



EXECUTIVE CHAMBERS

HONOLULU

BENJAMIN J. CAYETANO
GOVERNOR

March 23, 2001

Mr. Maynard Young, Director
University of Hawaii Facilities Planning Office
for Community Colleges
Manele Building, Room 103
4303 Diamond Head Road
Honolulu, Hawaii 96816

Dear Mr. Young:

With this letter, I accept the Final Environmental Impact Statement for University of Hawaii Center at West Hawaii, the island of Hawaii, as satisfactory fulfillment of the requirements of Chapter 343, Hawaii Revised Statutes. The economic, social and environmental impacts which will likely occur should this project be implemented are adequately described in the statement. The analysis, together with the comments made by reviewers, provides useful information to policymakers and the public.

My acceptance of the statement is an affirmation of the adequacy of that statement under the applicable laws but does not constitute an endorsement of the proposed action.

I find that the mitigation measures proposed in the environmental impact statement will minimize the negative impacts of the project. Therefore, if this project is implemented, the University of Hawaii Community Colleges and/or its agents should perform these or alternative and at least equally effective mitigation measures at the discretion of the permitting agencies. The mitigation measures identified in the environmental impact statement are listed in the enclosed document.

With warmest personal regards,

Aloha,


BENJAMIN J. CAYETANO

Enclosure

c: Bruce S. Anderson, Ph.D., M.P.H.
~~Office of Environmental Quality Control~~

Oct. 2000 (PEIS)
University of Hawaii Center
@ West Hawaii

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FINAL ENVIRONMENTAL IMPACT STATEMENT

for

University of Hawai'i Center at West Hawai'i

**Kalaoa, Hawai'i, Hawai'i
Tax Map Key: 7-3-10:33 (por)**

Proposing Agency:

University of Hawai'i Facilities Planning Office
For Community Colleges
Manele Building, Room 103
4303 Diamond Head Road
Honolulu, Hawai'i 96816

State of Hawai'i Project No. CC-98-9008

This Document is prepared pursuant to Chapter 343, Hawai'i Revised Statutes

October 2000

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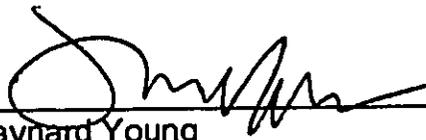
Proposing Agency:

University of Hawai'i Facilities Planning Office
For Community Colleges
Manele Building, Room 103
4303 Diamond Head Road
Honolulu, Hawai'i 96816

This Document is prepared pursuant to Chapter 343, Hawaii Revised Statutes, as amended, and Chapter 200 of Title 11, State of Hawai'i Department of Health Administrative Rules, Environmental Impact Statement

This document and all other ancillary documents were prepared under my direction.

Responsible Official: _____


Maynard Young
Director

Date: 1/3/01

Prepared By:

Wil Chee - Planning, Inc.
HMSA Center
1400 Rycroft St., Suite 928
Honolulu, Hawai'i 96814

October 2000

REVISIONS INCLUDED IN THE FINAL ENVIRONMENTAL IMPACT STATEMENT

This Final Environmental Impact Statement (FEIS) incorporates a number of revisions that have been made in response to comments received on the Draft Environmental Impact Statement (DEIS). Significant additions to the text are highlighted in yellow. The majority of the revisions to the FEIS involve text additions as opposed to text deletions.

New sections appear as highlighted items listed in the Contents. Similarly, new figures that have been added to the FEIS are identified as highlighted items in the List of Figures.

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CORRECTION

THE PRECEDING DOCUMENT(S) HAS
BEEN REPHOTOGRAPHED TO ASSURE
LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING

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GLOSSARY OF ACRONYMS

ALISH	Agricultural Lands of Importance in the State of Hawai'i System
CCFPCO	Physical Facilities Planning and Construction Office for the Community Colleges
CIP	Capital Improvements Program
DAGS	State of Hawai'i, Department of Accounting and General Services
DLNR	State of Hawai'i, Department of Land and Natural Resources
DOH	State of Hawai'i, Department of Health
EIS	Environmental Impact Statement
EISPN	Environmental Impact Statement Preparation Notice
FB	fiscal biennium
FWS	U.S. Fish and Wildlife Service
HawCC	Hawai'i Community College at Hilo
HELCO	Hawai'i Electric Light Company
HITS	Hawai'i Interactive Television System
HRS	Hawaii Revised Statutes
K to K Plan	Keahole to Kailua Development Plan
KPECA	Kona Palisades Estates Community Association
KV	kilovolt
kVA	kilovolt amps
LOS	level-of-service
LRDP	Long Range Development Plan
LUC	State of Hawai'i Land Use Commission
MSL	mean sea level
OEQC	State of Hawai'i, Office of Environmental Quality Control
OHA	State of Hawai'i, Office of Hawaiian Affairs
O&M	Operations and Maintenance
OSP	Office of State Planning
(por)	portion
rLV	Aa association Lava Flows
rLW	Pahoehoe association Lava Flows
rPYD	Punaluu extremely rocky peat soils association

GLOSSARY OF ACRONYMS (continued)

SEC.	Section
SHPD	State of Hawai'i, Historic Preservation Division
TMK	Tax Map Key
UH	University of Hawai'i
UHCWH	University of Hawai'i Center at West Hawai'i
UHM	University of Hawai'i at Manoa
U.I.C.	Underground Injection Control
U.S.	United States of America

1.0 PROJECT SUMMARY

1.1 INTRODUCTION

The proposed action is the creation of a permanent physical facility for higher education on approximately 33 acres within the southwestern portion of a 500-acre State-owned parcel at Kalaoa in the West Hawai'i region of the Island of Hawai'i (see Figure 1). This facility will be used to transition existing programs currently operating in leased facilities in the Kealahou Business Plaza. At completion, the new facility at Kalaoa will provide sufficient expansion capability for projected future growth characterized by a head count enrollment of 1,500 students. The facility will be known as the University of Hawai'i Center at West Hawai'i (UHCWH). In this Environmental Impact Statement (EIS), the UHCWH will also be referred to as the University Center.

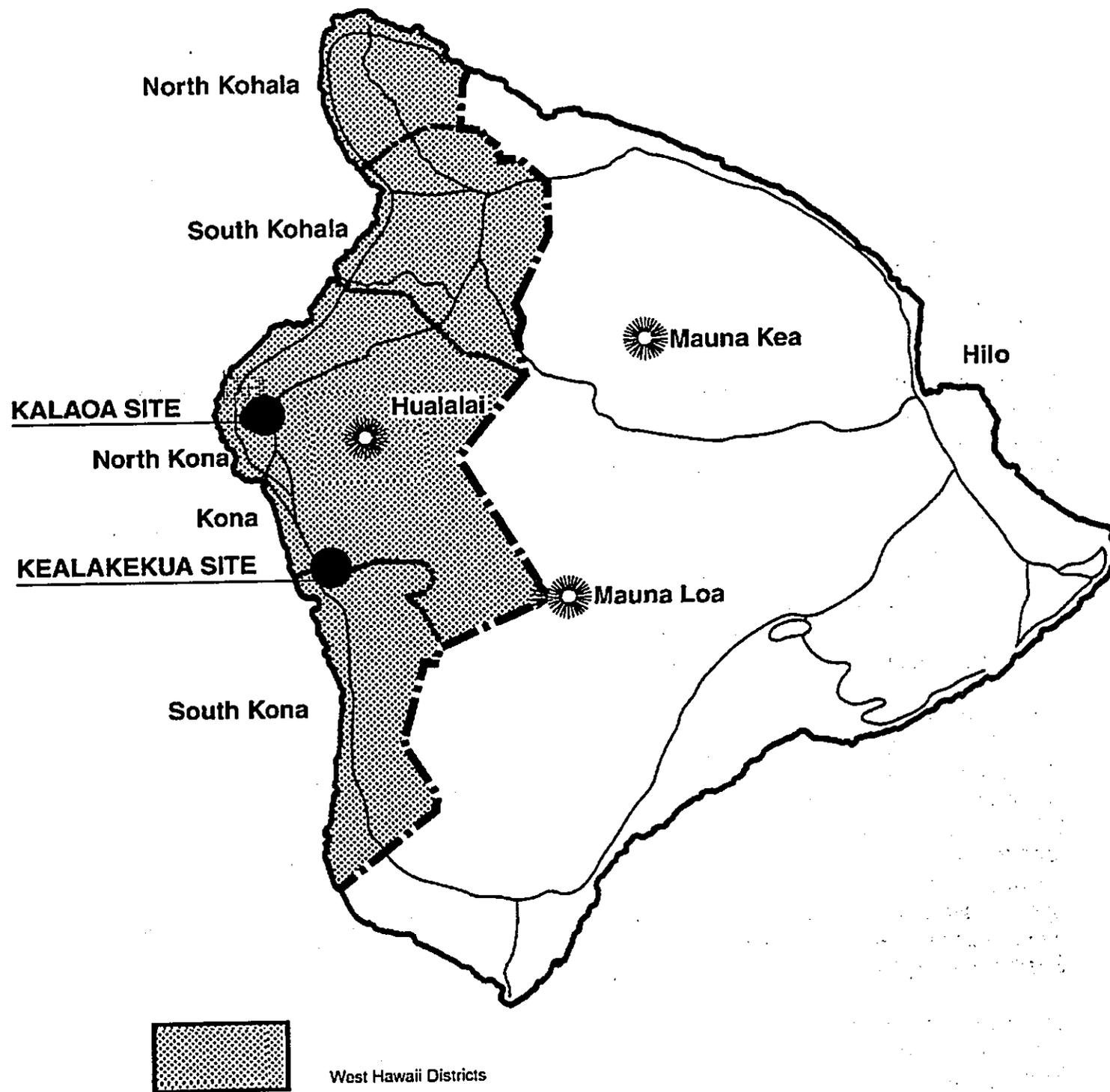
The following excerpt from the University of Hawai'i Center: West Hawai'i Development Plan 1998-2007 dated September 1997 states the mission of the UHCWH as promulgated by the "Interim Operational Roles and Responsibilities for University Centers and Originating Campuses" dated 19 June 1997:

"The University of Hawai'i Center, West Hawai'i establishes a permanent University of Hawai'i presence in West Hawai'i to provide individuals with access to programs offered elsewhere in the University system. This Center is a site at which qualified students who are unable to travel to a specific UH campus can enroll in courses or credential programs that are offered by one or more of the University's accredited institutions."

No separate accreditation will be accomplished for UHCWH since it is assigned (for administrative purposes) to the Hawai'i Community College at Hilo (HawCC). The UHCWH shall deliver established certificate and degree programs from any of the accredited UH campuses but will not offer degrees or certificates of its own. The primary purpose of UHCWH is instructional in function; however, it may also be a receiving site for research and/or public service programs. Both instruction and support services need to be delivered with the quality necessary to ensure continued accreditation of the campus delivering the program. Completion of the project will include permanent facilities for classrooms, laboratories, Hawai'i Interactive Television System (HITS), a library and offices at Kalaoa.

This EIS has been prepared pursuant to Chapter 343, Hawaii Revised Statutes (the EIS law) and associated Title 11, Chapter 200, Hawaii Administrative Rules, Department of Health, State of Hawai'i. The use of State or county lands or funds triggers the EIS law for the proposed action discussed in this document.

The EIS is intended to serve as a comprehensive environmental disclosure document. The intent of this document is to define the scope and analysis of the proposed action and serve to ensure that comprehensive and systematic consideration is given to potential impacts of the proposed action upon the natural and man-made environment.



ENVIRONMENTAL IMPACT STATEMENT
FOR THE
UNIVERSITY OF HAWAII CENTER AT WEST HAWAII

Kalaoa, Island of Hawaii, Hawaii

prepared for: University of Hawaii Facilities Planning Office for
Community Colleges
Honolulu, Hawaii

Figure 1

General Location Map

prepared by: Wil Chee - Planning, Inc.



General project information is listed below.

THE PROPOSED ACTION: Physical Development of the University Center at Kalaoa, Phases 1 through 4

THE APPLICANT: University of Hawai'i Facilities Planning Office
For Community Colleges
Manele Building, Room 103
4303 Diamond Head Road
Honolulu, Hawai'i 96816
Contact: Maynard Young, Director
(808) 734-9771

RECORDED FEE OWNER: State of Hawai'i

EIS PREPARER: Wil Chee - Planning, Inc.
HMSA Center, Suite 928
1400 Rycroft Street
Honolulu, Hawai'i 96814
Contact: Richard McGerrow
(808) 955-6088

UHCWH ADMINISTRATION: University of Hawai'i Center at West Hawai'i
P.O. Box 2059
Kealahou, Hawai'i 96750
Contact: Kathleen Damon, Director
(808) 322-4850

TAX MAP KEY: 7-3-10:33 (por)

LOT AREA: 500 acres (approximately 33 acres will be used for the proposed action)

STATE LAND USE CLASSIFICATION: Urban

COUNTY GENERAL PLAN LAND USE: Agricultural

COUNTY ZONING DESIGNATION: A-5a (Agriculture)

SPECIAL MANAGEMENT AREA: None

SPECIAL USE DISTRICTS: None

IMPACTS ASSESSMENT: The studies listed below and attached as appendices have been conducted in conjunction with this EIS to determine the potential impacts and mitigation measures that may result from the proposed action.

- Traffic Impact Assessment
- Archaeological Impact Assessment
- Botanical Impact Assessment
- Biological Impact Assessment

AGENCIES CONSULTED:

County of Hawai'i

Civil Defense Agency
Council Member's Office
Department of Public Works
Fire Department
Mayor's Office
Planning Department
Police Department
Water Supply Department

State of Hawai'i

Department of Business, Economic
Development and Tourism
Department of Health
Department of Environmental Quality
Control
Department of Hawaiian Affairs
Department of Hawaiian Home Lands
Department of Land and Natural Resources
Division of Forestry and Wildlife
Division of Historic Preservation
Department of Transportation
Fifth Representative District
First Senatorial District
Second Senatorial District
Third Senatorial District
University of Hawai'i Center at West Hawai'i
University of Hawai'i, Hawai'i Community
College
University of Hawai'i, UHM Environmental
Center

Federal

Department of the Interior, U.S. Fish and
Wildlife Service

Other Agencies or Organizations

Hawai'i Electric Light Co., Inc.
Hawaii Tribune Herald
Kona Palisades Estate Community
West Hawaii Today

ACCEPTING AUTHORITY:

Governor Benjamin J. Cayetano
State of Hawai'i
c/o Office of Environmental Quality Control
236 South Beretania Street, Suite 702
Honolulu, Hawai'i 96813

1.2 SUMMARY OF BENEFICIAL AND ADVERSE IMPACTS

Project actions would result in several benefits attributed to specific topics of concern:

- **Cultural Resources.** Pre-historic sites that are relatively abundant in the project area have been identified in several archaeological studies. An historic preservation plan was prepared by the project archaeologist in consultation with a community advisory group to protect and preserve the known cultural resources in the area. The plan includes recommendations for the use of some of the resources as interpretive venues for educating students, residents, and visitors about Hawaiian history and culture. Without the project, many of these cultural resources would remain unknown and inaccessible to the people of West Hawai'i. Instead, the resources may become a source of pride and may contribute to the furtherance of education pertaining to Hawaiian culture.
- **Land Use.** Completion of the University Center at Kalaoa would fulfill the goals, objectives, and policies stated in state and county planning documents. The plans are supportive of urban growth in Kalaoa and of the creation of a permanent facility for higher education.
- **Social Factors.** The new UHCWH facility at Kalaoa would immediately bolster the opportunities for higher education in the West Hawai'i region. The permanent University facility in West Hawai'i would allow its citizens to have a physical symbol and focal point for their educational aspirations including job training and continuing education.
- **Economic Factors.** In the short-term, the new University Center would boost the regional economy by providing added employment for construction workers, fees for design and engineering professionals, and profits for construction companies and building suppliers. In the long-term, the project would provide increased employment for faculty and support staff, but more importantly, it would provide its citizens with a range of skills and training that would increase employment and boost a diversifying economy in general.

Adverse impacts that require mitigation measures are summarized below:

- **Fauna.** Exterior lighting may attract flying insects that in turn may attract species that prey on them, such as the endangered Hawaiian hoary bat. Night lights and man made structures may cause injury to sea birds such as the endangered endemic Hawaiian subspecies of the Dark-rumped Petrel. Activities such as grading could destroy cave habitats that may contain endemic arthropods.
- **Cultural Resources.** Construction activities undertaken within an area known to have numerous archaeological sites could potentially cause irreparable damage to these resources.
- **Natural Hazards.** The project site is located in lava flow hazard zone "4" with "1" posing the greatest hazard and "9" posing the least. The project site also falls within an earthquake zone that comprises the entire island of Hawai'i.

Impacts associated with the following topics of concern would be addressed by project actions that reduce or minimize effects:

- Air Quality. Natural and man made pollutant sources such as vog and power plant emissions, respectively, would have relatively no effect on a learning environment primarily contained within air-conditioned facilities. In the short-term, construction site work and ground disturbing activities may generate fugitive dust and particulate emissions that would be controlled with dust control measures such as the implementation of a watering program. Non-stationary sources of both short- and long-term pollution include construction vehicles and personal automobiles that emit pollutant concentrations along their travel paths. At completion, the University Center would have parking and loading provisions for shuttles and vans, but it would ultimately be the responsibility of students, faculty, and staff to utilize carpools, public transportation (if it becomes available), and other more environmentally friendly modes of travel.
- Noise Quality. The distant background noise from the Kona International Airport would have relatively no effect on a learning environment primarily contained within air-conditioned facilities. In the short-term, construction activities would generate noise impacts that would be minimized by the use of properly muffled construction equipment, the implementation of curfew periods, and adherence to construction noise limits established by the State of Hawai'i, Department of Health. Area residents may still experience noise impacts to a degree consistent with each individual's reaction or tolerance to noisy stimuli. At project completion, the University Center would have parking and loading provisions for shuttles and vans to address the long-term noise impacts from non-stationary sources such as vehicles. Again, it would ultimately be the responsibility of students, faculty, and staff to utilize carpools, public transportation (if it becomes available), and other more environmentally friendly modes of travel.

1.3 SUMMARY OF PROPOSED MITIGATION MEASURES

Mitigation measures that address adverse impacts are summarized below:

- Fauna. Night lighting should be properly shielded to minimize potential injury to bats and the disorienting effects on the Dark-rumped Petrel. Efforts to minimize the destruction of cave habitats during grading should be undertaken during the construction period.
- Cultural Resources. Adherence to the accepted conceptual historic preservation plan would allow for the protection of important archaeological sites and historic and cultural resources. Incorporation of the plan would also result in the previously mentioned benefits from the use of resources via interpretive venues.
- Natural Hazards. There is sufficient space above the project site for the placement of lava diversion barriers if the technology for such devices improves and their effectiveness is proven. With respect to the earthquake hazard, the

project includes the construction of one-story buildings built in accordance with the Uniform Building Code Requirements for Seismic Zone 3, which contain structural design standards for earthquake resistance.

1.4 SUMMARY OF ALTERNATIVES CONSIDERED

In addition to the Proposed Action, the alternatives discussion in the EIS includes the consideration of no action, alternative sites, alternative siting considerations and layout configurations, Alternative A (the revised access road), Alternative B (water system option), and Alternative C (wastewater system options).

1.5 SUMMARY OF UNRESOLVED ISSUES

Concerns regarding the proposed project may arise in the future, particularly with respect to the preservation, integration, and interpretation of cultural resources. As indicated in the letter dated October 23, 2000 to the State of Hawai'i Department of Land and Natural Resources, Historic Preservation Division (SHPD), the UHCWH will exercise the second option presented by the SHPD in its letter dated May 25, 2000 to defer the development of interpretive programs until a later date to allow the students and staff of the UHCWH to become directly involved with those actions. The existence of cultural sites on the affected property provides the students and staff of the UHCWH with a unique opportunity to foster their understanding of traditional Hawaiian culture and history in an actual historical setting. Interpretive programs for each site will be coordinated with the State Historic Preservation Division for appropriate review and approval.

The property on which the project lies is owned by the State of Hawai'i and has been determined to comprise ceded lands (State lands acquired under Section 5B of the Admissions Act). As with all ceded lands that are designated as revenue lands, coordination with the Office of Hawaiian Affairs (OHA) officials will be required to discuss the issue of compensation to the Hawaiian people.

An interim measure (e.g., adjustment of traffic signal timing at the intersection of Queen Kaahumanu Highway at the Airport Access Road) intended to address potential short-term traffic impacts has been discussed with DOT (refer to the letter dated February 8, 2001 in Appendix A-6). DOT provided no written response; however, the traffic consultant has concluded from discussions with DOT that the traffic signal timing would not be adjusted until a problem materializes and is brought to DOT's attention by maintenance staff, police or the public (Phillip Rowell and Associates, 2001).

The State of Hawai'i Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife mentions the need for additional studies if the project expands beyond the 400-foot elevation.

1.6 COMPATIBILITY WITH LAND USE PLANS AND POLICIES

The proposed action is compatible with existing state policy documents (i.e., the Hawai'i State Plan and Functional Plans, the State Land Use Law, and the *West Hawai'i Regional Plan*). The proposed actions would also be compatible with state and county policy documents such as the *Hawai'i County General Plan* and *Keahole to Kailua Development Plan*. Zoning designations for the project site are consistent with the development of the University Center with the application of a Use Permit issued by the Hawai'i County Planning Commission.

1.7 LIST OF PERMITS OR APPROVALS

This EIS has been undertaken in accordance with the Environmental Review process (Chapter 343, HRS). The applicant is seeking acceptance and approval of the EIS with its submissions to and continuing coordination with OEQC.

A revised Historic Preservation Plan was submitted to the SHPD for review and approval. The letter from the SHPD dated December 18, 2000 (refer to Appendix A-4) grants tentative approval to the revised conceptual plan.

The remaining permits and approvals listed below will be obtained during the planning and design phases of the project. As of this writing, no permit applications have been submitted to permitting authorities for processing.

<u>Permits or Approvals</u>	<u>Administering Agency</u>
Burial Treatment Plan	Hawai'i Island Burial Council
Use Permit	Hawai'i County Planning Commission
Zone Change (for Open-zoned lands)	Hawai'i County Council
Water Supply System	County of Hawai'i Department of Water Supply
Wastewater System (including U.I.C. permit if injections wells are employed)	State of Hawai'i Department of Health
Construction Permits (Building and Grading)	County of Hawai'i Department of Public Works
Various approvals relating to road improvements, intersections and landscaping	State of Hawai'i Department of Transportation

2.0 PURPOSE OF AND NEED FOR ACTION

2.1 OVERVIEW

A brief overview of considerations pertaining to the affected property where project actions will occur is hereby presented.

