and the unexpired lease of Waimānalo to W. S. C. for $52,000. In 1910 W.G. Irwin and Co. merged with C. Brewer. By 1922, the present project area was under commercial sugar cane cultivation by the W.S.C. (Figure 6, 10, 11 & 12). The Waimānalo Plantation Locomotive was still in use between the years 1938-1940 (Figure 9). C. Brewer controlled W. S. C. until its liquidation in 1947 (Figure 10 & 11). The Waimānalo pier ended service in 1924 when the Pali road was officially opened (Marine Option Program 1999:13).

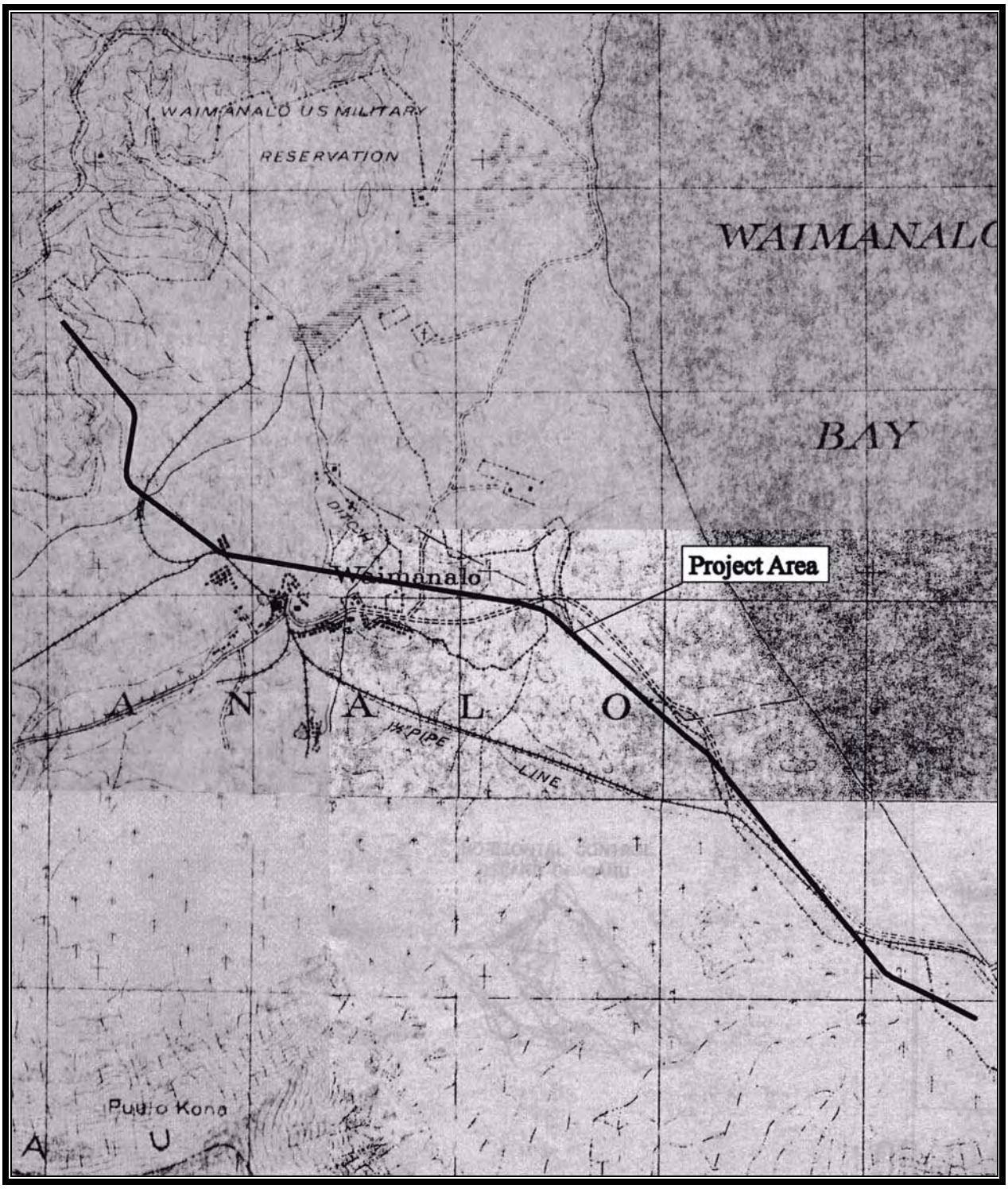

Figure 5. Portion of 1919 Fire Control Waimānalo and Koko Head Maps showing location of project area

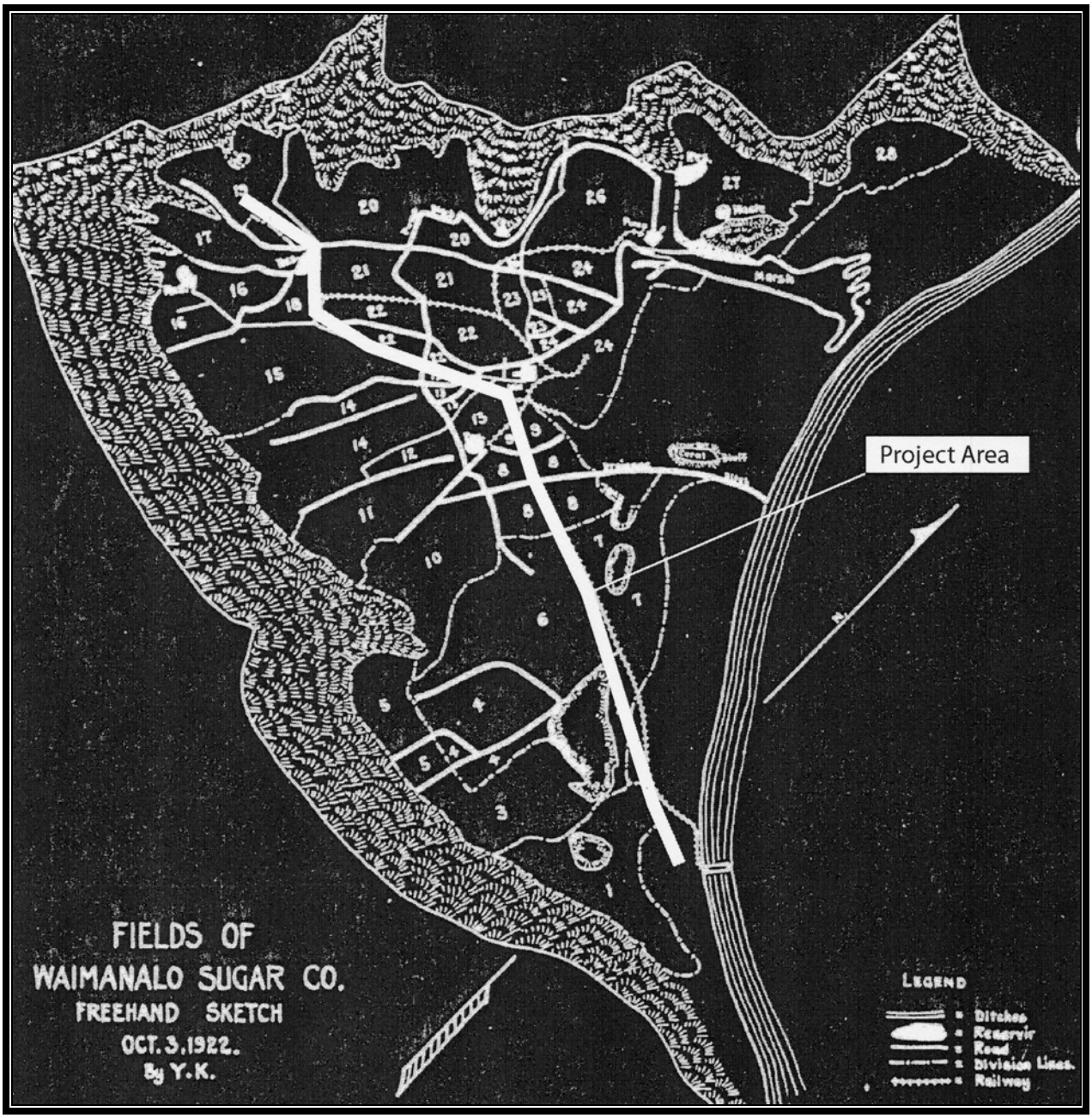

Figure 6. Portion of "Fields of Waimānalo Sugar Company Map" (1922) showing location of project area

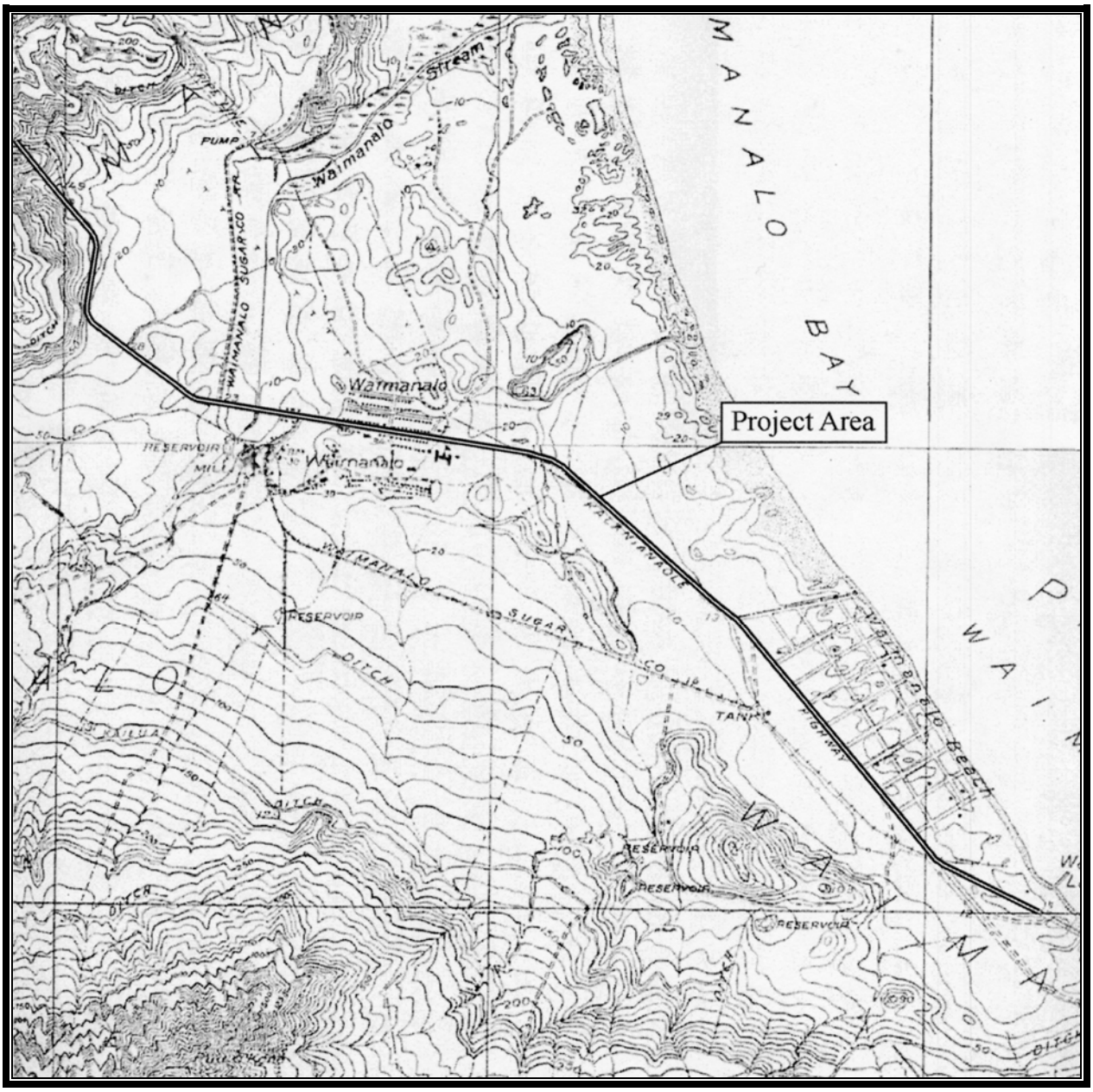

Figure 7. Portion of 1928 USGS Mokapu and Koko Head Maps showing location of project area

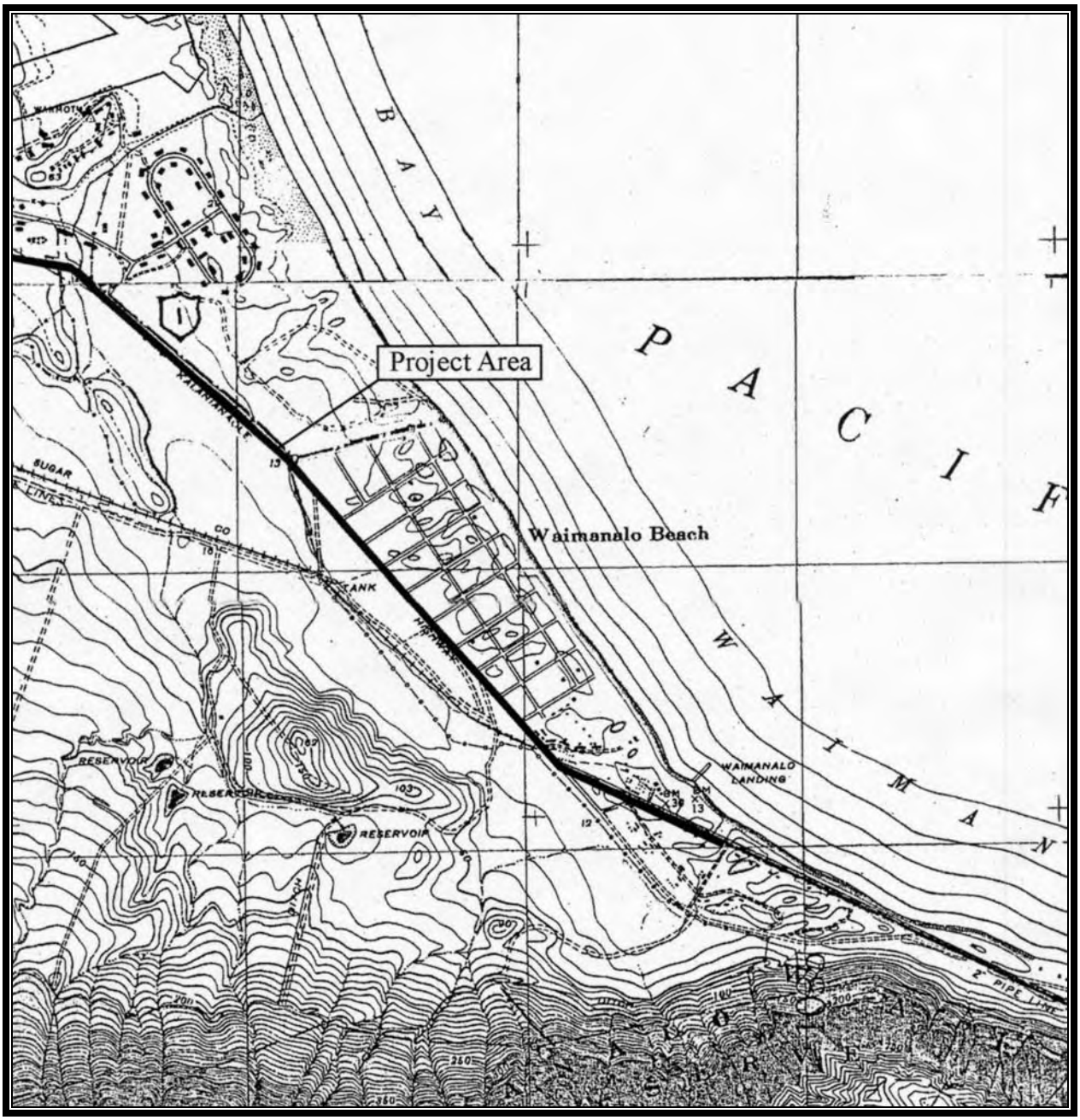

Figure 8. Portion of 1943 War Department Kailua and Makapu‘u Maps Showing Location of Project Area

Figure 9. Bishop Museum Photograph of Waimānalo Plantation Locomotive, O‘ahu 1938-1940

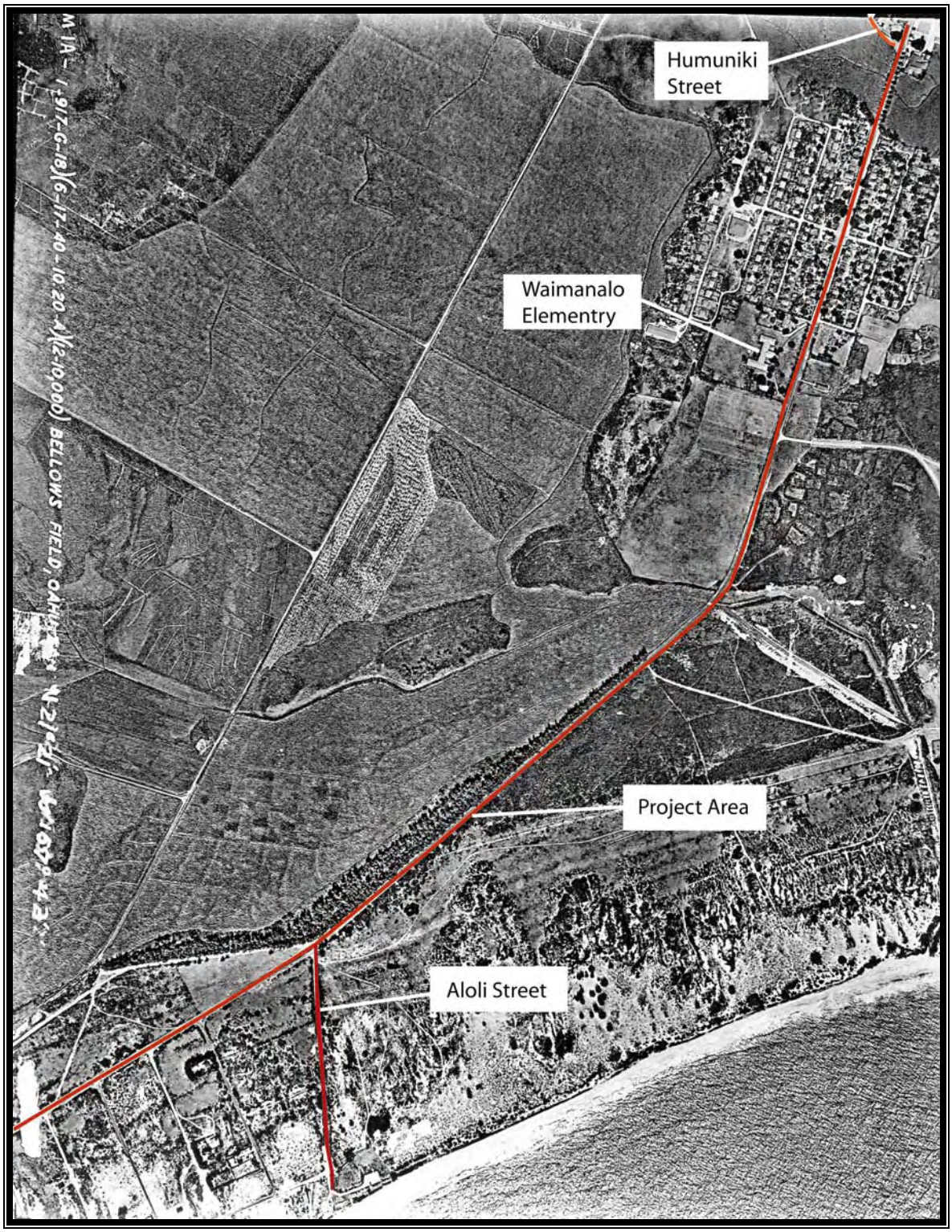

Figure 10. 1900s aerial photograph from the Bishop Museum showing sugar cultivation *mauka* of the project area

Figure 11 Bishop Museum Photograph 1920s Showing Waimānalo Sugar Mill

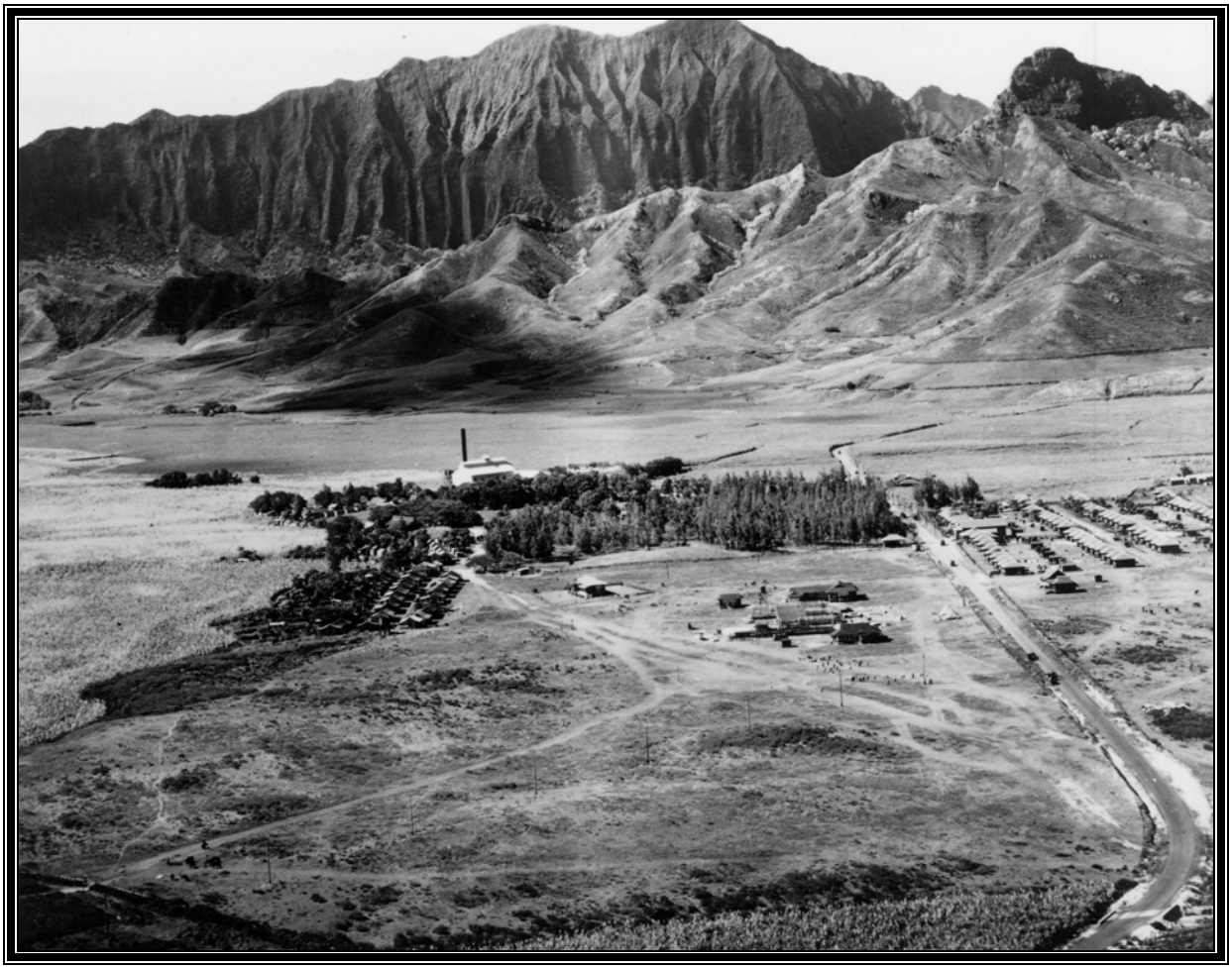

Figure 12. Bishop Museum aerial photograph of Waimānalo, O`ahu, Dec. 1925

IV. PREVIOUS ARCHAEOLOGICAL RESEARCH

Archaeological work along the shoreline of Waimānalo (Bellows Air Force Station) has detailed some of the earliest known sites in the Hawaiian Islands. Site 50-80-15-18 (018 Dune Site), which is situated at the present mouth of Waimānalo Stream, has been dated to circa A.D. 400 and is included on the National Register of Historic Places (as part of site 50-80 -15-511). While the dates reported for Bellows Air Force Station have been a matter of much discussion and dispute they are still regarded as relatively early.

Waimānalo, in general, is distinguished as being the place of one of the earliest archaeological investigations in the Hawaiian Islands. In 1879, Mr. Otto Finsch reported on human burials in sand deposits and associated artifacts in the area that is now Bellows Air Force Base (Finsch 1879). There have been approximately one hundred archaeological studies in Waimānalo Ahupuaʻa, which are summarized in Table 1 and Figure 13.

McAllister, in his *Archaeology of Oahu*, reports two sites in *mauka* Waimānalo (McAllister 1933:191). Both of these sites are *heiau*. Site 381 is located on the slope below Mt. Olomana to the west of the northernmost portion of the present study area. Site 382 is referred to by the name of the place - Pōhakunui - and stands on a hill near the top of Mahailua Road, southwest of the present project area.

The major foci in archaeological research in Waimānalo has been the Bellows area and to a much lesser extent the Waimānalo State Recreation Area. Bellows Air Force Station is one of the most extensively studied areas on Oʻahu. Beginning in the 1960s, approximately 70 separate reconnaissance, survey, excavation and monitoring projects have taken place, most in conjunction with construction activity. Human burials, lithic scatters, soil features and/or occupation layers have been found almost everywhere archaeological investigation has taken place. Possibly, the most important finds occurred in dune deposits adjacent to the mouth of Waimānalo Stream referred to as Site 018. Radiocarbon dates on charcoal from cultural layers within the dune which placed the earliest occupation to around 300-400 C14 years A.D. (Tuggle et al. 1978) have been much disputed but these deposits are still considered to be among the oldest in Hawaii (Pearson et al. 1972, Cordy and Tuggle, 1976 and Kirch, 1985:71). Much of the research since this discovery of early Bellows Dune occupation has focused on attempting to connect other archaeological finds in more inland areas of Bellows to this early Polynesian settlement. Bellows remains a focus of continuing archaeological research.

Approximately a dozen archaeological studies were carried out at the Waimānalo State Recreation Area just south of Bellows mostly between 1976 and 1980. There was hope that the occupation layers documented just to the north might be present in the State Recreation Area but findings thus far have been rather disappointing.

Studies in the general vicinity of the present project area include Hibbard and Kolb 1991, McGuire and Hammatt 2000a, Perzinski et al. 2001, and Perzinski et al. 2002.

The Hibbard and Kolb (1991) study was a report on a brief field inspection of a houselot and neighboring area at Waiokeola Street (TMK 4-1-36:18) approximately 500 m south of the present project area. The presence of a stacked mound and a tumbled wall of unknown function was noted. The import of this is unclear beyond indicating some cultural activity in the vicinity.

The McGuire and Hammatt (2000a) study was an archaeological monitoring report on excavations for the installation of six light poles for a ball field at Waimānalo Beach Park immediately adjacent to the southwest portion of the project area. No cultural findings were reported (dirt fill over sterile sand) but the actual area monitored was very small.

The Perzinski et al. 2001 report covers monitoring for a similar Sandwich Isles Communications project in three areas: at the intersection of Oluolu and Ehukai Streets, at the *mauka* end of Aloiloi Street and at Nakini Street. This project thus included monitoring immediately adjacent to the present project area. Along Nakini Street the observed sediments were sandy clay loam with modern trash mixed in extending to the base of excavation (Perzinski et al. 2001:15). No sites, burials, cultural layers, or significant finds were observed in the course of this work but a relatively small portion of this project was actually monitored.

The Perzinski et al. 2002 report addresses finds during archaeological monitoring at a *kūpuna* housing project on a 7.92-acre parcel at 41-209 Ilauhole Street, immediately adjacent to the present project area. Three inadvertently disturbed human burials and a cultural layer (State site #50-80-15-5939) were encountered during construction activities in the far (northwest) corner of the parcel. No cultural layer or burials were identified in the work on the Nakini Street side of that project.

Table 1 Previous archaeological studies within Waimānalo Ahupuaʻa

Year	**Author(s)**	**Title**	**Comments**
1879	Finsch, Otto; Alexander, A.D. (Translator)	Bericht Uber Insel Oahu (Letters from the Island of O`ahu)	Told there was "a place of skulls" in Waimānalo
1933	McAllister, Gilbert	Archaeology of Oʻahu	Identified 3 *heiau* (380, 381, & 382), a *puʻuhonua* (383), a fishpond (383a), and abandoned coastal village(384)
1971	Gormley, Michael K.; Yent, Martha; Davis, Bertell D.; Imamoto, Shirley; Kavanagh, B. P.	Site 3000: University of Hawaii at Mānoa, Summer Field School, Summer 1971.	Study of Kaupo Fishing Village area
1971	Pearson, Richard	Archaeological Reconnaissance Survey; Waimanalo Bay State Recreation Area; Waimanalo, Oahu TMK 4-1-03:016	Site 512 remnant sand dune & cultural layer & 513, cultural deposits, human remains

1971 (1967)	Pearson, R. J., P. V. Kirch & M. Pietrusewsky	"An Early Prehistoric Site at Bellows Beach, Waimanalo, Oahu, Hawaiian Islands," Archaeology and Physical Anthropology in Oceania VI (3)	Reports study of stratigraphy, cultural finds & 5 sets of human remains BAFS
1973	Davis Bertel	Kaupo Cave Shelter, Site 3000, Feature 1: A Preliminary Report on Artifact Analysis	UH Mānoa M.A. thesis based on field work at Kaupo Village complex
1974	Tuggle, H. David & M. J. Tomonari	Surface and Sub-surface Survey of Selected Zones of Bellows Field Archaeological Area	Summary of excavations historic deposits in 4 of 7 areas examined, BAFS
1975	Cordy, Ross	O18 O'ahu Island New Work and New Interpretations	Reports on further work at O18 and adjacent sites BAFS
1975	Nakama, Stella	Archaeological Surveillance of a Drip Irrigation Line: Bellows Air Force Station, Oahu, Hawaii.	Monitoring of a backhoe Trench - minimal findings BAFS
1975a	Tuggle H. David	Report on Archaeological Investigations of the Bellow Archaeological Zone National Register Site and Adjoining Portions of Bellows Air Force Station, Spring 1975	Presents findings at various zones of O18, BAFS
1975b	Tuggle, H. David	Archaeological Surveillance of Construction Excavation in Bellows Field Archaeological Zone of the Bellows Air Force Station, HI.	Brief study of construction monitoring NE BAFS
1975c	Tuggle, H. David	Preliminary Report on Subsurface Investigation of a Portion of Proposed Irrigation Line, Bellows Air Force Base, for Archaeological Evaluation	Letter report, no features or artifacts, BAFS
1975d	Tuggle, H. David	Archaeological Examination of Areas of Bellows Air Force Station Subject to Construction Activities.	Evaluates various areas, BAFS
1975	Tuggle, H. David, Stella K. Nakama, and Thomas N. Manabe	Subsurface Investigations of Site 511-5 Bellows AFS, Oahu, Hawaii, Pertaining to "Seawall Repair and Drip Line" Project	Provides data and conclusions re: archaeological import of site 511-5, BAFS

1976	Cordy, Ross and David Tuggle,	Bellows, Oahu, Hawaiian Island: New Work and New Interpretation.	Reviews problems, includes results of investigations in inland areas, BAFS
1976	Davis, Bertell D.	Archaeological Investigations at the Waimanalo Bay State Recreation Area, Koʻolaupoko, Waimanalo, Oʻahu Island.	Not seen
1976	Davis, Bertell	Archaeological Survey and Testing at the Waimanalo Bay State Recreation Area, Koʻolaupoko, Waimānalo, Oahu Island, TMK 4-1-08:16	Sterile cores, Site 512 found imu
1976	Nakama, Stella & H. David Tuggle	A Report on Archaeological Monitoring of Repair of Water Distribution System, Bellows AFS	42 features possibly dating to Hawaiian traditional period, BAFS
1976	Tuggle, H. David and Thomas N. Manabe	Archaeological Monitoring of Drip Irrigation Line Construction: Bellows Air Force Station #2.	Results of second phase of drip irrigation monitoring, BAFS
1977	Davis, Bertell	Archaeological Investigations at the Waimanalo Bay State Recreation Area, Koʻolaupoko, Waimānalo, Oahu Island: Phase I, Subsurface Survey	Coring at Sites 512-513. Site 512 small stratified deposit with cultural features; Site 513 not locate reported burials or cultural deposit
1978	Davis, Bertell	Subsurface Archaeological Reconnaissance of Selected Areas at Bellows AFS, Oʻahu Island	Reports cultural deposits and human remains from NE Bellows, BAFS
1978	Cox, David W.	Waimanalo Bay State Recreation Area, Archaeological Monitoring of Fence Line, Water Line, Electrical Line, Sewer Line, Park Development, Phases I and II, Waimanalo, Koolaupoko, Oahu Island (TMK 4-1-15:15)	1 burial, site 512 outlined
1979a	Beggerly, Patricia	Archaeological Subsurface Investigation at Waimanalo Bay State Recreation Area, Koolaupoko, Oahu	18 augur holes with no subsurface cultural deposits

1979b	Beggerly, Patricia	Archaeological Monitoring and Subsurface Investigation at Waimanalo Bay State Recreation Area, Koolaupoko, Oahu	No findings
1979	Carter, Laura	Archaeological Monitoring of Selected Areas at Bellows Air Force Station, Oahu Island	Presents data on site -9645 NE Bellows, BAFS
1979	Griffin, Agnes and Martha Yent	Archaeological Subsurface Investigation at Waimānalo Bay State Recreation Area, Koʻolaupoko, Oʻahu.	Generally confirms absence of culture
1979	State Parks In-house Archaeological Team	Archaeological Monitoring and Subsurface Investigation at Waimānalo Bay State Recreation Area, Oʻahu. October 9, 1979-November 1, 1979.	Not seen
1979	Yent, Martha; and Agnes Griffin	Bulldozed Areas at Waimānalo Bay State Recreation Area, Koʻolaupoko, O`ahu	No findings
1980	Beggerly, Patricia (Lovelace & Ota)	Archaeological Test Coring at Waimānalo Bay State Recreation Area, Memorandum	No cultural deposits located
1980	Lovelace, George & Jason Ota	Archaeological Test Coring at Waimānalo Bay State Recreation Area	No cultural deposits
1980	Ota, Jason	Archaeological Monitoring at Waimānalo State Recreation Area Memorandum	Modern trash under parking lot
1980	Riley, Thomas J.	Archaeological Reconnaissance and Subsurface Testing of Proposed Boathouse Project Site at Bellows AFS, Hawaii	Presents results of 111 auger borings & 10 1m2 excavations - minimal findings, BAFS
1981	Kam, Wendell,	Archaeological Report of a Human Burial at Manana Island, Koʻolaupoko, Waimānalo, Oahu	Not seen
1981	Neller, Earl	Waimānalo Ditch System: Photo Survey	Photographs of ditches

1981	Rosendahl, Paul H.	Archaeological Reconnaissance Survey of Proposed Additional Marine Corps Training Areas Bellows Air Force Station Oahu	Extensive historical summary, BAFS
1981	Rosendahl, Paul H. and Carol L. Silva	Archaeological Reconnaissance Survey of Proposed Additional Marine Corps Training Areas, Bellows Air Force Station, Oʻahu, Hawaiʻi	Surface survey of 356-acre parcel, relocated 5 previously recorded sites, no new sites, BAFS
1982	Tuggle, David	Archaeological Reconnaissance: Bellows Air Force Station Waimānalo,.	No significant findings, BAFS
1983	Leidemann, Helen & Paul L. Cleghorn	Archaeological Monitoring of Vegetation Clearance on Antenna Fields at Bellows Air Force Station, Oahu, Hawaii	Site 3312, gravestone complex 1917 era, BAFS
1983	Sue, Roy K., Martha Yent, and Jason Ota	Waimānalo Watershed Project and Archaeological Survey of the Solid Waste Collection Site, Waimanalo, Oʻahu	No sites located
1984a	Barrera, William	Archaeological Services During Installation of Five Replacement Antennas at Bellows Air Force Station, Oʻahu, Hawaii	Notes discontinuous but related archaeological deposits, BAFS
1984b	Barrera, William	Waimanalo, Oʻahu: Archaeological Survey at Proposed Well Locations	Well sites III & IV, no significant findings
1985	Athens, J. Stephen	Archaeological Monitoring for Soil Coring, Bellows Air Station, Waimānalo, Oʻahu.	No significant findings, BAFS
1985	Griffin, P. Bion	Test Excavations at the Searex Tower Site, Bellows Field Archaeological Area, Bellows Air Force Station, Waimānalo, Oʻahu	No significant findings, BAFS
1985	Hammatt, Hallett H.	Letter Report on Archaeological Monitoring at Bellows Air Force Station Post Exchange Site	Minimal findings, BAFS
1985	Hammatt, Hallett	Archaeological Monitoring for Fuel Tank Trench at Bellows Air Force Station, Waimānalo, Oahu	Notes human bone and fire hearth, BAFS

1985	Hurlbett, Robert E.	Preliminary Report upon Completion of Fieldwork: Archaeological Reconnaissance and Subsurface Testing for Recreation Library Project Sites, Bellows AFS, Oahu.	No significant findings, BAFS
1985	Hurlbett, Robert E., Margaret Rosendahl, & Paul H. Rosendahl	Archaeological Reconnaissance, Subsurface Testing and Monitoring of Proposed Projects HIC 84-1269, Recreation Library and HIC 86-3221, Recreation Library Utilities Support Project Sites at Bellows AFS, Waimanalo, Koʻolaupoko District, Island of Oʻahu, Hawaiʻi (TMK:1-4-1--15:1),	No evidence of cultural materials, BAFS
1985	Mc Neill, J. R.	Archaeological Reconnaissance and Monitoring of Obstacle Course Construction at Bellows Air Force Station, Oahu, Hawaii.	Minimal Findings, BAFS
1985	Neller, Earl	An Archaeological Reconnaissance of Manana Island, Oahu	Not seen
1986a	Athens, Stephen	Preliminary Report: Archaeological Reconnaissance Survey for Proposed Omni Antenna, Bellows A.F.S., Waimanalo, Oahu, Hawaii.	Mostly transit work, no surface remains, brief synopsis of augering, BAFS
1986b	Athens, Stephen	Site Summary: Archaeological Deposits at the Bellows A.F.S. Omni Antenna Pad & Trench, Waimanalo, Oahu	Presents results of work at Site -1445, BAFS
1986	Kam, Wendell	Field Inspection of Bellows AFB Picnic Area #6, Waimanalo, Koolaupoko, Oahu, Memorandum,	Not seen, BAFS
1986	Kam, Wendell	Bellows Fence Repair Burial.	Account of human remains uncovered during construction, BAFS

1986	Kam, Wendell	Investigation of Discovery of Human Skeletal Remains, Bellows AFS, Koolaupoko, Oahu, Letter Report	Account of human remains uncovered during construction, BAFS
1987	Athens, J. Stephen	Archaeological Survey and Testing for Airfield Perimeter Fence Project, Bellows Air Force Station	Designates sites -3709 subsurface cultural deposit and -3710 marsh deposits, BAFS
1987	Pietrusewsky, Michael	Burial on Rabbit Island, Waimanalo Side, Waimanalo, Koʻolaupoko, Oʻahu Island., Police, Honolulu; Medical Examiner, Honolulu	Not seen
1987	Spriggs, Matthew	Report of Radiocarbon Dating Analysis	Review of carbon dating, BAFS
1988a	Athens, J. Stephen	Archaeological Reconnaissance and Subsurface Testing, Proposed Omni Antenna and Cable Trench, Bellows Air Force Station, Waimanalo, Oahu.	Documents discontinuous subsurface deposits & an area of basalt debitage, BAFS
1988b	Athens, J. Stephen	Archaeological Survey and Testing for Airfield Perimeter Fence Project, Bellows Air Force Station, Oahu, Hawaii	2 C14 dates A.D. 1390-1505 A.D. 1400-1525, BAFS
1988	Hammatt, Hallett H.	Archaeological Reconnaissance of a 3.9-Acre Parcel Adjacent to Sea Life Park, Waimānalo, Oʻahu,	No findings - parcel had been leveled and filled
1988	Hammatt, Hallett H. & Douglas Borthwick	Archaeological Reconnaissance of the Mauka Portion of Phase II Waimanalo Agricultural Park Waimanalo, Oʻahu	Previously under cane cultivation, notes two taro complexes
1988	McNeil, Judith R.	Intensive Archaeological Survey and Data Recovery at Site 50-80-15-3709, Bellows Air Force Station, Oʻahu, Hawaii	Describes essentially intact deposits of site -3709, BAFS
1988	Medical Examiner	Police and Medical Examiner's Reports on Burial at Kaiona Beach Park, Honolulu	Not seen

1988	Streck, Charles F. and Farley K. Watanabe	Archaeological Reconnaissance of Areas Proposed for Emergency Flood Repair and Replacement of Structures, Bellows Air Force Station (BAFS), Waimanalo, O‘ahu Island.	Minimal Findings, BAFS
1989a	Hammatt, Hallett H. & David W. Shideler	Archaeological Survey and Testing at Bellows Air Force Station for New Antennas and Trench Lines, Waimanalo, Ko`olaupoko, O‘ahu	Delimits cultural deposits in the vicinity of the Bellows runways, BAFS
1989b	Hammatt, Hallett H. & David W. Shideler	Archaeological Reconnaissance and Subsurface Testing of Proposed KNMD 773133, Park Complex, North Coastal Region of Bellows AFS, Waimanalo, O‘ahu, Hawaii.	Delimits cultural deposits in the vicinity of the NE portion of Bellows, BAFS
1989	McNeill, Judith R.	Intensive Archaeological Investigations at Site 50-80-15-3709, Bellows Air Force Station, O‘ahu, Hawaii	Final Report of McNeill 1988, BAFS
1990	McMahon, Nancy; Michele T. Douglas, and Michael Pietrusewsky	Burial Removal at 41-042 Manana Street, O‘ahu, Site No. 50-80-15-4118, TMK: 4-1-05:027.	Burial of a single individual
1990	Rolett, Barry V.	University of Hawaii Archaeological Research on Bellows Air Force Station: Report of the 1989 Field School and a Proposal for Further Research in 1990	Summary of 1989 Reconnaissance and areal excavation, BAFS
1991	Hibbard, Don and Michael Kolb	Field Inspection of Houselot and Neighboring Area at TMK: 4-1-36:18, Waimanalo, Ko‘olaupoko, O‘ahu	Notes a stacked mound and tumbled wall of unknown function
1991	Kawachi, Carol	Kaupo Beach Park Burials, Waimanalo, Ko‘olaupoko, O`ahu.	Not seen

1991	Miller, Lynn	Archaeological Monitoring of the Tinker Road Bridge Repair (Replacement) Project, Bellows Air Force Station, Waimanalo, Oʻahu Island, Hawaiʻi.	Reports cultural evidence of site -511 including 3 distinct occupational levels, BAFS
1992	Carpenter, Alan	Fieldcheck of Kealakipapa Valley Road Remnants, Makapuʻu Head, Maunalua, Koʻolaupoko, Oʻahu.	Presents a historical review and field observations focused on road remnants
1992	Rolett, Barry V.	1990 Archaeological Excavation at Site 50-80-15-3300 (Bellows Air Force Station, Oahu), Conducted by the University of Hawaii Archaeological Field School	Results of field school excavation at Site -3300, BAFS
1992a	Shun, Kanalei	Archaeological Monitoring and Sampling during Installation of Perimeter Security Fencing, Bellows Air Force Station, Waimanalo, Koʻolaupoko District, Island of Oahu, Hawaiʻi	A.D. 1410-1635 base layer A.D. 430-905 from charcoal in river bank,
1992b	Shun, Kanalei	Archaeological Reconnaissance Survey and Subsurface Testing for Proposed Electric Tie Circuit, Bellows Air Force Station, Waimanalo, Koʻolaupoko District, Island of Oahu, Hawaiʻi	Presents testing results, only remnant localized cultural deposits, BAFS
1993	Athens, J. Stephen & Jerome V. Ward	"Environmental Change and Prehistoric Polynesian Settlement in Hawaiʻi," Asian Perspectives	Scholarly work, BAFS
1993	Cordy, Ross H. and H. David Tuggle	"Bellows, Oahu, Hawaiian Islands: New work and New Interpretations," Archaeology and Physical Anthropology in Oceania XI (3)	Scholarly work, BAFS
1993	Dixon, Boyd	An Archaeological Reconnaissance of Five Board of Water Supply Wells on Oʻahu, Hawaiʻi.	Waimānalo Well III site - no significant findings

1993	Landrum, Jim & Allan Schilz	Archaeological Reconnaissance Survey, Monitoring, and Subsurface Testing at the Proposed Mini-Putt Golf Course Site Project KNMD 929122, Bellows Air Force Station, Waimanalo Ahupua1a, Koolaupoko District, Island of O‘ahu, Hawaii	4 C14s - A.D. 1259-1489 and A.D. 1280-1530; 1411-1681, 1427-1666 (200 meters from shore, Site 4522, BAFS
1993	Shun, Kanalei	Archaeological Monitoring and Sampling During Emergency Flood Repair Construction, Waimanalo and Inoaole streams, Bellows Air Force Station, Waimanalo, Koolaupoko District, Island of Oahu, Hawaii	Cultural deposits, C14 A.D. 1500, A.D. 700, BAFS
1993	Sinoto, Aki and Jeffrey Pantaleo	Archaeological Surface Assessment and Monitoring of 12.4 Acre Parcel for Hawaii Job Corps Center, Waimanalo, O‘ahu	Not seen
1993	Stride, Mark; Douglas F. Borthwick, and Hallett H. Hammatt	Archaeological Reconnaissance Survey of the 56 Acres for the Proposed Olomana Golf Course Expansion Area (TMK: 4-1-13:11)	Only parallel ditches and a reservoir were identified as a site (Site -4524), a component of Site -4042 Waimanalo Sugar Co. infrastructure
1994	Tuggle, H. David	Archaeological Research of Areas Proposed for the development of Military Family Housing and Expansion of Military Training at Bellows Air Force Station, Oahu	Site 4853, A.D. 380 to 600, BAFS
1995	Erkelens, Conrad	Preliminary Report on Archaeological Monitoring and Data Recovery of Underground Storage Tank Removal, Bellows AFS, Waimanalo, Hawai‘i	C14 dates between A.D. 1400 to 1529 (73% probability), BAFS

1997	Carlson, Ingrid	Archaeological Monitoring of Thirteen Locales for Site Assessment Field Sampling Activities at Bellows Air Force Station, Waimanalo, Oʻahu, Hawaiʻi	3 archaeological sites are located, no intact cultural deposits were found, BAFS
1997	Dega, Mike, Kyle, Latinis, and Randy Ogg	Draft–Archaeological Monitoring and Sampling During Excavations for the Removal of Underground Storage Tanks at Bellows Air Force Station Hawaiʻi, Waimanalo, Koʻolaupoko District, Oahu, Hawaiʻi	Understood as a draft of the following study, BAFS
1997	Latinis, D. Kyle, Michael F. Dega and Robert L. Spear	Archaeological Monitoring and Salvage Data Recovery Excavations for the Removal of Underground Storage Tanks at Bellows AFS Hawaiʻi, Waimānalo, Koʻolaupoko District, Oʻahu Island, Hawaiʻi.	Reports site -5464 a disturbed cultural deposit & a human bone, BAFS
1997	Tuggle, David H.	Final-Archaeological Research of Areas Proposed for Development of Military Family Housing and Expansion of Military Training at Bellows Air Force Station, Oʻahu,	Synthesis and reorganization of archaeological data, BAFS
1998	Carlson, Ingrid	Archaeological Monitoring for Bellows Excess Lands Engineering Evaluation/Cost Analysis Phase I Field Sampling Activities Bellows Air Force Station, Waimanalo, Oʻahu, Hawaiʻi	Minimal findings at 13 areas, BAFS
1998	Carlson, Ingrid and Tom Dye	Archaeological Monitoring Report for Site Investigations at Multiple Sites, Bellows Air Force Station, Waimanalo, Koʻolaupoko District, Oʻahu, Hawaiʻi	Identifies paleosols, but no cultural materials at two locations, BAFS

1998	Desilets, Michael and Thomas S. Dye	Archaeological Monitoring and Sampling during Bellows OU7 UST Removal Project, Interim Remedial Action, Phase I, Bellows Air Force Station, Waimānalo, Koʻolaupoko, Oʻahu	Site 50-80-15-4853, Hawaiian-era deposits were located in swales of a beach ridge; large amount of imported rocks & coral, BAFS
1998	Dye, Thomas	Archaeological Services in Support of the Final EIS for Proposed Expansion of Military Training and the Construction of Improvements to Existing Recreational Resources at Bellows Air Force Station, Waimānalo, Hawaiʻi	Presents data on four sites - 4851, -4853, -4855, -4857, BAFS
1999	Dye, Thomas and Coral Magnuson	Archaeological Monitoring for Multiple Dump Sites DP06, Bellows AFS, Waimānalo, Koʻolaupoko District, Oʻahu, Hawaiʻi	Reports a deeply buried wetland sediment but no direct evidence of taro or other cultivation, BAFS
1999	Marine Option Program	Waimānalo Landing - Underwater Survey	Documents machinery, pilings and various pieces of loading equipment
1999	Ogg, Randy and Michael Dega	Archaeological Monitoring and Sampling During Waterline Replacement at Bellows AFS, Waimānalo, Koʻolaupoko District, O`ahu Island, Hawai`i	Reports results of monitoring of 1.4 kms of trenching - minimal findings, BAFS
2000	Desilets, Michael	Archaeological Monitoring for Underground Storage Tank Removal on ST II Sites at Bellows AFS Hawaiʻi	Documents 3 traditional Hawaiian sites (-4850, -5464, & -383) and 1 military site (–4859), BAFS
2000	Desilets, Michael	Archaeological Monitoring and Sampling, Interim Removal Action Five Underground Storage Sites -047 Bellows AFS Hawaiʻi	Traditional Hawaiian cultural remains identified at several POL sites including identification of two new sites - 5799 & 5800, BAFS
2000	Eble, Francis and Lisa Anderson	Results of Archaeological Pre-Construction Subsurface Reconnaissance for Replacement of Beach Cottages at Bellows AFS, Island of Oʻahu, Hawaiʻi	Reports recovery of cultural remains incl. midden and fishing gear from a disturbed context, BAFS

2000	McGuire, Ka`ohulani and Hallett H. Hammatt,	Archaeological Monitoring Report for the Installation of Light Poles for a Ballfield at Waimānalo Beach Park, Waimānalo, Koʻolaupoko District, Island of Oʻahu (TMK: 4-1-003-016)	Minimal findings
2000	McGuire, Ka`ohulani and Hallett H. Hammatt	Archaeological Assessment for the Sea Life Park chapel and Multi-use Building at Makapuʻu, Ahupuaʻa of Waimānalo Koʻolaupoko District, Island of Oʻahu (TMK: 4-1-14:13)	Minimal findings
2000	McIntosh, James and Paul L. Cleghorn	Report on Archaeological Pre-Constrction Reconnaissance Subsurface Testing and Sampling for Proposed Housing Facilities Construction, Bellows AFS, Waimānalo, Oʻahu Island, Hawaiʻi, TMK 4-1-15	Reports on 40 auger and 2 hand excavated test units -minimal findings, BAFS
2001	Addison, David J.	Archaeological Subsurface Testing for the Removal of Pipeline Utilities Under the Installation Restoration Program at Bellows AFS, Waimānalo, Koʻolaupoko District, Oʻahu, Hawaiʻi	Reports results of 23 backhoe trenches & 3 test units documenting a wide-spread, partially intact cultural stratum, BAFS
2001	Leidemann, Helen	Phase I Archaeological Inventory Survey of Housing Replacement at Bellows AFS Hawaiʻi TMK 1-4-1-15	N edge of Bellows, minimal findings, BAFS
2001	Perzinski, David, John Winieski and Hallett H. Hammatt	An Archaeological Monitoring Report for Waimānalo Sandwich Isles Communication Project, Waimānalo, Koʻolaupoko District, Oʻahu, Hawaiʻi (TMK: 4-1-19,20, 21)	Minimal findings
2002	Farrell, Nancy and Robert L. Spear	Archival Research and Documentation of Battery Ricker, ST-10 USTS at Sherwood Forest State Park...	Provides background data on history of Bellows Field area

2002	Hammatt, Hallett H. , David W. Shideler and Anthony R. Bush	Archaeological Inventory Survey in Support of Modifications of the USDA Hawai‘i Fruit Fly Production Facility at Waimānalo, Ko‘olaupoko, O‘ahu	Minimal findings, discusses adjacent Tai-Lee Ditch
2002	McGhee, Fred L. and Valerie Curtis	Archaeological Monitoring and Sampling in Conjunction with Force Protection Installation Bellows Air Force Station	Minimal findings, BAFS
2002	McIntosh, James and Paul L. Cleghorn	Report of Archaeological Monitoring and Sampling During Placement of Electrical Poles at Bellows AFS, Waimānalo, Ko‘olaupoko District, O‘ahu Island, Hawai‘i, TMK 4-1-15	Identified several buried cultural deposits at two locales, BAFS
2002	Ogg, Randy and Michael Dega	Archaeological Testing and Sampling During Removal at Two Underground Storage Tanks at Sherwood Forest State Park, Waimānalo, Ko‘olaupoko District, O‘ahu Island, Hawai‘i	None of 13 trenches yielded significant cultural resources, BAFS
2002	Perzinski, David, Brian Colin, and Hallett H. Hammatt	Archaeological Monitoring Report for Waimānalo Kūpuna Housing Project at 41-209 Ilauhole Street, Waimānalo Ahupua‘a, Ko‘olaupoko District, O‘ahu Hawai‘i (TMK 4-1-19:32)	3 human burials and a cultural layer are reported (Site -5939)
2002	Roberts, Alice K. S. and Patrick Bower	Archaeological Monitoring 8-Inch Waterline Installation Project Bellows AFS, Waimānalo, Ko‘olaupoko District, O‘ahu Island, Hawai‘i (DACA 83-00-P-0038)	Describes a new sub-surface site -5854, BAFS
2002	Roberts, Alice K. S. and Eric W. West	Archaeological Monitoring and Sampling During Construction of Housekeeping Facilities (BFMV 955000) Bellows AFS, Waimānalo, Ko‘olaupoko District, O‘ahu Island, Hawai‘i (DACA 83-01-P-0019)	No significant cultural remains, BAFS