The Office of State Planning (OSP) published the *West Hawaii Regional Plan* in November 1989. This document established a subregional planning area extending from Kailua to the airport, including all the lands bordered by the shoreline to the west and Mamalahoa Highway to the east.

In 1992, OSP filed an Urban Land District Petition with the State of Hawai'i Land Use Commission (LUC) on October 19, 1992 for the reclassification of approximately 2,640 acres of land in the Conservation and Agriculture Districts in North Kona, Island of Hawai'i. These lands were part of the subregional planning area outlined in the *West Hawaii Regional Plan*. The petition was based on a recommendation from OSP in its *State Land Use District Boundary Review Report* for the Island of Hawai'i. In the report, the petition area was identified as a "Priority Area for Action," thereby justifying a reclassification of the acreage to the Urban Land Use District.

By a Decision and Order dated December 8, 1993, the LUC granted the reclassification request and imposed 34 conditions that apply to the affected acreage and are binding upon the petitioner and every subsequent owner, lessee, sub-lessee, transferee, grantee, assignee, or developer.

On May 13, 1997, the Survey Division of the State of Hawai'i, Department of Accounting and General Services (DAGS) submitted a survey to DLNR for approval: *Consolidation and Re-subdivision of the Government Lands of Kalaoa 1 - 4 and Ooma 1st into Parcels 1 to 13, inclusive*. On August 17, 1999, the Planning Director for the County of Hawai'i approved for recordation with the Bureau of Conveyances, State of Hawai'i, the *Consolidation and Re-subdivision of the Government Lands of Kalaoa 1 - 4 and Ooma 1st into Parcels 1 to 13, inclusive*.

A brief overview pertaining to the establishment of higher education facilities in West Hawai'i is hereby presented.

In 1971, the first courses were offered in West Hawai'i by the University of Hawai'i at Hilo Center for Continuing Education and Community Services. In the fall of 1981, HawCC began offering courses in West Hawai'i. Administrative, instructional, and support service functions for the UH courses were centralized at the Kealahou Business Plaza in the fall of 1987.

In the summer of 1990, the Board of Regents commissioned a *University of Hawaii at Hilo, West Hawaii Campus Site Assessment Study*. Based on the findings of this report and on unanimous testimony by the affected community, the Board of Regents in July 1991 selected the Kalaoa site as the location for the future center for higher education in West Hawai'i. This site was the preferred choice of the majority of West Hawai'i residents.

In 1996, the Board of Regents established the UHCWH and the State Legislature appropriated Capital Improvements Program (CIP) funds in fiscal biennium (FB) 1997-99 for planning and design at the Kalaoa site. In February 1996, the *University of Hawai'i Center at West Hawai'i: Long Range Development Plan* (LRDP) was submitted to the Board of Regents. With the absence of an Academic Development Plan (unavailable when the LRDP was being prepared), the LRDP focused on the physical and tangible aspects of the UHCWH that were considered to be constant and timeless elements.

On July 1, 1998, the UHCWH became the responsibility of Community Colleges, University of Hawai'i/HawCC. In October 1998, the LRDP was updated based on the *University of Hawai'i Center at West Hawai'i: Educational Specifications* (EdSpecs) that translate the program needs formulated by HawCC into physical space, equipment, and utility requirements for each functional area and sub-area.

The *Environmental Impact Statement Preparation Notice (EISPN)* for the *University of Hawai'i Center at West Hawai'i* was published in the December 8, 1999 edition of The Environmental Notice. The *Draft Environmental Impact Statement for the University of Hawai'i Center at West Hawai'i* was published in the June 8, 2000 edition of The Environmental Notice.

At the present time, the UHCWH is the only designated University Center that is not located on a University of Hawai'i campus. The nearest campuses are in Hilo and more than 100 miles from the West Hawai'i Center. Without the benefit of a nearby university campus the UHCWH must provide access to the following programs and services: lower division undergraduate courses and programs, including specialized occupational and technical fields; well designed classrooms and laboratories; developed telecommunications and computer resources; comprehensive library services; academic support services, student services and administrative support services. The UHCWH must also provide support for baccalaureate and graduate instruction at its facilities.

Existing facilities of the UHCWH in portions of a shopping center complex have been described as hot, cramped, noisy and inadequate to support the instructional programs being offered and those planned. Other constraints include the location in Kealahou which is at least a 40 minute drive for more than half of the population in the region with very limited accessibility via public transportation. "Distance to the site" was cited by 65

percent of survey respondents as the greatest barrier to their enrollment (University of Hawai'i, Social Sciences Research Institute, 1988).

At the Kalaoa site, the UHCWH will have appropriate and adequate facilities for qualified students who are unable to travel to a specific UH campus. Students will be able to enroll in courses or credential programs that are offered by one or more of the accredited institutions of the University of Hawai'i. The project is in keeping with the stated mission, objectives and goals of the UHCWH.

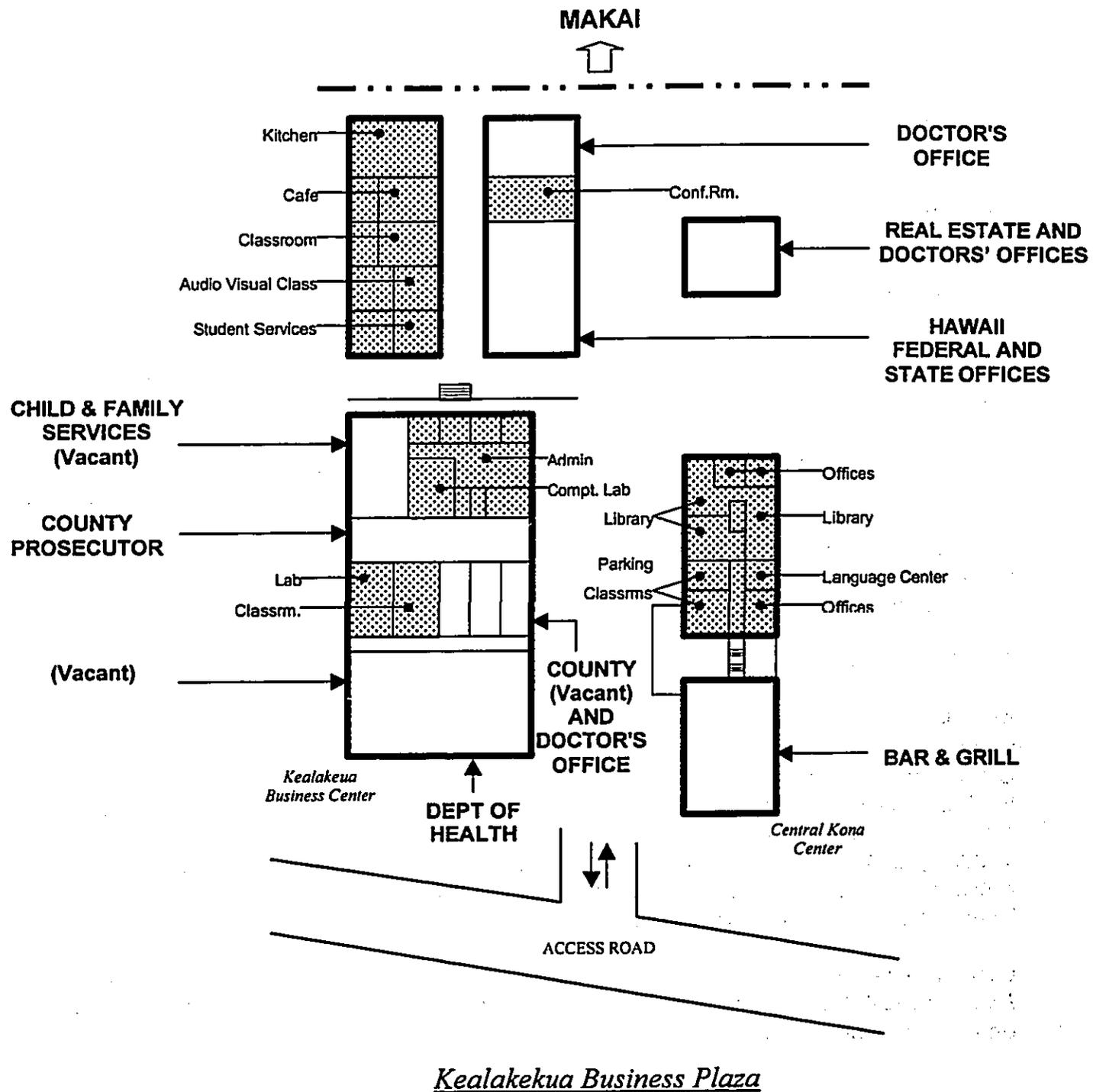
The Physical Facilities Planning and Construction Office for the Community Colleges (CCFPCO) proposes the creation of a permanent facility for higher education on approximately 33 acres within a 500-acre State-owned parcel at Kalaoa in the West Hawai'i region of the Island of Hawai'i. The parcel that will contain the University Center is located along the leeward or southwestern slopes of Mt. Hualalai in the North Kona District. The property identifier is Tax Map Key (TMK): 7 - 3 - 10: 33 (por). The project site is 3 miles mauka (mountainward) of Keahole Airport and located approximately midway between Mamalahoa Highway and Queen Kaahumanu Highway.

At project completion, the University Center will include sufficient capability to accommodate a head count enrollment of 1,500 students. The University Center will allow residents to continue to live and work in West Hawai'i while enjoying educational opportunities that previously would have required them to attend school in Hilo or on other islands. As currently planned, the University Center will be a commuter campus that does not contain dormitories, faculty housing, or athletic facilities.

The University Center will be built to accommodate the transition of functions and programs housed since Fall 1987 in hot, cramped, and noisy facilities within the Kealakekua Business Plaza—a commercial mall complex that also houses various federal and state offices, real estate offices, doctors' offices, the County Prosecutor's Office, the Department of Health, and a bar and grill (see Figure 2). The leased space totaling approximately 12,000 square feet is reportedly inadequate for the instructional programs currently offered and additional programs planned (Wil Chee - Planning, Inc., 1998a, pg. 4). The Kealakekua location is characterized by limited accessibility via public transportation and requires at least a 40-minute drive for more than half of the West Hawai'i population (Wil Chee - Planning, Inc., 1998a, pg. 4).

Other needs identified in the *University of Hawai'i Center: West Hawai'i Development Plan, 1998-2007* (University of Hawai'i, Hawai'i Community College, 1997) are described in the following paragraphs.

- Need Based on Demographic Factors. The total population of the West Hawai'i region—this includes the districts of North Kohala, South Kohala, North Kona, South Kona, and the Western portion of Kau—is expected to grow to almost 100,000 persons by the year 2010 (p. 10). This is sufficient population to justify the construction of a higher education center serving 1,200 to 1,600 students by year 2010 (p. 10).



NO SCALE

ENVIRONMENTAL IMPACT STATEMENT
FOR THE
UNIVERSITY OF HAWAII CENTER AT WEST HAWAII

Kalaoa, Island of Hawaii, Hawaii

prepared for: University of Hawaii Facilities Planning Office for
Community Colleges
Honolulu, Hawaii

Figure 2

Mixed Uses at the Kealakekua
Business Center

prepared by: Wil Chee - Planning, Inc.

The West Hawai'i population includes more persons in the 25 to 39 age group than either Honolulu or Kaua'i (p. 10). Course offerings, programs and delivery strategies must be developed to meet the needs of working adults in this age group.

The West Hawai'i population, in general, has a higher rate of high school graduation and a larger percentage of persons who have some college as compared to the populations in either Honolulu or Kauai (pg. 10). Many individuals who have completed either an associate or baccalaureate degree are professionals working in the region who desire further education to maintain or upgrade existing job skills (pg. 10).

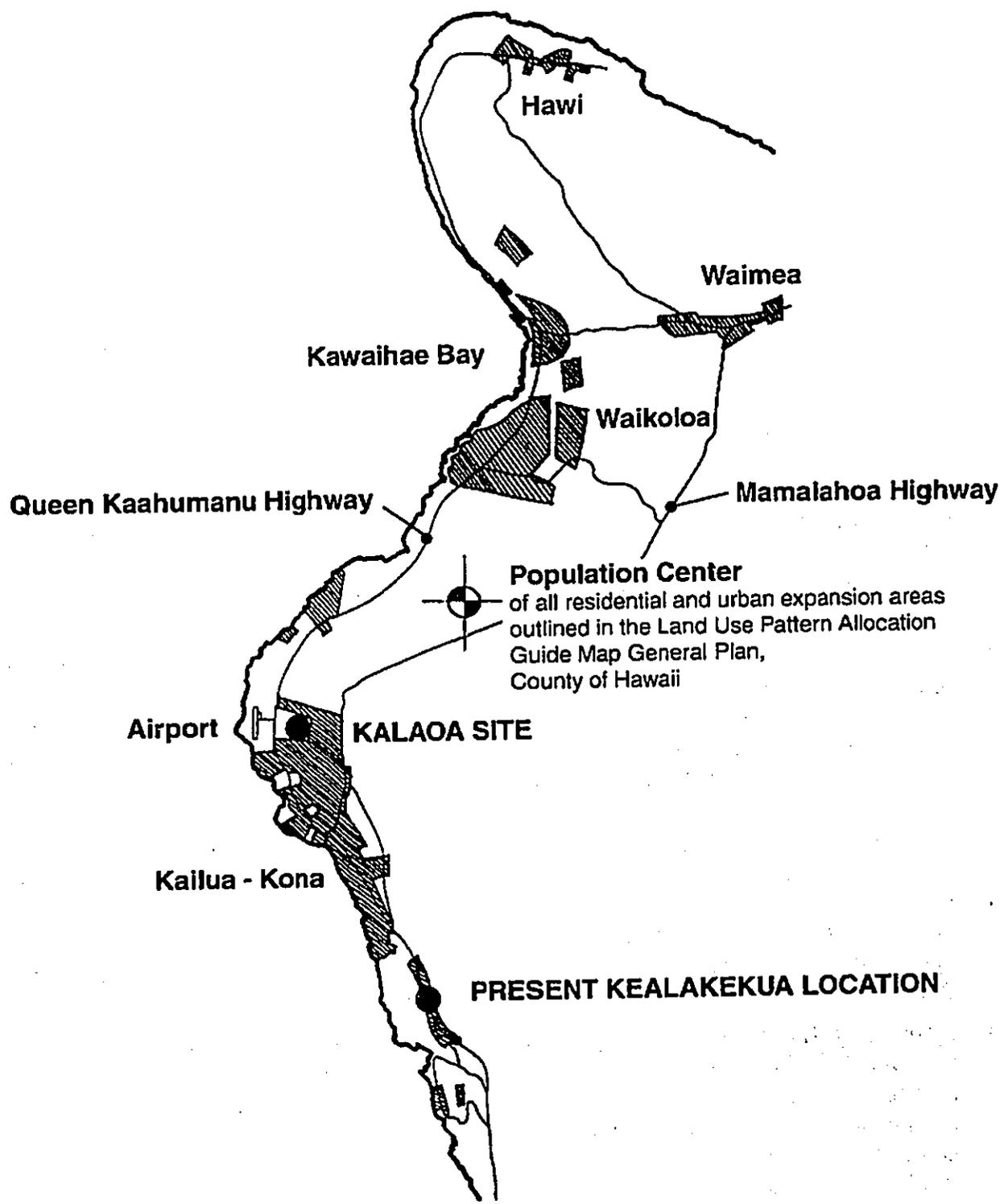
Two factors may be contributing to the low (2 percent) rate of enrollment in postsecondary education by persons in West Hawai'i who are 18 years of age or older as compared to other reporting areas having a sizeable University of Hawai'i presence: the location and size of education facilities at Kealahou, and the limited range of courses and programs offered at this time (pgs. 10-11).

Despite the relatively close proximity between Konawaena High School and postsecondary facilities in Kealahou, there is a low (22 percent) participation rate of students continuing from that high school to the University of Hawai'i (UH) (including its community colleges) as compared to other neighbor island high schools located near a UH campus (pg. 11).

- Need Based on Employment Trends. Employment trends in the West Hawai'i region are of great importance in the planning of the UHWCH because of two factors: most students cite preparation for employment as their primary reason for pursuing postsecondary education; and access to appropriately focused education and training programs can be a tremendous boost to the economic development of a community (pg. 11).

Service and sales positions account for 40 percent of the currently available jobs in West Hawai'i (pg. 11). In the West Hawai'i region, there is also a prevalence of executive/managerial and professional occupations that require extensive postsecondary education for entry to these fields (pg. 11). In the future, more scientific enterprises related to astronomy and ocean engineering may increase the need for professional and graduate education in West Hawai'i (pg. 11).

- Need for a More Central Location within West Hawai'i. The existing location of the UHCWH is considerably south of the population center of the region (see Figure 3). This fact, coupled with the lack of adequate facilities and necessary infrastructure will continue to interfere with the delivery of quality programs at the UHCWH (pg. 15). Under these conditions, the growth of student enrollment at the UHCWH would be hampered (pg. 15).
- Need to Meet Community Expectations. The community of West Hawai'i has advocated strongly for increased postsecondary educational opportunities over the past twenty years (pg. 12). The UHCWH uses the results of community needs assessments to determine program and course offerings (pg. 12).



ENVIRONMENTAL IMPACT STATEMENT
FOR THE
UNIVERSITY OF HAWAII CENTER AT WEST HAWAII

Kalaooa, Island of Hawai'i, Hawai'i

prepared for: University of Hawai'i Facilities Planning Office for
Community Colleges
Honolulu, Hawai'i

Figure 3

Population Center for West Hawai'i

prepared by: Wil Chee - Planning, Inc.



2.2 PROJECT OBJECTIVES

The proposed University Center at Kalaoa will accomplish the following objectives:

- Allow the relocation of functions and programs from existing leased facilities in the commercial mall complex in Kealahou to State-owned facilities specifically built to accommodate existing and future University Center functions;
- Reorganize facilities and functions into a cohesive campus that elevates the image of the University Center within the West Hawai'i region and fosters a nurturing learning environment;
- Extend higher education services to residents who live and work in the West Hawai'i region—the only major geographic population center in the Hawaiian Islands that does not have a permanent facility for higher education—and especially to those in West Hawai'i who cannot afford to pursue their educational needs at other University of Hawai'i campuses in Hilo or on other islands;
- Provide for the expansion of functions and programs to accommodate a future head count enrollment of 1,500 students; and
- Reflect the cultural legacy and volcanic origin of the West Hawai'i region through the integration of existing cultural resources at the Kalaoa site in the layout of the University Center and the use of lava materials and other architectural elements to create a Hawaiian sense of place.

2.3 PROJECT SCOPE

This EIS incorporates by reference the following studies and plans that contribute to the proposed development of the University Center on approximately 33 acres within the southwestern portion of a 500-acre State-owned parcel in Kalaoa, Hawai'i:

- University of Hawaii at Hilo, West Hawaii Campus: Site Assessment Study. Candidate sites for a center in West Hawai'i for higher education were evaluated in this document prepared by DPD Associates, Inc. (Circa, 1992). Selection criteria focused the site assessment on public parcels (State-owned) of at least 500 acres that are reasonable in shape and topography for ease of design and construction (pg. 1). Upon the completion of the study, the University of Hawai'i Board of Regents selected a parcel in Kalaoa approximately 8 miles from Kailua-Kona. The site assessment study noted that the citizens of Kailua-Kona advocated the Kalaoa site as their preferred choice for the location of the University Center (pg. 38).
- University of Hawai'i Center at West Hawai'i: Educational Specifications (Ed Specs). The Ed Specs were prepared by Wil Chee - Planning, Inc. (July 1998). The academic goals and objectives of the *University of Hawaii Center: West Hawaii Development Plan 1998-2007* (September 1997) form the basis for physical space projections and requirements identified in the Ed Specs (pgs. 17-96). With a head count enrollment of 1,500 students, the UHWCH will require approximately 83,932 square feet for five programs: Instruction, the Learning

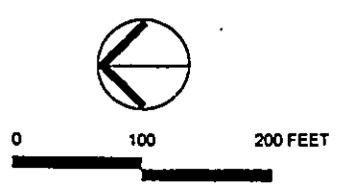
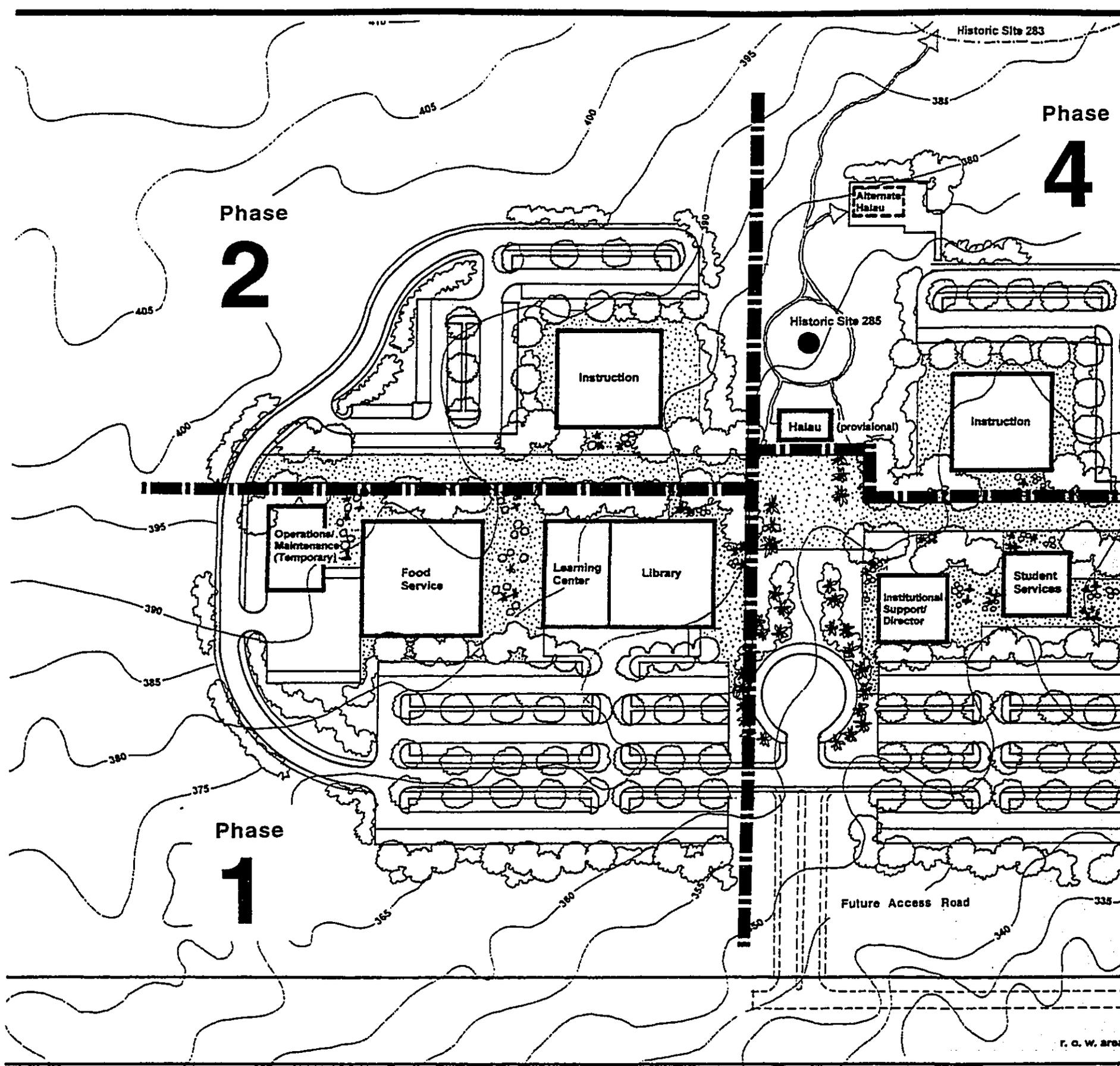
Resource Center, Student Services, Continuing Education, and Institutional Support (pg. 13).