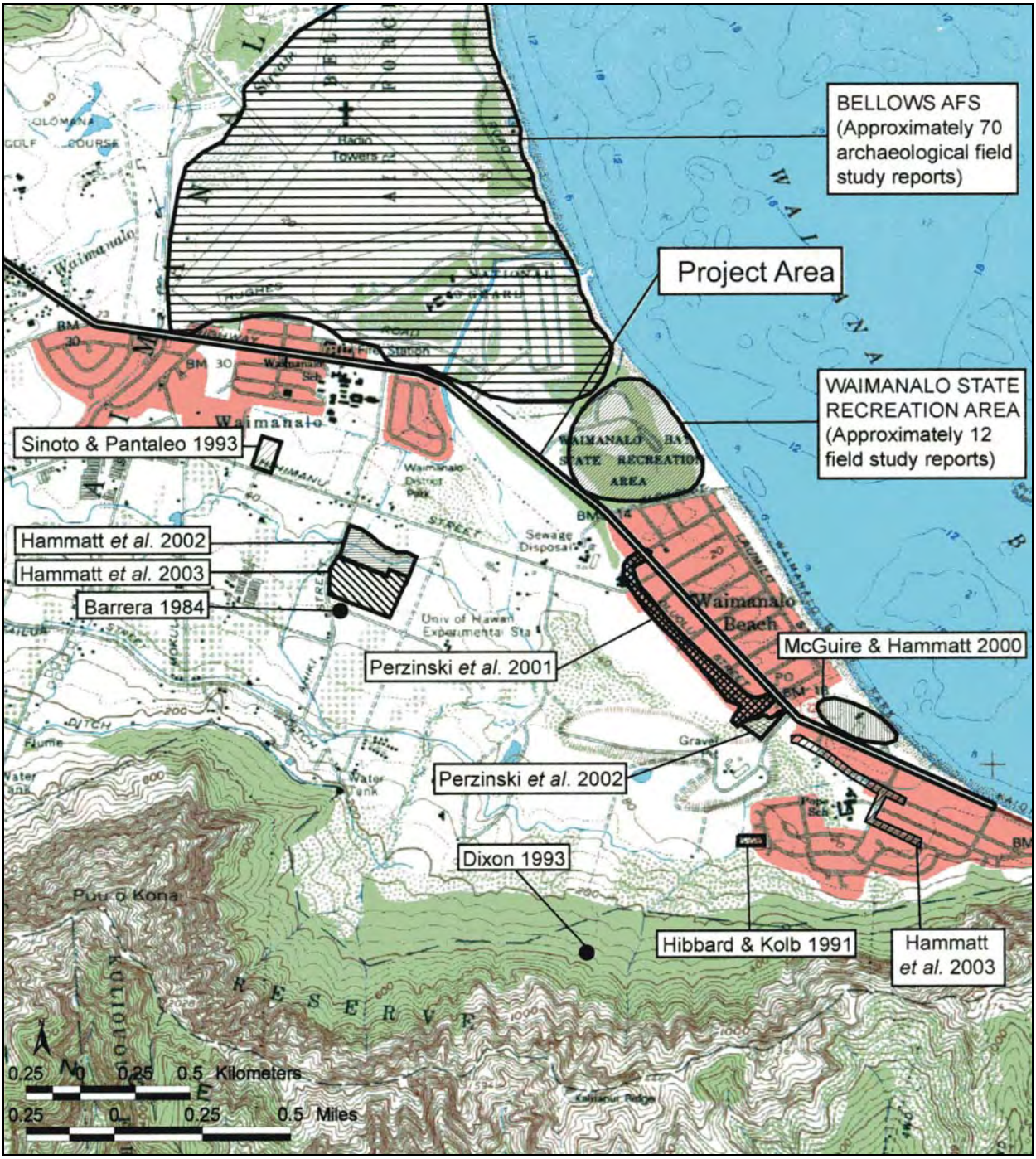

Figure 13 Map showing location of previouis archaeological studies in Central Waimānalo Ahupuaʻa

V. COMMUNITY CONSULTATIONS

Throughout the course of this study, an effort was made to contact and consult with Hawaiian cultural organizations, government agencies, and individuals who might have knowledge of and/or concerns about traditional cultural practices specifically related to the project area. This effort was made by letter, e-mail, telephone and in person contact. In the majority of cases, letters along with a map of the project area were mailed with the following text:

> In collaboration with Mountain Edge Environmental., Cultural Surveys Hawaiʻi is conducting a Cultural Impact Assessment for the proposed Waimānalo, Kalanianaʻole Improvement Project, Koʻolaupoko District, Waimānalo Ahupuaʻa on the island of Oʻahu. The purpose of the cultural study is to assess potential impacts to traditional cultural practices. This study is meant to satisfy requirements related to Chapter 343 HRS Articles IX and XII and Act 50 and t heir applicability to the project area.
>
> We are seeking your input regarding the following issues:
>
> General history and present and past land use of the study area.
>
> Knowledge of cultural sites which may be impacted by the project, e.g., historic sites, archaeological sites, burials, etc…
>
> Knowledge of traditional gathering practices in the study area-both past and present.
>
> Cultural associations with the study area through legends, traditional use or otherwise.
>
> Referrals of *kūpuna* who might be willing to share their cultural knowledge of the study area in general.
>
> Any other cultural concerns the community might have related to Hawaiian or other cultural practices in this area of the Waimānalo Ahupuaʻa, Island of Oʻahu.

In collaboration with the Department of Transportation and the Office of Environment Quality Control, Mountain Edge Environmental, Inc. drafted a letter which was sent to individuals on an approved list presented by the DOT and OEQC inviting them to a Public Informational Meeting (PIM). The purpose of the PIM was to present the conceptual plans which the design will be based on and to allow the public an opportunity to provide comments for inclusion in the Draft Environmental Assessment (EA) (For details of letter see Appendix).

Mountain Edge Environmental, Inc., prepared a flyer inviting the members of the Waimānalo community to the Public Informational Meeting on Wednesday, June 30, 2004. These flyers were handed out door-to-door (For details of the flyer see Appendix).

The individuals, organizations, and agencies we attempted to contact and the results of any consultations are presented in Table 2. Cultural Surveys Hawaiʻi starts out with a list of community contacts and then follows up on their referrals.

Table 2 Community Contacts

Name	Organization/Affiliation	Comments
Ahuna, Alika	Waimānalo Resident	We need to have safety for our children.
Curtis, Valerie	US Airforce Archaeologists	Referred to reports on Bellows Air Force Station in Waimānalo. Referred to the Waimānalo Neighborhood Board meetings. Referred to Traditional Cultural Place, Haunuaniho..a place of refuge on Bellows AFS. Referred to Sterling and Summers, *Sites of O'ahu.* Many excavations were conducted near the proposed project area, most are near the beach.
Doyle, Frank J.	P.E. Director Department of Environmental Services	No comment.
Guth, Hiedi	Office of Hawaiian Affairs	No comment.
Hall, Robert J.	Acting Executive Director of Housing and Community Development Corporation of Hawai'i	Refereed to June Tavares a long time resident of Waimānalo.
Hemmings, Fred	District 25 Hawai'i State Legislature	No comment.
Hines, Nickie	Waimānalo Resident	I have no concerns, most of the archaeology is located *mauka*, and in the sand. More important wherever the Hawaiians lived they buried their people right where they lived**.** So long as the project sticks to their plans I have no cultural concerns. I do have concern for the safety of our children.
Ho, Pricilla	Waimānalo Resident	Safety for our children.
Ho, Wilson Kekoa	Waimānalo Neighborhood Board	Culturally I have no concerns.

Kalama, Charlani	Cultural Practioner Waimānalo	Referred to Kumu Hula Frank Hewitt
Kama, Ben	Mayor's Representative, Neighborhood Commission Office	Invited CSH to Neighborhood Board Meeting. No comment.
Kapeliela, Kanaʻi	Burials Program Manager State Historic Preservation Division	No comment.
Kini, Kalei	Oʻahu Burial Council Koʻolaupoko Representative	He had no comment on burials or cultural impacts.
Komori, Eric	Historic Sites Inventory Coordinator	No comment.
Lorenzo, Windy	Waimānalo Resident	No comment.
Markell, Kaʻiana	History and Cultural Branch Chief State Historic Preservation Division	No comment.
Marshall, Barabara	Honolulu City Council	Ikaika Anderson Legislative Aide to Councilmember Barbara Marshall referred to Nickie Hines.
McEldowney, Dr. Holly	Administrator State Historic Preservation Division	No comment.
Montibon, Gwen	Department of Hawaiian Home Lands	No comment.
Nagano, Jan	President of Kuʻu Home O Waimānalo	No reply.
Tavares, June	Waimānalo Resident	No reply.
Teixeira-Vickery, Shelly	Waimānalo Resident	I am concerned of new comers or even residents who don't live in our unique community wanting to cause change for their own convenience, such as talk of making Kalanianaʻole into four lanes one day.
Waimānalo Public Library	Librarian	No comment.
Waters, Tommy	District 51 Hawaiʻi State Legislature	No reply.

Woodside, David and Leiana	Waimānalo Residents	Mr. Woodside believes a bypass is the solutions to the traffic problems in Waimānalo.
Yamamoto, Lawrence T.	State Conservationist, National Resources Conservation Service, U.S. Department of Agriculture	No reply.
Young, Peter	Chairperson, Department of Land and Natural Resources	No reply.

VI. SUMMARY OF KAMAʻĀINA INTERVIEWS

Kamaʻāina and *kūpuna* with knowledge of Waimānalo Ahupuaʻa and the area within the vicinity of the proposed project were interviewed for this assessment. The approach of Cultural Surveys to Cultural Impact Studies affords interviewees an opportunity to review transcriptions and to make any corrections, deletions or additions to the substance of their testimony.

The present Cultural Impact Study documents our good faith effort to contact *kūpuna*, other knowledgeable parties, and cultural practitioners that is an essential part of the process of documenting and evaluating traditional cultural practices as they may relate to proposed development of the subject lands.

Six interviewees with knowledge of the Waimānalo area were interviewed for this assessment. Shelly Teixeira-Vickery, a resident of Waimānalo participated in a informal interview, "talk story": session with Cultural Surveys Hawaiʻi. *Kūpuna* Nickie Hines, Liana and David Woodside, Alika Ahuna, and Pricilla Ho participated in a group interview with CSH. To assist in discussion of natural and cultural resources and any traditional cultural practices specific to the project area, CSH initiated interviews with questions from the five broad categories. The categories include: Burials, Trails, Native Gathering Practices of Plants, Marine and Fresh water Resources and Historic Properties.

Presented below are brief backgrounds of the six interviewees and their comments and concerns about the proposed project area.

Shelly Teixeira Vickery

Interview Summary:

A recorded interview was conducted with Shelly Teixeria-Vickery by Cultural Surveys Hawaiʻi in Waimānalo on March 17, 2004. Pictures were taken of the Mauanwili Trail and other sites and we drove along the present study area.

Shelly Teixeria-Vickery was born in Honolulu, 1961 and raised in Waimānalo her entire life. She is a 1979 graduate of Kailua High School. Shelly presently resides in the Waimānalo Village. Nine years ago she moved into their new home (*makai* of the old village), as part of Waimānalo's Self Help Homes Project at the intersection of Kalanianaʻole and Moole Street.

Shelly specifically commented:

> The Maunawili Trail is used today by many hikers and bicyclists. It is located up towards the area in which Bumby Kanahele's Sovereignty Group is located. There is a sign and it is maintained by the State or County. We refer to the trail as the "Maunawili Trail". Waikupanaha Road runs ʻEwa Diamond Head. The trails lead to the old wooden water flumes and Maunawili Falls.
>
> The first phase of new homes in the village was started in 1978, 23 years ago Waimānalo Village was previously called the "Old Camp". These were the homes of the plantation workers made with corrugated roofs. St. George's Church is across from the Waimānalo Elementary School. The school office was made of wood and burnt down in the mid-60s and was rebuilt of concrete.

There is still the plantation owners' house. It is huge house. You make a left on Poalima Street to the Owner's House. It is now owned by a Japanese Family. Shima's Market was located on the corner of Moʻole Street and Kalanianaʻole Highway. It is now relocated to its present area because of fire. The Waimānalo Tavern and Kuni's Chevron Gas shared the corner of the village across from the Association building, where their park is currently located.

Traditional cultural practices included gardening, and raising animals. Today families avoid fishing around the Bellows area due to pollution. They still use many other areas of Waimānalo's coastline to fish and still throw net, pole, and diving are the methods used. People still plant in their yards things they can use and can eat. We plant flowers for making lei's and vegetables to eat. We use to go up the Maunawili Trail to gather *laua'e, awapuhi,* and *kukui* nut for the making of oil. We make the oil the old way.

Muliwaiʻōlena is a place named in legend and historical accounts. The water never goes into the ocean until the rain comes otherwise it just sits here.

Waimānalo is one of the few areas on this island that is still considered to have that country environment. If you use Nānākuli as an example they widened the road from two lanes to four lanes and that was a mess. People should not ride through Waimānalo in a hurry because it is such a beautiful place.

I am concerned of new comers or even residents who don't live in our unique community wanting to cause change for their own convenience, such as talk of making Kalanianaʻole into four lanes one day. I hope that idea will never happen because it would be a sad day for Waimānalo and its people. The way I see it, if one is in a hurry take the freeway. The drive through our community and along the coast is so beautiful why would anyone want to drive fast?

Na *Kūpuna* O Waimānalo: Nickie Hines, Leiana & David Woodside, Alike Ahuna and Priscilla Ho

Interview Summary:

On March 17, 2004 Cultural Surveys Hawaiʻi was invited to meet with 5 *kūpuna* of Waimānalo at the home of Alika Ahuna. Aunty Nickie Hines graciously brought together the *kūpuna* for a "talk story" brunch session at her brother's home. The brunch was set on the beautifully sculptured yard of Alika Ahuna beside the seashore. It had been quite sometime since these 5 friends (*nā kūpuna*) have gathered together. The day began with prayer, thanks and guidance for this meeting. We set the table and maps of the present project area were laid out. Present at the brunch was Nickie Hines, Leiana & David Woodside, Alika Ahuna and Priscilla Ho. The meeting ended with brunch and a song offered to the *kūpuna* by Auliʻi Mitchell.

Kupuna Nickie Hines specifically commented:

> We do not like change here in Waimānalo. We like the country way of living. Most of us came here after the war and we had to clean up Waimānalo. They left it a mess, the military. It was not easy. We worked hard for what we have today. I have no concerns, most of the archaeology is located *mauka*, and in the sand. More importantly, wherever the Hawaiians lived they buried their people right where they lived. So long as the project sticks to their plans I have no cultural concerns. If possible I think there should be monitors as they work on this project along Kalanianaʻole Highway. I do have concern for the safety of our children. Waimānalo's sidewalk need improvement.

Kupuna David Woodside specifically commented:

> I still think this project is a waist of time. I think a bypass should be build from Bellows main gate proceeding northwest towards Kailua to tie into Olomana Golf course *makai* of the town. The plan presented it is just going to make sidewalks, turn lanes and a signal light, so I don't anticipate anything that will be culturally impacted. The city and state is not really concerned about the area. Young people should be more aware of what is happening to state land to build the road. Our main concern is the future widening of Kalanianaʻole Highway. I think the improvement of the side walks is good for the children; big problem is getting the traffic from the Homestead area to the golf course.

Kupuna Pricilla Ho specifically commented:

> We don't like change in Waimānalo. They should leave things the way it is. Most of the people came here after the war time. Waimānalo had to be cleaned up. It was a lot of hard work. Today everything is changing. I worry about our *moʻopuna*. The traffic is so bad. My main concern is for the safety of our children and grandchildren crossing the street. A young boy was just killed on his bike. They need to improve the highway with sidewalks for the safety of the children in Waimānalo.

Kupuna Alika Ahuna specifically commented:

> We do not want the road widened. There is no room to widen the road. It would be a disaster like in Nānākuli. The Department of Transportation was supposed to do something about the traffic problem years ago. The road thru Waimānalo needs to be improved not widened. Years ago the Department of Transportation talked about building a bypass. That is so those in a rush can bypass Waimānalo and our local residence would not experience the traffic that we do today. Nothing was ever done about that. Most important today is that the DOT makes improvements for the safety our children and grandchildren in Waimānalo.

VII. TRADITIONAL CULTURAL PRACTICES

Traditional cultural practices are based on profound awareness concerning harmony between man and their natural resources. The Hawaiians of old depended on these cultural practices for survival. Based on their familiarity with specific places and through much trial and error, Hawaiians communities were able to devise systems that fostered sustainable use of nature's resources. Many of these cultural practices have been passed down from generation to generation and are still practiced in some of Hawaiiʻs communities today.

This project seeks to assess traditional cultural practices as well as resources pertaining to the project area within Waimānalo Ahupuaʻa. This section will convey the different types of traditional practices, cultural resources associated with the proposed project area. Excerpts from interviews are incorporated in sections where applicable.

A. Gathering for Plant Resources

Hawaiians utilized upland resources for a multitude of purposes. Forest resources were gathered, for not only the basic needs of food and clothing, but for tools, weapons, canoe building, house construction, dyes, adornments, hula, medicinal and religious purposes. Within the project area itself no specific documentation was found in regards to gathering of plants during traditional Hawaiian times.

Shelly Teixeria-Vickery mentions in her interview with CSH, "Traditional cultural practices included gardening, and raising animals. We plant flowers for making lei's and vegetables to eat. We use to go up the Maunawili Trail to gather *lauaʻe, awapuhi,* and *kukui* nut for the making of oil. We make the oil the old way. People still plant in their yards things they can use and can eat."

During this assessment there were no ongoing practices related to traditional gathering of plant resources were identified in the present project area in Waimānalo. None of the individuals contacted or interviewed for this assessment identified any native plant gathering practices within the project area. Based on the information it is likely that there was far greater emphasis on gathering plant resources further inland.

B. Marine Resources

The sea is a rich resource and the Hawaiian people were traditionally expert fishermen. Fish of all types supplied the Hawaiian diet with a rich source of protein. Hawaiian women practiced the gathering of seaweeds and salt. Informant Shelly Teixeria-Vickery was quick to talk about coastal and offshore resources, "They still use many other areas of Waimānalo's coastline to fish and still throw net, pole, and diving are the methods used." During this assessment none of the other interviews spoke on behalf of cultural practices involving marine resources.

C. Historic Properties

According to the Archaeological Monitoring Plan conducted by Cultural Surveys Hawaiʻi, a total of two sites were documented within the project area. McAllister, in his *Archaeology of Oahu*, reports two sites in *mauka* Waimānalo (McAllister 1933:191). Site 382 a *heiau* is referred to by the name of the place - Pōhakunui - and stands on a hill near the top of Mahailua Road,

southwest of the present project area. Pōhakunui Heiau is included on the National Register of Historic Places as site number 50-80-15-382.

Archaeological work along the shoreline of Waimānalo (Bellows Air Force Station) has detailed some of the earliest known sites in the Hawaiian Islands. Site 50-80-15-18 (018 Dune Site), which is situated at the present mouth of Waimānalo Stream, has been dated to circa A.D. 400 and is included on the National Register of Historic Places (as part of site 50-80 -15-511)

D. Burials

Previous Archaeological research in the project area references to the major foci in archaeological research in Waimānalo. The Bellows Air Force Station is one of the most extensively studied areas on O‘ahu. Beginning in the 1960s, approximately 70 separate reconnaissance, survey, excavation and monitoring projects have taken place, most in conjunction with construction activity. Human burials, lithic scatters, soil features and/or occupation layers have been found almost everywhere archaeological investigation has taken place. Possibly, the most important finds occurred in dune deposits adjacent to the mouth of Waimānalo Stream referred to as Site 018. Much of the research since this discovery of early Bellows Dune occupation has focused on attempting to connect other archaeological finds in more inland areas of Bellows to this early Polynesian settlement. Bellows remains a focus of continuing archaeological research.

According to the Perzinski et al. 2002 report addresses finds during archaeological monitoring at a *kūpuna* housing project on a 7.92-acre parcel at 41-209 Ilauhole Street, immediately adjacent to the present project area. Three inadvertently disturbed human burials and a cultural layer (State site #50-80-15-5939) were encountered during construction activities in the far (northwest) corner of the parcel

E. Trails

Trails served to connect the various settlements throughout the islands of Hawai‘i. Based on nineteenth and twentieth century maps the primary transportation routes *mauka/makai* correlated closely to the existing major roadways.

In ancient times, Hawaiians traveled along foot trails to reach their villages, fields, and favored fishing grounds. These trails covered rough terrain, such as *‘a‘ā* or jagged lava, steeping tones of smooth, wave rolled cobbles were carefully positioned. To reflect moonlight, fist-sized pieces of white coral were sometimes placed along a trail allowing the traveler to pass at night (Kirch 1996:87). In this assessment interviewee Shelly Teixeria-Vickery shared, “The Maunawili Trail is used toady by many hikers and bicyclists. It is located up towards the area in which Bumby Kanahele’s Sovereignty Group is located. There is a sign and it is maintained by the State or County. We refer to the trail as the “Maunawili Trail”. Waikupanaha Road runs ‘Ewa Diamond Head. The trails lead to the old wooden water flumes and Maunawili Falls.”

F. *Wahi pana* (Sacred or Storied Places)

It appears from traditional Hawaiian accounts the place names Muliwai‘ōlena (*Ka Leo o Ka Lāhui* March 14, 15 1893) and ‘Āpuakea (aka ‘Āpua and Kapua) (Alona Sept. 22, 1939 O‘ahu Place Names) appear to be associated (in legendary accounts) with Hawaiian habitation

(specifically with the mother and daughter Muliwai‘ōlena and ‘Āpuakea) and with a place of meeting.

Waimānalo, "Potable water" (Pukui, et al. 225:1974), is a large *ahupua‘a* located in the district of Ko‘olaupoko, O‘ahu. “Ahupua‘a” refers to the traditional land divisions that were basic units of social, economic, and political life in pre-contact Hawai‘i.

Above Puhā is an old crater called Ka Lua O Pele (Pele’s Pit). Pele dug here long ago and gave it up when she came to water. Much *pālolo* clay was found here and Alona remembered seeing the women come to get it to rub into their scalps before going to the sea. The clay was washed out in sea water

Aa spring called Wai Kūpanaha (*kūpaianaha*) in the valley *mauka* of the sugar mill, surrounded by tall taro plants, banana trees and fragrant white gingers. According to Charles Alona, the Wai kūpanaha on the west side of Mr. Castle’s place was a *lele* (part of a lot of land belonging to an ‘*ili*), or a part of this *kuleana*, so both were given the same name.

There are two peculiar springs at Waimānalo, Ko‘olaupoko. The one called Kunpunakāne is away up the mountains. The spring called Kupunawahine is a spring way down on the level land. The strange, strange thing about these ponds was that on calm, sunny days they begin to cry out to each other. Their voices were soft and sounded very much like a woman mourning her husband. On days that were over cast with clouds in the sky, the water of the mountain spring changed. The water of the mountain spring became warm and when you drank the water in the lowland spring it was cool, according to their legend.

VIII. SUMMARY AND RECOMMENDATIONS

It appears from traditional Hawaiian accounts the place names Muliwai‘olena (*Ka Leo o Ka Lāhui* March 14, 15 1893) and ‘Āpuakea (aka ‘Āpua and Kapua) (Alona Sept. 22, 1939 O‘ahu Place Names) appear to be associated (in legendary accounts) with Hawaiian habitation (specifically with the mother and daughter Muliwaiolena and ‘Āpuakea) and with a place of meeting. It seems probable that this fresh watercourse and the associated pass through the reef would have made this general area a locus of increased traditional Hawaiian activity. It appears likely that the lagoonal estuary (Muliwaiolena) and the associated pass through the reef made the adjacent coast a logical landing both in traditional Hawaiian times and during the period of the formal Waimānalo Landing pier (1883 to 1924). The traditions of a settlement at Pu‘u-o-Molokai “across from the Waimānalo Park” also suggests traditional Hawaiian settlement in the vicinity.

Historical documentation presents the *ahupua‘a* of Waimānalo was awarded to Victoria Kamāmalu, subject to the *kuleana* claims of the commoners. She received the third largest share of lands among the *ali‘i nui* of the Kingdom of Hawai‘i including 47 other *ahupua‘a*-sized parcels in addition to Waimānalo. Approximately 113 *kuleana* Land Commission Award claims were awarded in Waimānalo. Nearly all of these *kuleana* were along Waimānalo Stream or its upper tributaries in the west portion of the *ahupua‘a*. There appear to have been only two Land Commission Awards in all of central and east Waimānalo, both located on the coast in east Waimānalo. While it seems highly probable that the Hawaiian population of Waimānalo was much larger and more dispersed in pre-contact times, it nevertheless appears highly likely that the traditional Hawaiian population of Waimānalo was always very much focused along Waimānalo Stream and its upper tributaries.

Ranching came to Waimānalo in the early 1800s, Thomas Cummins and his son John A. Cummins turned Waimānalo into a large cattle and horse ranch. The Cummins Estate, “Mauna Rose” was known for its lavish parties. Cummins was also host to American and British officers on warships visiting in Hawaiian waters. Hawai‘i’s royalty made Waimānalo their home, and spent a great part of their time at the Cummins Estate.

In 1876 the Hawaiian Kingdom entered into a Reciprocity Treaty with the United States. This allowed the growing Hawaiian sugar industry a free market and the potential for great profits.

John A. Cummins saw the potential of sugar production at Waimānalo and in 1880 started construction of a sugar mill. The Waimānalo Landing pier is understood to date from c. 1883 (Marine Option Program 1999:12). In 1890, J. A. Cummins renegotiates his father’s lease for an additional 30 years and "sub-lets the lands of Waimānalo to the Waimanalo Sugar Company (W.S.C.) which he then controlled" (Bartholomew and Ass., 1959:14). The plantation continued to buy sugar from the Chinese farmers until around 1900, when W. S. C. did most of its own cultivation.

By 1922, the present project area was under commercial sugar cane cultivation by the W.S.C. The Waimānalo Plantation Locomotive was still in use between the years 1938-1940 C. Brewer controlled W. S. C. until its liquidation in 1947.

The major focus in archaeological research in Waimānalo, the Bellows area, is directly adjacent to the northernmost portion of the project area. Human burials, lithic scatters, soil

features and/or occupation layers have been found almost everywhere archaeological investigation has taken place. The Perzinski et al. 2002 *kūpuna* housing project encountered burials and a cultural layer on the north end of their study parcel, adjacent to the southern area of the present project. Additionally, there are substantial Jaucas sand deposits under the south portion of the project area that have been associated with burials and cultural layers in the vicinity (Perzinski et al. 2002).

Five interviews were conducted with members of the Waimānalo community. One interviewee noted that in traditional times and in present times the area *makai* of the project area was most likely used for various fishing activities. Four interviewees expressed their concerns about the proposed project along Kalaniana‘ole Highway. *Kupuna* Aunty Nickie Hines spoke openly about her concern for monitors as work begins within the project area because wherever Hawaiians lived they buried their people in the same place. A reoccurring theme through out these four interviews was the improvements of sidewalks for the safety of Waimānalo’s children who walk or ride a bike to school along the busy highway. It is their wish that Waimānalo remains a unique place for its people in the future.