- University of Hawai'i Center at West Hawai'i: Long Range Development Plan (LRDP). The LRDP was prepared by Wil Chee - Planning, Inc. (October 1998). The University Center concept is depicted in the basic site plan which defines the basic layout of main buildings, and in ultimate plans for grading and drainage, water and wastewater systems, landscaping, power systems, lighting, telecommunications and the building automation system, and the mechanical (air conditioning) system (pgs. 51-62). Architectural design guides, design considerations (for security, safety, and maintenance), landscape design guidelines, and style and character guidelines for the University Center are included in the LRDP (pgs. 63-77). The LRDP also identifies four phases of implementation (pgs. 78-83) and includes a transition plan (pgs. 84-85).

CCFPCO will manage the development and construction of proposed facilities that are conceptualized in the site plan, ultimate plans, implementation plan, and transition plan included in the LRDP. Detailed building design and construction documents are not available at this time because the proposed action has yet to be formulated beyond the conceptualized site plan and ultimate plans presented in the LRDP. Nevertheless, the four major phases of the project will be fully examined in this EIS for their potential direct, indirect, and cumulative impacts upon the environment. These four phases are listed below and depicted in Figure 4:

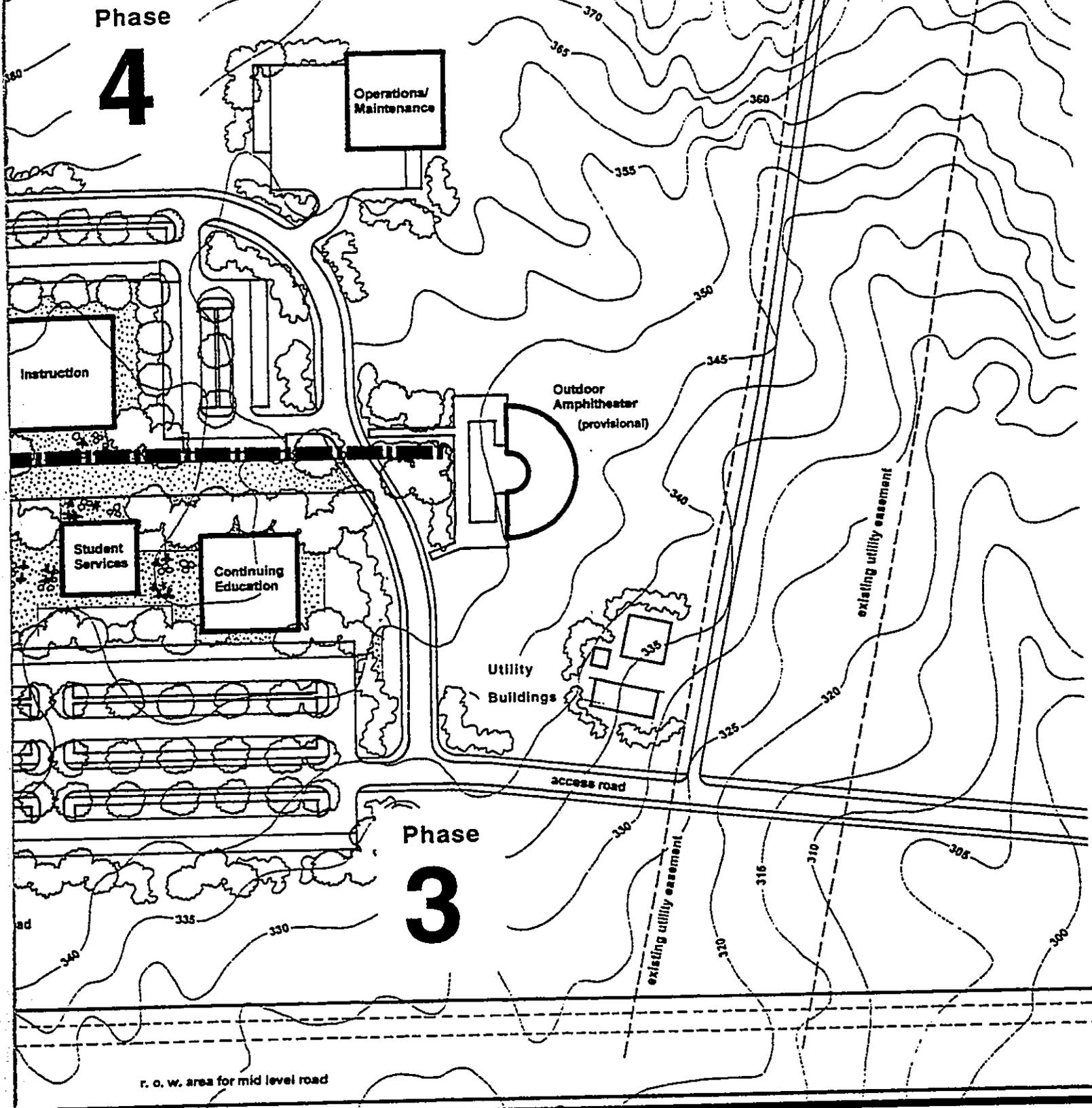
- Phase 1: The Northwestern Quadrant. The first phase will consist of three buildings—the Library/Learning Resource Center, the Food Service Building, and a temporary Operations and Maintenance (O&M) building. The Library/Learning Resource Center will function as the academic heart of the University Center. The Food Service Building is needed in order to allow the Food Service instructional program to function at a new location in Kalaoa. Both buildings will temporarily accommodate the three remaining service functions: Institutional Support/Director, Student Services and Continuing Education. The temporary O&M building made of pre-fabricated metal will be used to house and/or service maintenance vehicles and to provide storage and shop functions until the permanent O&M building is completed in Phase 4.

Grading and excavation in the northwest quadrant will be accomplished during this phase. Surplus excavated materials will be deposited in the Phase 3 area, or southwestern quadrant. Other major Phase 1 actions will include the construction and/or installation of infrastructure and utilities such as a water tank, wastewater collection lines, the first increment of septic tanks with an effluent disposal system, and four 4-inch concrete encased underground ducts for telecommunications lines from Kaimi Nani Drive. Kaimi Nani Drive will be extended to provide vehicular access to the northwest quadrant. A 12 kilovolt (kV) powerline will be extended from the existing Huehue substation. Minor infrastructure items for CATV, fire alarm systems, and security systems will be built. One chiller plant will be constructed initially in Phase 1 to provide enough service load for the air conditioning demands of Phases 1 and 2.



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Historic Site 283



ENVIRONMENTAL IMPACT STATEMENT
 FOR THE
 UNIVERSITY OF HAWAI'I CENTER AT WEST HAWAI'I

Kalaooa, Island of Hawai'i, Hawai'i
 prepared for: University of Hawai'i Facilities Planning Office for
 Community Colleges
 Honolulu, Hawai'i

Figure 4

Phasing Plan

prepared by: Wil Chee - Planning, Inc.

- **Phase 2: The Northeast Quadrant.** The northeast quadrant will be graded and surplus excavated materials will be deposited in the Phase 4 area, or southeastern quadrant. The building for Instruction will be constructed and will house classrooms and division offices to allow an enrollment capacity of 750 students. With the completion of Phase 2, the University Center will be able to accommodate a planned enrollment of 750 students (including part-time and evening students).

A minor left-turn lane will be added to Kaimi Nani Drive to accommodate traffic. Water and wastewater mains will be extended from the Phase 1 area into the Phase 2 area. All other utility lines including the chilled water main will also be extended in Phase 2.

- **Phase 3: The Southwestern Quadrant.** Buildings for service functions such as Institutional Support/Director, Student Services, and Continuing Education will be constructed in this phase. The Library/Learning Resource Center and Food Service functions will expand to their full capacity as the three other functions relocate from temporary spaces to their own buildings.

Grading will be accomplished and all other utility mains will be extended. The looped water system will be completed with its connection to Kaimi Nani Drive. A second power line from the Kona International Airport will be extended to the University Center. A second septic tank with an effluent disposal system will be installed, and a second chilled water plant will be constructed in Phase 3.

- **Phase 4: The Southeastern Quadrant.** In this phase, the remaining General Instruction classrooms and division offices, and the permanent O&M building will be constructed. Completion of Phase 4 actions will allow for a maximum head count enrollment of 1,500 students.

Grading will be accomplished and all utility mains will be connected in this phase to complete loop systems. A main entry road from the Mid-Level Road (if Hawai'i County or other entities construct the roadway within this timeframe) may be constructed in Phase 4.

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3.0 ALTERNATIVES, INCLUDING THE PROPOSED ACTION

3.1 NO ACTION

The no action alternative would result in the continued use of hot, cramped, and noisy facilities at the Kealakekua Business Plaza for the UHCWH functions despite the conceptual plans and administrative approvals that are already in place for the creation of a permanent facility in Kalaoa. As indicated in Section 2.1, the leased space totals approximately 12,000 square feet.

Continued use of the leased facilities at Kealakekua would hamper the growth of student enrollment at the UHCWH if there continues to be inadequate space for the instructional programs offered and additional programs planned. With no action, it would become increasingly difficult for the UHCWH to provide the diversity of courses and programs that are necessary to allow the West Hawai'i work force to prepare and adapt to changing technology affecting job development and growth. The breadth and depth of programs and courses offered would be further compromised if a greater portion of the budget for the UHCWH must be allotted for lease rent as opposed to equipment, supplies, faculty, and staff.

The following inadequacies associated with the use of temporary facilities in Kealakekua for the UHCWH functions would be perpetuated with the no action alternative:

- Facilities for higher education would continue to be located considerably south of the geographic center for the West Hawai'i region in an area that is not readily accessible via public transportation.
- The drive to the UHCWH would continue to require at least 40 minutes for more than half of the West Hawai'i population.
- The UHCWH functions would continue to be sited within an existing commercial office center that does not afford the image or surroundings befitting an institution of higher education.
- An overall lack of centralization and cohesive organization of the UHCWH functions would prevail as the UHCWH continues to use the available spaces that are separated by federal, state, and county offices and private businesses.
- Existing spaces utilized for the UHCWH programs and courses would continue to be under-sized, especially the classrooms, because the spaces in the commercial mall complex were not designed for this purpose.
- Support activities that require meeting spaces would continue to be held outdoors, at other locations or not at all due to the lack of ample and/or appropriate meeting areas within the Kealakekua Business Plaza.
- The educational experience would continue to worsen if classrooms are not soundproofed against the noise from commercial or business activities.
- The State of Hawaii would continue to pay lease rents because the land is not publicly owned.

3.2 THE PROPOSED ACTION

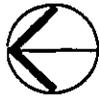
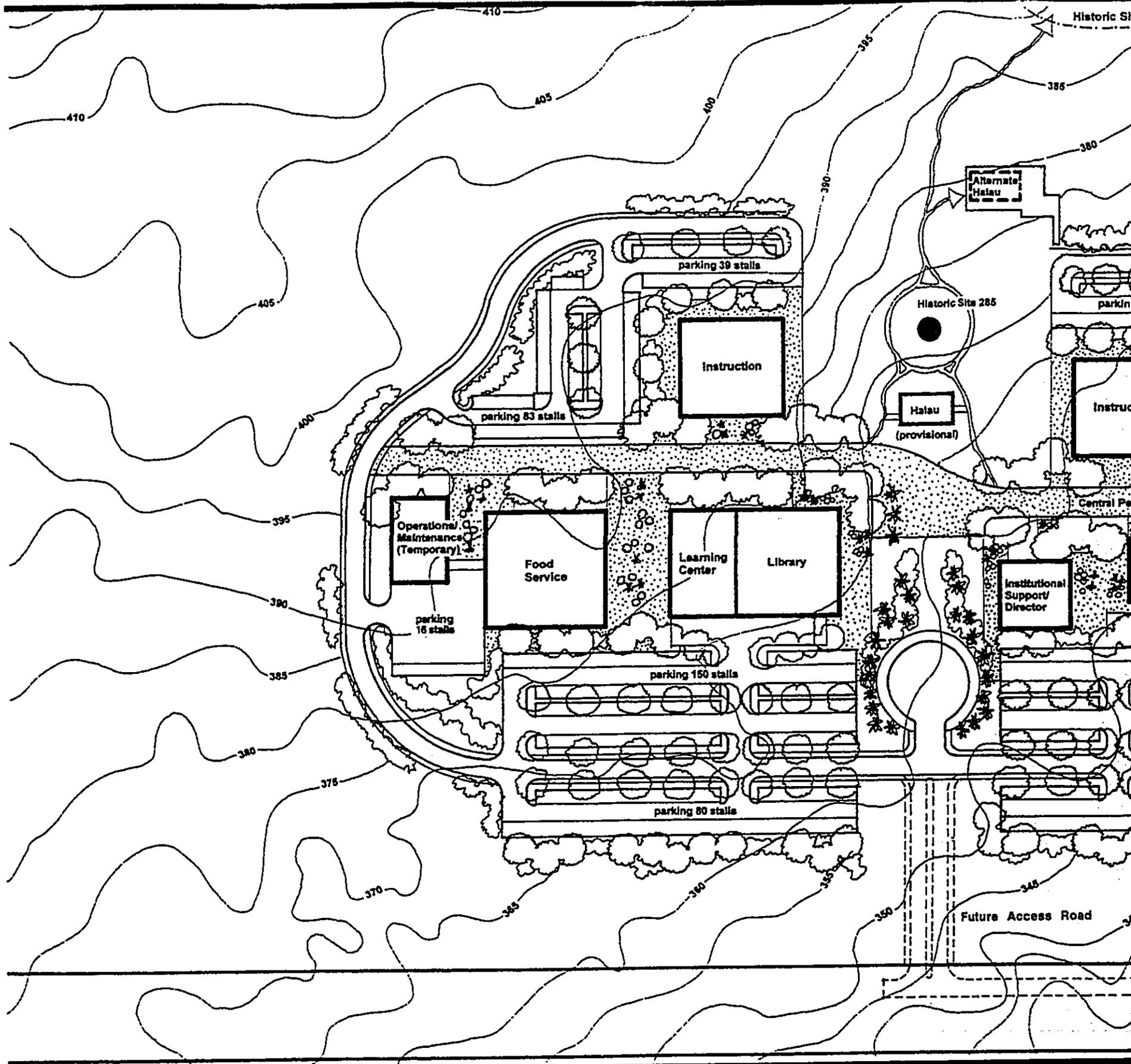
Completion of the proposed action would create a permanent University Center on approximately 33 acres in the southwestern portion of the 500-acre Kalaoa site. Project implementation would be accomplished in four phases to accommodate the transition of the existing UHCWH functions housed at temporary facilities in Kealahou and projected growth of the University Center to a head count enrollment of 1,500 students.

The proposed University Center is intended to blend into the surrounding lava lands covered in scrub grass, small trees and shrubs. Proposed building forms would therefore be of a low-rise character. Building materials would mostly reflect the structure and color of the surrounding environment and the dominant character of pahoehoe lava.

The overall site plan for the University Center reflects two main design themes: an entirely pedestrian-oriented campus and the integration of the campus area with important existing elements of a historical and cultural nature (see Figure 5). To create the pedestrian-oriented campus, peripheral parking areas would be accessed via a curvilinear circumferential road. Buildings would be aligned along a main pedestrian mall oriented south to north roughly following the existing slope patterns of the area. The integration of historic and/or cultural elements would be exemplified in the creation of a central open space oriented perpendicular to the pedestrian mall. The main feature of this open space is historic site 285 consisting of a stone enclosure constructed of stacked pahoehoe slabs. The campus would be focused around this historic Hawaiian feature and would be linked to other mauka-makai elements via a proposed trail that leads to additional historic Hawaiian features. From an overall perspective, the campus would exude a strong visual connection extending from the campus entry in a mauka-makai direction to the slopes of Hualalai.

At completion, the University Center would exhibit the following design characteristics:

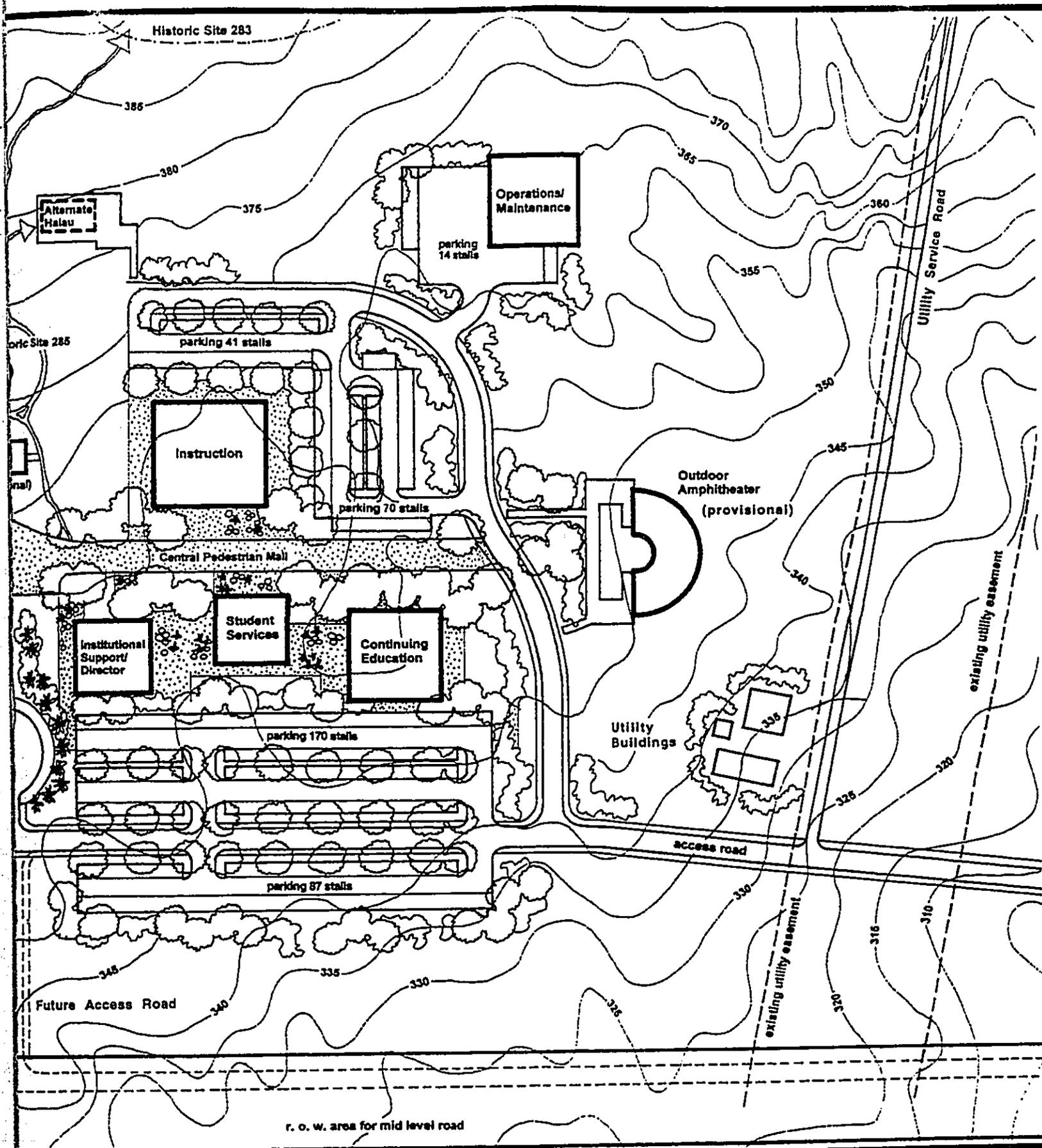
- A curvilinear vehicular road that circumscribes the physical limits of the University Center except at the eastern edge of the project site which is deliberately left open in respect to historic site 285 and its linkage to other cultural sites to the east;
- Low, one-story buildings in keeping with the low density development of University Center surroundings;
- Architectural and design elements that integrate the characteristics of the lava fields and natural vegetation within the University Center site;
- A central pedestrian mall;
- Parking on the perimeter of the project site for the purpose of keeping the interior portions of the site free for pedestrians;
- Landscaping in keeping with the natural surroundings of the Kalaoa site;
- Trails and interpretive signage that enhance the cultural experience and offer historical perspective;



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 Paved Areas

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ENVIRONMENTAL IMPACT STATEMENT
FOR THE
UNIVERSITY OF HAWAII CENTER AT WEST HAWAII

Kalaoa, Island of Hawai'i, Hawai'i

prepared for: University of Hawai'i Facilities Planning Office for
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Honolulu, Hawai'i

Figure 5

Ultimate Site Plan

prepared by: Wil Cnee - Planning, Inc.

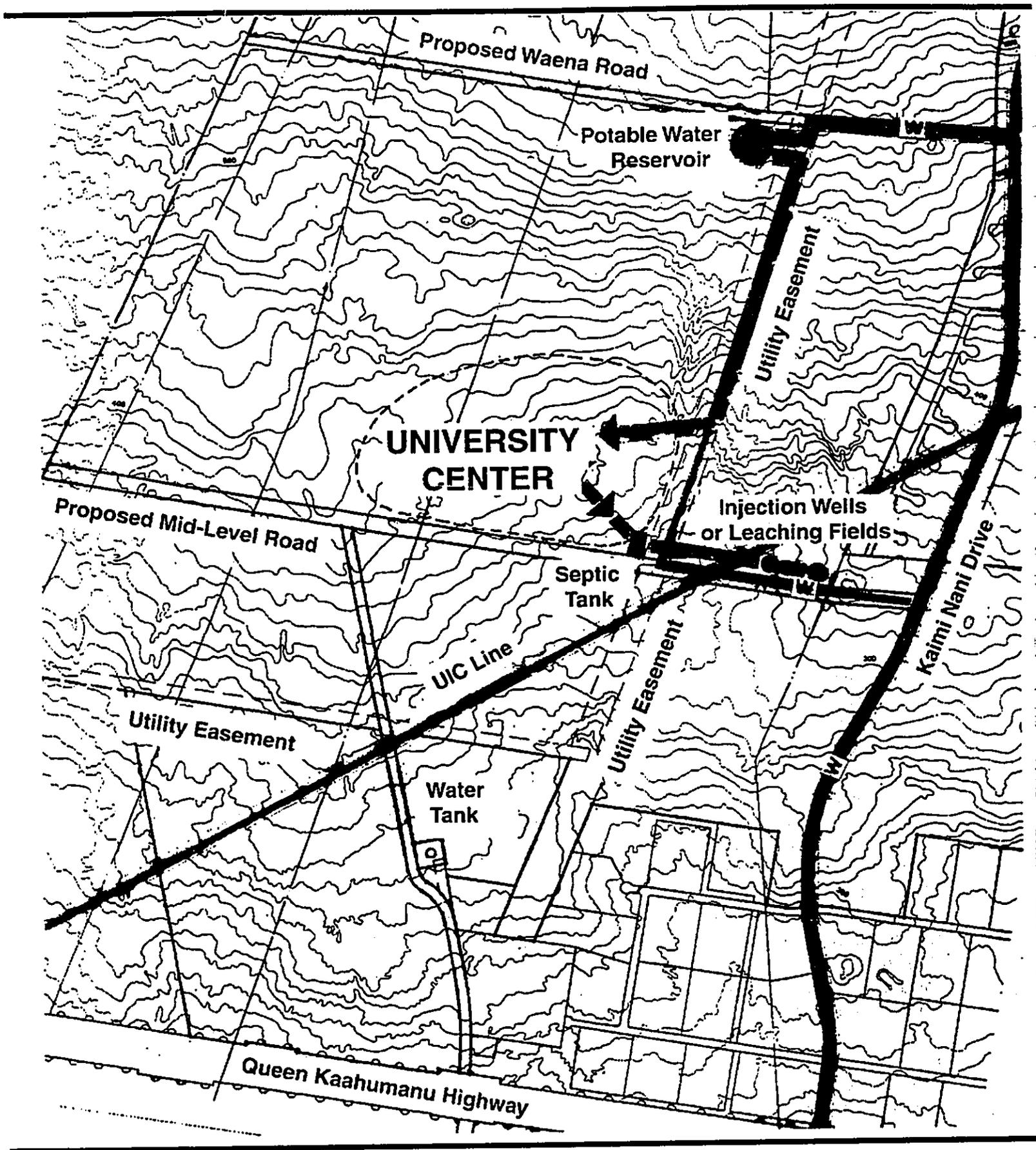
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- A halau structure (a provisional item) situated within the open space area within close proximity to the historic site; and
 - An outdoor amphitheater (a provisional item) situated within close proximity to the pedestrian mall and south of the circumferential road.

The proposed project would include the following utility systems for the extension of infrastructure service to the University Center (see Figures 6 and 7):

- Water service would be provided per County of Hawai'i Department of Water Supply recommendations (see Section 5.12.2 for more details). A 0.5-million gallon water storage tank is needed to provide sufficient water pressure to satisfy County fire flow requirements. Buildings would be supplied from the water tank via gravity feed without additional pumping.
- The wastewater system would include septic tanks with underground injection wells and/or leaching fields (see Section 5.12.3 for more details).
- Drainage systems would be installed to divert and deflect storm water around buildings to lower elevations.
- Two 12 kilovolt (kV) overhead lines would be extended from the 69 kV overhead transmission line located in the utility easement along the southern boundary of the University Center site. Two underground feeders connected to the overhead feeders would supply electrical power to the on-site system. A primary electrical switching station would house equipment for the system.
- Telecommunication lines would be extended from existing lines along Kaimi Nani Drive.
- Solid waste disposal service would be provided via a private disposal company that transports solid waste to a permitted municipal landfill for ultimate disposal.
- Buildings at the University Center would be equipped with security systems and air conditioning systems.

As previously indicated, the creation of the University Center would occur in four phases. Phase 1 actions would result in the construction of three major building components plus associated parking and site improvements. Two of the buildings would be used for the Learning Resource Center/Library and Food Service functions. O&M functions would temporarily be located in the third building. In Phase 1, non-building costs would be substantial due to the creation of access roads and initial mechanical and civil infrastructure systems. The functions housed in facilities at Kealahou would relocate to the new facilities at Kalaoa. With the integration of modern technology, the University Center would provide electronic education via the Internet and distance learning courses.

Facilities for Instruction, the pedestrian mall, and associated parking would be developed in Phase 2. With the completion of this phase, the University Center would accommodate an enrollment of 750 students (including part-time and evening students).



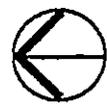
ENVIRONMENTAL IMPACT STATEMENT
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Kalaoa, Island of Hawaii, Hawaii

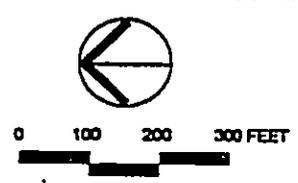
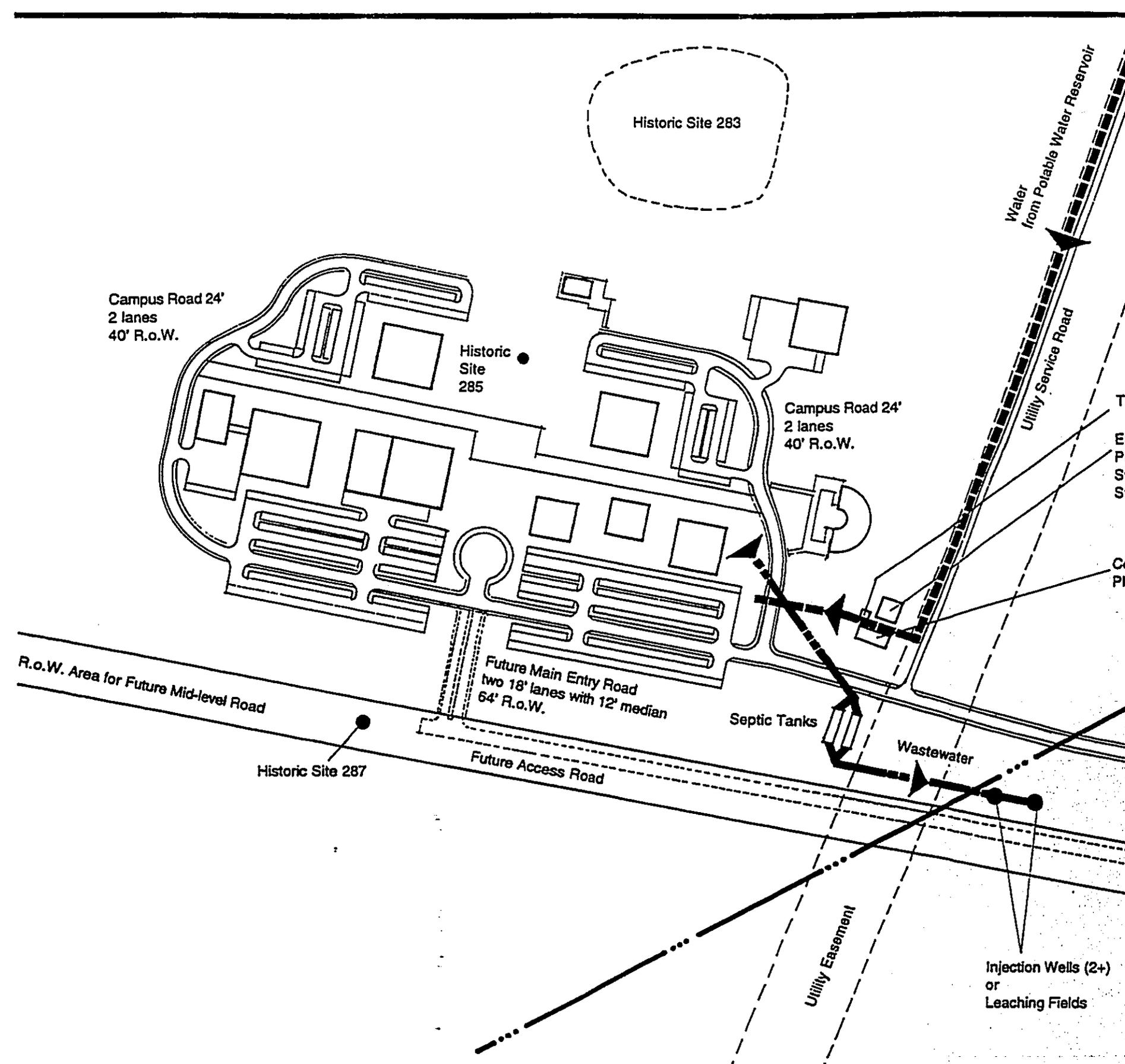
prepared for: University of Hawaii Facilities Planning Office for
Community Colleges
Honolulu, Hawaii

Figure 6

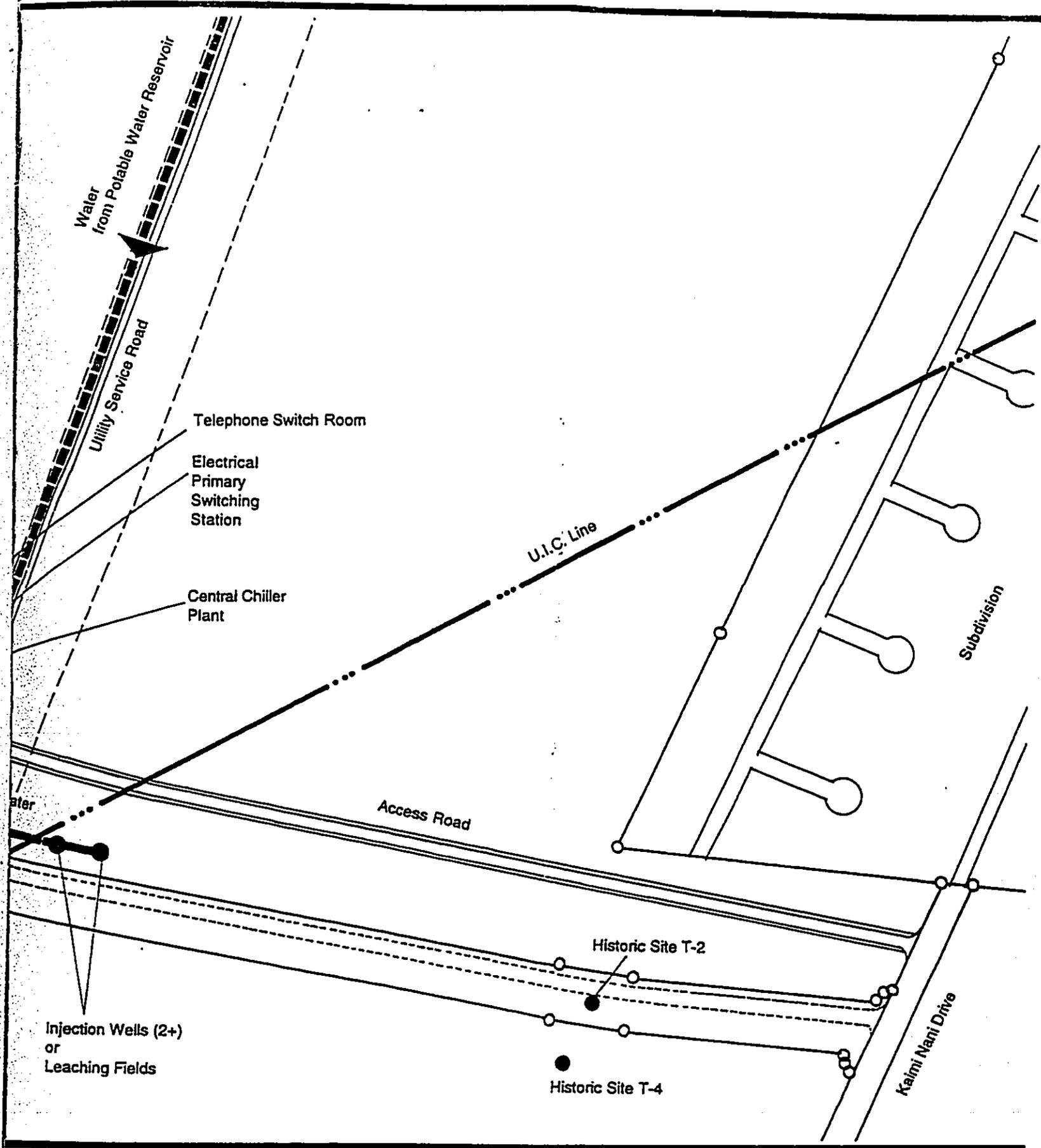
Overview of Utility Systems



prepared by: Wil Chee - Planning, Inc.



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UNIVERSITY OF HAWAII CENTER AT WEST HAWAII

Kalaooa, Island of Hawaii, Hawaii

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Honolulu, Hawaii

Figure 7

Utility Systems at the Project Site

prepared by: Wil Chee - Planning, Inc.

Phase 3 actions include the construction of facilities for Institutional Support/Director, Student Services, and Continuing Education; associated parking areas; and the completion of the pedestrian mall.

Phase 4 actions include the completion of Instruction facilities and the construction of the permanent O&M building and associated parking. With the completion of Phase 4, the University Center would accommodate a head count enrollment of 1,500 students (including part-time and evening students).

The timeframe for design and engineering work associated with Phase 1 is expected to commence in Fall 2000 if all necessary environmental and procedural approvals and permits are acquired. The timing for Phases 2, 3 and 4 will proceed in a manner consistent with enrollment demands and funding availability. Budgetary realities necessitate the full development of the UHCWH over a span of several years.

As indicated in the LRDP, the total estimated cost for full development of the UHCWH is approximately \$52 million (Table 12: Capital Improvements Program, Project Estimate Summary, pg. 83). A summary of the estimated Capital Improvements Program (CIP) allocation is hereby presented as Table 1.

TABLE 1: ESTIMATED CIP ALLOCATION FOR THE PROPOSED ACTION.

Priority No.	Project Description	Design (in Thousands)	Construction (in Thousands)	Total (in Thousands)	Cumulative Total (in Thousands)	Comments
1	Phase 1 (I & E)	\$571	\$11,410	\$11,981		
2	Learning Resource Ctr	\$299	\$7,282	\$7,581	\$19,561	
3	Food Service	\$228	\$5,429	\$5,657	\$25,218	
4	Temporary O&M	\$68	\$1,481	\$1,549	\$26,767	
5	Phase 2 (I & E)	\$140	\$2,460	\$2,600	\$29,368	
6	Instruction	\$146	\$3,396	\$3,542	\$32,910	HCE=750
7	Phase 3 (I & E)	\$228	\$4,214	\$4,442	\$37,351	
8	Student Services	\$68	\$1,418	\$1,486	\$38,837	
9	Continuing Education	\$97	\$2,202	\$2,299	\$41,136	
10	Institutional Support	\$81	\$1,770	\$1,851	\$42,988	
11	Phase 4 (I & E)	\$156	\$2,834	\$2,990	\$45,978	
12	Instruction	\$146	\$3,396	\$3,542	\$49,520	
13	Permanent O&M	\$102	\$2,321	\$2,423	\$51,943	HCE=1,500
Totals		\$2,330	\$49,613	\$51,943		

Source: Wil Chee - Planning, Inc., 1999b, pg. 83.

Notes: I & E = Infrastructure & Exterior improvements
HCE = Head Count Enrollment

Estimated design costs are based on DAGS compensation curves, and a 15 percent contingency factor. The probable construction costs shown in Table 1 are based on historic records of educational facilities designed and recently built in Hawaii. Costs were based on the LRDP concept using 1998 figures with no escalation for inflation. Actual costs after the design phase is completed are subject to change from those presented in Table 1.

According to the table, the UHCWH would accommodate a head count enrollment of 750 students with the completion of the Phase 2 Instruction building (priority no. 6). At ultimate completion (priority no. 13), the UHCWH would accommodate a head count enrollment of 1,500 students.

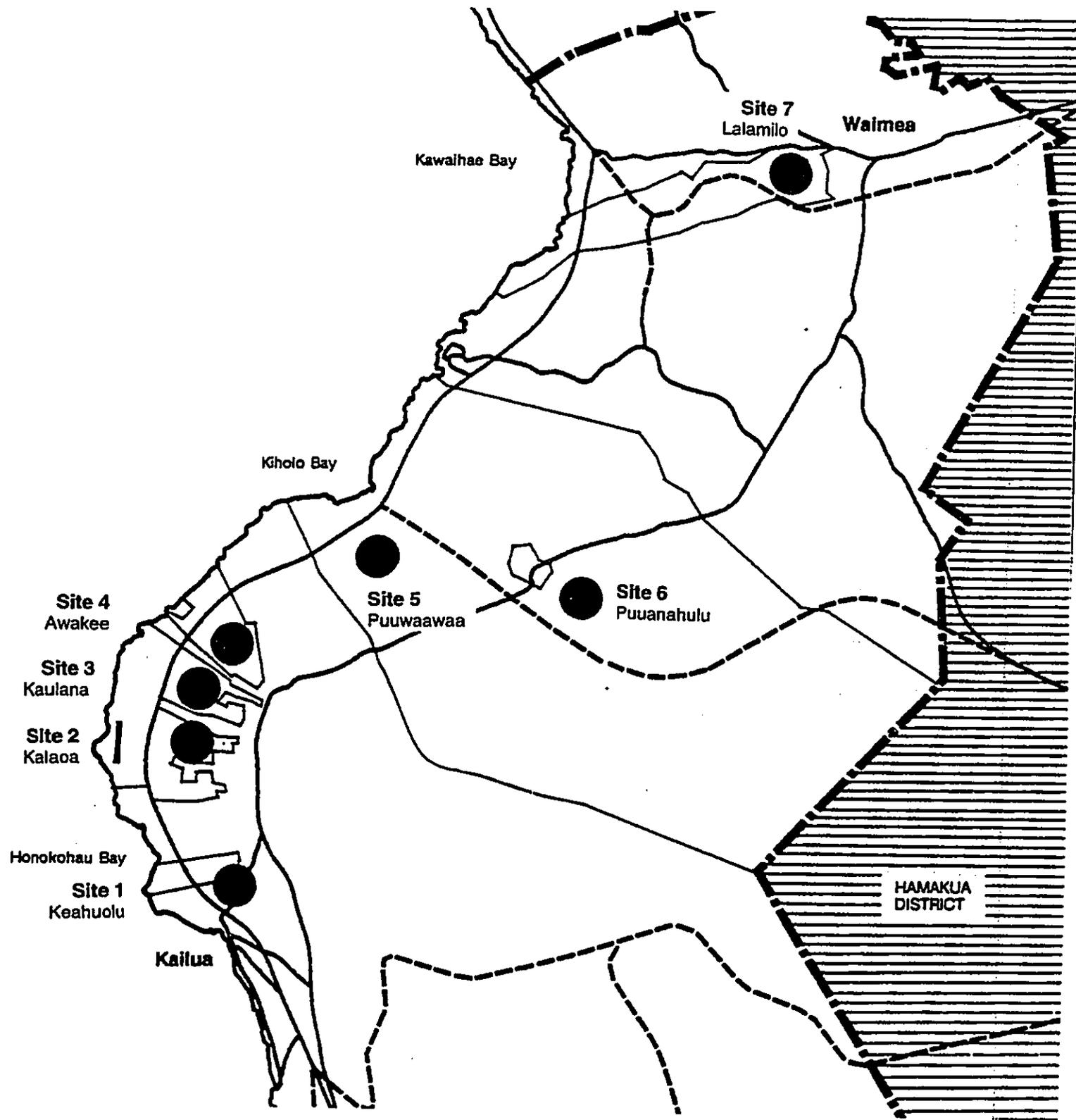
3.3 ALTERNATIVE SITES

As indicated in Section 2.3, alternatives to the 500-acre Kalaoa site are addressed in *University of Hawaii at Hilo, West Hawaii Campus: Site Assessment Study* (DPD Associates, Inc., Circa 1992). The site assessment study is hereby incorporated by reference in this discussion of alternative sites.

The site assessment study prepared in circa 1992 for the Board of Regents evaluated a total of seven (7) candidate sites (see Figure 8). As a first criterion, candidate sites had to comprise publicly owned parcels (i.e., State of Hawai'i lands). Candidate sites also had to encompass sufficient acreage (i.e., a minimum of 500 acres) for expansion within the next 50 to 100 years. Sites with adjacent lands allowing for future expansion were considered especially desirable. Candidate sites were also evaluated based on parcel shape and topography, and proximity to existing infrastructure systems because these criteria relate to ease of construction and development. Developmental concerns also relate to environmental concerns because shorter routes for conduits, trenches, and roads cause less environmental disturbance from grading, excavation and related activities along the access route as compared to a longer alignments.

Three sites emerged as most desirable to serve the projected long-range (50 to 100 years) urban framework in West Hawai'i (pg. 51): Site 2 – Kalaoa (the subject of the LRDP), Site 3 – Kaulana (abutting the private Kau development north of Kailua-Kona), and Site 4 – Awakee (abutting the proposed urban development area of Kaupulehu). The remaining sites did not meet established criterion and are characterized by factors that may produce undesirable locational effects with respect to future population trends:

- Site 1 – Keahuolu (along Palani Road). There is no room for future expansion of this 450-acre site due to surrounding existing uses (pg. 33). Selection of Site 1 would have been most beneficial to South Kona residents and least beneficial to residents of North Kohala and Waimea, and the supporting communities of Kawaihae, Lalamilo, Waikoloa and Signal Puako (pg. 53).
- Site 5 – Puuwaawaa (directly mauka of the proposed Kapaloa-Kiholo State Park). This site is far from existing infrastructure systems (pg. 43). Site 5 would



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Figure 8
Candidate Sites

prepared by: Wil Chee - Planning, Inc.



have offered commuting benefits to the populations north of Keahole while subjecting the Kailua-Kona population to an unacceptable commuting pattern (pg. 57).

- Site 6 – Puuanahulu (close to the intersection of Mamalahoa Highway and the Queen Kaahumanu – Saddle Road arterial connection). This remote site is located outside of serviced infrastructure systems among lands characterized as open space (pg. 45). Site 6 is located approximately midway between Waimea and Kailua-Kona. It was determined that the populations south of Keahole would disapprove of this remote location (pg. 58).
- Site 7 – Lalamilo (abutting residential areas near Waimea). This site is located considerably north of the geographic center of West Hawai'i (pg. 47). Site 7 would have been most beneficial to North and South Kohala residents but is least beneficial to the populations south of Keahole Point (pg. 59).