Based on the above findings, the proposed project will have minimal or no impact on Hawaiian culture, its practices and traditions.

It should be noted, however, that subsurface properties associated with former traditional Hawaiian activities in the project area, such as burials, artifacts and cultural layers, may be present despite no studies specific to the highway corridor. Based on studies in adjacent areas and the soil survey of O‘ahu indicates that portions of the present project area are underlain by Jaucas Sand deposits which may contain traditional Hawaiian sites such as cultural layers and/or human burials. Where sand is encountered, there is a potential for cultural artifacts and burials. As a precautionary measure, personnel involved in future development activities in the area should be informed of the possibility of inadvertent cultural finds, and should be made aware of the appropriate notification measures to follow.

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McIntosh, James and Paul L. Cleghorn

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2002 Archaeological Monitoring and Sampling During Construction of Housekeeping Facilities (BFMV 955000) Bellows AFS, Waimānalo, Ko‘olaupoko District, O‘ahu Island, Hawai`i (DACA 83-01-P-0019), GANDA

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X. APPENDIX

LINDA LINGLE
GOVERNOR

RODNEY K. HARAGA
DIRECTOR

Deputy Director
BRUCE Y. MATSUI
LINDEN H. JOESTING
BRIAN H. SEKIGUCHI

IN REPLY REFER TO:

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

May 28, 2004

SUBJECT: Draft Environmental Assessment Consultation and Public Informational Meeting (PIM)
Kalanianaole Highway Improvements
Between Olomana Golf Course and Waimanalo Beach Park
Waimanalo, Oahu, Hawaii

The State Department of Transportation (DOT) is preparing a Draft Environmental Assessment (EA) for the Kalanianaole Highway Improvements project and would appreciate your input. A Public Informational Meeting (PIM) is planned on Wednesday, June 30, 2004 from 7:00 pm to 9:00 pm at the Waimanalo Public and School Library (41-1320 Kalanianaole Highway). The purpose of the PIM is to present the conceptual plans which the design will be based on and to allow the public an opportunity to provide comments for inclusion in the Draft EA.

The DOT is planning to improve traffic operations on Kalanianaole Highway between Olomana Golf Course and Waimanalo Beach Park by making improvements within the existing highway right-of-way. The project location is shown on the attached figure. Improving the highway will make the highway operate more efficiently and also make it safer and friendlier to pedestrians and other highway users.

Proposed improvements to the highway include left turning lanes at Flamingo Road, Kumuhau Street, Humuniki Street, Mekia Street, Moole Street (both directions), Inoaole Street, and Aloiloi Street. The left turning lanes will improve the through traffic along Kalanianaole Highway and provide for safer conditions. Shelter lanes are proposed for left turning vehicles entering Kalanianaole Highway from side streets to make it safer for those drivers and to help improve traffic flow along Kalanianaole Highway. Where space is available, bus pullouts are proposed to alleviate queuing and improve traffic flow. The bus pullouts will also allow vehicles to pass by the bus instead of going around the bus and crossing double yellow solid pavement markings.

The plans also call for the existing concrete sidewalk on the mauka-side of the highway from Kumuhau Street to Inoaole Street to be reconstructed with a new ADA (Americans with Disabilities Act) accessible concrete sidewalk. The replacement will also include new ADA accessible driveways and curb ramps. This portion of the highway has been designated by the community as being one of the primary routes used by school children traveling to and from the Waimanalo Elementary and Intermediate School. Remaining areas along Kalanianaole Highway that do not have concrete sidewalks will have an asphalt concrete paved shoulder. Also, in locations identified by the community, a shared use grassed path (where available) is proposed to allow equestrian riders to traverse along Kalanianaole Highway to designated locations along the project.

If you would like to be a consulted party in preparation of the Draft EA, please send a letter with your questions, comments or concerns to:

State of Hawaii, Department of Transportation
Highways Division, Design Branch, Technical Design Services Office
601 Kamokila Blvd., Rm. 688
Kapolei, Hawaii 96707
Attn: Vincent Llorin

Fax: 692-7555

e-mail: vincent.llorin@hawaii.gov

LINDA LINGLE
GOVERNOR

RODNEY K. HARAGA
DIRECTOR

Deputy Director
BRUCE Y. MATSUI
LINDEN H. JOESTING
BRIAN H. SEKIGUCHI

IN REPLY REFER TO:

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

May 28, 2004

Dear Waimanalo Neighbor:

The State Department of Transportation (DOT) is preparing a Draft Environmental Assessment (EA) for the Kalanianaole Highway Improvements project and would appreciate your input. A Public Informational Meeting (PIM) is planned on Wednesday, June 30, 2004 from 7:00 pm to 9:00 pm at the Waimanalo Public and School Library (41-1320 Kalanianaole Highway). The purpose of the PIM is to discuss present the conceptual plans which the design will be based on and to allow the public an opportunity to provide comments for inclusion in the Draft EA. The purpose of the Draft EA is to address the environmental, social, and economic consequences of the proposed project before granting permits that allow construction to begin. Additionally, the EA process provides an opportunity for public involvement in planning projects that affect the community.

The DOT is planning to improve traffic operations on Kalanianaole Highway between Olomana Golf Course and Waimanalo Beach Park by making improvements within the existing highway right-of-way. The project location is shown on the opposite side of this page. Improving the highway will make the highway operate more efficiently and also make it safer and friendlier to pedestrians and other highway users.

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We would greatly appreciate any questions, concerns or comments pertaining to the Kalanianaole Highway improvements. If you are interested in participating in preparation of the Draft EA, please send a letter with your questions, concerns or comments to:

State of Hawaii, Department of Transportation
Highways Division, Design Branch, Technical Design Services Office
601 Kamokila Blvd., Rm. 688
Kapolei, Hawaii 96707
Attn: Vincent Llorin

Fax: 692-7555

e-mail: vincent.llorin@hawaii.gov

APPENDIX I

CZM Program Federal Consistency Review

RECEIVED DIR 0533

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LINDA LINGLE
GOVERNOR
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DIRECTOR
MARK K. ANDERSON
DEPUTY DIRECTOR
LAURA H. THIELEN
DIRECTOR
OFFICE OF PLANNING

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

DESIGN BRANCH
DIVISION
DEPT OF TRANSPORTATION

OFFICE OF PLANNING

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824

2006 MAR 31 A 11: 10

HIGHWAYS DIVISION

Ref. No. P-11305

March 28, 2006

2006 MAR 29 P 4: 36

DIRECTOR'S OFFICE
DEPT OF
TRANSPORTATION

To: Rodney K. Haraga, Director
Department of Transportation

Attention: Vincent Llorin
Highways Division

From: Laura H. Thielen, Director

Subject: Hawaii Coastal Zone Management (CZM) Program Federal Consistency Review for Federal Highway Administration Funding for the Kalanianaole Highway Improvements - Olomana Golf Course to Waimanalo Beach Park, Oahu

The proposal to use Federal funds from the Federal Highway Administration to construct improvements to Kalanianaole Highway between Olomana Golf Course and Waimanalo Beach Park, Oahu, has been reviewed for consistency with the Hawaii CZM Program. We concur with your agency's CZM consistency certification for the project, based on the following conditions:

1. To minimize potential impacts to the threatened Newell's Shearwaters, construction activities shall only occur during the daytime between mid-April through November. In addition, the new lighting system for the highway shall use shielded lighting. CZM coastal ecosystem policies in Hawaii Revised Statutes (HRS), Chapter 205A, and CZM enforceable policy HRS, Chapter 195D - *Conservation of Aquatic Life, Wildlife, and Land Plants*, provide for the protection of threatened and endangered species.

2. The project shall comply with the State Historic Preservation Division (SHPD) recommendations that a program of on-site and on-call archaeological monitoring be conducted for all ground disturbance associated with the proposed improvements that exceed the depth of the existing base course or will take place in unpaved/unimproved portions of the area of potential effect, and that the monitoring be conducted in accordance with an approved archaeological monitoring plan. (SHPD National Historic Preservation Act Section 106 review letter dated May 27, 2005.) HRS, Chapter 6E - *Historic Preservation*, is an enforceable policy of the Hawaii CZM Program.

3. A special management area use permit, if applicable, shall be obtained from the City and County of Honolulu. The special management area requirements are specified in HRS, Chapter 205A, Part II, and are enforceable policies of the Hawaii CZM Program.

4. If a federal permit, such as the Department of the Army Permit from the U.S. Army Corps of Engineers is required for any portion of the project, then an additional CZM federal consistency review may be required. If so, specific questions and concerns related to the federal permit may be raised.

CZM consistency concurrence is not an endorsement of the project nor does it convey approval with any other regulations administered by any State or County agency. Thank you for your cooperation in complying with the Hawaii CZM Program. If you have any questions, please call John Nakagawa of our CZM Program at 587-2878.

c: Ms. Jennifer Hernando, Mountain Edge Environmental, Inc.
U.S. Army Corps of Engineers, Regulatory Branch
U.S. Fish and Wildlife Service, Pacific Islands Ecoregion
Department of Land and Natural Resources,
State Historic Preservation Division
Department of Planning and Permitting, City and County of Honolulu

APPENDIX J

Section 106 Correspondence

V. Llovin, Hwy-DS

U.S. Department
of Transportation
**Federal Highway
Administration**

Hawaii Division
Box 50206
300 Ala Moana Boulevard, Room 3-306
Honolulu, HI 96850

November 16, 2004

In Reply Refer To:
HEC-HI

Mr. Peter Young
State Historic Preservation Officer
Department of Land and Natural Resources
State Historic Preservation Division
Kakuihewa Building
601 Kamōkila Boulevard, Room 555
Kapolei, HI 96707

Dear Mr. Young:

Subject: Section 106 Review (NHPA)
Proposed Kalaniana'ole Highway Improvements
Waimānalo, O'ahu, Hawai'i

In accordance with Section 106 of the National Historic Preservation Act (NHPA), the Federal Highway Administration, in cooperation with the State of Hawaii Department of Transportation–Highways Division, is requesting the State Historic Preservation Officer (SHPO) determine if an archaeological inventory survey is necessary for the proposed Kalaniana'ole Highway Improvements project.

The Kalaniana'ole Highway Improvements project proposes to improve traffic operations on Kalaniana'ole Highway between Olomana Golf Course and Waimānalo Beach Park by making improvements within the existing highway right-of-way. Improving the highway will make the highway operate more efficiently and also make it safer and friendlier for pedestrians and other highway users.

Proposed improvements to the highway include left turning lanes at Flamingo Road, Kumuhau Street, Humuniki Street, Mekia Street, Mō'ole Street (both directions), Inoa'ole Street, and 'Alo'ilo'i Street. The left turning lanes will improve the through traffic along Kalanian'aole Highway and provide for safer conditions. Shelter lanes are proposed for left turning vehicles entering Kalaniana'ole Highway from side streets to make it safer for those drivers and to help improve traffic flow along Kalaniana'ole Highway. Where space is available, bus pullouts are proposed to alleviate queuing and improve traffic flow. The bus pullouts will also allow vehicles to pass by the bus instead of going around the bus and crossing double yellow solid pavement markings.

BUCKLE UP AMERICA

The plans also call for the existing concrete sidewalk on the *mauka* side of the highway from Kumuhau Street to Inoa'ole Street to be replaced with a new concrete sidewalk, which meets Americans with Disabilities Act (ADA) requirements. The replacement will also include new ADA accessible driveways and curb ramps. This portion of the highway has been designated by the community as being one of the primary routes used by school children traveling to and from the Waimānalo Elementary and Intermediate Schools. Remaining areas along Kalaniana'ole Highway that do not have concrete sidewalks will have an asphalt concrete paved shoulder. Also, in locations identified by the community, a shared use grassed path (where available) is proposed to allow equestrian riders to traverse along Kalaniana'ole Highway to designated locations along the project.

The Area of Potential Effect (APE) for the project is the existing highway right-of-way from Olomana Golf Course to Waimānalo Beach Park. Throughout this stretch of Kalaniana'ole Highway, the existing highway right-of-way varies in width from a minimum of approximately 50 feet to a maximum of approximately 280 feet, although the majority of the highway right-of-way is approximately 50 to 100 feet wide.

To document and evaluate the effects the planned highway improvements may have on Native Hawaiians or other concerned ethnic groups, Cultural Surveys Hawaii, Inc., has completed a Cultural Impact Assessment for the proposed project, a copy of which is attached to this letter. The Cultural Impact Assessment includes an overview of previous archaeological studies conducted in the Waimānalo area. While no archaeological studies have been completed within the existing highway right-of-way, many studies have been done adjacent to the highway and in the project vicinity. These studies are discussed in the attached Cultural Impact Assessment and are summarized below.

The major focus in archaeological research in Waimānalo has been in the area of Bellows Air Force Station, which borders a portion of the project. A total of approximately 70 separate reconnaissances, surveys, excavations, and monitoring projects have taken place since the 1960s, most in conjunction with construction activity. Occupation layers have been found almost everywhere archeological investigation has taken place at Bellows. Often these occupation layers included human remains, lithic scatters, or soil features. Approximately a dozen archaeological studies were carried out at the Waimānalo State Recreation Area just south of Bellows mostly between 1976 and 1980.

Other studies in the project vicinity include Hibbard and Kolb 1991, McGuire and Hammatt 2000a, Perzinski et al. 2001, and Perzinski et al. 2002.

The Hibbard and Kolb (1991) study was a report on a brief field inspection of a houselot and neighboring area at Waiokeola Street (TMK 4-1-36:18) approximately 500 meters south of the present project area. The presence of a stacked mound and a tumbled wall of unknown function were noted. The importance of this is unclear beyond indicating some cultural activity in the vicinity.

The McGuire and Hammatt (2000a) study was an archaeological monitoring report on excavations for the installation of six light poles for a ball field at Waimānalo Beach Park

immediately adjacent to the southwest portion of the project area. No cultural findings were reported (dirt fill over sterile sand) but the actual area monitored was very small.

The Perzinski et al. 2001 report covers monitoring for a similar Sandwich Isles Communications project in three areas: at the intersection of 'Olu'olu and 'Ehukai Streets, at the *mauka* end of 'Alo'ilo'i Street, and at Nākini Street. This project thus included monitoring immediately adjacent to the present project area. Along Nākini Street the observed sediments were sandy clay loam with modern trash mixed in extending to the base of excavation (Perzinski et al. 2001:15). No sites, burials, cultural layers, or significant finds were observed in the course of this work, but a relatively small portion of this project was actually monitored.

The Perzinski et al. 2002 report addresses finds during archaeological monitoring at a *kūpuna* housing project on a 7.92-acre parcel at 41-209 Ilauhole Street, immediately adjacent to the present project area. Three inadvertently disturbed human burials and a cultural layer (State site #50-80-15-5939) were encountered during construction activities in the far (northwest) corner of the parcel. No cultural layer or burials were identified in the work on the Nākini Street side of that project.

The cultural impact assessment concludes that the proposed project will have minimal or no impact on Hawaiian culture, practices, or traditions. Based on the available information, we request your opinion if an archaeological inventory survey is necessary for the proposed project APE. Please be advised that the State Department of Transportation is also coordinating with Native Hawaiian organizations.

Should you have any questions, please contact me at 541-2700, extension 308.

Sincerely yours,

Clifford L. Chew

Clifford L. Chew
Transportation Engineer

Attachment: *Kalaniana'ole Improvement Project, Cultural Impact Assessment, Waimānalo Ahupua'a, Ko'olaupoko District, Island of O'ahu*, prepared by Cultural Surveys Hawai'i, Inc., August 2004

cc: √ HDOT, HWY-DS (VL)

LINDA LINGLE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA
DEPUTY DIRECTOR - LAND

DEAN NAKANO
ACTING DEPUTY DIRECTOR - WATER

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

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HAWAII DIVISION

Mr. Clifford L. Chew
Transportation Engineer
U. S. Department of Transportation
Federal Highway Administration
Hawaii Division
Box 50206
300 Ala Moana Boulevard, Room 3-306
Honolulu, Hawaii 96850

LOG NO: 2005.1036
DOC NO: 0505NN02

Dear Mr. Chew:

SUBJECT: National Historic Preservation Act Section 106 Review - Proposed Kalaniana`ole Highway Improvements Between Olomana Golf Course And Waimanalo Beach Park (Ref: HEC-HI)
Waimanalo, Ko`olaupoko, O`ahu
TMK: (1) 4-1

Thank you for the opportunity to comment on the proposed Kalaniana`ole Highway Improvements between Olomana Golf Course and Waimanalo Beach Park. The Federal Highway Administration in cooperation with the State of Hawaii Department of Transportation proposes to improve traffic operations on Kalaniana`ole Highway through Waimanalo to provide a safer and friendlier environment for pedestrians and highway users. The proposed improvements include left turn lanes, shelter lanes for left turning vehicles and bus pullouts. Improvements to existing concrete sidewalks on the *mauka* side of the highway to meet ADA requirements and asphalt concrete paved shoulders in areas without concrete sidewalks are also proposed. Our review is based on historic reports, maps, and aerial photographs maintained at the State Historic Preservation Division; no field inspection was made of the project areas. We received notification of this undertaking from your office on November 18, 2004 and apologize for our late comments.

Archaeology Comments

A review of our records shows that there are no known historic sites within the existing highway corridor. The area of potential effect (APE) for this undertaking is the existing highway right-of-way from Olomana Golf Course to Waimanalo Beach Park. The highway right-of-way varies in width from 50-feet to a maximum of approximately 280-feet although the majority of the existing highway is approximately 50-feet to 100-feet wide.

According to the US Department of Agriculture's soil survey maps, the southeastern end of the project area is underlain by Jaucas Sands, which are known to contain cultural layers and human burials. We do have records of inadvertent discoveries of human burials within this

portion of the APE. Thus we believe that improvements, in areas of Jaucas sands, which will exceed the depth of the base course of the existing highway, and any ground disturbance for improvements which extend outside the current paved highway corridor, may have an "adverse effect" on significant historic site which may be present in these sand deposits.

Because the project is located within an existing highway corridor, making routine inventory survey unfeasible we recommend that a program of on-site and on-call archaeological monitoring be conducted for all ground disturbance associated with the proposed improvements that exceed the depth of the existing base course or will take place in unpaved/unimproved portions of the APE. The archaeological monitoring shall be conducted in accordance with an approved archaeological monitoring plan.

History and Culture Comments

We concur with the findings of this study that this undertaking will have no effect on significant cultural/historic properties. We also find that this study also represents a good faith effort to consult with the Native Hawaiian community on this undertaking.

Should you have any questions about archaeology, please feel free to call Mary Carney at 692-8027. Should you have any questions about burial matters or cultural matters, please feel free to contact Nathan Napoka at 587-0192.

Sincerely,

Peter T. Young
State Historic Preservation Officer

NN:jen

c: A. Van Horn Diamond, Chair, O`ahu Island Burial Council
Nathan Napoka, Branch Chief, History and Culture Branch

LINDA LINGLE
GOVERNOR OF HAWAII

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA
DEPUTY DIRECTOR - LAND

DEAN NAKANO
ACTING DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
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FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

March 24, 2006

Dr. H.H. Hammatt
Cultural Surveys Hawaii, Inc.
P.O. Box 1114
Kailua, Hawai'i 96734

LOG NO: 2006.0839
DOC NO: 0603CM84
Archaeology

Dear Dr. Hammatt:

SUBJECT: **Chapter 6E-8 Historic Preservation Review [State DOT] –**
Revised Archaeological Monitoring Plan
Proposed Kalaniana'ole Highway Improvements Project
Waimānalo Ahupua'a, Ko'olaupoko District, Island of O'ahu
TMK: (1) 4-1-various plats and parcels

Thank you for the opportunity to review the aforementioned revised report by Hammatt *et al.* (2006), which we received on March 23, 2006. In a letter (LOG NO: 2006.0701, DOC NO: 0603CM52) dated March 15, 2006, we requested three minor additions to the monitoring provisions, which you have revised to our satisfaction.

The monitoring plan is accepted in fulfillment of the requirements of Hawai'i Administrative Rules (HAR) Chapter 13-279.

Please contact Chris Monahan at 808-692-8015, if you have questions about this letter.

Aloha,

Melanie Chinen, Administrator
State Historic Preservation Division

CM

LINDA LINGLE
GOVERNOR

RODNEY K. HARAGA
DIRECTOR

Deputy Directors
BARRY FUKUNAGA
BRENNON T. MORIOKA
BRIAN H. SEKIGUCHI

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:

HWY-DS 2.1114

MAY 30 2006

TO: THE HONORABLE PETER YOUNG, CHAIR
DEPARTMENT OF LAND AND NATURAL RESOURCES

FROM: BRENNON T. MORIOKA
DEPUTY DIRECTOR-HIGHWAYS

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT (DEA)
KALANIANAOLE HIGHWAY IMPROVEMENTS
FEDERAL AID PROJECT NO. STP-072-1(44)

Thank you for your letter (LOG NO: 2006.0702, DOC NO: 0603CM53) of March 15, 2006 regarding the DEA for the Kalanianaole Highway Improvements.

As you are aware we have revised the Archaeological Monitoring Plan to incorporate your requested revisions. Based on your letter (LOG NO: 2006.0839, DOC 0603CM53) dated March 24, 2006 we understand that you are satisfied with the revisions and that the Archaeological Monitoring Plan is accepted in fulfillment of the requirements of Hawaii Administrative Rules Chapter 13-279.

If there are any questions, please contact Mr. Vincent Llorin at 692-7568, Technical Design Service Office, Highways Division.

DIR 0449

PHONE (808) 594-1888

FAX (808) 594-1865

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DESIGN BRANCH
HIGHWAYS DIVISION
DEPT. OF TRANSPORTATION

DIRECTOR'S OFFICE
DEPT. OF
TRANSPORTATION
2006 MAR 14 A 10:27

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

HRD06/1424C

March 7, 2006

Rodney Haraga
State of Hawai'i Department of Transportation
Punchbowl Street, Room, 509
Honolulu, HI 96813

RE: Draft Environmental Assessment for the Proposed Kalaniana'ole Highway Improvements, Olomana Golf Course to Waimanalo Beach Park, Waimānalo, O'ahu.

Dear Mr. Haraga,

The Office of Hawaiian Affairs (OHA) is in receipt of your February 9, 2006 request for comment on the above listed proposed project. OHA offers the following comments:

Our staff strongly feels that, in contrast with Department of Transportation Federal Highway Administration and the Hawai'i State Historic Preservation Division determinations that "the proposed improvements will have no effect on significant cultural/historic properties", the project will very likely impact historic properties as is defined in the amended National Historic Preservation Act of 1966. Adverse impacts from ground altering activities, particularly to Native Hawaiian burial grounds, are expected in coastal Waimānalo.

Our staff asks that the Archeological Monitoring Plan stipulate that one monitor will be present for each active excavating machine, meaning that three simultaneous excavations will require three archeological monitors. We feel that this level of attention is appropriate when excavating in Jaucus sand deposits in coastal Waimānalo.

It may also be appropriate for the applicant to solicit from the community individuals who are interested in acting as cultural monitors for the proposed project. As impacts to historic properties are likely, the surrounding community should be involved in decision making process regarding the project.

OHA also asks that, in accordance with Section 6E-46.6, Hawaii Revised Statutes and Chapter 13-300, Hawaii Administrative Rules, if any significant cultural deposits or human skeletal remains are encountered, work shall stop in the immediate vicinity and the State Historic Preservation Division (SHPD/DLNR) shall be contacted.

Thank you for the opportunity to comment. If you have further questions or concerns, please contact Jesse Yorck, Native Rights Policy Advocate, at (808) 594-0239 or jessey@oha.org.

'O wau iho nō,

Clyde W. Nāmu'o
Administrator

CC: Abraham Wong
Federal Highway Administration, Hawaii Division
P.O. Box 50206
300 Ala Moana Blvd., Room 3-306
Honolulu, HI 96850

LINDA LINGLE
GOVERNOR

RODNEY K. HARAGA
DIRECTOR

Deputy Directors
BARRY FUKUNAGA
BRENNON T. MORIOKA
BRIAN H. SEKIGUCHI

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:
DIR 0449
HWY-DS 2.1115

MAY 30 2006

TO: CLYDE W. NAMUO, ADMINISTRATOR
OFFICE OF HAWAIIAN AFFAIRS

FROM: BRENNON T. MORIOKA
DEPUTY DIRECTOR-HIGHWAYS

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT (DEA)
KALANIANAOLE HIGHWAY IMPROVEMENTS
FEDERAL AID PROJECT NO. STP-072-1(44)

Thank you for your letter of March 7, 2006, regarding the DEA for the Kalanianaole Highway Improvements. We appreciate your comments regarding revisions to the Archaeological Monitoring Plan.

Please note that the Archaeological Monitoring Plan has already been approved by the State Historic Preservation Division; however, as part of project implementation we will coordinate with the Koolaupoko representative of the Oahu Island Burial Council to consider soliciting community individuals interested in acting as cultural monitors for the proposed project. We will also consider your suggestion for one cultural monitor for each active excavating machine.

The Archaeological Monitoring Plan already addresses stopping work and contacting the State Historic Preservation Division if cultural deposits or human skeletal remains are encountered, see Appendix I (Archaeological Monitoring Plan), Section 4 (Archaeological Monitoring Needs and Provisions), sub-section B (Archaeological Monitoring Provisions) of the DEA. The Archaeological Monitoring Plan states the following:

> 3. *<u>Treatment of remains encountered</u>: If cultural deposits or human skeletal remains are encountered during ground disturbing activities, work will be stopped immediately in that area and the archaeologist will notify the Burial Sites Program of the SHPD/DLNR of the nature of the discovery. Burial finds will be treated according to Hawaii Administrative Rules (HAR) 13-300-39 governing the inadvertent discovery of human remains.*
>
> *No remains will be removed without the knowledge and consent of the Burial Sites Program of the SHPD/DLNR. If any associated materials are encountered with an inadvertent human burial, all material will be treated as grave goods. If other cultural materials are encountered, not in association with a human burial, including an intact cultural layer, charcoal, artifacts or midden deposits, or any disturbed objects or deposits, then select sorted samples of charcoal, and bulk samples of midden material will be collected and standard documentation conducted (i.e., scale maps and stratigraphic profiles drawn in the field,*

MAY 3 0 2006

photographs, detailed descriptions, and interpretation). Monitoring shall include some sampling. A minimum of five photographs showing work at various stages shall be part of the final report. Any reburial plans will be made in consultation with the Burial Sites Program of the SHPD/DLNR.

4. *Authority to halt construction. The monitoring archaeologist has the authority to halt construction in the immediate area of the find in order to carry out the plan. The field archaeologist will make it clear to construction personnel with whom he/she is working that the archaeologist has the authority to halt work when it is appropriate.*

If there are any questions, please contact Mr. Vincent Llorin at 692-7568, Technical Design Service Office, Highways Division.