The Board of Regents decided on Site 2 – Kalaoa during a public hearing in Kailua-Kona in April 1991. The selection of the Kalaoa site includes the following justification:

- The 500-acre State-owned parcel has great potential for expansion;
- The site is within reasonable distance of water supply, roadway and other established infrastructure elements; and
- The site is the preferred University location as expressed by the local community.

Overall support for the creation of a University Center at Kalaoa is reflected not only in community sentiments but also in State of Hawai'i and County of Hawai'i policy documents: the *West Hawaii Regional Plan* (Office of State Planning, 1989) and the *Keahole to Kailua Development Plan, North Kona, Island of Hawaii* (County of Hawai'i, Department of Planning, 1991). Creation of permanent University facilities in Kalaoa is listed as one of the action statements in the *West Hawaii Regional Plan* (pg. 50). The *Keahole to Kailua Development Plan* depicts a university campus site comprising approximately 500 acres in the vicinity of Keahole Airport, mauka of Queen Kaahumanu Highway and the proposed Mid-Level Road (Figure 3.1: Land Use Plan and pg. 3-12). For all these reasons, alternatives to the Kalaoa site are therefore eliminated from further consideration.

3.4 ALTERNATIVE SITING CONSIDERATIONS AND LAYOUT CONFIGURATIONS

Alternative siting and layout configurations for the University Center at Kalaoa are addressed in *University of Hawai'i Center at West Hawai'i: Long Range Development Plan* (Wil Chee - Planning, Inc., 1998). The plan is hereby incorporated by reference.

The siting of the University Center core on approximately 33 acres within the 500-acre Kalaoa site was determined based on practical considerations that would facilitate development. Again, these developmental considerations have environmental implications because a location close to available infrastructure systems requires shorter access routes and less environmental disturbance as compared to a location

that requires longer conduits, roads, and similar features to extend existing utility service. Terrain that is flatter requires less movement of the earth and soils whereas a hilly area requires more excavation, grading, cutting, and filling to create flat, suitable areas for buildings and structures.

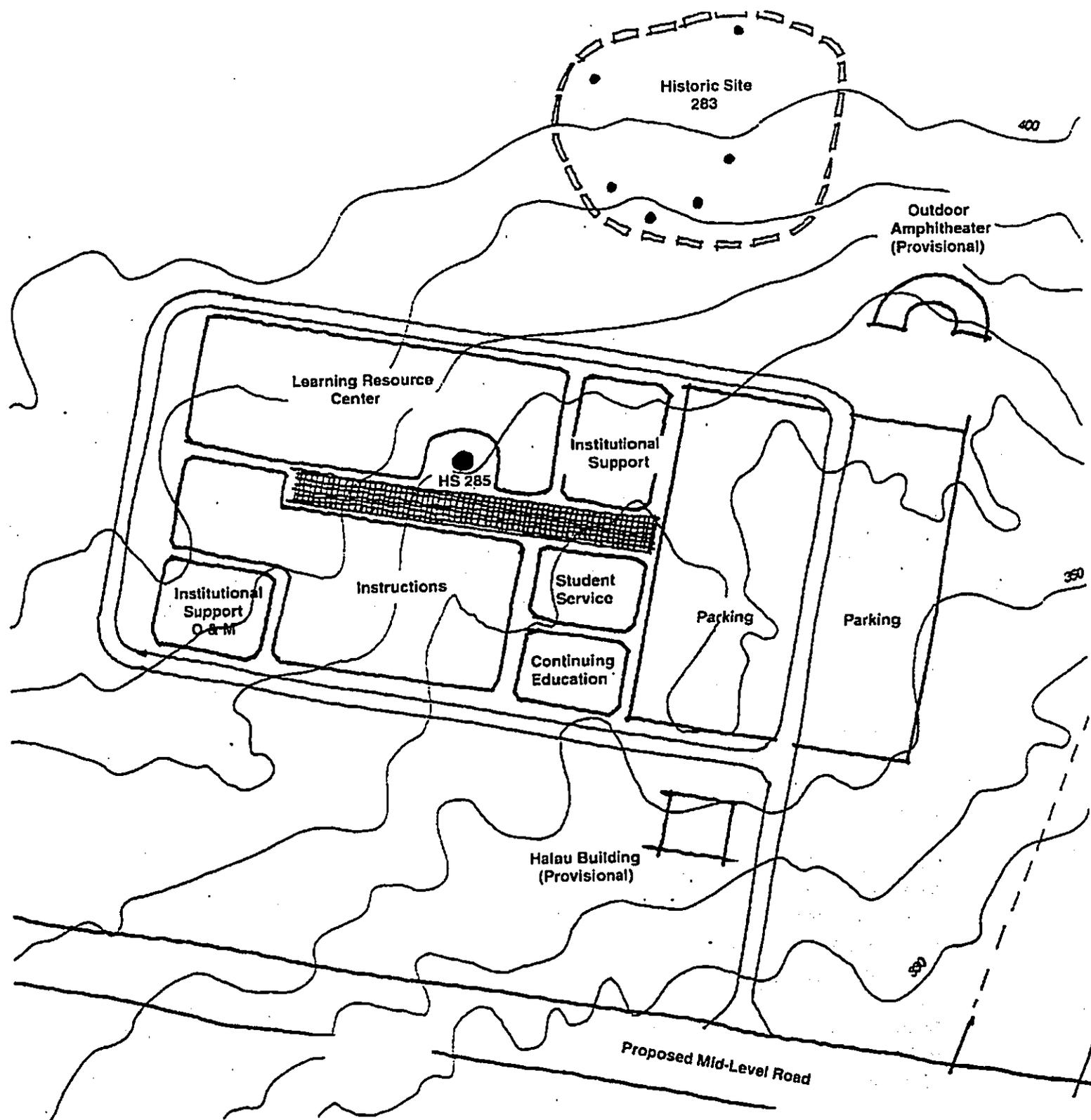
The area on the southwestern portion of the 500-acre Kalaoa site was chosen for the University Center core because it exhibits the best characteristics for immediate development with respect to terrain and proximity to existing utility systems and roadways (pg. 41). The siting of the University Center core also acknowledges the existing Hawai'i Electric Light Company (HELCO) utility corridor, the existing Palisades residential area, and the proposed alignment of the future Mid-Level Road. In response to these factors, no alternatives to the siting of the University Center core were considered warranted, and the analysis could then focus on layout configurations.

The spatial organization of the major elements of the University Center core is in direct response to the general topography of the site. Main elements include the five major functional areas, the overall circulation patterns for vehicles and pedestrians, and arrangements for parking and open space.

Three site utilization schemes considered the major elements of the University Center (pgs. 42-45). The schemes focused primarily on the diagrammatic relationship of the major site elements. Summaries of the three utilization schemes are presented below.

- Scheme 1. This scheme is based on a strictly rectangular grid system (see Figure 9). The University Center core is contained within a circumferential roadway. A large parking area is provided at the campus entrance. From this parking area, a central pedestrian mall extends into the campus and serves functional areas aligned in a U-shaped pattern.
- Scheme 2. This scheme is much less rigid and more responsive to topographic realities (see Figure 10). The circumferential road in this scheme is accessible via a more centrally located entrance. Parking areas are more integrated with the required functional areas. The alignment of the central pedestrian mall is less rigid and is complemented by the introduction of a major mauka-makai open space pattern incorporating historic site 285.
- Scheme 3. The road pattern in this scheme is arranged in a larger loop as compared to the two other schemes (see Figure 11). With Scheme 3, there are two access points from the Mid-Level Road. Functional areas, the central pedestrian mall and parking areas are all aligned in parallel fashion in a mauka-makai direction. This scheme, as with Scheme 1, includes no major open spaces.

An evaluation of the three schemes revealed that Scheme 2 has the best sense of arrival. It also is the only scheme that provides parking directly adjacent to functional areas. Furthermore, it offers the best opportunities for a meaningful incorporation of historic site 285 into the University Center core. Consultation with the CCFPCO, HawCC administration and the students and staff of the UHCWH in Kealahou led to



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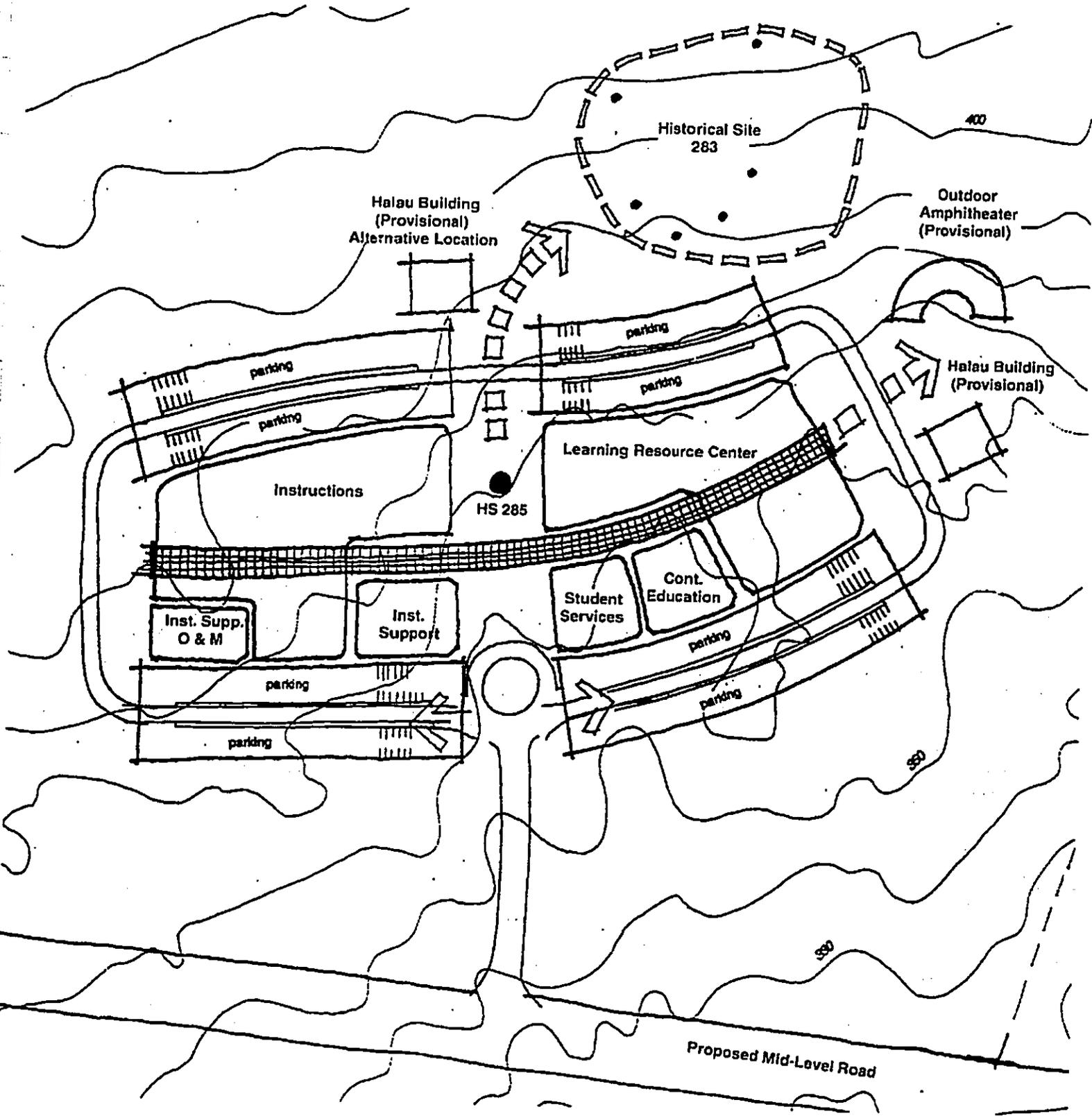
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Figure 9

Site Utilization Scheme 1

prepared by: Wil Chee - Planning, Inc.





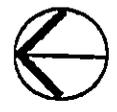
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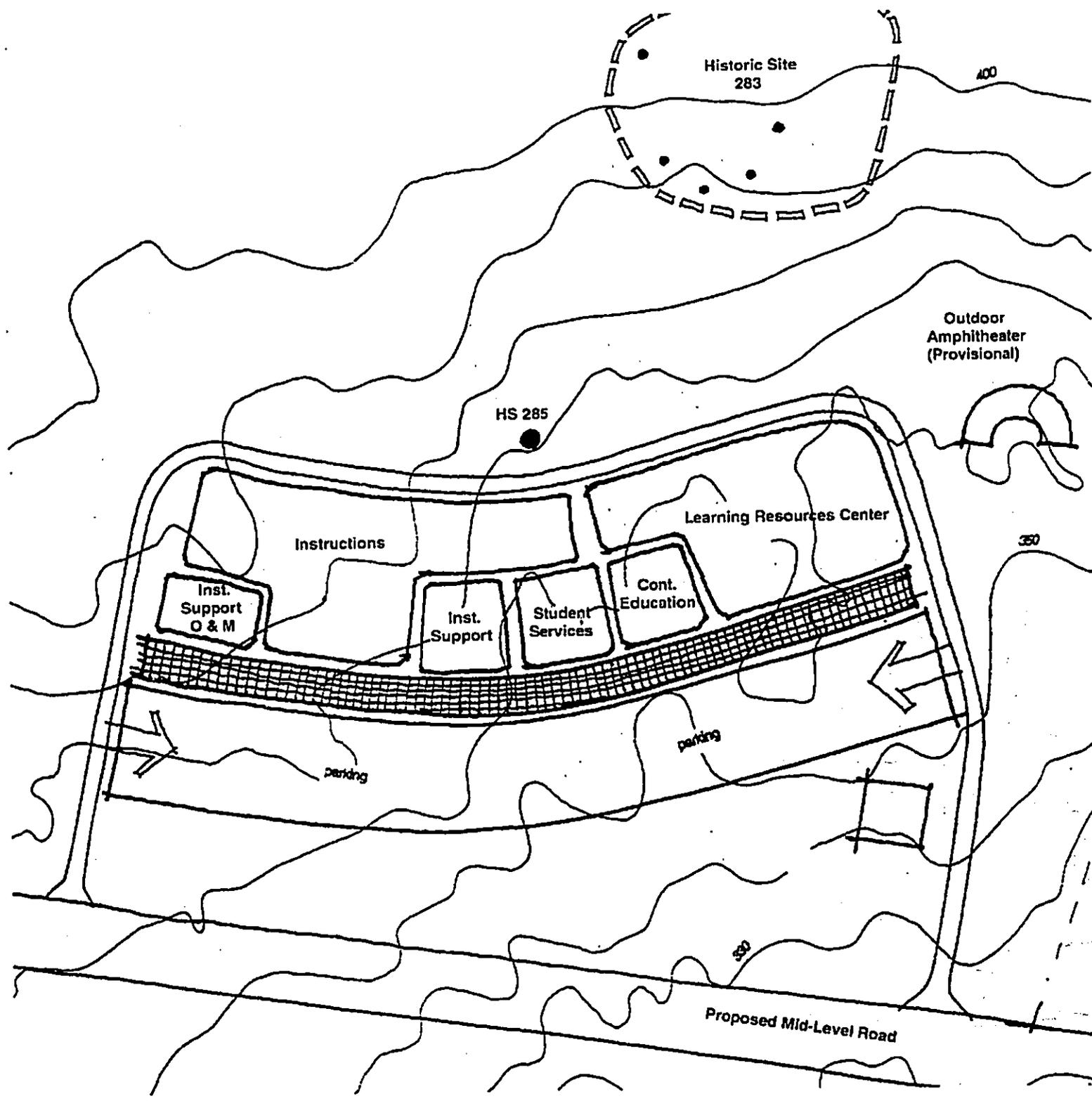
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Figure 10

Site Utilization Scheme 2



prepared by: Wil Chee - Planning, Inc.



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Figure 11
Site Utilization Scheme 3

prepared by: Wil Chee - Planning, Inc.



the affirmation of Scheme 2 as the preferred site utilization scheme. This led to the development of alternative site plans (pgs. 46-50).

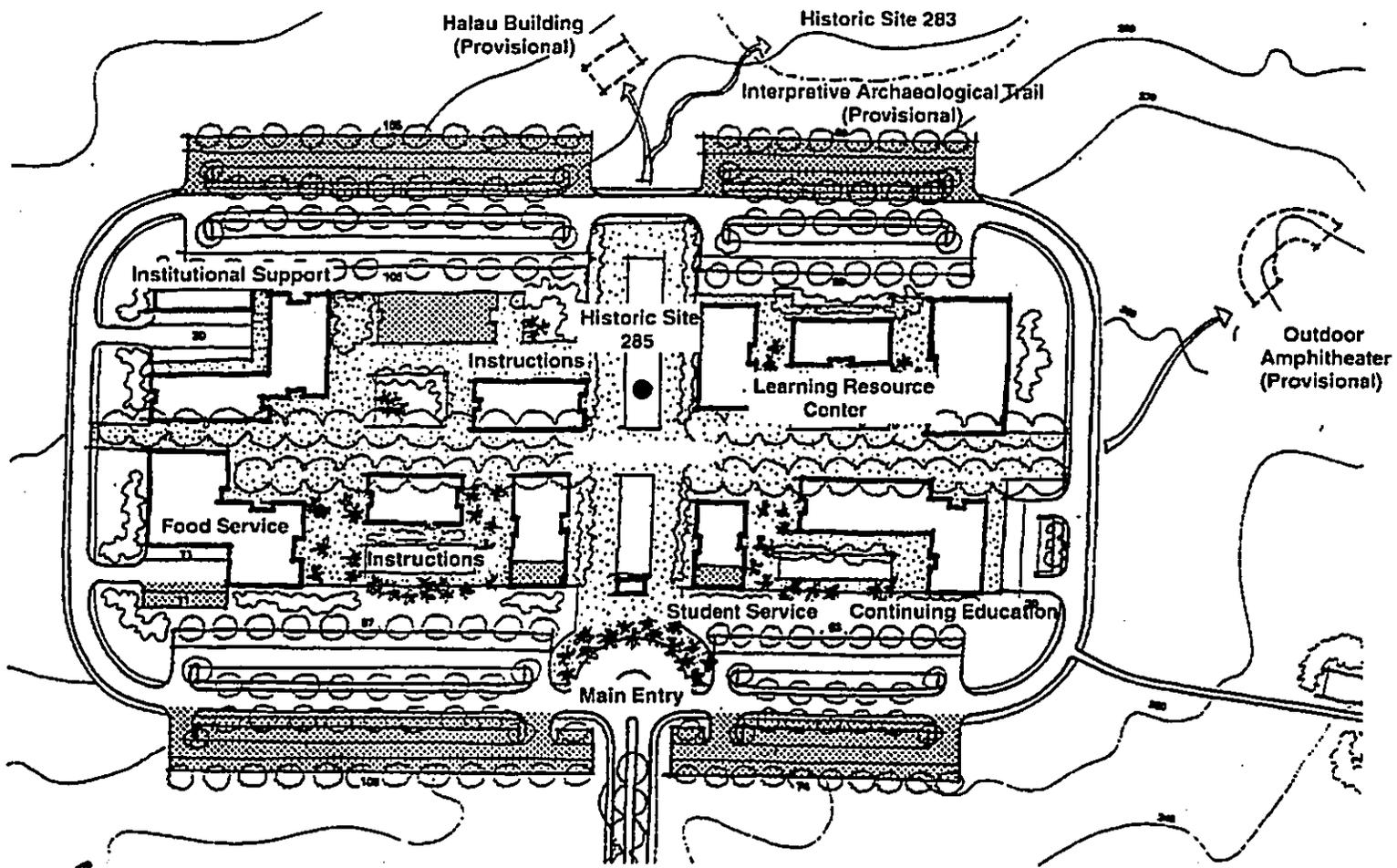
Three alternative site plans were developed from site utilization Scheme 2. The three alternative site plans share the following design elements:

- A perimeter roadway;
- A central access point;
- The central pedestrian mall;
- The central open space;
- Separate parking areas; and
- Access to infrastructure.

The three alternative site plans have the following characteristics:

- Alternative Site Plan 1. This site plan is organized along a rigid rectangular grid pattern created by a north-south pedestrian mall and a mauka-makai central open space (see Figure 12). Each functional area is grouped to create individual courtyards connected to the pedestrian mall.
- Alternative Site Plan 2. Site Plan 2 has a more fluid alignment of the perimeter road and central pedestrian mall (see Figure 13). Both elements closely follow the existing topography of the project site. The unique feature of this plan is the arrangement of the functional areas as groups of large buildings centered around an inner courtyard, thereby creating a lush inner oasis-like atmosphere within each building group that is in contrast to the existing, arid, lava-strewn surroundings. Unlike the other alternatives, the buildings in this plan focus attention inward.
- Alternative Site Plan 3. This site plan includes a less deliberate placement of the buildings in each quadrant (see Figure 14). Site Plan 3 also emphasizes the central open space more than the other alternatives by attributing a dominant location to historic site 285 and making it a pivotal element of the overall layout. Alternative 3 includes access to Kaimi Nani Drive, which is accommodated entirely within the University Center core property. This allows vehicular access that is independent from the actual timeframe of the proposed construction of the future Mid-Level Road.

An evaluation of the proposed alternative site plans reveals subtle variations that distinguish each plan. The advantage of Alternative Site Plan 3 is its access pattern. Firstly, an access road from Kaimi Nani Drive through the University Center property shortens the length of the required road, thereby minimizing environmental change and necessary capital expenditure. Additionally, an access road within the University Center property is more expedient with respect to legal and procedural requirements. As a result of these considerations, Alternative Site Plan 3 became the basis for the proposed action.