LINDA LINGLE
GOVERNOR

RODNEY K. HARAGA
DIRECTOR

Deputy Directors
FRANCIS PAUL KEENO
BARRY FUKUNAGA
BRENNON T. MORIOKA
BRIAN H. SEKIGUCHI

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

JUL 20 2006

IN REPLY REFER TO:

HWY-DS 2.1588

TO: MELANIE CHINEN, ADMINISTRATOR
STATE HISTORIC PRESERVATION DIVISION
DEPARTMENT OF LAND AND NATURAL RESOURCES

ATTN: JACE L. McQUIVEY, CHAIRPERSON
OAHU ISLAND BURIAL COUNCIL
BURIAL SITES PROGRAM

FROM: BRENNON T. MORIOKA
DEPUTY DIRECTOR-HIGHWAYS

SUBJECT: SECTION 106, NATIONAL HISTORIC PRESERVATION ACT CONSULTATION: PROPOSED KALANIANAOLE HIGHWAY IMPROVEMENTS PROJECT WAIMANALO AHUPUAA, KOOLAUPOKO DISTRICT, OAHU

The State of Hawaii Department of Transportation (HDOT), on behalf of the U.S. Department of Transportation, Federal Highway Administration (FHWA), respectfully seeks to initiate by this letter consultation with the Oahu Island Burial Council as appropriate under Section 106 of the National Historic Preservation Act for the proposed Kalanianaole Highway Improvements project (Waimanalo).

Project Description and Purpose

The HDOT proposes to construct modifications to Kalanianaole Highway in Waimanalo,Koolaupoko, Oahu. The purpose of the project is to improve traffic operations on Kalanianaole Highway between Olomana Golf Course and Waimanalo Beach Park.

Proposed improvements to the highway include left turning lanes at Flamingo Road, Kumuhau Street, Humuniki Street, Mekia Street, Moole Street (both directions), Inoaole Street, and Aloiloi Street. The left turning lanes will improve the through traffic along Kalanianaole Highway and provide for safer conditions. Some reworking of the Poalima/Kalanianaole Highway intersection may be indicated. Shelter lanes are proposed for left turning vehicles entering Kalanianaole Highway from side streets to make it safer for those drivers and to help improve traffic flow along Kalanianaole Highway. Where space is available, bus pullouts are proposed to alleviate queuing and improve traffic flow. The bus pullouts will also allow vehicles to pass by the bus instead of going around the bus and crossing double yellow solid pavement markings.

The plans also call for the existing concrete sidewalk on the *mauka* (inland) side of the highway from Kumuhau Street to Inoaole Street to be reconstructed with a new Americans with Disabilities Act (ADA) accessible concrete sidewalk. The replacement will also include new ADA accessible driveways and curb ramps. This portion of the highway has been designated by the community as being one of the primary routes used by school children traveling to and from the Waimanalo Elementary and Intermediate School. Remaining areas along Kalanianaole Highway that do not have concrete sidewalks will have an asphalt concrete paved shoulder. Also, in locations identified by the community, a shared use grassed path (where available) is proposed to allow equestrians to traverse along Kalanianaole Highway to designated locations along the project.

Evaluation of Project Impacts

An Archaeological Monitoring Plan (Hammatt et al. 2006) and a Cultural Impact Assessment (Mitchell and Hammatt 2005) were prepared for this HDOT DTS project. The Archaeological Monitoring Plan was reviewed and accepted by the Department of Land and Natural Resources/State Historic Preservation Division (DLNR/SHPD) in March of 2006 (LOG NO: 2006.0839; DOC NO: 0603CM84 Archaeology). A copy of the two studies and the SHPD review letter are enclosed for your reference. The studies assessed the potential for significant historic properties and potential impacts to cultural practices. The scope of work included background historical research, a review of land use within the vicinity, a review of previous archaeological surveys conducted within and near the project area, a field inspection of the project area, a predictive model for pre-Contact and historic land use within the vicinity, and a cultural impact assessment for the project area.

Findings

The Archaeological Monitoring Plan (Hammatt et al. 2006) concluded that given: 1) the inferences for settlement and increased activity in the vicinity associated with the watercourse Muliwaiolena, the Waimanalo landing, and place names Apuakea and PuuoMolokai; 2) the presence of a known cultural layer and multiple burials in the general vicinity; and 3) the extensive Jaucas sand deposits which have been associated with burials and cultural layers, a program of on-site monitoring appears justified. Given the cultural sensitivity of the project area, the plan calls for an archaeological monitor to be on site during all ground disturbance activities below road grade or intruding 30 cm (one foot) or more into undisturbed sediments.

The Cultural Impact Assessment (Mitchell and Hammatt 2005) similarly concluded that subsurface properties associated with former traditional Hawaiian activities in the project corridor such as burials, artifacts and cultural layers, may be present despite no studies specific to the highway corridor.

Mitigation of Project Impacts

Given the cultural sensitivity of the project area, the Archaeological Monitoring Plan calls for an archaeological monitor to be on site during all ground disturbance activities below road grade or intruding 30 cm (one foot) or more into undisturbed sediments. The Cultural Impact Assessment recommends that personnel involved in future development activities in the area should be informed of the possibility of inadvertent cultural finds and should be made aware of the appropriate notification measures to follow.

Summary

In summary, with the implementation of an archaeological monitoring program, the HDOT has determined that the project will have "no adverse effect" on historic property. We respectfully request your comment on this determination in accordance with 36 CFR Part 800.4(a)(1) and 800.4(d)(1). Upon your request, the FHWA and/or its representatives will be happy to meet with you at any mutually convenient time to present the project in greater detail. We request that responses regarding this project be addressed to Mr. Vincent Llorin, within 30 days at the following address:

Mr. Vincent Llorin, Project Engineer
Technical Design Services Office
Design Branch, Highways Division
601 Kamokila Boulevard, Room 688
Kapolei, Hawaii 96707

Section 106 consultation letters are also being sent to: 1) the Office of Hawaiian Affairs (OHA), 2) Hui Malama I Na Kupuna o Hawaii Nei and 3) the Hawaiian Civic Club of Waimanalo.

Attachments

1) Map showing area of potential effect.
2) Archaeological Monitoring Plan For the Proposed Kalanianaole Highway Improvements Project Waimanalo Ahupuaa, Koolaupoko, Oahu (Por. TMK: 4-1-03 through 09, 12, 13, 15, 16, 18, 19, 20, 21, 22, 28, 33, 34) (Hammatt et al. 2006).
3) SHPD Chapter 6E-8 review letter of March 24, 2006 (LOG NO: 2006.0839; DOC NO: 0603CM84 Archaeology).
4) Cultural Impact Assessment For the Kalanianaole Improvement Project, Waimanalo Ahupuaa, Koolaupoko District, Island of Oahu Por. TMK: 4-1-03 through 09, 12, 13, 15, 16, 18, 19, 20, 21, 22, 28, 33, 34 (Mitchell and Hammatt 2005).

If you have other questions or require additional information, please contact Vincent Llorin, Project Manager, at 692-7568, Technical Design Services Office, Design Branch, Highways Division.

c (w/attachments):

Office of Hawaiian Affairs
Mr. Clyde W. Namuo, Administrator
711 Kapiolani Blvd. Suite 500
Honolulu, Hawaii 96813

Hawaiian Civic Club of Waimanalo
Attn: Kuulei Aila
41-166 Poliala Street
Waimanalo, Hawaii 96795

Hui Malama I Na Kupuna o Hawaii Nei
Attn: Mr. William Aila
86-630 Lualualei Homestead Road
Waianae, Hawaii 96792

Cultural Surveys Hawai'i Inc.
Archaeological and Cultural Impact Studies
Hallett H. Hammatt, Ph.D., President

Providing Excellence in Cultural Resource Management

O'ahu P.O. Box 1114
Kailua, HI 96734
Ph.: (808) 262-9972
Fax.: (808) 262-4950

Maui 16 S. Market St., #2N
Wailuku, HI 96793
Ph.: (808) 242-9882
Fax.: (808) 244-1994

Kaua'i P.O. Box 498
Lawai, HI 96765
Ph.: (808) 245-4883

July 25, 2006

Mr. Jace L. McQuivey, Chairperson
O‘ahu Island Burial Council
c/o Ms. Pi‘ilani Chang, Burial Sites Program
State Historic Preservation Division
Room 555 Kākuhihewa Building
601 Kamōkila Boulevard,
Kapolei Hawai‘i 96707

Subject: Section 106 National Historic Preservation Act Consultation:
Proposed Kalaniana‘ole Highway Improvements Project,
Waimānalo Ahupua‘a, Ko‘olaupoko District, O‘ahu

Dear Mr. Jace L. McQuivey:

Cultural Surveys Hawai‘i has been asked to facilitate consultation with the O‘ahu Island Burial Council as appropriate under Section 106 of the National Historic Preservation Act for the Kalaniana‘ole Highway Improvements Project, Waimānalo Ahupua‘a, Ko‘olaupoko District, O‘ahu.

Enclosed please find a letter (dated July 20, 2006 from Mr. Brennon T. Morioka, Deputy Director-Highways addressed to Melanie Chinen, Administrator, State Historic Preservation Division) from the State of Hawai‘i Department of Transportation respectfully seeking to initiate Section 106 consultation. This letter presents a description of the project and its purpose, an evaluation of impacts and proposed mitigation. The letter makes reference to 4 supportive attachment documents (attached) offering further background and evaluation and concludes by making an offer that the FHWA and/or its representatives would be most happy to meet at any mutually convenient time to present the project in greater detail. The letter respectfully requests that any Section 106 responses regarding this project be addressed to Mr. Vincent Llorin, within 30 days at the following address:

Mr. Vincent Llorin, Project Engineer
Technical Design Services Office
Design Branch, Highways Division
601 Kamōkila Boulevard, Room 688
Kapolei Hawai‘i 96707

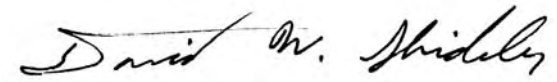
Along with the Department of Transportation letter of July 20, 2006 we are providing the indicated attachments as follows:

1) a map showing the area of potential effect,
2) a copy of the *Archaeological Monitoring Plan for the Proposed Kalanianaʻole Highway Improvements Project, Waimānalo Ahupuaʻa, Koʻolaupoko, Oʻahu, (Por. TMK: 4-1-03 through 09, 12, 13, 15, 16, 18, 19, 20, 21, 22, 28, 33, 34)*
3) a copy of the *Cultural Impact Assessment for the Kalanianaʻole Improvement Project, Waimānalo Ahupuaʻa, Koʻolaupoko District, Island of Oʻahu, Por. TMK: 4-1-03 through 09, 12, 13, 15, 16, 18, 19, 20, 21, 22, 28, 33, 34*
4) a copy of the SHPD Chapter 6E-8 review letter of March 24, 2006 (Log No 2006.0839; Doc No 0603CM84 Archaeology)

We are also sending this packet of information to Mr. Kalei Kini, Koʻolaupoko District representative of the Oʻahu Island Burial Council.

If Cultural Surveys may be of any help in providing additional information or facilitating an informational presentation or if you have any questions, please feel free to call at 262-9972 on Oʻahu or toll free at 1-800-599-9962. You may also reach me by e-mail at dshideler@culturalsurveys.com.

Sincerely,



David W. Shideler
Director, Oʻahu Office
Cultural Surveys Hawaiʻi, Inc.

Cultural Surveys Hawai'i Inc.
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Hallett H. Hammatt, Ph.D., President

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Ph.: (808) 245-4883

July 25, 2006

Mr. Kalei Kini, Koʻolaupoko District representative
Oʻahu Island Burial Council
c/o Ms. Piʻilani Chang, Burial Sites Program
State Historic Preservation Division
Room 555 Kākuhihewa Building
601 Kamōkila Boulevard,
Kapolei Hawaiʻi 96707

Subject: Section 106 National Historic Preservation Act Consultation: Proposed Kalanianaʻole Highway Improvements Project, Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu

Dear Mr. Kalei Kini:

Cultural Surveys Hawaiʻi has been asked to facilitate consultation with the Oʻahu Island Burial Council as appropriate under Section 106 of the National Historic Preservation Act for the Kalanianaʻole Highway Improvements Project, Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu.

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Mr. Vincent Llorin, Project Engineer
Technical Design Services Office
Design Branch, Highways Division
601 Kamōkila Boulevard, Room 688
Kapolei Hawaiʻi 96707

July 25, 2006

Along with the Department of Transportation letter of July 20, 2006 we are providing the indicated attachments as follows:

1) a map showing the area of potential effect,
2) a copy of the *Archaeological Monitoring Plan for the Proposed Kalanianaʻole Highway Improvements Project, Waimānalo Ahupuaʻa, Koʻolaupoko, Oʻahu, (Por. TMK: 4-1-03 through 09, 12, 13, 15, 16, 18, 19, 20, 21, 22, 28, 33, 34)*
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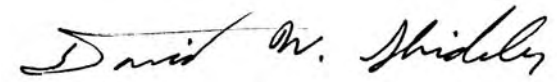
4) a copy of the SHPD Chapter 6E-8 review letter of March 24, 2006 (Log No 2006.0839; Doc No 0603CM84 Archaeology)

We are also sending this packet of information to Mr. Jace L. McQuivey, Chairperson Oʻahu Island Burial Council

If Cultural Surveys may be of any help in providing additional information or facilitating an informational presentation or if you have any questions, please feel free to call at 262-9972 on Oʻahu or toll free at 1-800-599-9962. You may also reach me by e-mail at dshideler@culturalsurveys.com.

Sincerely,



David W. Shideler
Director, Oʻahu Office
Cultural Surveys Hawaiʻi, Inc.

Cultural Surveys Hawai'i Inc.
Archaeological and Cultural Impact Studies
Hallett H. Hammatt, Ph.D., President

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Fax.: (808) 244-1994

Kaua'i P.O. Box 498
Lawai, HI 96765
Ph.: (808) 245-4883

July 25, 2006

Hui Mālama I Nā Kūpuna o Hawai‘i Nei
Attn: Mr. William Āila
86-630 Lualualei Homestead Road
Wai‘anae, Hawai‘i 96792

Subject: Section 106 National Historic Preservation Act Consultation: Proposed Kalaniana‘ole Highway Improvements Project, Waimānalo Ahupua‘a, Ko‘olaupoko District, O‘ahu

Dear Mr. William Āila:

Cultural Surveys Hawai‘i has been asked to facilitate consultation with Hui Mālama I Nā Kūpuna o Hawai‘i Nei as appropriate under Section 106 of the National Historic Preservation Act for the Kalaniana‘ole Highway Improvements Project, Waimānalo Ahupua‘a, Ko‘olaupoko District, O‘ahu.

Enclosed please find a letter (dated July 20, 2006 from Mr. Brennon T. Morioka, Deputy Director-Highways addressed to Melanie Chinen, Administrator, State Historic Preservation Division) from the State of Hawai‘i Department of Transportation respectfully seeking to initiate Section 106 consultation. This letter presents a description of the project and its purpose, an evaluation of impacts and proposed mitigation. The letter makes reference to 4 supportive attachment documents (attached) offering further background and evaluation and concludes by making an offer that the FHWA and/or its representatives would be most happy to meet at any mutually convenient time to present the project in greater detail. The letter respectfully requests that any Section 106 responses regarding this project be addressed to Mr. Vincent Llorin, within 30 days at the following address:

Mr. Vincent Llorin, Project Engineer
Technical Design Services Office
Design Branch, Highways Division
601 Kamōkila Boulevard, Room 688
Kapolei Hawai‘i 96707

Along with the Department of Transportation letter of July 20, 2006 we are providing the indicated attachments as follows:

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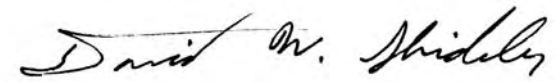
If Cultural Surveys may be of any help in providing additional information or facilitating an informational presentation or if you have any questions, please feel free to call at 262-9972 on O‘ahu or toll free at 1-800-599-9962. You may also reach me by e-mail at dshideler@culturalsurveys.com.

Sincerely,



David W. Shideler
Director, O‘ahu Office
Cultural Surveys Hawai‘i, Inc.

Cultural Surveys Hawai'i Inc.
Archaeological and Cultural Impact Studies
Hallett H. Hammatt, Ph.D., President

Providing Excellence in Cultural Resource Management

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Fax.: (808) 262-4950

Maui 16 S. Market St., #2N
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Ph.: (808) 242-9882
Fax.: (808) 244-1994

Kaua'i P.O. Box 498
Lawai, HI 96765
Ph.: (808) 245-4883

July 25, 2006

Mr. Clyde W. Nāmuʻo
Office of Hawaiian Affairs
711 Kapiʻolani Blvd. Suite 500
Honolulu, Hawaiʻi 96813

Subject: Section 106 National Historic Preservation Act Consultation: Proposed Kalanianaʻole Highway Improvements Project, Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu

Dear Mr. Clyde W. Nāmuʻo:

Cultural Surveys Hawaiʻi has been asked to facilitate consultation with the Office of Hawaiian Affairs as appropriate under Section 106 of the National Historic Preservation Act for the Kalanianaʻole Highway Improvements Project, Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu.

Enclosed please find a letter (dated July 20, 2006 from Mr. Brennon T. Morioka, Deputy Director-Highways addressed to Melanie Chinen, Administrator, State Historic Preservation Division) from the State of Hawaiʻi Department of Transportation respectfully seeking to initiate Section 106 consultation. This letter presents a description of the project and its purpose, an evaluation of impacts and proposed mitigation. The letter makes reference to 4 supportive attachment documents (attached) offering further background and evaluation and concludes by making an offer that the FHWA and/or its representatives would be most happy to meet at any mutually convenient time to present the project in greater detail. The letter respectfully requests that any Section 106 responses regarding this project be addressed to Mr. Vincent Llorin, within 30 days at the following address:

Mr. Vincent Llorin, Project Engineer
Technical Design Services Office
Design Branch, Highways Division
601 Kamōkila Boulevard, Room 688
Kapolei Hawaiʻi 96707

Along with the Department of Transportation letter of July 20, 2006 we are providing the indicated attachments as follows:

1) a map showing the area of potential effect,
2) a copy of the *Archaeological Monitoring Plan for the Proposed Kalanianaʻole Highway Improvements Project, Waimānalo Ahupuaʻa, Koʻolaupoko, Oʻahu, (Por. TMK: 4-1-03 through 09, 12, 13, 15, 16, 18, 19, 20, 21, 22, 28, 33, 34)*
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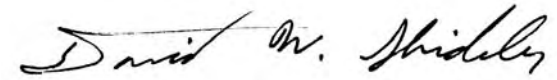
Sincerely,



David W. Shideler
Director, Oʻahu Office
Cultural Surveys Hawaiʻi, Inc.

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Archaeological and Cultural Impact Studies
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Ph.: (808) 245-4883

July 25, 2006

Ku‘ulei Aila
Hawaiian Civic Club of Waimānalo
41-166 Poliala Street
Waimānalo, Hawai‘i 96795

Subject: Section 106 National Historic Preservation Act Consultation: Proposed Kalaniana‘ole Highway Improvements Project, Waimānalo Ahupua‘a, Ko‘olaupoko District, O‘ahu

Dear Ku‘ulei Aila:

Cultural Surveys Hawai‘i has been asked to facilitate consultation with the O‘ahu Island Burial Council as appropriate under Section 106 of the National Historic Preservation Act for the Kalaniana‘ole Highway Improvements Project, Waimānalo Ahupua‘a, Ko‘olaupoko District, O‘ahu.

Enclosed please find a letter (dated July 20, 2006 from Mr. Brennon T. Morioka, Deputy Director-Highways addressed to Melanie Chinen, Administrator, State Historic Preservation Division) from the State of Hawai‘i Department of Transportation respectfully seeking to initiate Section 106 consultation. This letter presents a description of the project and its purpose, an evaluation of impacts and proposed mitigation. The letter makes reference to 4 supportive attachment documents (attached) offering further background and evaluation and concludes by making an offer that the FHWA and/or its representatives would be most happy to meet at any mutually convenient time to present the project in greater detail. The letter respectfully requests that any Section 106 responses regarding this project be addressed to Mr. Vincent Llorin, within 30 days at the following address:

Mr. Vincent Llorin, Project Engineer
Technical Design Services Office
Design Branch, Highways Division
601 Kamōkila Boulevard, Room 688
Kapolei Hawai‘i 96707

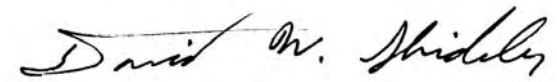
July 25, 2006

Along with the Department of Transportation letter of July 20, 2006 we are providing the indicated attachments as follows:

1) a map showing the area of potential effect,
2) a copy of the *Archaeological Monitoring Plan for the Proposed Kalaniana‘ole Highway Improvements Project, Waimānalo Ahupua‘a, Ko‘olaupoko, O‘ahu, (Por. TMK: 4-1-03 through 09, 12, 13, 15, 16, 18, 19, 20, 21, 22, 28, 33, 34)*
3) a copy of the *Cultural Impact Assessment for the Kalaniana‘ole Improvement Project, Waimānalo Ahupua‘a, Ko‘olaupoko District, Island of O‘ahu, Por. TMK: 4-1-03 through 09, 12, 13, 15, 16, 18, 19, 20, 21, 22, 28, 33, 34*
4) a copy of the SHPD Chapter 6E-8 review letter of March 24, 2006 (Log No 2006.0839; Doc No 0603CM84 Archaeology)

If Cultural Surveys may be of any help in providing additional information or facilitating an informational presentation or if you have any questions, please feel free to call at 262-9972 on O‘ahu or toll free at 1-800-599-9962. You may also reach me by e-mail at dshideler@culturalsurveys.com.

Sincerely,



David W. Shideler
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Kaua'i P.O. Box 498
Lawai, HI 96765
Ph.: (808) 245-4883

September 25, 2006

Mr. Kalei Kini, Koʻolaupoko District representative
Oʻahu Island Burial Council
1784 Akaakaawa Street
Kailua Hawaiʻi 96734

Subject: Proposed Kalanianaʻole Highway Improvements Project, Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu

Dear Mr. Kalei Kini:

Cultural Surveys Hawaiʻi has been asked to facilitate consultation as appropriate for the Kalanianaʻole Highway Improvements Project, Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu. We have been asked to solicit any comment you may have regarding two points raised by the Office of Hawaiian Affairs (OHA) regarding this project.

In a letter of March 7, 2006 (signed by administrator Mr. Clyde Nāmuʻo addressed to Mr. Rodney Haraga, State of Hawaiʻi Department of Transportation), OHA raised two points:

- Our staff asks that the Archaeological Monitoring Plan stipulate that one monitor will be present for each active excavating machine, meaning that three simultaneous excavations will require three archaeological monitors. We feel that this level of attention is appropriate when excavating in Jaucas sand deposits in coastal Waimānalo.
- It may also be appropriate for the applicant to solicit from the community individuals who are interested in acting as cultural monitors for the proposed project. As impacts to historic properties are likely, the surrounding community should be involved in decision making process regarding the project.

If you have any comment regarding these OHA points or if you have any guidance to offer regarding appropriate individuals or ways of addressing the cultural monitoring issue would you please be so kind as to convey your *manaʻo* to us at your earliest convenience. Please feel free to call at 262-9972 or you may also reach me by e-mail at dshideler@culturalsurveys.com.

Sincerely,

David W. Shideler
Director, Oʻahu Office, Cultural Surveys Hawaiʻi, Inc.

U.S. Department
of Transportation
**Federal Highway
Administration**

Hawaii Division
Box 50206
300 Ala Moana Boulevard, Room 3-306
Honolulu, HI 96850

December 11, 2006

In Reply Refer To:
HEC-HI

Ms. Melanie Chinen
State Historic Preservation Division
Department of Land and Natural Resources
Kakuhihewa Building
601 Kamokila Blvd., Rm. 555
Kapolei, HI 96707

Dear Ms. Chinen:

Subject: Notification of Conclusion of Section 106 (NHPA)
Proposed Kalaniana'ole Highway Improvements
Waimānalo, O'ahu, Hawai'i

The Federal Highway Administration (FHWA), in cooperation with the State of Hawai'i Department of Transportation-Highways Division (HDOT), respectfully seeks to notify the State Historic Preservation Division by this letter of the conclusion of consultation with the O'ahu Island Burial Council, Hui Mālama i Nā Kupuna o Hawai'i Nei, the Hawaiian Civic Club of Waimānalo, and the Office of Hawaiian Affairs as appropriate under Section 106 of the National Historic Preservation Act for the proposed Kalaniana'ole Highway Improvements (Waimānalo) project.

Project Description and Purpose

HDOT proposes to construct modifications to Kalaniana'ole Highway in Waimānalo Ko'olaupoko, O'ahu. The purpose of the project is to improve traffic operations on Kalaniana'ole Highway between Olomana Golf Course and Waimānalo Beach Park.

Proposed improvements to the highway include left turning lanes at Flamingo Road, Kumuhau Street, Humuniki Street, Mekia Street, Moole Street (both directions), Ino'a'ole Street, and Aloiloi Street. The left turning lanes will improve the through traffic along Kalaniana'ole Highway and provide for safer conditions. Some reworking of the Poalima/Kalanianaole Hwy. Intersection may be indicated. Shelter lanes are proposed for left turning vehicles entering Kalaniana'ole Highway from side streets to make it safer for those drivers and to help improve traffic flow along Kalaniana'ole Highway. Where space if available, bus pullouts are proposed to alleviate queuing and improve traffic flow. The bus pullouts will also allow vehicles to pass by the bus instead of going around the bus and crossing double yellow solid pavement markings.

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The plans also call for the existing concrete sidewalk on the *mauka* (inland) side of the highway from Kumuhau Street to Ino'a'ole Street to be reconstructed with a new ADA (Americans with Disabilities Act) accessible concrete sidewalk. The replacement will also include new ADA accessible driveways and curb ramps. This portion of the highway has been designated by the community as being one of the primary routes used by school children traveling to and from the Waimānalo Elementary and Intermediate School. Remaining areas along Kalaniana'ole Highway that do not have concrete sidewalks will have an asphalt concrete paved shoulder. Also, in locations identified by the community, a shared use grassed path (where available) is proposed to allow equestrian riders to traverse along Kalaniana'ole Highway to designated locations along the project.

Evaluation of Project Impacts

An Archaeological Monitoring Plan (Hammatt et al. 2006) and a Cultural Impact Assessment (Mitchell and Hammatt 2005) were prepared for this HDOT project. The Archaeological Monitoring Plan was reviewed and accepted by the Department of Land and Natural Resources/State Historic Preservation Division (DLNR/SHPD) in March of 2006 (LOG NO: 2006.0839; DOC NO: 0603CM84 Archaeology). The studies assessed the potential for significant historic properties and potential impacts to cultural practices. The scope of work included background historical research, a review of land use within the vicinity, a review of previous archaeological surveys conducted within and near the project area, a field inspection of the project area, a predictive model for pre-Contact and Historic land use within the vicinity, and a cultural impact assessment for the project area.

Findings

The Archaeological Monitoring Plan (Hammatt et al. 2006) concluded that given: 1) the inferences for settlement and increased activity in the vicinity associated with the watercourse Muliwaiolena, the Waimānalo landing, and place names 'Āpuakea and Pu'u-o-Molokai, 2) the presence of a known cultural layer and multiple burials in the general vicinity and 3) the extensive Jaucas sand deposits which have been associated with burials and cultural layers, a program of on-site monitoring appears justified. Given the cultural sensitivity of the project area, the plan calls for an archaeological monitor to be on site during all ground disturbance activities below road grade or intruding 30 cm (1 foot) or more into undisturbed sediments.