 Phase II (1,500 student enrollment)

Note: All buildings are one-story

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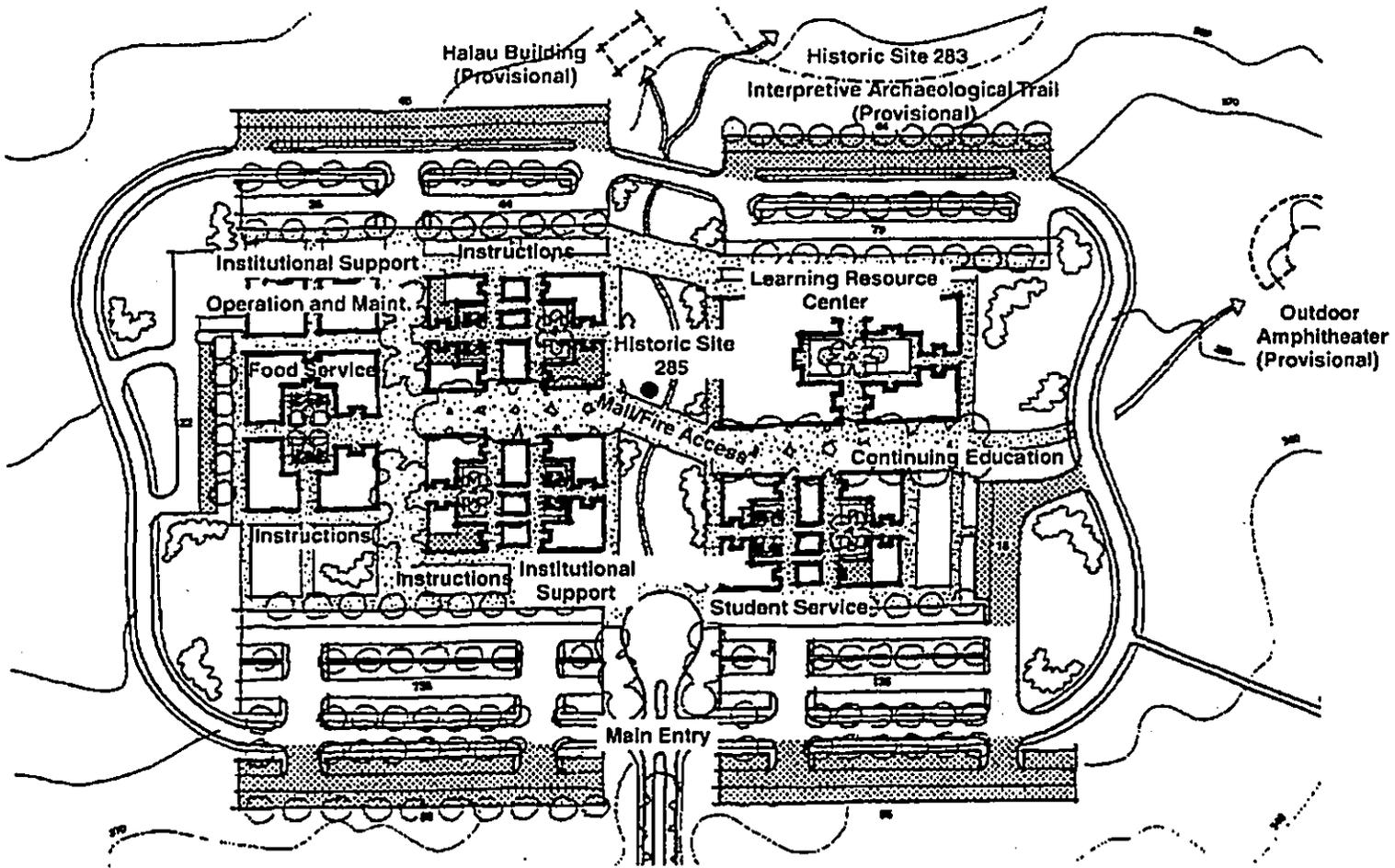
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Figure 12

Alternative Site Plan 1

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Phase II (1,500 student enrollment)

Note: All buildings are one-story

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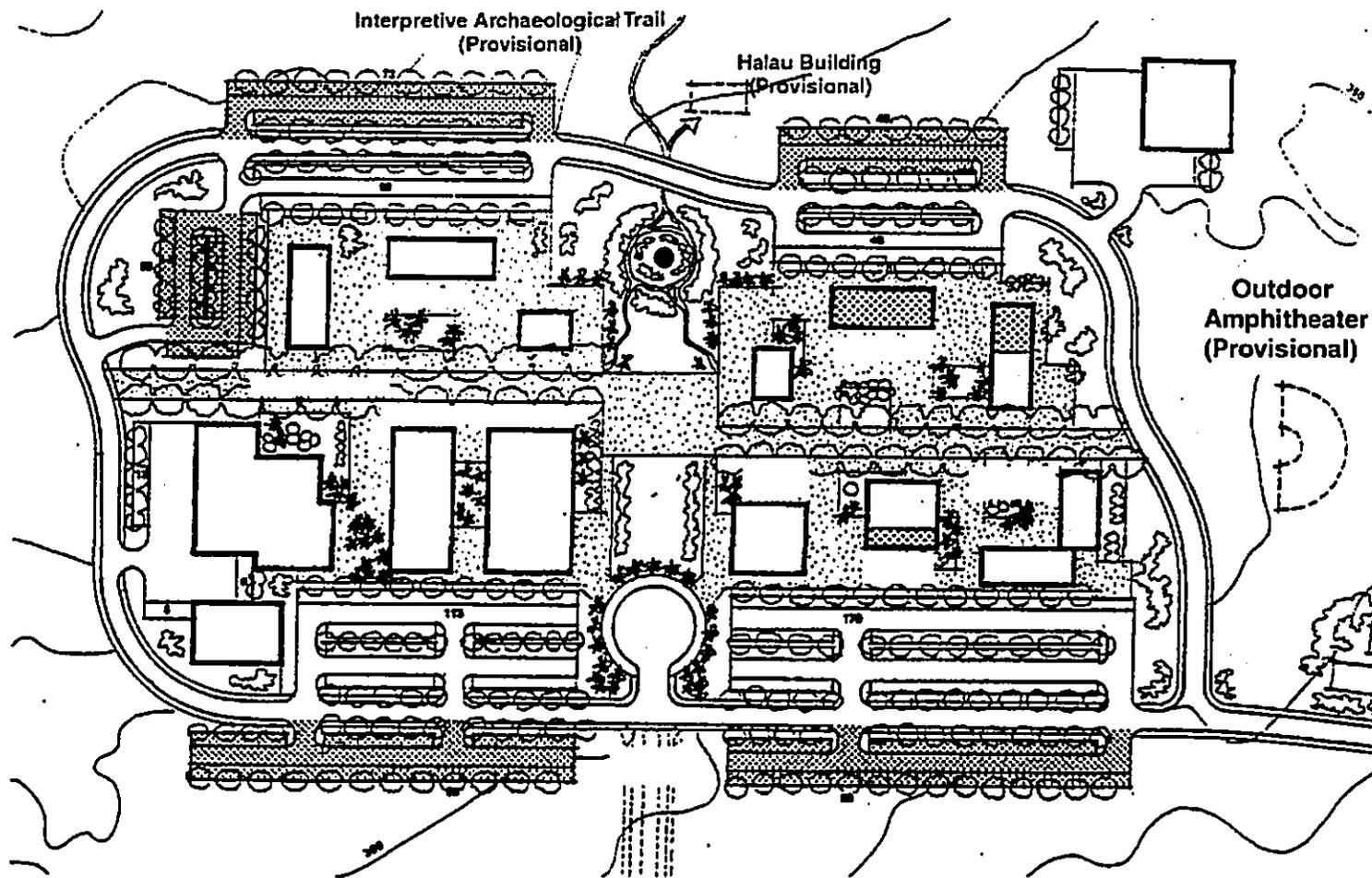
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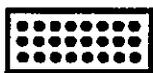
Figure 13

Alternative Site Plan 2



prepared by: Wil Chee - Planning, Inc.



 Phase II (1,500 student enrollment)

Note: All buildings are one-story

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Figure 14

Alternative Site Plan 3

prepared by: Wil Chee - Planning, Inc.



3.5 ALTERNATIVE A: REVISED ACCESS ROAD

This alternative includes the same features as the proposed action, but with a different access route from Kaimi Nani Drive to the project site (see Figure 15). The design architects developed Alternative A as a result of discussions with the County of Hawai'i, Public Works Department. It is hereby noted that the project planners have received no written comments from this department with respect to the recommendations in this section; therefore, this option remains as a possible alternative as opposed to an incorporated project feature.

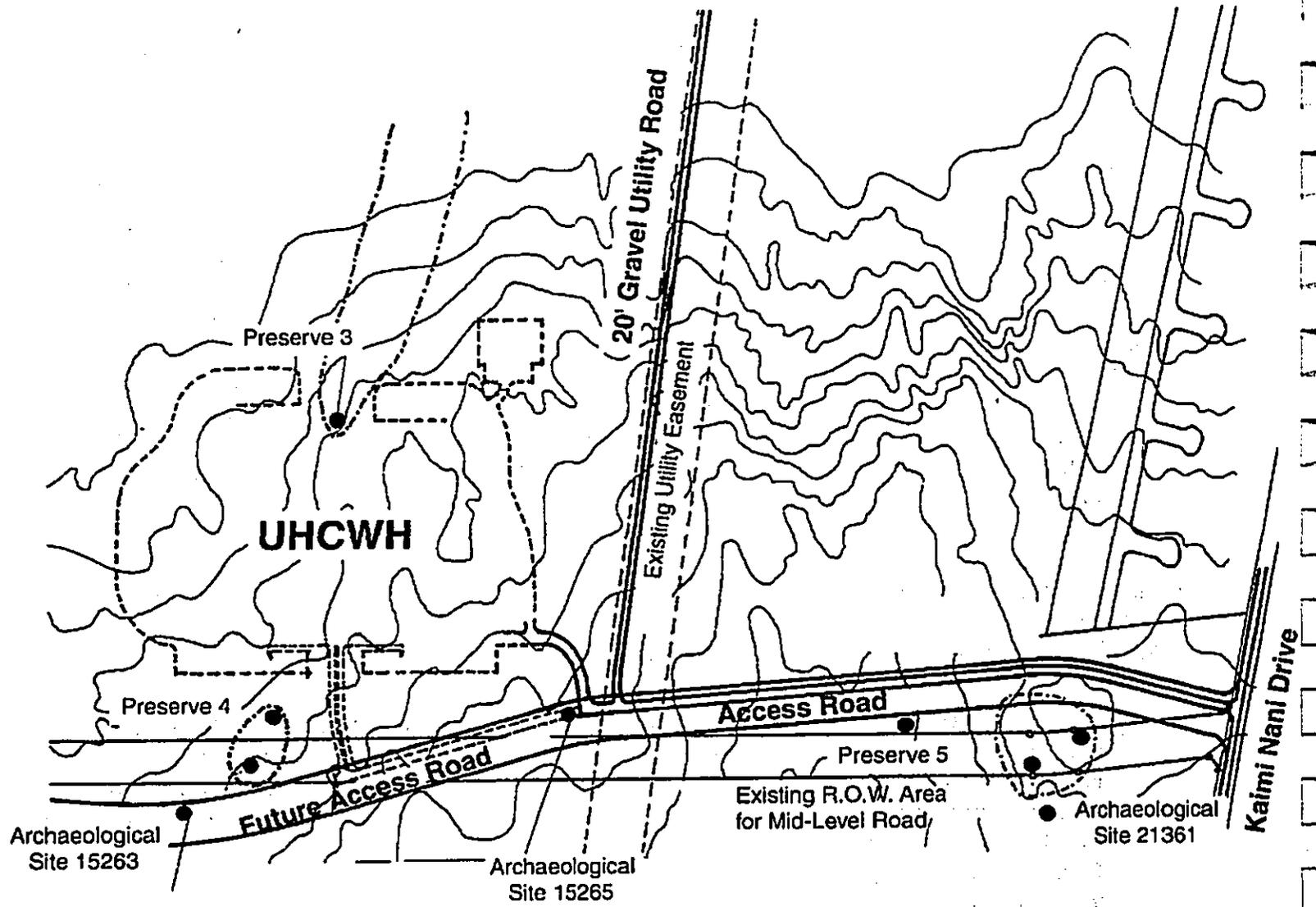
Department personnel indicated that a major access road so close (approximately 150 feet) to the Mid-Level Road right-of-way would probably be unacceptable because of the new left turn pocket on Kaimi Nani Drive that would probably be required to handle traffic generated by the project (Kober/Hanssen/Mitchell Architects, Inc, 1999, Civil Engineering – Page 1). Public Works officials recommended that the proposed action include the improvement of approximately half of the Mid-Level Road arterial right-of-way, which equals to 24 feet of pavement, shoulders, and paved swales (Ibid). Department officials also indicated that a realignment of the Mid-Level Road right-of-way would probably be acceptable to the County if the intent of the roadway remains the same (Ibid).

Given the above comments and recommendations, Alternative A includes the construction of a portion of the access road to the University Center within the Mid-Level Road right-of-way. This access road would be realigned to avoid archaeological sites. Advantages of this access road within the Mid-Level Road right-of-way are listed below:

- The realigned access road would provide an access route acceptable to the County of Hawaii and in keeping with the planned development of the Mid-Level Road as described in the *Keahole to Kailua Development Plan*. The realignment would also allow the County to avoid the archaeological sites recorded within the Mid-Level Road right-of-way (Kober/Hanssen/Mitchell Architects, Inc, 1999, Civil Engineering – Page 2).
- The length of the access road would not be much longer or much different than the access road proposed in the LRDP (Ibid).
- A realigned access road would allow the County of Hawai'i and State of Hawai'i to share common development goals that would result in overall savings to the taxpayers by avoiding the creation of parallel roads and parallel lighting systems within the affected area (Ibid).

3.6 ALTERNATIVE B: WATER SYSTEM OPTION

This alternative includes the initial concept for the water system as discussed in the LRDP; the other features described for the proposed action remain the same. The water system in Alternative B would require tapping into the existing Kaimi Nani mains that are supplied from the wells above Mamalahoa Highway. As indicated in the letter



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Figure 15

Revised Access Road

prepared by: Wil Chee - Planning, Inc.



dated December 20, 1999 from the Kona Palisades Estates Community Association (KPECA), the residents of this community object to the connection to the Kaimi Nani Drive water supply because this would presumably reduce the KPECA water pressure even lower; inadequate water pressure is currently experienced by residents who live in the mauka third of the subdivision (pg. 1).

Community sentiment, combined with the recommendations from the County of Hawaii Department of Water Supply, led to the elimination of this water system option from further consideration.

3.7 ALTERNATIVE C: WASTEWATER SYSTEM OPTIONS

3.7.1 Cesspools

This alternative includes the same features as the proposed action with the exception of cesspools for wastewater treatment and disposal. Although the nearby residential communities use cesspools, this option would not be permissible for a large public facility such as the UHCWH. Consequently, this alternative was eliminated from consideration.

3.7.2 Mechanical Sewage Treatment Plants

The difference between this alternative and the proposed action is the use of mechanical sewage treatment plants for wastewater treatment and disposal. Prohibitive costs and the odorous nuisance to the nearby existing residential community resulted in the elimination of this alternative from further consideration.

3.7.3 Sewage Lagoon

This alternative includes the same features as the proposed action with the exception of a sewage lagoon for wastewater treatment and disposal. This option was deemed the most environmentally efficient method of sewage treatment; however, the community voiced strong reservations about this method because of potential odors and proximity to residential areas. This option was therefore eliminated from further consideration.

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4.0 AFFECTED ENVIRONMENT

This chapter presents the relevant resource components of the existing environment that would be affected by the alternatives under consideration if they were implemented. In other words, this chapter describes the baseline environment. The discussions presented in this chapter are necessary to understand and evaluate the effects of each considered alternative (i.e., those that remain from Chapter 3.0).

The historical perspective is summarized in Section 2.1. Information pertaining to economic and social development is presented in Sections 4.13 and 4.14. The local and regional perspective with respect to geographic elements is hereby described.

West Hawai'i comprises the districts of North Kohala, South Kohala, North Kona, and South Kona. The West Hawai'i region encompasses nearly 1,000 square miles or approximately the combined size of Molokai and Oahu. Project actions will occur in the North Kona District.

The North Kona District encompasses coastal lowlands that stretch from Nenu Point northward to Anaehoomalu Bay. Lands in the mauka areas form a relatively uniform pattern along the northwestern slopes of Mauna Loa to its summit at approximately 13,120 feet above mean sea level (MSL). The most prominent topographical feature of the district is Mt. Hualalai which rises to an elevation of approximately 8,270 feet above MSL. The last documented eruption of this volcano was in circa 1800 - 1801.

The principal settlement of the North Kona District is the town of Kailua-Kona. It is the second largest city on the Island of Hawai'i.

The two major vehicular corridors through the North Kona District follow north-south alignments: the coastal Queen Kaahumanu Highway and the upper belt road named Mamalahoa Highway. Queen Kaahumanu Highway opened in 1975 and serves as the major vehicular corridor connecting Kailua-Kona to Kawaihae (the location of the only deep water harbor in West Hawai'i). Other regional transportation elements in the North Kona District are Honokohau small boat harbor and Keahole International Airport.

The entire West Hawai'i region comprises lava flows from the Hualalai Volcanic Series estimated to be nearly 3,000 years old. Lands in the West Hawai'i region are mostly characterized as sparsely vegetated pahoehoe. The mountain wilderness reflects a long history of deforestation resulting from the combined impacts of domestic cattle ranching and feral hoofed mammals. The region also includes a vast, barren 'a'a lava flow that is approximately 300 years old.

The project site described in this chapter encompasses approximately 33 acres on the southwestern portion of the 500-acre Kalaoa site identified by TMK: 7-3-10:33 (por). The affected property encompasses pristine lava lands covered in scrub grass, small

trees and shrubs. Ancient Hawaiians may have undertaken agricultural uses on the site; but no modern development has occurred on the affected property. The project site generates no demand for utility service from its undeveloped state; consequently, no infrastructure systems have been extended to the site, with the exception of the electrical utility corridor. Furthermore, no vehicular access to the project site is available at this time.

4.1 GEOLOGIC CONDITIONS

The existing geomorphology in the project area is the product of large-scale eruptions from Mt. Hualalai—a now-dormant shield volcano. Large-scale eruptions from this volcano may have ceased some 130,000 years ago; however, the most recent lava flows occurred in circa 1800-1801. The subsurface layer comprises a basalt formation.

Geologic conditions at the project site are characterized by multiple interbedded pahoehoe and 'a'a lava flows (see Figure 16). A pahoehoe lava flow hardens to form a generally smooth surface whereas the 'a'a type forms splintered or jagged fragments. Both flow types can contain buried voids such as pockets, blisters, extensive lava tubes and tunnels that formed as molten rock cooled and residual lava drained from primary flow pathways. Numerous lava tubes and/or voids including several prominent lava tube features have been discovered in the vicinity of the project site, and it is very likely that the project site contains lava tubes or void features (C.W. Associates, Inc., 1998, pg. 9).

4.2 TOPOGRAPHY AND SOILS

The project site is situated within a localized depression (or a lowland area) on the southwestern slopes of Mt. Hualalai between the elevations of 300 feet above MSL to 400 feet above MSL. The terrain at the project site slopes generally from northeast to southwest. Slopes vary from 5 to 10 percent (see Figure 17).

Soils in the project area are generally described as rare and thin in extent because the volcanic flows of Hualalai and the Island of Hawai'i in general are relatively young. In the absence of residual ground soils, there may be a thin layer of brown, silty, weathered, volcanic ash. The ground surface may also be exposed as barren rock with soils deposited within the surface cracks of the rock.

The project site contains the Lava Flows, Aa association (rLV) and the Lava Flows, Pahoehoe association (rLW) as cooperatively defined by the Soil Conservation Service of the U.S. Department of Agriculture and the UH Agricultural Experiment Station (1973, pg. 34). Both soils associations have no soil covering and are typically bare of vegetation except for mosses and lichens (Ibid). Vegetation such as ferns and a few small ohia trees may also be present on the Aa Lava Flows association (Ibid).



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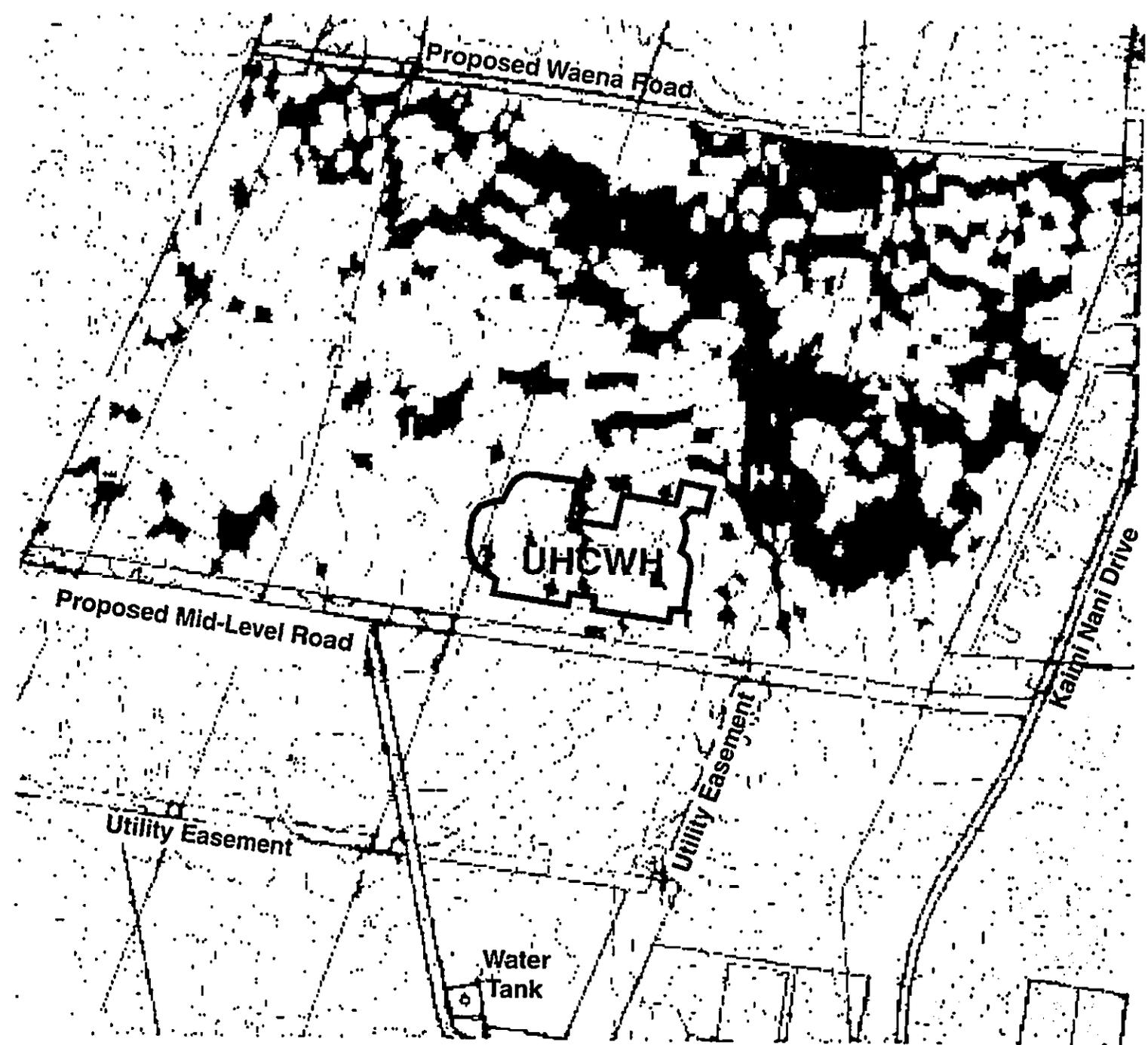
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Figure 16

Lava Flows

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 Slope over 10%

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Figure 17
Slopes

prepared by: Wil Chee - Planning, Inc.