The Cultural Impact Assessment (Mitchell and Hammatt 2005) similarly concluded that subsurface properties associated with former traditional Hawaiian activities in the project corridor such as burials, artifacts and cultural layers, may be present despite no studies specific to the highway corridor.

Mitigation of Project Impacts

Given the cultural sensitivity of the project area, the Archaeological Monitoring Plan calls for an archaeological monitor to be on site during all ground disturbance activities below road grade or intruding 30 cm (1 foot) or more into undisturbed sediments. The Cultural Impact Assessment recommends that personnel involved in future development activities in the area should be informed of the possibility of inadvertent cultural finds, and should be made aware of the appropriate notification

measures to follow. In summary with the implementation of an archaeological monitoring program, the HDOT has determined that the project will have "no adverse effect" on historic property.

Summary of Section 106 of the National Historic Preservation Act Consultation

The HDOT on behalf of the FHWA respectfully requested in writing (return receipts of consultation letter correspondence attached) on July 25, 2006 the comment on this determination in accordance with 36 CFR Part 800.4(a)(1) and 800.4(d)(1) from the following Hawaiian organizations:

- The O'ahu Island Burial Council (both chairperson and Ko'olaupoko regional representative)
- The Office of Hawaiian Affairs (OHA), 2
- Hui Mālama I Nā Kūpuna o Hawai'i Nei, and
- The Hawaiian Civic Club of Waimānalo

Attachments sent with the requests to these entities included:

- Map showing area of potential effect
- Archaeological Monitoring Plan For the Proposed Kalaniana'ole Highway Improvements Project Waimānalo Ahupua'a, Ko'olaupoko, O'ahu (Por. TMK: 4-1-03 through 09, 12, 13, 15, 16, 18, 19, 20, 21, 22, 28, 33, 34) (Hammatt et al. 2006)
- SHPD Chapter 6E-8 review letter of March 24, 2006 (LOG NO: 2006.0839; DOC NO: 0603CM84 Archaeology)
- Cultural Impact Assessment For the Kalaniana'ole Improvement Project, Waimānalo Ahupua'a, Ko'olaupoko District, Island of O'ahu Por. TMK: 4-1-03 through 09, 12, 13, 15, 16, 18, 19, 20, 21, 22, 28, 33, 34 (Mitchell and Hammatt 2005)

Additionally, because the O'ahu Island Burial Council did not meet in August, a brief face-to-face consultation was placed on the Council Agenda and was carried out at their meeting of September 13, 2006.

None of the Hawaiian agencies consulted had any substantive comments. FHWA, in cooperation with HDOT, respectfully concludes that the letter and spirit of consultation as appropriate under Section 106 of the National Historic Preservation Act for the proposed Kalaniana'ole Highway Improvements (Waimānalo) project has now been concluded. We request of the State Historic Preservation Division acknowledgement of the conclusion of this consultation.

Should you have any questions, please contact me at 541-2700, extension 305.

Sincerely yours,

Pat V. Phung, P.E.
Transportation Engineer

SENDER: COMPLETE THIS SECTION

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Mr. Kalei Kini
Ko'olaupoko District Representative
O'ahu island Burial Council
c/o Ms. Pi'ilani Chang, Burial Sites Program
State Historic Preservation Division
Room 555, Kakuhihewa Building
601 Kamokila Blvd.
Kapolei Hawai'i 96707

COMPLETE THIS SECTION ON DELIVERY

A. Signature: X [signature] ☐ Agent ☐ Addressee
B. Received by (Printed Name): Geraldine V. Flores C. Date of Delivery
D. Is delivery address different from item 1? ☐ Yes If YES, enter delivery address below: ☐ No
3. Service Type: ☒ Certified Mail ☐ Express Mail ☐ Registered ☐ Return Receipt for Merchandise ☐ Insured Mail ☐ C.O.D.
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Hawaiian Civic Club of Waimanalo
Attn: Ku'ulei Aila
41-166 Poliala Street
Waimanalo, Hawai'i 96795

COMPLETE THIS SECTION ON DELIVERY

A. Signature: X [signature] ☐ Agent
B. Received by (Printed Name): Cecilia R. Kaholoa'a C. Date of Delivery
D. Is delivery address different from item 1? ☐ Yes If YES, enter delivery address below: ☐ No
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■ Attach this card to the back of the mailpiece, or on the front if space permits.

Mr. Jace L. McQuivey, Chairperson
O'ahu island Burial Council
c/o Ms. Pi'ilani Chang, Burial Sites Program
State Historic Preservation Division
Room 555, Kakuhihewa Building
601 Kamokila Blvd.
Kapolei Hawai'i 96707

COMPLETE THIS SECTION ON DELIVERY

A. Signature: X [signature] ☐ Agent ☐ Addressee
B. Received by (Printed Name): Geraldine V. Flores C. Date of Delivery
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Hui Malama I Na Kupuna o Hawai'i
Attn: Mr. William Aila
86-630 Lualualei Homestead Road
Wai'anae, Hawai'i 96792

COMPLETE THIS SECTION ON DELIVERY

A. Signature: X [signature] ☐ Agent ☒ Addressee
B. Received by (Printed Name): William Aila Jr. C. Date of Delivery: 7/27/06
D. Is delivery address different from item 1? ☒ Yes If YES, enter delivery address below: ☐ No
3. Service Type: ☐ Certified Mail ☐ Express Mail ☐ Registered ☐ Return Receipt for Merchandise ☐ Insured Mail ☐ C.O.D.
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■ Attach this card to the back of the mailpiece, or on the front if space permits.

Mr. Clyde W. Namu'o
Office of Hawaiian Affairs
711 Kapi'olani Blvd. Suite 500
Honolulu, Hawai'i 96813

COMPLETE THIS SECTION ON DELIVERY

A. Signature: X [signature] ☐ Agent ☐ Addressee
B. Received by (Printed Name): M. Kawesaki C. Date of Delivery: 8/1/06
D. Is delivery address different from item 1? ☐ Yes If YES, enter delivery address below: ☐ No
3. Service Type: ☒ Certified Mail ☐ Express Mail ☐ Registered ☐ Return Receipt for Merchandise ☐ Insured Mail ☐ C.O.D.
4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label): 7003 1010 0002 5207 9649
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Return receipts of consultation letter correspondence

APPENDIX K

Archaeological Monitoring Plan

Archaeological Monitoring Plan
For the Proposed Kalaniana‘ole Highway Improvements Project
Waimānalo Ahupua‘a, Ko‘olaupoko, O‘ahu

(Por. TMK: 4-1-03 through 09, 12, 13, 15, 16, 18, 19, 20, 21, 22, 28, 33, 34)

by

Hallett H. Hammatt, Ph.D.,
Sallee D.M. Freeman, M.A.,
and
David W. Shideler, M.A.

Prepared for

Department of Transportation
Highways Division
City and County of Honolulu

by

Cultural Surveys Hawai‘i, Inc.
March 2006

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- B. Scope of Work 1
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I. INTRODUCTION

A. Project Background

Cultural Surveys Hawai‘i, Inc. was contracted to prepare an archaeological monitoring plan in support of the Kalaniana‘ole Highway Improvements Project. The purpose of the project is to improve traffic operations on Kalaniana‘ole Highway between Olomana Golf Course and Waimānalo Beach Park in Waimānalo, O‘ahu, Hawai‘i (Figures 1-3).

Proposed improvements to the highway include left turning lanes at Flamingo Road, Kumuhau Street, Humuniki Street, Mekia Street, Moole Street (both directions), Ino‘a‘ole Street, and Aloiloi Street. The left turning lanes will improve the through traffic along Kalaniana‘ole Highway and provide for safer conditions. Some reworking of the Poalima/Kalanianaole Hwy. Intersection may be indicated. Shelter lanes are proposed for left turning vehicles entering Kalaniana‘ole Highway from side streets to make it safer for those drivers and to help improve traffic flow along Kalaniana‘ole Highway. Where space if available, bus pullouts are proposed to alleviate queuing and improve traffic flow. The bus pullouts will also allow vehicles to pass by the bus instead of going around the bus and crossing double yellow solid pavement markings.

The plans also call for the existing concrete sidewalk on the *mauka* (inland) side of the highway from Kumuhau Street to Ino‘a‘ole Street to be reconstructed with a new ADA (Americans with Disabilities Act) accessible concrete sidewalk. The replacement will also include new ADA accessible driveways and curb ramps. This portion of the highway has been designated by the community as being one of the primary routes used by school children traveling to and from the Waimānalo Elementary and Intermediate School. Remaining areas along Kalaniana‘ole Highway that do not have concrete sidewalks will have an asphalt concrete paved shoulder. Also, in locations identified by the community, a shared use grassed path (where available) is proposed to allow equestrian riders to traverse along Kalaniana‘ole Highway to designated locations along the project.

B. Scope of Work

The scope of work for the current project includes the preparation of a monitoring plan to be submitted to SHPD/DLNR for review and approval. This plan will meet state requirements for archaeological monitoring. In general, the monitoring plan includes provisions to conduct on-site monitoring by a qualified archaeologist within the project area, and the necessary steps should any historic sites (i.e. subsurface fire pits, artifacts, or human skeletal remains) be inadvertently uncovered during monitored construction activities. The overview of previous archaeological studies and known sites in proximity to the current project area was developed to provide the basis for monitoring provisions. This plan must be approved by SHPD/DLNR before subsurface work in the project area can begin.

C. Methodology

Background research included a review of historical documents and maps at the Hawai‘i State Archives, Hawai‘i State Survey Office, State Historic Preservation Division library and files, and the Cultural Surveys Hawai‘i library.

This research provided the environmental, cultural, historic, and archaeological background for the project area. The sources studied were used to formulate a predictive model regarding the

expected type and location of sub-surface pre- and post-contact historic properties in the project area.

D. Project Area Description

The project area is located on the windward side of the Island of Oʻahu, in the district of Koʻolaupoko within the *ahupuaʻa* of Waimānalo (Figures 1-3). Waimānalo is a broad amphitheater-shaped valley with a relatively level floor composed of moderately sloping alluvial fans. It is in the "late mature to old Age" stage of erosional development (MacDonald et al. 1983:217). The subject property is located in central Waimānalo on the "Waimānalo Plain" (Armstrong, et al. 1973:30) along Kalanianaʻole Highway. The project area extends from Olomana Golf Course to the east end of Waimānalo Beach Park (Figures 1-3). Elevations within the project area range from approximately 5 feet AMSL at the southern boundary to 80 feet at the north. Annual rainfall averages between 1000 and 1500 mm (40 to 60 inches) per year (Giambelluca et al. 1986:73).

There are twelve soil types of varying properties within the project area. The southeast half of the project area consists of Jaucas sand with some Kawaihapai clay loam 0-2% slopes, Mokuleia loam, Ewa silty clay loam 0-2% slopes, Haleiwa silty clay 0-2% slopes, and coral outcrop. The northwestern half of the project area consists of Ewa silty clay loam 0-2% slopes, Kokokahi clay 6-12% slopes, Pohakupu silty clay loam 0-8% slopes, Kaloko clay, noncalcareous variant, Hanalei silty clay 0-2% slopes, Alaeloa silty clay 15-35% slopes, Papaa clay 6-20 % slopes, and Papaa clay 35-70% slopes. The soil survey of Oʻahu indicates that portions of the present project area are underlain by Jaucas Sand deposits, which may contain traditional Hawaiian sites such as cultural layers and/or human burials.

Vegetation in these lower elevations of Waimānalo is overwhelmingly exotic (introduced), including *koa haole*, Christmas-berry, lantana, guava, and a variety of exotic weeds, but landscape plantings predominate in this area.

Figure 1. Portion of 1999 U.S. Geological Survey Koko Head Quad map showing location of project area

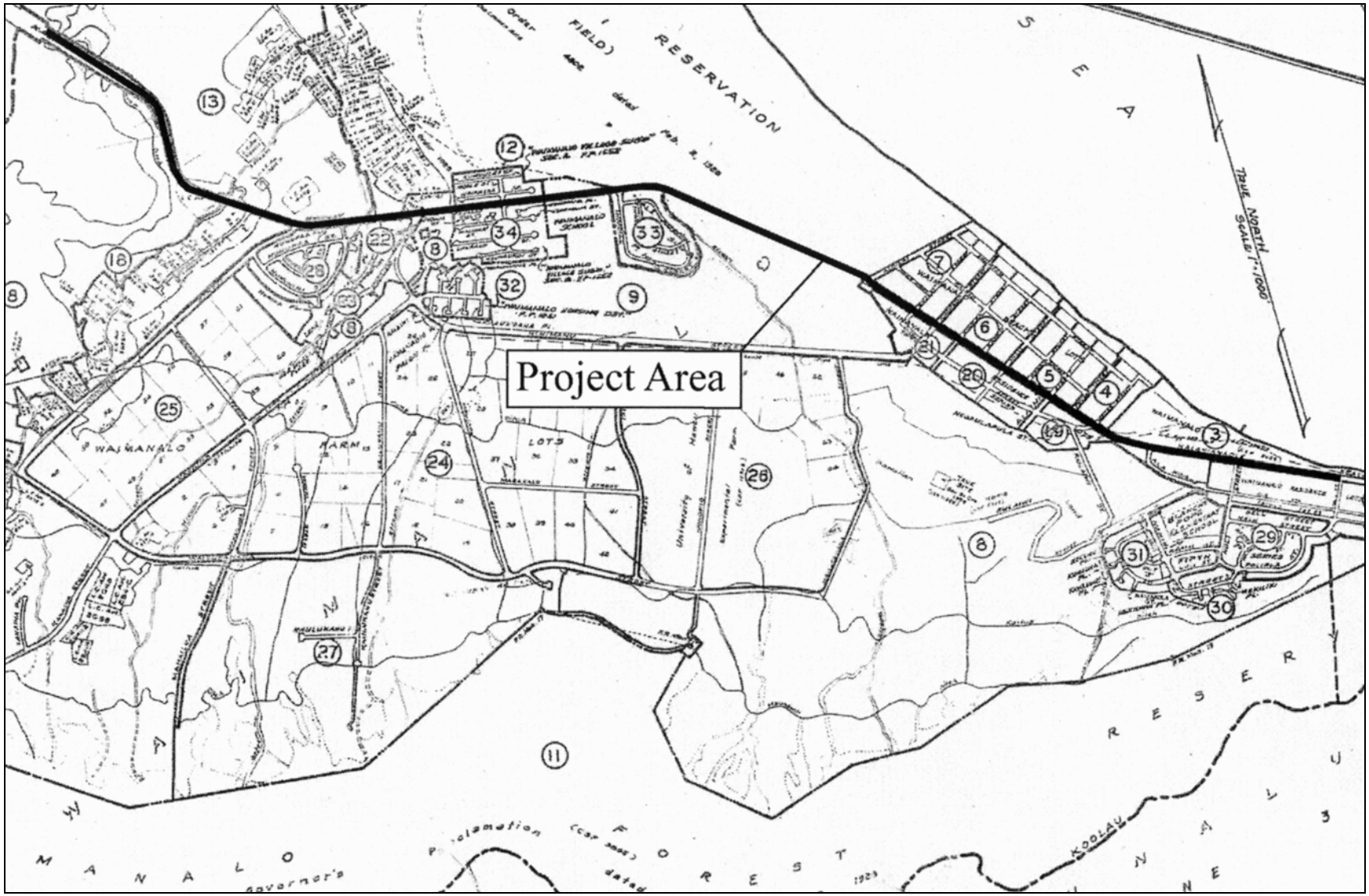

Figure 2. Portion of TMK 4-1 showing project area

Figure 3.. Map showing project area and surrounding streets

II. HISTORIC SETTING

A. Introduction

A number of historical sketches of the Waimānalo area have been compiled, notably, the mythological and archaeological material on Waimānalo found in *Sites of O'ahu* (Sterling and Summers, 1978), *A General Plan for Waimānalo Valley, Island of O'ahu* (Harold Bartholomew and Associates, 1959), and the "Historical Documentary Research" of Waimānalo with specific reference(s) to Bellows Air Force Station by Carol L. Silva (Rosendahl, ARA 20-020781, 1981). The following brief synopsis owes much to these works and credit must be given the authors for the bulk of the research.

Mythological and early historical references to Waimānalo attest to the importance of the area during traditional Hawaiian times. Archaeological work along the shoreline of Waimānalo (Bellows Air Force Station) has detailed some of the earliest known sites in the Hawaiian Islands. Site 50-80-15-18 (018 Dune Site), which is situated at the mouth of the Waimānalo Stream, has been dated to circa A.D. 400 and is included on the National Register of Historic Places (as part of site 50-80 -15-511). While the dates reported for Bellows Air Force Station have been a matter of much discussion and dispute they are still regarded as relatively early.

B. Traditional Accounts

The traditional accounts infer some generally recurring themes about Waimānalo. The themes include the scarcity of water except for small springs and Waimānalo Stream, the abundance of food crops along Waimānalo Stream, the good fishing resources and broad reef of the ocean fronting Waimānalo, and the somewhat isolated nature of Waimānalo, especially in terms of land routes, but with the sandy beach frontage allowing easy access by sea.

An example of the mythological references to Waimānalo, from the Pele and Hi'iaka epic states: "As they traveled on, Makapu'u and its neighbor hills passed out of sight. Arriving at Ka-ala-pueo, they caught view of the desolate hill Pōhaku-loa, faint, famished, forlorn..." (Emerson 1915:89). Hi'iaka is moved to chant a chant of the Big Island on the theme of privation including the line:

> *Wī 'ai 'ole, make i ka i'a 'ole, e.*
>
> It's famine, privation of taro, of fish! (Emerson 1915:89).

Emerson's (1915:89) account goes on to relate regarding eastern Waimānalo: "It is indeed a barren land. Fish is the only food it produces. Our vegetables come from Waimānalo. When the people of that district bring down bundles of food we barter for it our fish."

Another theme associated with Hi'iaka's traverse of Waimānalo is her interactions with the local beauty 'Āpuakea.. Fornander (1919: Vol. VI:343, "*Philological and Miscellaneous Notes*") relates: At Kapu'a in Ko'olau Muliwaiolena and her daughter 'Āpuakea were killed because the latter compared herself to Hi'iaka in beauty." A fuller account is given in a rendition of the story of Hi'iaka-i-ka-poli-o-Pele in the Hawaiian language newspaper *Ka Leo o Ka Lāhui:*

> They traveled past Kuhui (Kukui?) And Pāhonu where the people shouted at the beauty of Hiʻiaka. The news reached the ears of ʻĀpuakea and she said to her mother, Muliwaiolena, "Oh, Muliwaiolena, go and take a look at the women whose beauty the people are shouting about and see if they are as beautiful as I am." Muliwaiolena came out and looked. Never had she seen anything on Oʻahu to equal the beauty of these women. Turning to ʻĀpuakea she said, "Daughter, your beauty does not compare with their great beauty. You are like the soles of their feet." Hearing this the expression on ʻĀpuakea's face changed and she fainted away.
>
> Hiʻiaka overheard the words of the woman to her daughter and she uttered this chant:
>
> > O ʻĀpuakea-nui, you beautiful woman,
> >
> > Comparisons have been made of your charms,
> >
> > You are beautiful, beautiful indeed.
>
> Muliwaiolena then called out to Hiʻiaka and her friend, "Come in, eat and drink and when you are full then continue on your long journey." But the travelers did not accept as they did not like the embarrassing comparison that had been made between themselves and the young girl, ʻĀpuakea.
>
> As the travelers went off Muliwaiolena suddenly fell dead. Shortly afterwards ʻĀpuakea died... (*Ka Leo o Ka Lāhui* March 14, 15 1893.)
>
> It is said "that the people named the place [ʻĀpuakea, by the coast, central Waimānalo] for her and for her fair skin." (Alona, Charles, informant Sept. 22, 1939 Waimānalo, Oʻahu Place Names in Sterling and Summers 1978:247)

Another myth (Thrum 1923:185 "Punaʻaikoaʻe") includes references to the surf of Waimānalo in which two lovers swim till they are out of sight of land and eventually land on Molokai.

In the famous story of Kahalaopuna her murderous fiancé is said to have been the son of a chief of Waimānalo, Kailua, Kāneʻohe and Heʻeia (Nakuina 1904:41)

In a canoe paddling race, Lonoikamakahiki is able to win Oʻahu from the ruling chief Kākuhihewa in part through a stratagem of paddling to Kailua inside of the Waimānalo reef (Fornander 1917:IV 300301"Story of Lonoikamakahiki")

An area just *mauka* of the present project area appears to have been given the place name "Puʻu o Molokai." The following explanation is provided:

> Across from the Waimānalo Park, surrounded by a cane field are two low hills. The smaller of the two is Puʻu-o-Molokai.
>
> Long ago a Molokai man came here and went to live on a low hill not far from Muliwai-olena. The reason for his coming from Molokai to Oʻahu was forgotten long ago but others followed and dwelt with him. This hill was called Puʻu-o-Molokai or Molokai's hill. The newcomers made their homes on the hill itself and kept very much to themselves. When a boy married one of the girls of Waimānalo,

> he had to leave his own people to dwell with his wife's. If a girl married a Waimānalo man she too left her own people. Gradually the Molokai people were absorbed by those of Waimānalo. Alona's great-grandfather was one of those who belonged to the Molokai group. (Alona, Charles, informant Sept. 14, 1939 Waimānalo, Oʻahu Place Names in Sterling and Summers 1978:247)

Waimānalo was a frequent point of arrival and departure in late pre-contact and early post-contact times as in the following account of the loss of Oʻahu sovereignty.

> When King Kahekili of Maui heard of the death of the priest, Kaopulupulu, by Kahahana (a chief appointed by Kahekili to govern Oahu), he sent some of his men thither by canoe, who landed at Waimānalo, Koʻolau, where as spies, they learned from the people respecting Kaopulupulu and his death, with that of his son; therefore they returned and told the King the truth of these reports, at which the affection of Kahekili welled up for the dead priest, and he condemned the King he had established. Coming with an army from Maui, he landed at Waikīkī without meeting Kahahana, and took back the government of Oʻahu under his own kingship. The chiefs and people of Oʻahu all joined under Kahekili for Kahahana had been a chief of wrong-doing... (Thrum 1907:212-3).

Samuel Kamakau in 1875 related, "The Ahupuaʻa of Waimānalo, including the fish pond at Maunalua and the traveling *uhu* of Makapuʻu belonged to Maui-mua (First Maui)", (*Kuokoa* Nov. 27, 1875; in Sterling and Summers 1973:244).

During Kamehameha's conquest of Oʻahu, part of his fleet landed near Makapuʻu and then joined with Kamehameha's other forces, finally conquering Oʻahu. Prior to the invasion, Kamehameha sent a messenger to Kahekili;

> Kiʻkane, Kamehameha's messenger to Kahekili, threw down two *maika* stones, this stone (the white) brings life through farming and fishing, rearing men, and providing them with food; this other stone (the black) brings war. Let the reader ponder the meaning of this answer. Kahekili asked, Is Kamehameha coming to Oʻahu to fight? 'Yes' answered Ki-Kane. What harbor will he choose? It was Kikoʻo's counsel to make Waimānalo the harbor and battle site. 'It is too low there to cast sling stones to reach the heights. It is good only for food and fish...' (Kamakau 1961:250).

After Kamehameha's conquest of Oʻahu and his apportionment of the island, among his chiefs, Waimānalo apparently was retained as his personal property. This seems to be the case as in 1845, when Kamehameha III, Kauikeaouli, who had "inherited" the land, as a son of Kamehameha I, claims the *ahupuaʻa* of Waimānalo "to be the private lands of his Majesty Kamehameha III, to have and to hold to himself, his heirs and successors, forever; and said lands shall be regulated and disposed of according to his Royal will and pleasure, subject only to the rights of tenants" (Com. of Public Lands, 1929:28).

C. Early Historic Accounts

Two early foreign visitors, both missionaries, were generally unimpressed with Waimānalo. Their descriptions of the area, however, are of interest. Levi Chamberlain in 1828 comments on Waimānalo being a "considerable settlement" and while there, stayed in a native house, "a miserable place for the abode of human beings and presented a motley group of children and

women, dogs, hogs and fowls" (Chamberlain 1857:80-1, in Silva 1981:A-20). In 1830, Edwin Hall writes, "we could not however, but notice, that most of the inhabitants on the eastern end of the island were much more degraded, and exhibited far less evidence of improvement than any we saw on other parts of the island; a fact calling for our sympathy and pity, and for our endeavors to enlighten and elevate them" (Hall 1939:111; in Silva 1981: A-21).

D. Māhele Data

The *ahupuaʻa* of Waimānalo was awarded to Victoria Kamāmalu, subject to the *kuleana* claims of the commoners. She received the third largest share of lands among the *aliʻi nui* of the Kingdom of Hawaiʻi including 47 other *ahupuaʻa*-sized parcels in addition to Waimānalo. Approximately 113 *kuleana* Land Commission Award claims were awarded in Waimānalo. Nearly all of these *kuleana* were along Waimānalo Stream or its upper tributaries in the west portion of the *ahupuaʻa* (Figure 4). There appear to have been only two Land Commission Awards in all of central and east Waimānalo, both located on the coast in east Waimānalo. While it seems highly probable that the Hawaiian population of Waimānalo was much larger and more dispersed in pre-contact times, it nevertheless appears highly likely that the traditional Hawaiian population of Waimānalo was always very much focused along Waimānalo Stream and its upper tributaries.

E. Ranching Period

In 1828 an Englishman, Thomas Cummins, arrived in Hawaiʻi and soon after married the High Chiefess Kaumakaokane, who was related to Kamehameha I. This marriage provided Cummins with connections to the throne. Cummins received a Royal Patent to an estate of crown lands in Waimānalo in 1842 (Dorrence 1995:1), and in 1850 Kamehameha III leased the entire Waimānalo Ahupuaʻa (except for the *kuleana*) to Thomas Cummins. The original deed is dated Feb. 12, 1850 and was for a period of 50 years for 6,970 acres at $350.00 per annum. However, there was confusion over the land title. Alexander Liholiho Kamehameha IV, "deeded" Waimānalo to a Wm. Webster in 1855 for $1. Wm. Webster mortgaged the land for some $2,000 with the mortgage being released in 1857. The same thing happened again in 1857 with the mortgage clearing by April 1858. These deeds and mortgages did not actually cause the control of lands to change, as Thomas Cummins retained his lease, but they apparently served as security for loans made to Alexander Liholiho.

Thomas Cummins and his son John A. Cummins turned Waimānalo into a large cattle and horse ranch. The Cummins Estate, "Mauna Rose" was known for its lavish parties. Cummins was also host to American and British officers on warships visiting in Hawaiian waters.

"The Kamehamehas, King Kalākaua and Queen Liliʻuokalani all made this part of the island their home, and they spent a great part of their time at the Cummins Estate" (Star Bulletin 6/22/1935:9; in Silva 1981:A-22). However, it appears as if not all were enthusiastic about the cattle ranching:

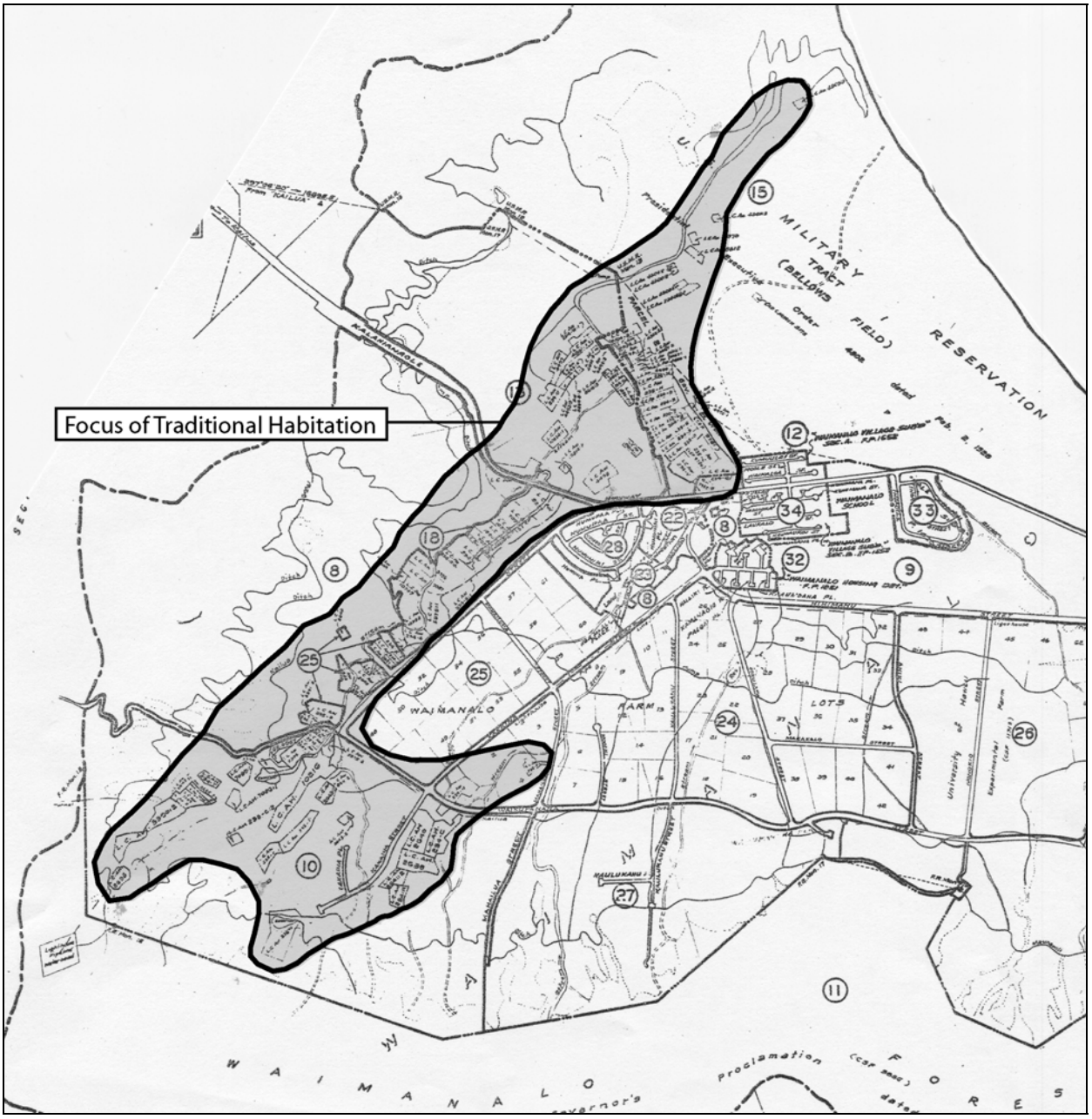

Figure 4. Map showing the location of the aggregation of *kuleana* Land Commission Awards along Waimānalo (Puhā) Stream in West Waimānalo

> At the time, it seemed that the valley was filled with breadfruit, mountain apples, *kukui* and coconut trees. There were taro patches, with banks covered with ti and *wauke* plants. Grass houses occupied the dry lands, a hundred of them here and sweet potatoes and sugar cane were much grown. It was a great help toward their livelihood... The whole ahupuaʻa of Waimānalo was leased to white men except the native *kuleana* and because the cattle wandered over them, they were compelled to build fences for protection. The taro patches that were neatly built in the time when chiefs ruled over the people and the land were broken up. The sugar cane, ti and *wauke* plants were destroyed. The big trees that grew in those days, died because the roots could not get moisture. The valley became a place for animals (*Kuokoa*, Oct. 26, 1906; in Sterling and Summers 1973:244).

F. The Waimānalo Sugar Company

The Cummins Estate eventually began to buy up the *kuleana* of the native farmers, gaining some 200 acres in fee. By the early 1870's Chinese rice farmers were using some of these lands under agreement with John A. Cummins. In 1876 the Hawaiian Kingdom entered into a Reciprocity Treaty with the United States. This allowed the growing Hawaiian sugar industry a free market and the potential for great profits. One of the Chinese rice farmers, Tai Lee, began sugar cultivation on Cummins' land. Eventually Tai Lee and other Chinese farmers cultivated up to 1,200 acres of cane in Waimānalo.

John A. Cummins saw the potential of sugar production at Waimānalo and in 1880 started construction of a sugar mill. The Waimānalo Landing pier is understood to date from approximately 1883 (Marine Option Program 1999:12). In 1890, J. A. Cummins renegotiates his father's lease for an additional 30 years and "sub-lets the lands of Waimānalo to the Waimānalo Sugar Company (W.S.C.) which he then controlled" (Bartholomew and Associates, 1959:14). The plantation continued to buy sugar from the Chinese farmers until around 1900, when W. S. C. did most of its own cultivation.

During this time, sugar and most goods were transported between Honolulu and Waimānalo by steamer. The Cummins Estate was still renowned for its extravagant hospitality. Lavish week-long luaus were given for Hawaiian Royalty. King Kalākaua came and rode on the newly built railroad in 1882 and in 1885 Cummins was host in celebrating Queen Kapiʻolani's birthday. The second steam engine Cummins bought in 1883 for his Waimānalo plantation, later named the "Olomana," is today in the Smithsonian Institution in Washington D.C. as a reminder of this period of history (Williams 1996:B1). The present project area (Kalanianaʻole Highway) lies along the railway route established in this era. (Figures 5, 7-8).

The Waimānalo Sugar Co. continued to grow and business was good. More lands were being put under cultivation. New tracks were being laid and another locomotive was ordered. Interest in W. S. C. grew, and in 1885 W.G. Irwin of the W.G. Irwin & Co., agents for W. S. C., gained control with J. A. Cummins staying on as overseer. In 1894, J. A. Cummins sold the majority of shares in W. S. C. to two California men and a Kohala sugar planter Robert. R. Hind, with George Chalmers taking over duties as plantation manager. J. A. Cummins died in 1913 and his estate sold the remaining fee simple lands and the unexpired lease of Waimānalo to W. S. C. for $52,000. In 1910 W.G. Irwin and Co. merged with C. Brewer. By 1922, the present project area was under commercial sugar cane cultivation by the W.S.C. (Figure 6). C. Brewer controlled W. S. C. until its liquidation in 1947. The Waimānalo pier ended service in 1924 when the Pali road was officially opened (Marine Option Program 1999:13).

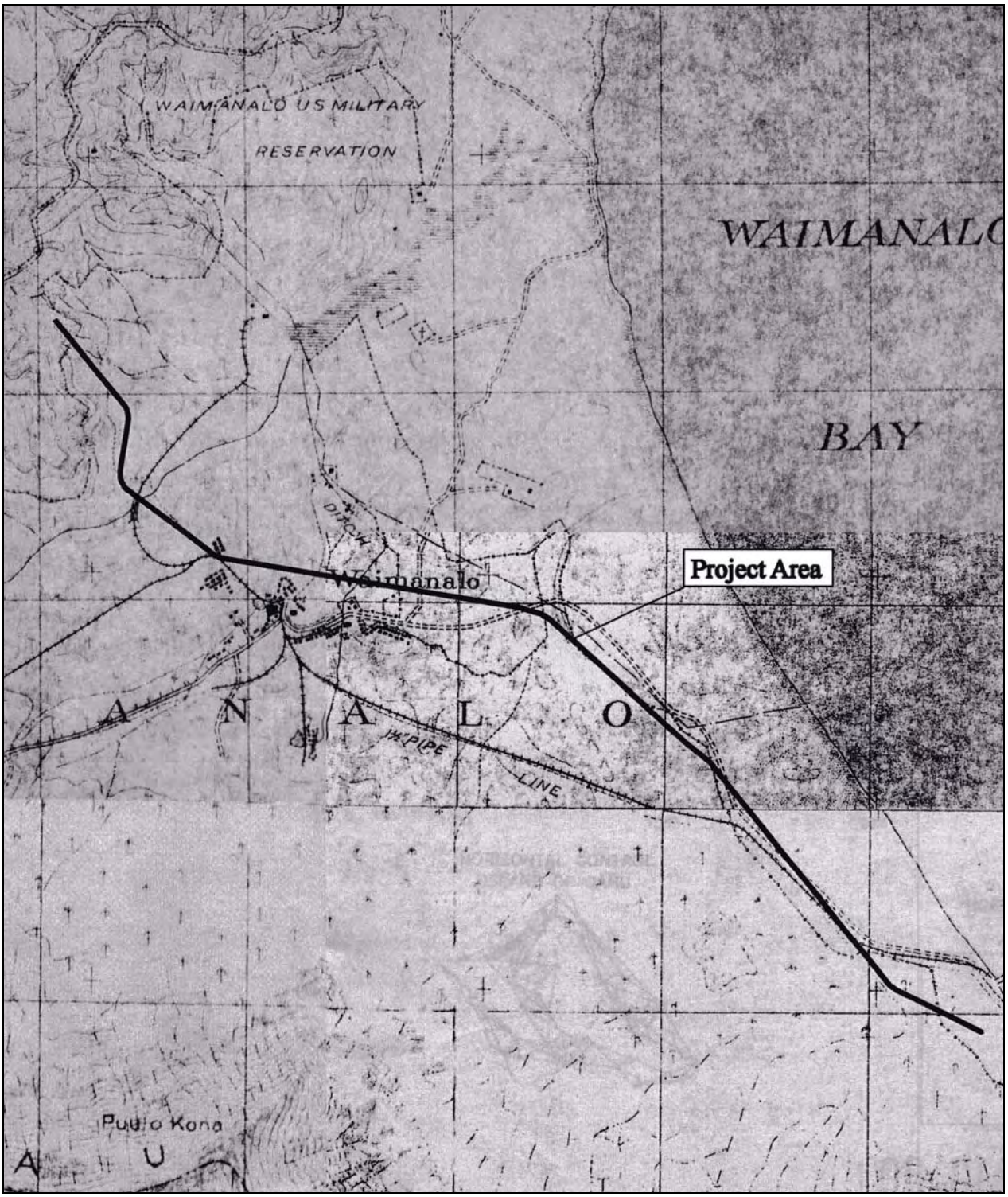

Figure 5. Portion of 1919 Fire Control Waimānalo and Koko Head maps showing location of project area

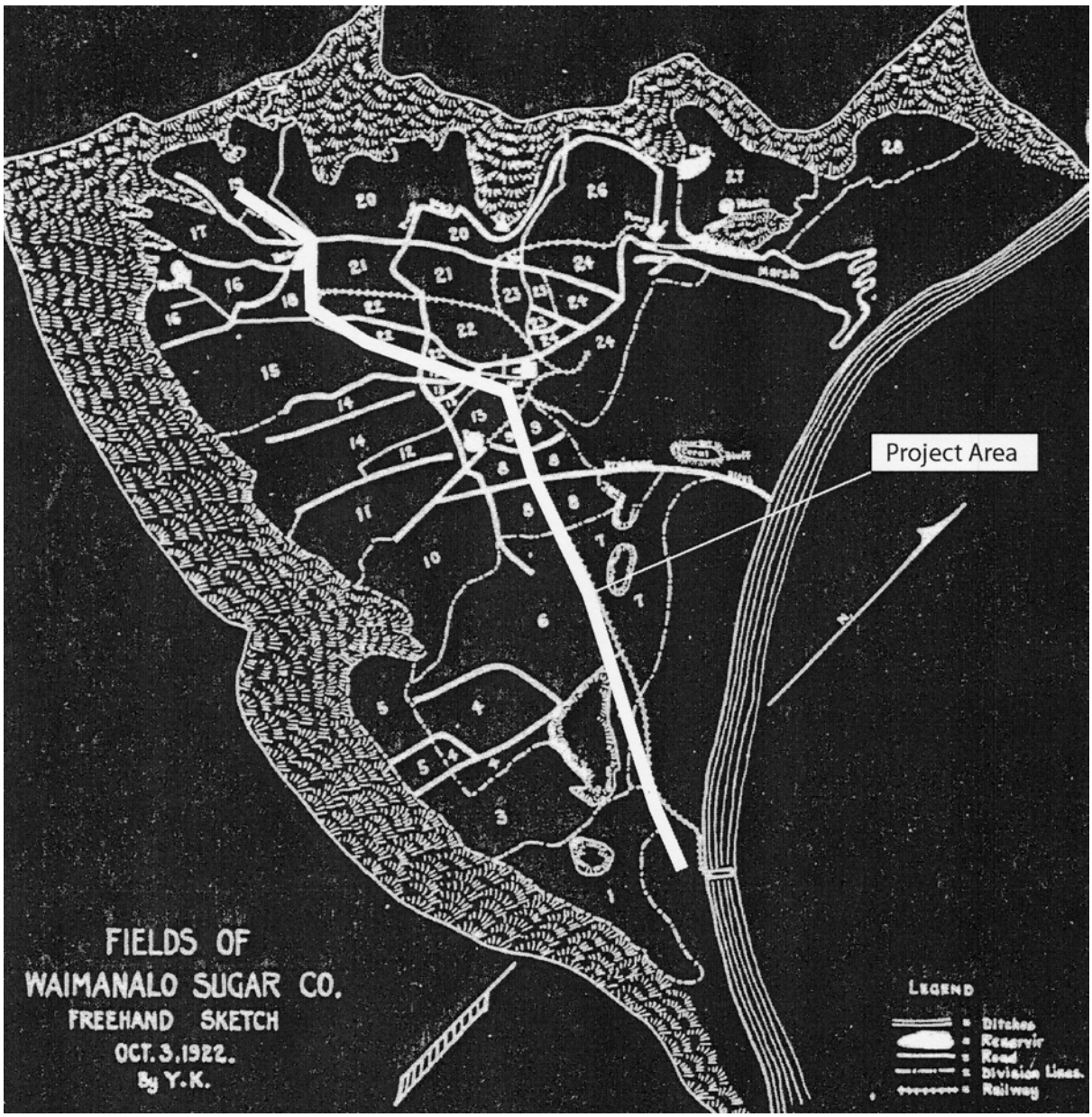

Figure 6. Portion of "Fields of Waimānalo Sugar Company Map" (1922) showing location of project area, From Condé and Best (1973)

Figure 7. Portion of 1928 USGS Mokapu and Koko Head Maps showing location of project area

Figure 8. Portion of 1943 War Department Kailua and Makapu‘u Maps showing location of project area

III. PREVIOUS ARCHAEOLOGICAL RESEARCH

Waimānalo, in general, is distinguished as being the place of one of the earliest archaeological investigations in the Hawaiian Islands. In 1879, Mr. Otto Finsch reported on human burials in sand deposits and associated artifacts in the area that is now Bellows Air Force Base (Finsch 1879). There have been approximately one hundred archaeological studies in Waimānalo Ahupuaʻa, which are summarized in Table 1 and Figure 9.

McAllister, in his *Archaeology of Oahu*, reports two sites in *mauka* Waimānalo (McAllister 1933:191). Both of these sites are *heiau*. Site 381 is located on the slope below Mt. Olomana to the west of the northernmost portion of the present study area. Site 382 is referred to by the name of the place - Pōhakunui - and stands on a hill near the top of Mahailua Road, southwest of the present project area.

The major focus in archaeological research in Waimānalo has been the Bellows area and to a much lesser extent the Waimānalo State Recreation Area. Bellows Air Force Station is one of the most extensively studied areas on Oʻahu. Beginning in the 1960s, approximately 70 separate reconnaissance, survey, excavation and monitoring projects have taken place, most in conjunction with construction activity. Human burials, lithic scatters, soil features and/or occupation layers have been found almost everywhere archaeological investigation has taken place. Possibly, the most important finds occurred in dune deposits adjacent to the mouth of Waimānalo Stream referred to as Site 018. Radiocarbon dates on charcoal from cultural layers within the dune which placed the earliest occupation to around 300-400 C14 years A.D. (Tuggle et al. 1978) have been much disputed but these deposits are still considered to be among the oldest in Hawaiʻi (Cordy and Tuggle, 1976 and Kirch, 1985:71). Much of the research since this discovery of early Bellows Dune occupation has focused on attempting to connect other archaeological finds in more inland areas of Bellows to this early Polynesian settlement. Bellows remains a focus of continuing archaeological research.

Approximately a dozen archaeological studies were carried out at the Waimānalo State Recreation Area just south of Bellows mostly between 1976 and 1980. There was hope that the occupation layers documented just to the north might be present in the State Recreation Area but findings thus far have been rather disappointing.

Studies in the general vicinity of the present project area include Hibbard and Kolb 1991, McGuire and Hammatt 2000a, Perzinski et al. 2001, and Perzinski et al. 2002.

The Hibbard and Kolb (1991) study was a report on a brief field inspection of a houselot and neighboring area at Waiokeola Street (TMK 4-1-36:18) approximately 500 m south of the present project area. The presence of a stacked mound and a tumbled wall of unknown function was noted. The import of this is unclear beyond indicating some cultural activity in the vicinity.

The McGuire and Hammatt (2000a) study was an archaeological monitoring report on excavations for the installation of six light poles for a ball field at Waimānalo Beach Park immediately adjacent to the southwest portion of the project area. No cultural findings were reported (dirt fill over sterile sand) but the actual area monitored was very small.

The Perzinski et al. 2001 report covers monitoring for a similar Sandwich Isles Communications project in three areas: at the intersection of Oluolu and Ehukai Streets, at the *mauka* end of Aloiloi Street and at Nakini Street. This project thus included monitoring

immediately adjacent to the present project area. Along Nakini Street the observed sediments were sandy clay loam with modern trash mixed in extending to the base of excavation (Perzinski et al. 2001:15). No sites, burials, cultural layers, or significant finds were observed in the course of this work but a relatively small portion of this project was actually monitored.

The Perzinski et al. 2002 report addresses finds during archaeological monitoring at a *kūpuna* housing project on a 7.92-acre parcel at 41-209 Ilauhole Street, immediately adjacent to the present project area. Three inadvertently disturbed human burials and a cultural layer (State site #50-80-15-5939) were encountered during construction activities in the far (northwest) corner of the parcel. No cultural layer or burials were identified in the work on the Nakini Street side of that project.

Table 1. Previous archaeological studies within Waimānalo Ahupuaʻa

Year	Author(s)	Title	Comments
1879	Finsch, Otto; Alexander, A.D. (Translator)	Bericht Uber Insel Oahu (Letters from the Island of O`ahu)	Told there was "a place of skulls" in Waimānalo
1933	McAllister, Gilbert	Archaeology of Oʻahu	Identified 3 *heiau* (380, 381, & 382), a *puʻuhonua* (383), a fishpond (383a), and abandoned coastal village(384)
1971	Gormley, Michael K.; Yent, Martha; Davis, Bertell D.; Imamoto, Shirley; Kavanagh, B. P.	Site 3000: University of Hawaiʻi at Mānoa, Summer Field School, Summer 1971.	Study of Kaupo Fishing Village area
1971	Pearson, Richard	Archaeological Reconnaissance Survey; Waimānalo Bay State Recreation Area; Waimānalo, Oahu TMK 4-1-03:016	Site 512 remnant sand dune & cultural layer & 513, cultural deposits, human remains
1971 (1967)	Pearson, R. J., P. V. Kirch & M. Pietrusewsky	"An Early Prehistoric Site at Bellows Beach, Waimānalo, Oahu, Hawaiian Islands," Archaeology and Physical Anthropology in Oceania VI (3)	Reports study of stratigraphy, cultural finds & 5 sets of human remains BAFS
1973	Davis, Bertel	Kaupo Cave Shelter, Site 3000, Feature 1: A Preliminary Report on Artifact Analysis	UH Mānoa M.A. thesis based on field work at Kaupo Village complex
1974	Tuggle, H. David & M. J. Tomonari	Surface and Sub-surface Survey of Selected Zones of Bellows Field Archaeological Area	Summary of excavations historic deposits in 4 of 7 areas examined, BAFS

1975	Cordy, Ross	O18 O‘ahu Island New Work and New Interpretations	Reports on further work at O18 and adjacent sites BAFS
1975	Nakama, Stella	Archaeological Surveillance of a Drip Irrigation Line: Bellows Air Force Station, Oahu, Hawai‘i.	Monitoring of a backhoe Trench - minimal findings BAFS
1975a	Tuggle H. David	Report on Archaeological Investigations of the Bellow Archaeological Zone National Register Site and Adjoining Portions of Bellows Air Force Station, Spring 1975	Presents findings at various zones of O18, BAFS
1975b	Tuggle, H. David	Archaeological Surveillance of Construction Excavation in Bellows Field Archaeological Zone of the Bellows Air Force Station, HI.	Brief study of construction monitoring NE BAFS
1975c	Tuggle, H. David	Preliminary Report on Subsurface Investigation of a Portion of Proposed Irrigation Line, Bellows Air Force Base, for Archaeological Evaluation	Letter report, no features or artifacts, BAFS
1975d	Tuggle, H. David	Archaeological Examination of Areas of Bellows Air Force Station Subject to Construction Activities.	Evaluates various areas, BAFS
1975	Tuggle, H. David, Stella K. Nakama, and Thomas N. Manabe	Subsurface Investigations of Site 511-5 Bellows AFS, Oahu, Hawai‘i, Pertaining to “Seawall Repair and Drip Line” Project	Provides data and conclusions re: archaeological import of site 511-5, BAFS
1976	Cordy, Ross and David Tuggle,	Bellows, Oahu, Hawaiian Island: New Work and New Interpretation.	Reviews problems, includes results of investigations in inland areas, BAFS
1976	Davis, Bertell D.	Archaeological Investigations at the Waimānalo Bay State Recreation Area, Ko`olaupoko, Waimānalo, O‘ahu Island.	Not seen
1976	Davis, Bertell	Archaeological Survey and Testing at the Waimānalo Bay State Recreation Area, Ko‘olaupoko, Waimānalo, Oahu Island, TMK 4-1-08:16	Sterile cores, Site 512 found imu

1976	Nakama, Stella & H. David Tuggle	A Report on Archaeological Monitoring of Repair of Water Distribution System, Bellows AFS	42 features possibly dating to Hawaiian traditional period, BAFS
1976	Tuggle, H. David and Thomas N. Manabe	Archaeological Monitoring of Drip Irrigation Line Construction: Bellows Air Force Station #2.	Results of second phase of drip irrigation monitoring, BAFS
1977	Davis, Bertell	Archaeological Investigations at the Waimānalo Bay State Recreation Area, Koʻolaupoko, Waimānalo, Oahu Island: Phase I, Subsurface Survey	Coring at Sites 512-513. Site 512 small stratified deposit with cultural features; Site 513 not locate reported burials or cultural deposit
1978	Davis, Bertell	Subsurface Archaeological Reconnaissance of Selected Areas at Bellows AFS, Oʻahu Island	Reports cultural deposits and human remains from NE Bellows, BAFS
1978	Cox, David W.	Waimānalo Bay State Recreation Area, Archaeological Monitoring of Fence Line, Water Line, Electrical Line, Sewer Line, Park Development, Phases I and II, Waimānalo, Koolaupoko, Oahu Island (TMK 4-1-15:15)	1 burial, site 512 outlined
1979a	Beggerly, Patricia	Archaeological Subsurface Investigation at Waimānalo Bay State Recreation Area, Koolaupoko, Oahu	18 augur holes with no subsurface cultural deposits
1979b	Beggerly, Patricia	Archaeological Monitoring and Subsurface Investigation at Waimānalo Bay State Recreation Area, Koolaupoko, Oahu	No findings
1979	Carter, Laura	Archaeological Monitoring of Selected Areas at Bellows Air Force Station, Oahu Island	Presents data on site -9645 NE Bellows, BAFS
1979	Griffin, Agnes and Martha Yent	Archaeological Subsurface Investigation at Waimānalo Bay State Recreation Area, Koʻolaupoko, Oʻahu.	Generally confirms absence of culture

1979	State Parks In-house Archaeological Team	Archaeological Monitoring and Subsurface Investigation at Waimānalo Bay State Recreation Area, O‘ahu. October 9, 1979-November 1, 1979.	Not seen
1979	Yent, Martha; and Agnes Griffin	Bulldozed Areas at Waimānalo Bay State Recreation Area, Ko`olaupoko, O`ahu	No findings
1980	Beggerly, Patricia (Lovelace & Ota)	Archaeological Test Coring at Waimānalo Bay State Recreation Area, Memorandum	No cultural deposits located
1980	Lovelace, George & Jason Ota	Archaeological Test Coring at Waimānalo Bay State Recreation Area	No cultural deposits
1980	Ota, Jason	Archaeological Monitoring at Waimānalo State Recreation Area Memorandum	Modern trash under parking lot
1980	Riley, Thomas J.	Archaeological Reconnaissance and Subsurface Testing of Proposed Boathouse Project Site at Bellows AFS, Hawai‘i	Presents results of 111 auger borings & 10 1m2 excavations - minimal findings, BAFS
1981	Kam, Wendell,	Archaeological Report of a Human Burial at Manana Island, Koolaupoko, Waimānalo, Oahu	Not seen
1981	Neller, Earl	Waimānalo Ditch System: Photo Survey	Photographs of ditches
1981	Rosendahl, Paul H.	Archaeological Reconnaissance Survey of Proposed Additional Marine Corps Training Areas Bellows Air Force Station Oahu	Extensive historical summary, BAFS
1981	Rosendahl, Paul H. and Carol L. Silva	Archaeological Reconnaissance Survey of Proposed Additional Marine Corps Training Areas, Bellows Air Force Station, Oahu, Hawai‘i	Surface survey of 356-acre parcel, relocated 5 previously recorded sites, no new sites, BAFS
1982	Tuggle, David	Archaeological Reconnaissance: Bellows Air Force Station Waimānalo, Oahu, Hawai‘i.	No significant findings, BAFS

1983	Leidemann, Helen & Paul L. Cleghorn	Archaeological Monitoring of Vegetation Clearance on Antenna Fields at Bellows Air Force Station, Oahu, Hawai‘i	Site 3312, gravestone complex 1917 era, BAFS
1983	Sue, Roy K., Martha Yent, and Jason Ota	Waimānalo Watershed Project and Archaeological Survey of the Solid Waste Collection Site, Waimānalo, O‘ahu	No sites located
1984a	Barrera, William	Archaeological Services During Installation of Five Replacement Antennas at Bellows Air Force Station, O‘ahu, Hawai‘i	Notes discontinuous but related archaeological deposits, BAFS
1984b	Barrera, William	Waimānalo, O‘ahu: Archaeological Survey at Proposed Well Locations	Well sites III & IV, no significant findings
1985	Athens, J. Stephen	Archaeological Monitoring for Soil Coring, Bellows Air Station, Waimānalo, O‘ahu.	No significant findings, BAFS
1985	Griffin, P. Bion	Test Excavations at the Searex Tower Site, Bellows Field Archaeological Area, Bellows Air Force Station, Waimānalo, O‘ahu	No significant findings, BAFS
1985	Hammatt, Hallett H.	Letter Report on Archaeological Monitoring at Bellows Air Force Station Post Exchange Site	Minimal findings, BAFS
1985	Hammatt, Hallett	Archaeological Monitoring for Fuel Tank Trench at Bellows Air Force Station, Waimānalo, Oahu	Notes human bone and fire hearth, BAFS
1985	Hurlbett, Robert E.	Preliminary Report upon Completion of Fieldwork: Archaeological Reconnaissance and Subsurface Testing for Recreation Library Project Sites, Bellows AFS, Oahu.	No significant findings, BAFS