In addition to the Lava Flows associations, the project site also contains the soils association described as Punaluu extremely rocky peat, 6 to 20 percent slopes (rPYD). In a typical profile, approximately 40 to 50 percent of the surface consists of rock outcrops (pg. 48). The surface layer comprises black peat that is approximately 4 inches thick and the subsurface is pahoehoe lava bedrock (Ibid). The peat is rapidly permeable whereas the pahoehoe lava is very slowly permeable despite the rapid movement of water through the cracks (Ibid). For this soils association, runoff is slow and the erosion hazard is slight (Ibid). This soils association is used for pasture (Ibid).

4.3 CLIMATE

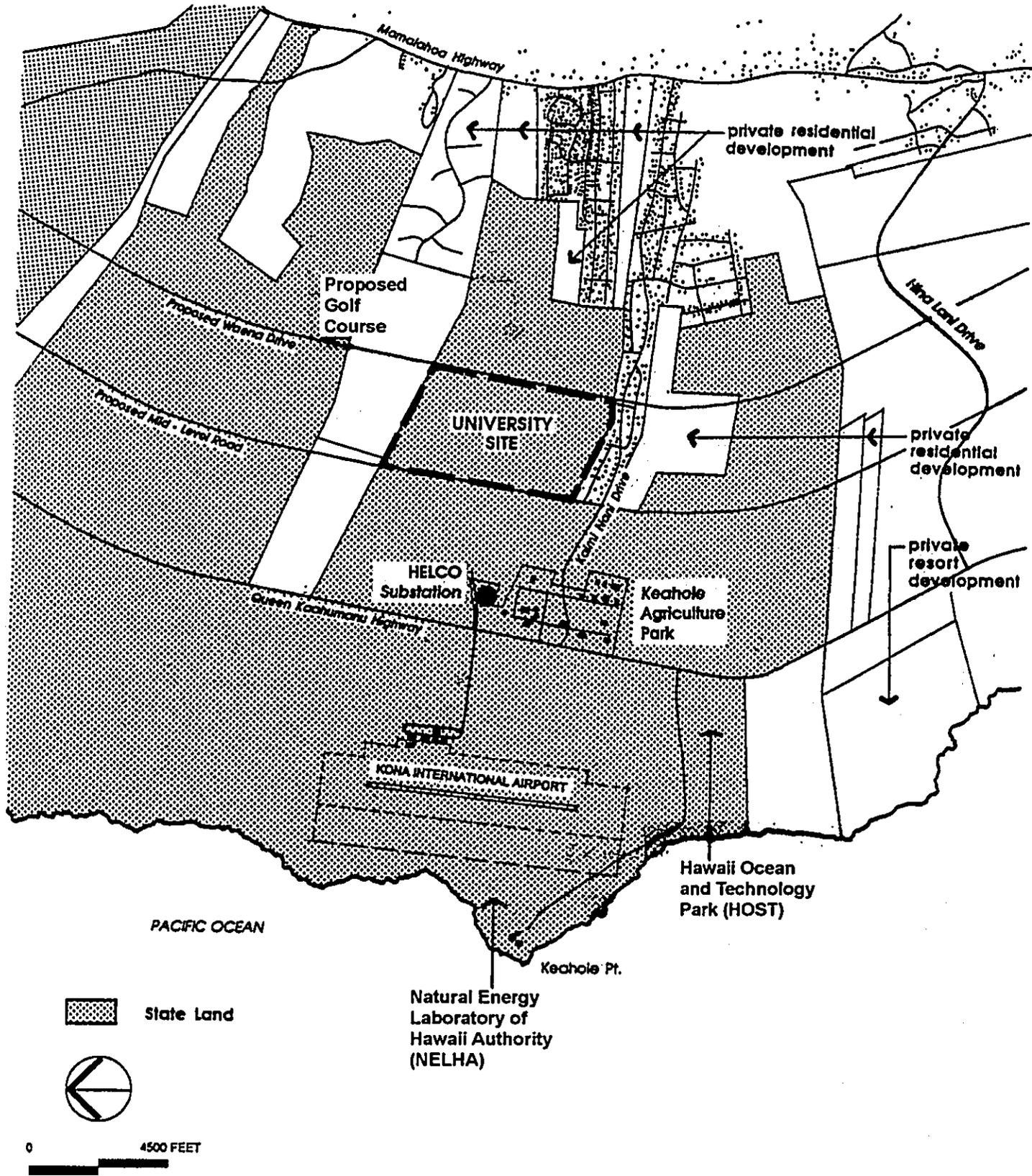
The climate experienced at the project site is described as hot and arid as compared to the characteristically mild climate of the Hawaiian Islands. Southerly and southwesterly winds predominate in the project area as a result of a shielding effect from landmasses such as Mauna Loa, Mauna Kea and Mt. Hualalai. Weather data recorded at Keahole Point and Kona International Airport indicate that calm conditions prevail approximately 28.8 and 23.6 percent of the time, respectively (Armstrong, pg. 65).

Rainfall at the project site tends to occur during the late afternoon and evening periods. The project site lies well below the high rainfall belt (with peak rainfall of 75 inches a year) located between a 1- to 2-mile wide area between elevations of 2,000 and 3,000 feet in West Hawai'i (Fukunaga and Associates, Inc., 1994, pg. II-2). Average annual precipitation recorded at the Kailua monitoring station (located at an elevation of 30 feet) is 25 inches (State of Hawai'i, Department of Business, Economic Development, and Tourism, 1997, pg. 160). Rainfall on the project site is projected at less than 20 inches per year.

4.4 AIR QUALITY

The project site is located within an area that is exposed to natural air pollutants such as volcanic haze or vog. Man-made industrial sources of air pollutants in the project area include the HELCO Keahole Generating Station and the Kailua Landfill (see Figure 18). As shown in Figures 19 and 20, meteorological monitoring data taken at the HELCO site suggests that winds from the west-northwest, west, and west-southwest have the most potential to carry windborne pollutants from the HELCO site to the UHCWH. These winds generally occur 3.0, 3.5, and 8.0 percent of the time, respectively. Other non-stationary sources of air pollutants occur along Queen Kaahumanu Highway as a result of the exhaust from motor vehicles traversing the highway.

The shielding effect of Mauna Kea and Mt. Hualalai allows air pollutants to persistently pervade the project area. Traffic congestion during calm wind conditions further elevates the effects of exhaust emissions on air quality.



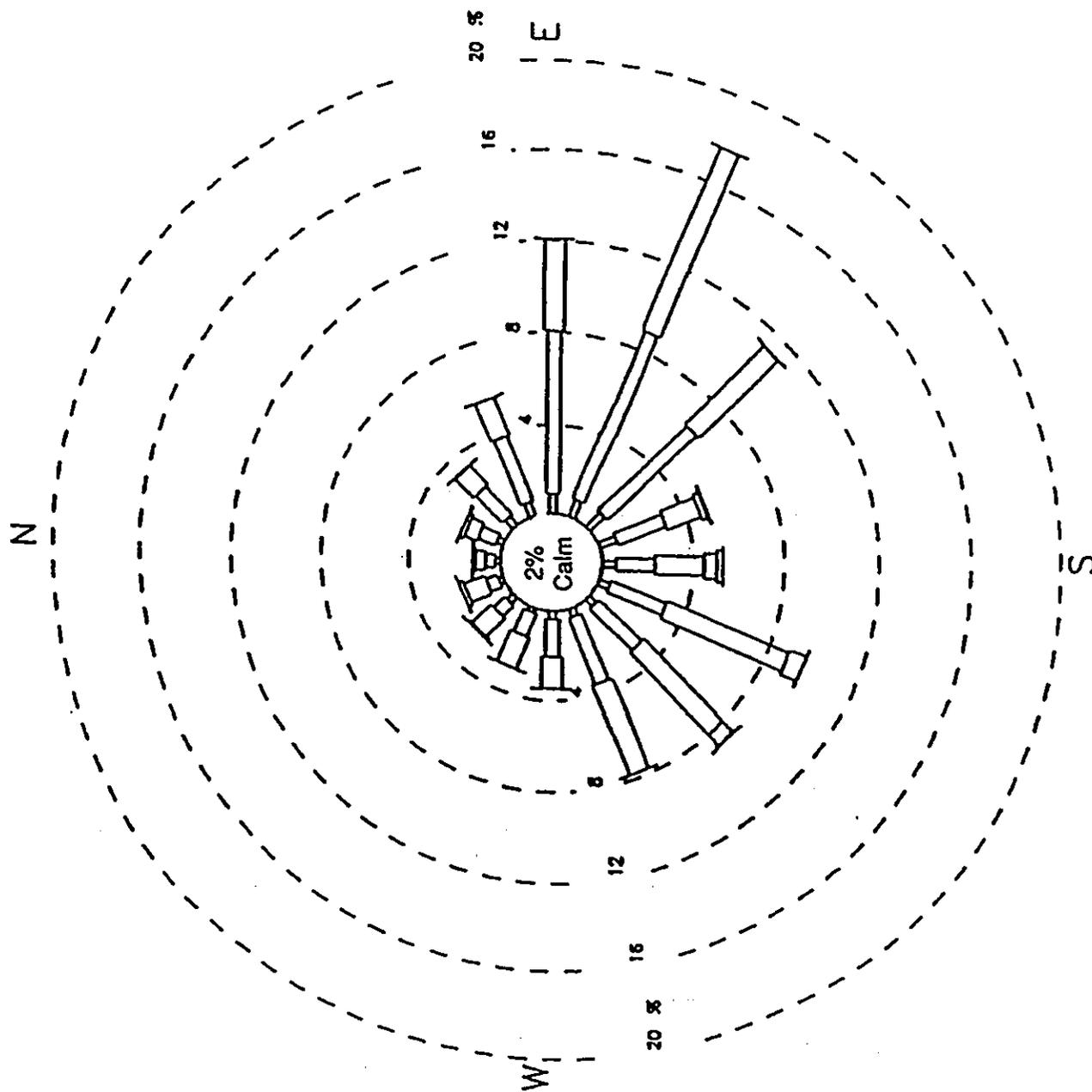
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Figure 18

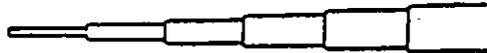
Location of Pollutant Sources
Near the UHCWH

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LEGEND

Wind Speed (in knots)



1 - 3	4 - 6	7 - 10	11 - 16	17 - 21	22 - 99
(8%)	(43%)	(46%)	(2%)	(0%)	(0%)

Stability Class Distribution

- A - 5%
- B - 7%
- C - 19%
- D - 22%
- E - 36%
- F - 11%

NOTE Wind direction is the direction wind is blowing from.
Source HELCO Meteorological Monitoring Data, February 1984 to January 1985

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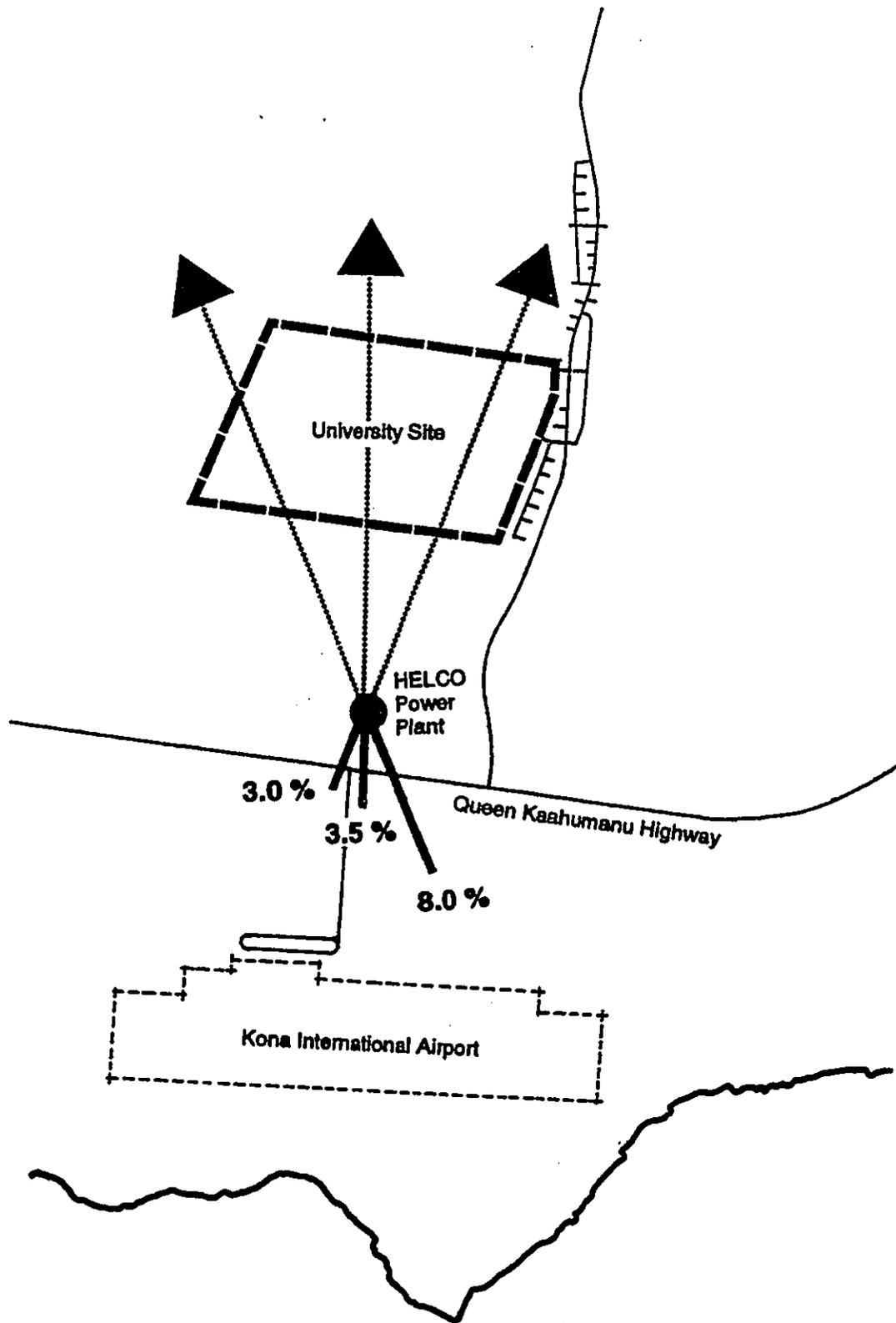
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Figure 19

Wind Rose



prepared by: Wil Chee - Planning, Inc.



Source: HELCO Meteorological Monitoring Data, February 1984 to January 1985

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**Figure 20
Air Impacts from HELCO**

prepared by: Wil Chee - Planning, Inc.



4.5 NOISE QUALITY

The project site is exposed to relatively low noise impacts from aircraft operations at Kona International Airport and the operation of the existing Keahole Generating Station (refer to Figure 18). As of this time, the background ambient noise levels at the project site reflect the natural setting due in large part to the absence of vehicular access to the property and its undeveloped state.

4.6 WATER RESOURCES

Rainfall above an elevation of 2,000 feet is the primary source of groundwater recharge in the Kona region. More than one-third of rainfall that falls within a 4- to 5-mile belt of 30 to 75 inches of median annual rainfall percolates through the ground to become ground water at depth (Fukunaga and Associates, Inc., 1994, pg. III-1). Runoff in the Kona region rarely escapes to the sea even during periods of heavy rainfall; no perennial streams exist anywhere in Kona (Ibid).

The project area is located over the Keauhou Aquifer System—a system of basal and high-level aquifers. The project site is located over a basal aquifer consisting of a lens of fresh to brackish (i.e., briny) water that floats on seawater. This basal aquifer presumably extends approximately 1.5 to 4.5 miles inland from the coastline, or near the Mamalahoa Highway (Ibid). The water is mostly brackish and nonpotable (not fresh enough for drinking) for at least 1.5 miles inland with the exception of the Kahaluu Shaft (south of Kailua-Kona), which is approximately 1 mile from the coast (Ibid). The brackish water extends increasingly inland for northern locations as follows: the water is brackish approximately 1.5 miles inland at Holualoa, 2 miles inland at Kailua-Kona, and 3 miles inland at Keahole (Ibid).

The general direction of basal aquifer groundwater flow is assumed to occur perpendicular to the coastline. Groundwater recharge of the Kona basal aquifer inland boundary occurs primarily (approximately 90 percent) by the seaward flow of high-level ground water across a geologic structure or formation having low permeability (Fukunaga and Associates, Inc., 1994, pg. III-3); approximately 10 percent of the total recharge of the Kona basal aquifer is by direct infiltration of overlying rainfall (Ibid).

In 1996, drinking water for the State of Hawai'i was provided via approximately 150 regulated public water systems utilizing approximately 450 wells (Juvik and Juvik, 1998, pg. 295). None of the 64 contaminated drinking water wells in April 1996 were located within the West Hawaii region (Juvik and Juvik, 1998, pgs. 295-296).

The nearshore waters along the western coastline of the Island of Hawai'i are designated as Class AA. In accordance with Chapter 11-54-06 of the Hawaii Administrative Rules (HAR), the objective of Class AA waters is to preserve them "in their natural Pristine state as nearly as possible with an absolute minimum of pollution or alteration of water quality of any human-caused source or actions."

4.7 BIOLOGICAL RESOURCES

4.7.1 Flora

The area encompassing the project site has been the subject of two botanical surveys: Char and Associates completed the first study in 1992; and Derral R. Herbst, Ph.D., conducted the second in 1998. The latter study (refer to Appendix A-1) assessed the specific area where the University Center would be sited and was conducted for the purposes of determining if any of the botanical resources present are significant, endangered, or protected by local or federal regulations. A pertinent literature search was completed before a walk-through survey was conducted. Transects were selected in areas with the greatest possibility of supporting protected species and vegetation communities. The following paragraphs summarize the findings of the more recent botanical survey (Herbst, 1998).

Trees, shrubs, grasses and forbs comprise the vascular flora of the project site. The flora surveyed is a mix of native and introduced species. The mix consists of 35 taxa in 25 families; 22 taxa (or 62.9 percent) are naturalized non-native species whereas 13 taxa (or 37.1 percent) are considered native (pg. 2). The native species are common and widely distributed throughout the Hawaiian Islands (Ibid). A full listing of plant species observed or documented on the project site may be found in Appendix 1 of the botanical survey (refer to Appendix A-1).

Using the Gange/Cuddihy classification scheme as a reference, the entire project site can be classified as a Lowland Vegetation Community. Included in this community are two distinctive vegetation associations: the Lowland Dry Grassland and the Lowland Dry Shrubland. The lower or western portion of the project site exhibits the characteristics of the Fountain Grass Grassland subtype of the Lowland Dry Grassland community and is dominated by fountain grass (*Pennisetum setaceum*). This non-native grass from northern Africa that was introduced into the Kona District in the 1920s now dominates much of the arid, lava-strewn landscape in the project area. The upper or eastern portions of the project site may be classified as a degraded 'A'ali'i Lowland Shrubland subtype of the Lowland Dry Shrubland community; however, it is also dominated by fountain grass. The center portion of the project site is characterized as a transitional area between the two vegetation types.

No plant species protected by State or Federal regulations were observed by Herbst or have been documented in the area proposed for project actions. Nevertheless, the project site lies within the historic distributional range of several species on the U.S. Fish and Wildlife Service (FWS) list of threatened, endangered and candidate threatened or endangered species. In addition to the listed plants, Table 2 enumerates a candidate species and a species of concern that has no legal standing, but could potentially become either threatened or endangered.

TABLE 2: IMPORTANT BOTANICAL RESOURCES

SPECIES	STATUS
<i>Bidens micrantha</i> ssp. <i>ctenophylla</i> (Sherff) Nagata & Ganders (<i>ko'oko'olau</i>)	Candidate Species
<i>Caesalpinia kawaiensis</i> H. Mann (<i>uhiuhi</i>)	Listed as Endangered
<i>Capparis sandwichiana</i> DC (<i>maiapilo</i> , <i>pua pilo</i>)	Species of Concern
<i>Colubrina oppositifolia</i> Brongn. ex H. Mann (<i>kauila</i>)	Listed as Endangered
<i>Nothocestrum breviflorum</i> A. Gray (<i>'aiea</i>)	Listed as Endangered
<i>Pleomele hawaiiensis</i> Degener & I. Degener (<i>hala pepe</i>)	Listed as Endangered

Source: Herbst, 1998, pg. 4.

Of the six species listed in Table 2, only the *maiapilo* was observed within the area surveyed by Herbst. The species may be vulnerable because it is located in areas likely to be affected by urban development or human disturbances; it needs to be watched. An *'aiea* tree was encountered during the Char survey in 1992 but is somewhat distant (approximately 2,000 feet) from the area that would be affected by project actions.

In conclusion, no flora that is listed as threatened, endangered or candidate threatened or endangered as set forth in the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) were observed during the 1998 survey. None are known to occur on the project site; however, listed species are known to occur from surveys of nearby properties. No trees on the project site are considered worthy candidates for the County of Hawaii exceptional tree program (pg. 4). The vegetation encountered and documented in the 1998 survey is neither pristine nor unique and is not considered worthy of preservation (Ibid).

4.7.2 Fauna

Reginald David and Eric Guinther conducted a faunal survey of the project site in August 1999 (refer to Appendix A-2). The main objective of the survey was to determine if any of the faunal resources present on the site are federally listed as threatened, endangered, or proposed threatened or endangered species. The likelihood of usage of the affected property by listed species due to available habitat at the site was also assessed. A pertinent literature search was also completed. The following paragraphs summarize the findings of the faunal survey (David and Guinther, 2000).

No mammalian species were seen or heard during the course of the 2-day survey. Skeletal remains of roof rats (*Rattus r. rattus*) and other rat species (*Rattus sp.*), the European house mouse (*Mus domesticus*), a lone small Indian mongoose (*Herpestes a. auropunctatus*), and one feral goat (*Capra h. hircus*) were observed (pg. 7). The scat of

domestic dog (*Canis f. familiaris*), cat (*Felis catus*), donkey (*Equus a. asinus*), and goat was also encountered in numerous places within the affected property (Ibid). The listed endangered Hawaiian hoary bat or 'Ope'ape'a was not detected during the survey (Ibid).