1985	Hurlbett, Robert E., Margaret Rosendahl, & Paul H. Rosendahl	Archaeological Reconnaissance, Subsurface Testing and Monitoring of Proposed Projects HIC 84-1269, Recreation Library and HIC 86-3221, Recreation Library Utilities Support Project Sites at Bellows AFS, Waimānalo, Koʻolaupoko District, Island of Oʻahu, Hawaiʻi (TMK:1-4-1--15:1),	No evidence of cultural materials, BAFS
1985	Mc Neill, J. R.	Archaeological Reconnaissance and Monitoring of Obstacle Course Construction at Bellows Air Force Station, Oahu, Hawaiʻi.	Minimal Findings, BAFS
1985	Neller, Earl	An Archaeological Reconnaissance of Manana Island, Oahu	Not seen
1986a	Athens, Stephen	Preliminary Report: Archaeological Reconnaissance Survey for Proposed Omni Antenna, Bellows A.F.S., Waimānalo, Oahu, Hawaiʻi.	Mostly transit work, no surface remains, brief synopsis of augering, BAFS
1986b	Athens, Stephen	Site Summary: Archaeological Deposits at the Bellows A.F.S. Omni Antenna Pad & Trench, Waimānalo, Oahu	Presents results of work at Site -1445, BAFS
1986	Kam, Wendell	Bellows Fence Repair Burial.	Account of human remains uncovered during construction, BAFS
1986	Kam, Wendell	Investigation of Discovery of Human Skeletal Remains, Bellows AFS, Koolaupoko, Oahu, Letter Report	Account of human remains uncovered during construction, BAFS
1987	Athens, J. Stephen	Archaeological Survey and Testing for Airfield Perimeter Fence Project, Bellows Air Force Station	Designates sites -3709 subsurface cultural deposit and -3710 marsh deposits, BAFS
1987	Pietrusewsky, Michael	Burial on Rabbit Island, Waimānalo Side, Waimānalo, Koʻolaupoko, Oʻahu Island., Police, Honolulu; Medical Examiner, Honolulu	Not seen

1987	Spriggs, Matthew	Report of Radiocarbon Dating Analysis	Review of carbon dating, BAFS
1988	Athens, J. Stephen	Archaeological Reconnaissance and Subsurface Testing, Proposed Omni Antenna and Cable Trench, Bellows Air Force Station, Waimānalo, Oahu.	Documents discontinuous subsurface deposits & an area of basalt debitage, BAFS
1988	Hammatt, Hallett H.	Archaeological Reconnaissance of a 3.9-Acre Parcel Adjacent to Sea Life Park, Waimānalo, Oʻahu,	No findings - parcel had been leveled and filled
1988	Hammatt, Hallett H. & Douglas Borthwick	Archaeological Reconnaissance of the Mauka Portion of Phase II Waimānalo Agricultural Park Waimānalo, Oʻahu	Previously under cane cultivation, notes two taro complexes
1988	McNeil, Judith R.	Intensive Archaeological Survey and Data Recovery at Site 50-80-15-3709, Bellows Air Force Station, Oʻahu, Hawaiʻi	Describes essentially intact deposits of site -3709, BAFS
1988	Medical Examiner	Police and Medical Examiner's Reports on Burial at Kaiona Beach Park, Honolulu	Not seen
1988	Streck, Charles F. and Farley K. Watanabe	Archaeological Reconnaissance of Areas Proposed for Emergency Flood Repair and Replacement of Structures, Bellows Air Force Station (BAFS), Waimānalo, Oʻahu Island.	Minimal Findings, BAFS
1989a	Hammatt, Hallett H. & David W. Shideler	Archaeological Survey and Testing at Bellows Air Force Station for New Antennas and Trench Lines, Waimānalo, Ko`olaupoko, Oʻahu	Delimits cultural deposits in the vicinity of the Bellows runways, BAFS
1989b	Hammatt, Hallett H. & David W. Shideler	Archaeological Reconnaissance and Subsurface Testing of Proposed KNMD 773133, Park Complex, North Coastal Region of Bellows AFS, Waimānalo, Oʻahu, Hawaiʻi.	Delimits cultural deposits in the vicinity of the NE portion of Bellows, BAFS

1990	McMahon, Nancy; Michele T. Douglas, and Michael Pietrusewsky	Burial Removal at 41-042 Manana Street, Oʻahu, Site No. 50-80-15-4118, TMK: 4-1-05:027.	Burial of a single individual
1990	Rolett, Barry V.	University of Hawaiʻi Archaeological Research on Bellows Air Force Station: Report of the 1989 Field School and a Proposal for Further Research in 1990	Summary of 1989 Reconnaissance and areal excavation, BAFS
1991	Hibbard, Don and Michael Kolb	Field Inspection of Houselot and Neighboring Area at TMK: 4-1-36:18, Waimānalo, Koʻolaupoko, Oʻahu	Notes a stacked mound and tumbled wall of unknown function
1991	Kawachi, Carol	Kaupo Beach Park Burials, Waimānalo, Koʻolaupoko, O`ahu.	Not seen
1991	Miller, Lynn	Archaeological Monitoring of the Tinker Road Bridge Repair (Replacement) Project, Bellows Air Force Station, Waimānalo, Oʻahu Island, Hawai`i.	Reports cultural evidence of site -511 including 3 distinct occupational levels, BAFS
1992	Carpenter, Alan	Fieldcheck of Kealakipapa Valley Road Remnants, Makapuʻu Head, Maunalua, Koʻolaupoko, Oʻahu.	Presents a historical review and field observations focused on road remnants
1992	Rolett, Barry V.	1990 Archaeological Excavation at Site 50-80-15-3300 (Bellows Air Force Station, Oahu), Conducted by the University of Hawaiʻi Archaeological Field School	Results of field school excavation at Site -3300, BAFS
1992	Shun, Kanalei	Archaeological Survey and Subsurface Testing for Proposed Electric Tie Circuit, Bellows Air Force Station, Waimānalo, Koʻolaupoko District, Island of Oahu, Hawaiʻi	Presents testing results, only remnant localized cultural deposits, BAFS
1993	Dixon, Boyd	An Archaeological Reconnaissance of Five Board of Water Supply Wells on Oʻahu, Hawaiʻi.	Waimānalo Well III site - no significant findings

1993	Landrum, Jim & Allan Schilz	Archaeological Reconnaissance Survey, Monitoring, and Subsurface Testing at the Proposed Mini-Putt Golf Course Site Project KNMD 929122, Bellows Air Force Station, Waimānalo Ahupua1a, Koolaupoko District, Island of Oʻahu, Hawaiʻi	4 C14s - A.D. 1259-1489 and A.D. 1280-1530; 1411-1681, 1427-1666 (200 meters from shore, Site 4522, BAFS
1993	Shun, Kanalei	Archaeological Monitoring and Sampling During Emergency Flood Repair Construction, Waimānalo and Inoaole streams, Bellows Air Force Station, Waimānalo, Koolaupoko District, Island of Oahu, Hawaiʻi	Cultural deposits, C14 A.D. 1500, A.D. 700, BAFS
1993	Sinoto, Aki and Jeffrey Pantaleo	Archaeological Surface Assessment and Monitoring of 12.4 Acre Parcel for Hawaiʻi Job Corps Center, Waimānalo, Oʻahu	Not seen
1993	Stride, Mark; Douglas F. Borthwick, and Hallett H. Hammatt	Archaeological Reconnaissance Survey of the 56 Acres for the Proposed Olomana Golf Course Expansion Area (TMK: 4-1-13:11)	Only parallel ditches and a reservoir were identified as a site (Site -4524), a component of Site -4042 Waimānalo Sugar Co. infrastructure
1994	Tuggle, H. David	Archaeological Research of Areas Proposed for the development of Military Family Housing and Expansion of Military Training at Bellows Air Force Station, Oahu	Site 4853, A.D. 380 to 600, BAFS
1995	Erkelens, Conrad	Preliminary Report on Archaeological Monitoring and Data Recovery of Underground Storage Tank Removal, Bellows AFS, Waimānalo, Hawaiʻi	C14 dates between A.D. 1400 to 1529 (73% probability), BAFS

1997	Carlson, Ingrid	Archaeological Monitoring of Thirteen Locales for Site Assessment Field Sampling Activities at Bellows Air Force Station, Waimānalo, Oʻahu, Hawaiʻi	3 archaeological sites are located, no intact cultural deposits were found, BAFS
1997	Dega, Mike, Kyle, Latinis, and Randy Ogg	Draft–Archaeological Monitoring and Sampling During Excavations for the Removal of Underground Storage Tanks at Bellows Air Force Station Hawaiʻi, Waimānalo, Koʻolaupoko District, Oahu, Hawaiʻi	Understood as a draft of the following study, BAFS
1997	Latinis, D. Kyle, Michael F. Dega and Robert L. Spear	Archaeological Monitoring and Salvage Data Recovery Excavations for the Removal of Underground Storage Tanks at Bellows AFS Hawaiʻi, Waimānalo, Koʻolaupoko District, Oʻahu Island, Hawaiʻi.	Reports site -5464 a disturbed cultural deposit & a human bone, BAFS
1997	Tuggle, David H.	Final-Archaeological Research of Areas Proposed for Development of Military Family Housing and Expansion of Military Training at Bellows Air Force Station, Oʻahu,	Synthesis and reorganization of archaeological data, BAFS
1998	Carlson, Ingrid	Archaeological Monitoring for Bellows Excess Lands Engineering Evaluation/Cost Analysis Phase I Field Sampling Activities Bellows Air Force Station, Waimānalo, Oʻahu, Hawaiʻi	Minimal findings at 13 areas, BAFS
1998	Carlson, Ingrid and Tom Dye	Archaeological Monitoring Report for Site Investigations at Multiple Sites, Bellows Air Force Station, Waimānalo, Koʻolaupoko District, Oʻahu, Hawaiʻi	Identifies paleosols, but no cultural materials at two locations, BAFS

1998	Desilets, Michael and Thomas S. Dye	Archaeological Monitoring and Sampling during Bellows OU7 UST Removal Project, Interim Remedial Action, Phase I, Bellows Air Force Station, Waimānalo, Koʻolaupoko, Oʻahu	Site 50-80-15-4853, Hawaiian-era deposits were located in swales of a beach ridge; large amount of imported rocks & coral, BAFS
1998	Dye, Thomas	Archaeological Services in Support of the Final EIS for Proposed Expansion of Military Training and the Construction of Improvements to Existing Recreational Resources at Bellows Air Force Station, Waimānalo, Hawaiʻi	Presents data on four sites - 4851, -4853, -4855, -4857, BAFS
1999	Dye, Thomas and Coral Magnuson	Archaeological Monitoring for Multiple Dump Sites DP06, Bellows AFS, Waimānalo, Koʻolaupoko District, Oʻahu, Hawaiʻi	Reports a deeply buried wetland sediment but no direct evidence of taro or other cultivation, BAFS
1999	Marine Option Program	Waimānalo Landing - Underwater Survey	Documents machinery, pilings and various pieces of loading equipment
1999	Ogg, Randy and Michael Dega	Archaeological Monitoring and Sampling During Waterline Replacement at Bellows AFS, Waimānalo, Koʻolaupoko District, O`ahu Island, Hawai`i	Reports results of monitoring of 1.4 kms of trenching - minimal findings, BAFS
2000	Desilets, Michael	Archaeological Monitoring for Underground Storage Tank Removal on ST II Sites at Bellows AFS Hawaiʻi	Documents 3 traditional Hawaiian sites (-4850, -5464, & -383) and 1 military site (–4859), BAFS
2000	Desilets, Michael	Archaeological Monitoring and Sampling, Interim Removal Action Five Underground Storage Sites -047 Bellows AFS Hawaiʻi	Traditional Hawaiian cultural remains identified at several POL sites including identification of two new sites - 5799 & 5800, BAFS
2000	Eble, Francis and Lisa Anderson	Results of Archaeological Pre-Construction Subsurface Reconnaissance for Replacement of Beach Cottages at Bellows AFS, Island of Oʻahu, Hawaiʻi	Reports recovery of cultural remains incl. midden and fishing gear from a disturbed context, BAFS

2000a	McGuire, Kaʻohulani and Hallett H. Hammatt	Archaeological Monitoring Report for the Installation of Light Poles for a Ballfield at Waimānalo Beach Park, Waimānalo, Koʻolaupoko District, Island of Oʻahu (TMK: 4-1-003-016)	Minimal findings
2000b	McGuire, Kaʻohulani and Hallett H. Hammatt	Archaeological Assessment for the Sea Life Park chapel and Multi-use Building at Makapuʻu, Ahupuaʻa of Waimānalo Koʻolaupoko District, Island of Oʻahu (TMK: 4-1-14:13)	Minimal findings
2000	McIntosh, James and Paul L. Cleghorn	Report on Archaeological Pre-Constrction Reconnaissance Subsurface Testing and Sampling for Proposed Housing Facilities Construction, Bellows AFS, Waimānalo, Oʻahu Island, Hawaiʻi, TMK 4-1-15	Reports on 40 auger and 2 hand excavated test units -minimal findings, BAFS
2001	Addison, David J.	Archaeological Subsurface Testing for the Removal of Pipeline Utilities Under the Installation Restoration Program at Bellows AFS, Waimānalo, Koʻolaupoko District, Oʻahu, Hawaiʻi	Reports results of 23 backhoe trenches & 3 test units documenting a wide-spread, partially intact cultural stratum, BAFS
2001	Leidemann, Helen	Phase I Archaeological Inventory Survey of Housing Replacement at Bellows AFS Hawaiʻi TMK 1-4-1-15	N edge of Bellows, minimal findings, BAFS
2001	Perzinski, David, John Winieski and Hallett H. Hammatt	An Archaeological Monitoring Report for Waimānalo Sandwich Isles Communication Project, Waimānalo, Koʻolaupoko District, Oʻahu, Hawaiʻi (TMK: 4-1-19,20, 21)	Minimal findings
2002	Farrell, Nancy and Robert L. Spear	Archival Research and Documentation of Battery Ricker, ST-10 USTS at Sherwood Forest State Park...	Provides background data on history of Bellows Field area

2002	Hammatt, Hallett H. , David W. Shideler and Anthony R. Bush	Archaeological Inventory Survey in Support of Modifications of the USDA Hawai‘I Fruit Fly Production Facility at Waimānalo, Ko‘olaupoko, O‘ahu	Minimal findings, discusses adjacent Tai-Lee Ditch
2002	McGhee, Fred L. and Valerie Curtis	Archaeological Monitoring and Sampling in Conjunction with Force Protection Installation Bellows Air Force Station	Minimal findings, BAFS
2002	McIntosh, James and Paul L. Cleghorn	Report of Archaeological Monitoring and Sampling During Placement of Electrical Poles at Bellows AFS, Waimānalo, Ko‘olaupoko District, O‘ahu Island, Hawai‘i, TMK 4-1-15	Identified several buried cultural deposits at two locales, BAFS
2002	Ogg, Randy and Michael Dega	Archaeological Testing and Sampling During Removal at Two Underground Storage Tanks at Sherwood Forest State Park, Waimānalo, Ko‘olaupoko District, O‘ahu Island, Hawai‘i	None of 13 trenches yielded significant cultural resources, BAFS
2002	Perzinski, David, Brian Colin, and Hallett H. Hammatt	Archaeological Monitoring Report for Waimānalo Kūpuna Housing Project at 41-209 Ilauhole Street, Waimānalo Ahupua‘a, Ko‘olaupoko District, O‘ahu Hawai‘i (TMK 4-1-19:32)	3 human burials and a cultural layer are reported (Site -5939)
2002	Roberts, Alice K. S. and Patrick Bower	Archaeological Monitoring 8-Inch Waterline Installation Project Bellows AFS, Waimānalo, Ko‘olaupoko District, O‘ahu Island, Hawai‘i (DACA 83-00-P-0038)	Describes a new sub-surface site -5854, BAFS
2002	Roberts, Alice K. S. and Eric W. West	Archaeological Monitoring and Sampling During Construction of Housekeeping Facilities (BFMV 955000) Bellows AFS, Waimānalo, Ko‘olaupoko District, O‘ahu Island, Hawai‘i (DACA 83-01-P-0019)	No significant cultural remains, BAFS

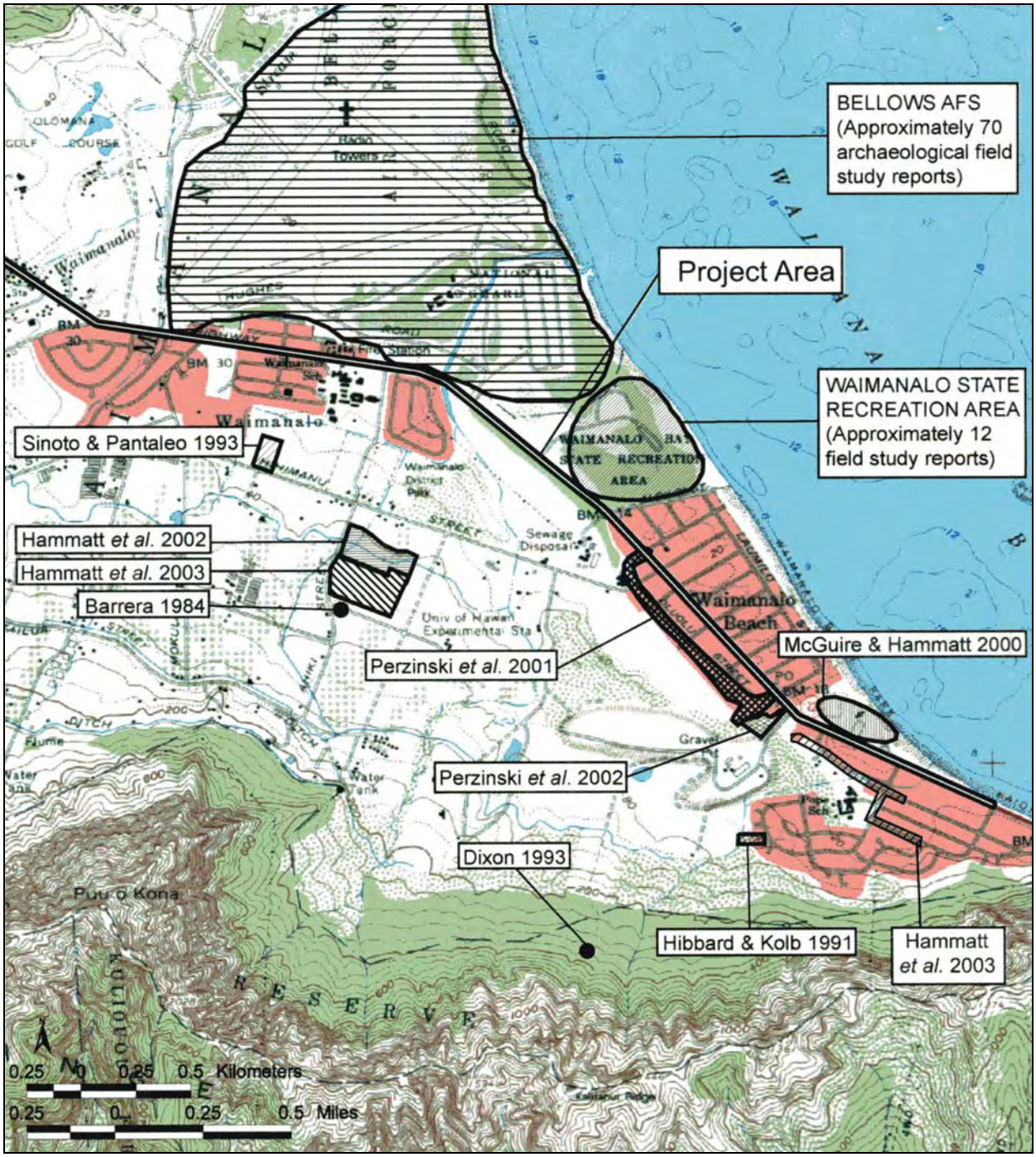

Figure 9. Map showing location of previous archaeological studies in central Waimānalo Ahupuaʻa

IV. ARCHAEOLOGICAL MONITORING NEEDS AND PROVISIONS

A. Archaeological Monitoring Needs

It appears from traditional Hawaiian accounts the place names Muliwai‘olena (*Ka Leo o Ka Lāhui* March 14, 15 1893) and ‘Āpuakea (aka ‘Āpua and Kapua) (Alona Sept. 22, 1939 O‘ahu Place Names) appear to be associated (in legendary accounts) with Hawaiian habitation and with a place of meeting. It seems probable that this fresh watercourse and the associated pass through the reef would have made this general area a locus of traditional Hawaiian activity. It appears likely that the lagoonal estuary (Muliwaiolena) and the associated pass through the reef made the adjacent coast a logical landing both in traditional Hawaiian times and during the period of the formal Waimānalo Landing pier (1883 to 1924). The traditions of a settlement at Pu‘u-o-Molokai “across from the Waimānalo Park” also suggest traditional Hawaiian settlement in the vicinity.

The major focus in archaeological research in Waimānalo, the Bellows area, is directly adjacent to the northernmost portion of the project area. Human burials, lithic scatters, soil features and/or occupation layers have been found almost everywhere archaeological investigation has taken place. The Perzinski et al. 2002 *kūpuna* housing project encountered burials and a cultural layer on the north end of their study parcel, adjacent to the southern area of the present project. Additionally, there are substantial Jaucas sand deposits under the south portion of the project area that have been associated with burials and cultural layers in the vicinity (Perzinski et al. 2002).

On the basis of our historical research and a review of previous archaeological studies, cultural deposits (pre- or post-contact) and/or human burials (pre- or post-contact) appear likely during subsurface excavations along the Kalaniana‘ole Highway improvements project. Given: 1) the inferences for settlement in the vicinity associated with the watercourse Muliwaiolena and place names ‘Āpuakea and Pu‘u-o-Molokai, 2) the presence of a known cultural layer and multiple burials in the general vicinity and 3) the extensive Jaucas sand deposits which have been associated with burials and cultural layers, a program of on-site monitoring appears justified for all work intruding 30 cm (1 foot) or more into undisturbed sediments.

B. Archaeological Monitoring Provisions

As was noted above, given: 1) the inferences for settlement and increased activity in the vicinity associated with the watercourse Muliwaiolena, the Waimānalo landing, and place names ‘Āpuakea and Pu‘u-o-Molokai, 2) the presence of a known cultural layer and multiple burials in the general vicinity and 3) the extensive Jaucas sand deposits which have been associated with burials and cultural layers, a program of on-site monitoring appears justified. Given the cultural sensitivity of the project area, an archaeological monitor will be on site during all ground disturbance activities below road grade or intruding 30 cm (1 foot) or more into undisturbed sediments. The following points list the possible finds, and procedures for response to particular finds and events associated with the highway improvements project.

1. <u>Possible finds</u>: There is a possibility that human burials (pre- or post-contact) and cultural deposits (pre- or post-contact) may be encountered. These may be particularly early in the Hawaiian cultural sequence.

2. <u>Determination of Significance</u>: The monitoring archaeologist will inspect all finds and then notify the State Historic Preservation Division, contacting that

Division's Archaeology Branch or, if the find is a human skeletal remain, the Burials Site Program to discuss the context and agree upon the find's significance. Mitigation needs (as appropriate) for non-burial sites will be discussed and resolved with the Archaeology Branch, and burial finds will be discussed with the Burial Sites Program.

3. Treatment of remains encountered: If cultural deposits or human skeletal remains are encountered during ground disturbing activities, work will be stopped immediately in that area and the archaeologist will notify the Burial Sites Program of the SHPD/DLNR of the nature of the discovery. If human remains are positively identified, no screening of back dirt piles or other invasive procedures (e.g. cleaning of soil profiles, digging into trench walls) will be conducted unless instructed by the SHPD. Burial finds will be treated according to Hawai'i Administrative Rules (HAR) 13-300-39 governing the inadvertent discovery of human remains. In the event human remains are discovered, the Burial Sites Program may request additional documentation, including letter memos and/or other reports, as necessary.

   No remains will be removed without the knowledge and consent of the Burial Sites Program of the SHPD/DLNR. If any associated materials are encountered with an inadvertent human burial, all material will be treated as grave goods. If other cultural materials are encountered, not in association with a human burial, including an intact cultural layer, charcoal, artifacts or midden deposits, or any disturbed objects or deposits, then select sorted samples of charcoal, and bulk samples of midden material will be collected and standard documentation conducted (i.e. scale maps and stratigraphic profiles drawn in the field, photographs, detailed descriptions, and interpretation). Photographs of excavations will be taken and included in the final report, even if no significant cultural resources are documented. Monitoring shall include some sampling. A minimum of five photographs showing work at various stages shall be part of the final report. Any reburial plans will be made in consultation with the Burial Sites Program of the SHPD/DLNR.

4. Authority to halt construction. The monitoring archaeologist has the authority to halt construction in the immediate area of the find in order to carry out the plan. The field archaeologist will make it clear to construction personnel with whom he/she is working that the archaeologist has the authority to halt work when it is appropriate.

5. Pre-construction conference. Before work commences on the project the on-site archaeologist will explain to the construction crew what materials may be encountered and the procedures to follow if historical and archeological materials are encountered, as well as the role of the archaeologist. The archaeologist shall emphasize that all historic finds, including objects such as bottles, are the property of the landowner and may not be taken or otherwise disposed of without the written consent of the landowner and the State Historic Preservation Division. At this time it will be made clear that the archaeologist must be on site during excavation procedures below base course or extending 1 foot below undisturbed sediments and is on-call during any shallower work along the route.

6. Laboratory work. Laboratory work to be carried out on artifacts and midden collected from non-burial contexts. If human remains are encountered, the SHPD/DLNR will decide if it is appropriate to remove the human skeletal remains and if ontological analysis of human remains is warranted. If removal is appropriate the remains may be stored temporarily at a facility designated by SHPD/DLNR for the purpose of completing bone inventory. The remains may continue to be stored at that facility or transferred to another facility (designated by SHPD/DLNR) until reburial plans are made. Artifactual material will be catalogued and analyzed along with samples of midden material, if collected. Charcoal and other datable materials will be submitted for dating, if in situ well-documented samples are obtained from a clearly pre-historic context which has not mixed with historic materials.

7. Schedule for Reports. A draft Archaeological Monitoring Report will be submitted within 90 days of completion of monitoring fieldwork to the SHPD/DLNR for review and approval.

8. Archiving of Collections. All burial materials will be given to SHPD/DLNR for storage. Materials not associated with burials will be temporarily stored at a facility designated by SHPD/DLNR until an appropriate curation facility is available. Disposition of any cultural materials, including artifacts, not associated with a human burial shall occur only after written concurrence of the landowner and in consultation with the SHPD/DLNR.

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