Drought conditions that have affected most of North Kona for the past three years may be contributing to the low diversity of biological resources observed at the project site. Nevertheless, the findings of the 1999 mammalian survey are consistent with other recent surveys conducted for the lowland areas of North Kona. The Hawaiian hoary bat may occasionally overfly the project site; however, the affected property currently has little to offer a passing bat due to the relative absence of suitable trees for roosting and the low diversity of volant (flying) insect life that may attract bats (pg. 8).

Three alien avian species including two Spotted Doves (*Streptopelia chinensis*), the Zebra Dove (*Geopelia striata*), and the House Finch (*Carpodacus m. mexicanus*) were detected during the survey (pg. 7). A Barn Owl (*Tyto alba*) roost was also observed within a collapsed lava tube feature (Ibid). The skulls of two other alien avian species were observed under the Barn Owl roost: a Japanese White-eye (*Zosterops japonica*) and a Nutmeg Manikin (*Lonchura punctulata*) (Ibid). No endangered or threatened avian species were detected within the project site (Ibid).

The findings of the avian survey are consistent with the presently available habitat on the project site. The low diversity and density of avian species may reflect on-going drought conditions. Resources necessary for the sustenance or nesting of native avian species are unavailable at the project site (pg. 8). Migratory and extralimital avian species that are known to frequent the coastal areas in North Kona may utilize the site between the months of September and May (Ibid). Small numbers of the endangered endemic Hawaiian subspecies of the Dark-rumped Petrel (*Pterodroma phaeopygia sanwicensis*) or *Ua'u* (a pelagic seabird) may also over-fly the project site between the months of May and October (Banko, 1980 and Harrison, 1990). The project site contains no suitable nesting habitat for this species (pg. 8).

The vertebrate observed on the site included a gecko (*Geytha mutilata*).

No more than 15 different invertebrate were detected during the survey, and all encountered species are presumably alien. The commonly encountered species include various wasps (*Polistes sp.* and *Vespula sp.*), the honey bee (*Apis mellifera*), and the garden orb-weaver spider (*Argiope sp.*). Conditions within explored caves (i.e., lava tubes) were found to be quite dry. The caves harbored bigheaded ants (*Pheidole megacephala*) and a harvestman spider (*Phalangidae* or *Pholcidae*). The sphinx moth (*Manduca blackburni*) that is proposed for listing as an endangered species under the Endangered Species Act (Federal Register, 1999) may occur in the project vicinity although it is believed to be no longer present on the Island of Hawai'i (pg. 8). Despite the absence of significant cave fauna during the faunal survey, cave habitats may harbor unique endemic arthropods (pg. 10).

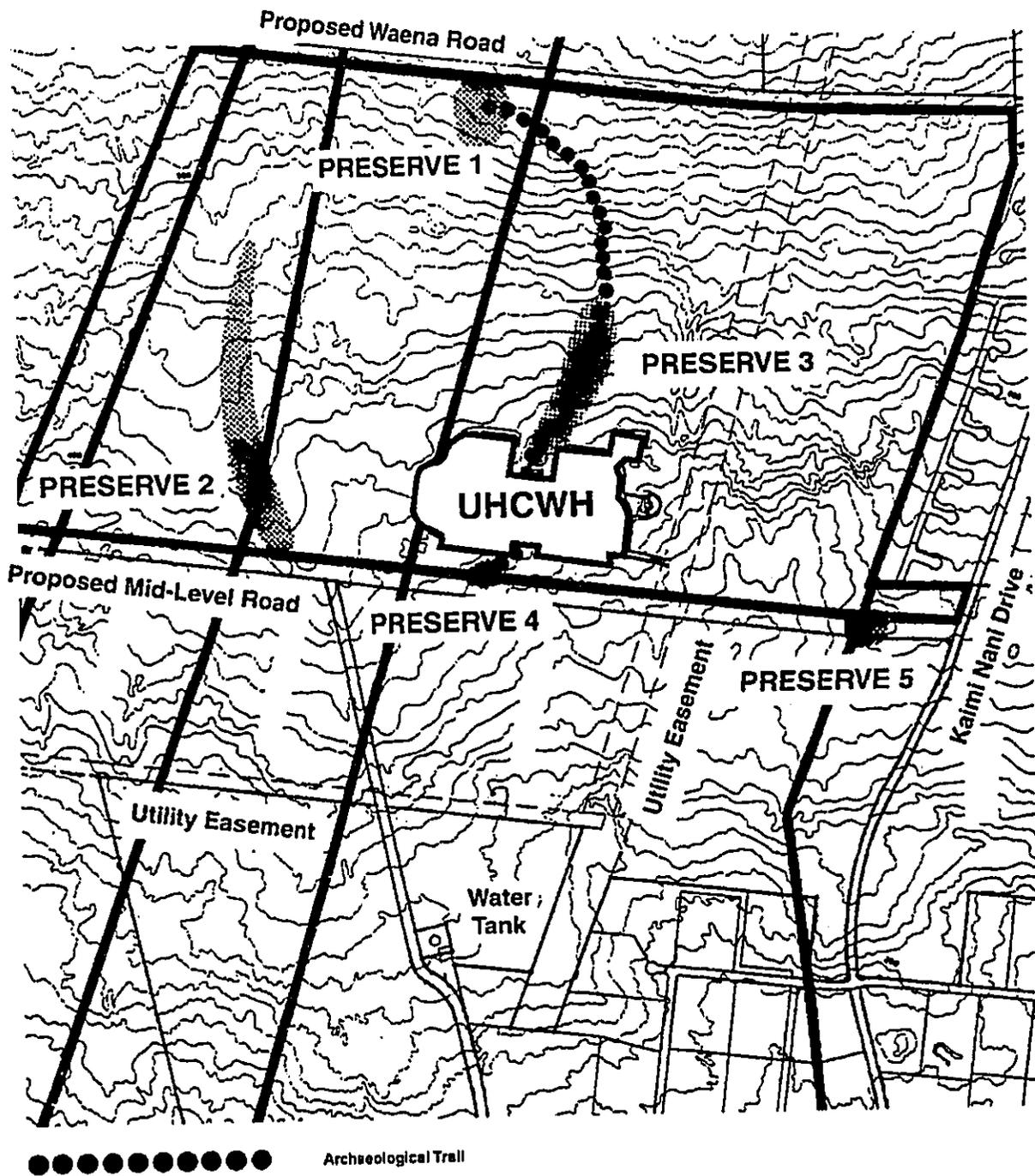
Cave habitats occur on the site in a variety of sizes from very small to quite large (comparable to a several room house). Although several were explored, especially those larger ones that offered some potential to harbor possible unique troglobites (cave dwelling species), nothing was found; however, all of the larger caves have potential archaeological interest as well.

4.8 CULTURAL RESOURCES

Numerous archaeological sites within the project area have been given due consideration as evidenced by archaeological investigations conducted in 1998 (refer to Appendix A-3) and resulting recommendations for the establishment of five (5) preserve areas that could be used to educate the current and future residents and visitors of West Hawai'i (see Figure 21). In response to comments from the State of Hawai'i Department of Land and Natural Resources, Historic Preservation Division (SHPD) on the (draft) *Historic Preservation Plan for the Proposed University Center at West Hawai'i, North Kona, Hawai'i Island* (Cleghorn, 2000), the report was completed as a *Conceptual Historic Preservation Plan for the Proposed University Center at West Hawai'i, North Kona, Hawai'i Island* (Cleghorn, 2000). The revised plan (refer to Appendix A-4) has been submitted for review and approval by the (SHPD). The UHCWH will exercise the second option presented by the SHPD to defer the development of interpretive programs until a later date to allow the students and staff of the UHCWH to become directly involved with those actions. The existence of cultural sites on the Kalaoa site provides a unique opportunity for students, especially those enrolled in Hawaiian studies courses, to become directly involved with the development of interpretive programs. The interpretive programs for each site will be forwarded to the SHPD for review and approval as they are completed.

The UHCWH Advisory Council on Kalaoa Cultural Site Preservation (the Kalaoa Advisory Council) provided considerable input to the formulation of the conceptual historic preservation plan (pg. 1). Elements from pages 13 through 20 of the plan are briefly summarized below.

- Preserve 1. The seven (7) recorded archaeological sites that characterize this preserve area are located north of the project site. The recommended form of protection includes conservation as an interpretive venue. A buffer zone of 100 to 165 feet around this site complex is recommended, within which no construction or other mechanized land altering activities should take place. Prior to any construction in this area, the outer margins of the buffer area should be conspicuously flagged with surveyor's flagging tape. The envisioned educational and interpretive venue at this preserve area should include a trail system and appropriate signage, etc. [The archaeologist notes that the development of this venue may not occur within the near future due to economic feasibility; therefore, the preserve should be protected with the recommended buffer in its present form until such time that detailed plans for an appropriate venue can be developed and implemented.] The development of plans for the eradication of



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Figure 21

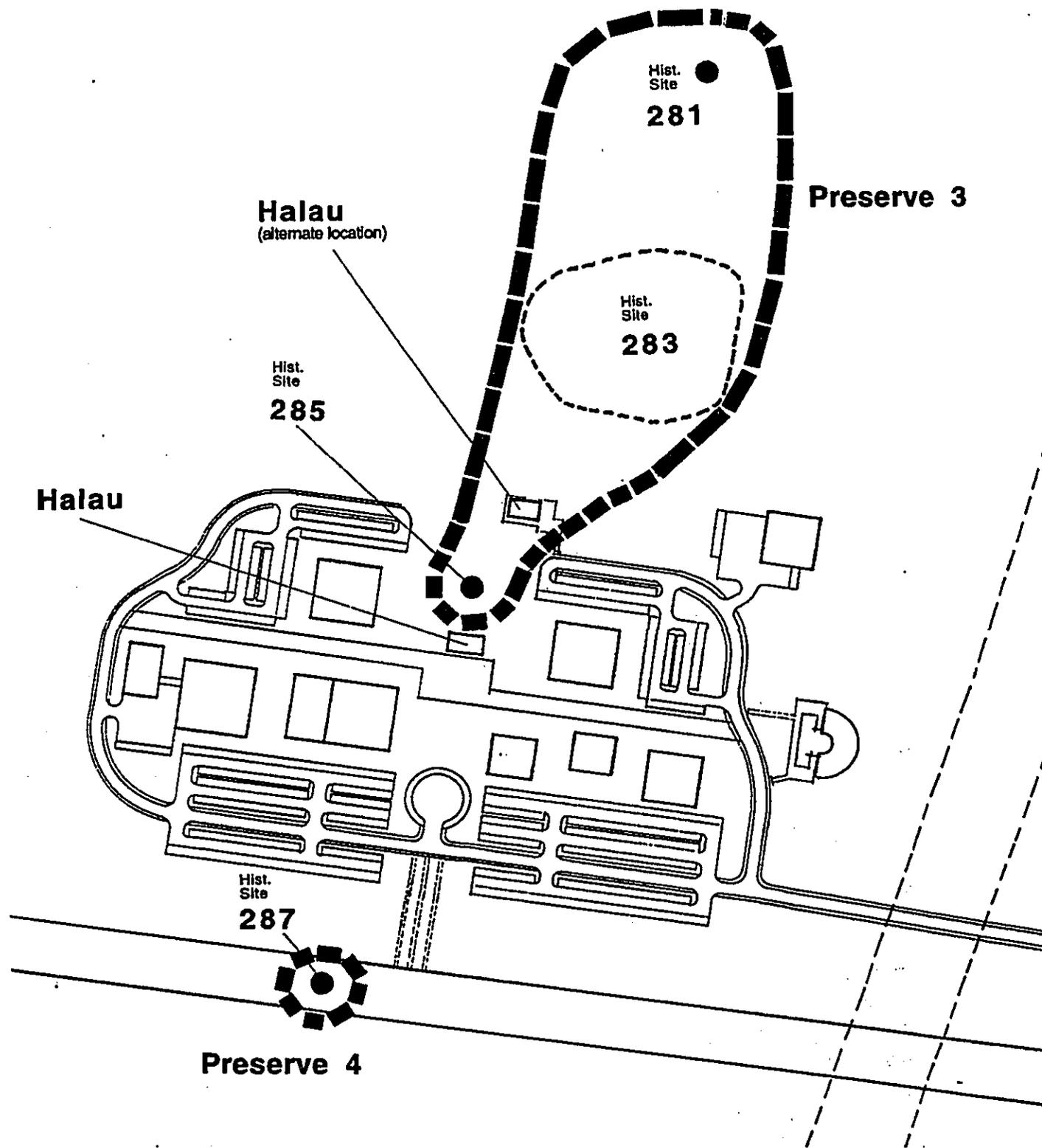
Preserve Areas and Features

prepared by: Wil Chee - Planning, Inc.



alien vegetation in the preserve area and its re-vegetation with native and Polynesian introduced species should be developed concurrently with interpretive plans. Access to the preserve is recommended to be by a foot trail system over the natural undulating terrain that provides for the viewing of various archaeological features.

- **Preserve 2.** This preserve area located considerably northwest of the project site encompasses two (2) archaeological sites comprising numerous features located within the lava tubes. The recommended form of protection includes no public access, with the exception of visitation by lineal descendants of the human burials, if any are located. The buffer zone around this preserve should be a minimum of 165 feet; however, further guidance should be sought from the Hawai'i Island Burial Council. Preserve 2 is situated far from the project site, which affords the preserve some inherent protection; however, the flagging of the outer margins of the buffer zone is still recommended prior to any construction activities in the area. In recognition of the cultural significance of the preserve, only familial visitation by lineal descendants should be allowed, and all other kinds of activities should be prohibited at or in the vicinity of this preserve area. The area within the preserve should be left as is, with no attempts to clear or re-vegetate it. Accessibility to the preserve should be denied except for possible lineal descendants that may be found. Furthermore, the building of a stone wall around the circumference of the preserve and the sealing of portions of the lava tube containing human remains should be explored with the Hawai'i Island Burial Council and any lineal descendants who are located.
- **Preserve 3.** This preserve consists of four (4) archaeological sites and numerous features located within and near the developable boundaries of the project site. The recommended form of protection is conservation as an interpretive venue. A buffer zone of 100 to 165 feet around the preserve is recommended in which no construction or mechanized land altering activities are allowed. Metal fence posts and bright orange plastic construction fencing is recommended for the short-term protection of Preserve 3 due to the close proximity to areas of proposed development for the University Center (see Figure 22). The envisioned educational and interpretive venue at this preserve area should include a trail system and appropriate signage, etc. A detailed vegetation clearance and re-vegetation plan should be developed concurrently with the interpretive plans. Access to the preserve from the University Center should be provided via a foot trail system over the natural undulating topography that provides for the viewing of various archaeological features.
- **Preserve 4.** This preserve consists of two sites located north of the project site near the alignment of the future Mid-Level Road. The recommended form of protection is conservation as an interpretive venue. A buffer zone of 100 to 165 feet around the preserve is recommended in which no construction or mechanized land altering activities are allowed. Prior to any construction in this area, the outer margins of the buffer area should be conspicuously flagged with surveyor's flagging tape. The envisioned educational and interpretive venue at this preserve area should include a trail system and appropriate signage, etc. [The archaeologist notes that the development of this venue may not occur within



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Figure 22

Preserves Near the Project Site

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the near future due to economic feasibility; therefore, the preserve should be protected with the recommended buffer in its present form until such time that detailed plans for an appropriate venue can be developed and implemented.] The development of plans for the eradication of alien vegetation in the preserve area and its re-vegetation with native and Polynesian introduced species should be developed concurrently with interpretive plans. Access to the preserve is recommended to be by a foot trail system over the natural undulating terrain that provides for the viewing of various archaeological features.

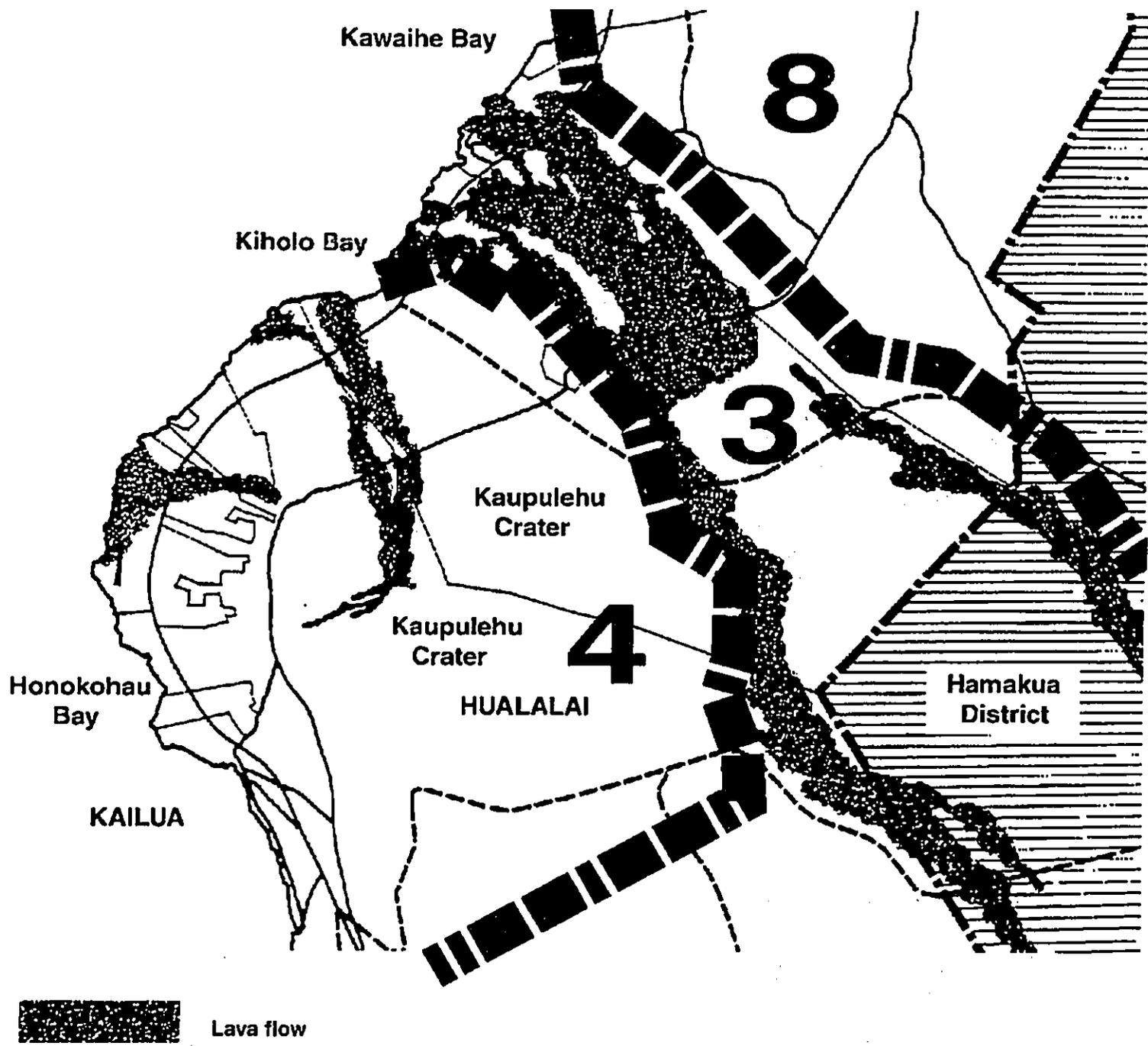
- **Preserve 5.** This preserve encompasses one archaeological site consisting of a lava tube complex. The recommended form of protection is conservation as an interpretive venue. A buffer zone of 100 to 165 feet around the preserve is recommended in which no construction or mechanized land altering activities are allowed. Prior to any construction in this area, the outer margins of the buffer area should be conspicuously flagged with surveyor's flagging tape. The envisioned educational and interpretive venue at this preserve area should include a trail system and appropriate signage, etc. [The archaeologist notes that the development of this venue may not occur within the near future due to economic feasibility; therefore, the preserve should be protected with the recommended buffer in its present form until such time that detailed plans for an appropriate venue can be developed and implemented. A possible teaming arrangement with the residents of the Pacific Palisades subdivision may be developed to share the responsibilities of caring for the preserve.] The development of plans for the eradication of alien vegetation in the preserve area and its re-vegetation with native and Polynesian introduced species should be developed concurrently with interpretive plans. Access to the preserve is recommended to be by a foot trail system over the natural undulating terrain that provides for the viewing of various archaeological features.

4.9 NATURAL HAZARDS

Natural hazards that pose the greatest potential risk to West Hawai'i and the project site include volcanic eruptions and earthquakes. The risks from tsunamis and floods are of lesser concern due to the characteristics of the project area.

- **Volcanic Eruptions.** According to *Volcanic and Seismic Hazards on the Island of Hawai'i* (Heliker, 1990), project site lies in lava flow hazard zone "4" with "1" posing the greatest hazard and "9" posing the least. The Hualalai volcano is the eruption center for zone "4" (see Figure 23). Flows from the last volcanic eruption of Hualalai (circa 1800-1801) reached the area south of Kiholo Bay and also the area underlying a portion of the Kona International Airport.

Well-placed lava diversion barriers may be successfully applied to divert lava flows via artificial means; however, this method is largely untested and costly (pg. 45). Lava diversion structures are considered to be reasonable options for the protection of isolated, high value property in unpopulated areas at great risk from lava flows (i.e., in Mauna Loa to protect the observatory).



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Figure 23

Lava Flow Hazard Zones

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-
- Earthquakes. The project site and the entire West Hawai'i region lie within an earthquake zone. Historically, earthquakes have been concentrated beneath the Kilauea and Mauna Loa, and in the region between them. Nevertheless, the precise time and magnitude of earthquakes cannot be accurately predicted within a reasonable degree of certainty.

Structural design standards for earthquake resistance must be applied for public and certain types of private buildings per the Uniform Building Code Requirements for Seismic Zone 3, which encompasses the entire Island of Hawai'i. The intent of these standards is to reduce the potential damage from earthquakes.

- Tsunamis. Tsunamis occur as a series of waves that strike a coastline, and the waves decrease in height over time. Tsunami can cause serious damage to coastal areas. The degree of tsunami damage is dependent upon several factors including the topography of the affected area, wave origin, and wave intensity.
The general tsunami inundation lines are concentrated within short distances of the shoreline. The project is located some 3.0 miles from the coastline of West Hawai'i and presumably distant from high risk areas that are subject to a tsunami hazard.
- Flood Hazard. The project site is located within a characteristically dry and arid environment where the risks from flooding are virtually nonexistent. The risks with respect to the flood hazard are therefore slight.

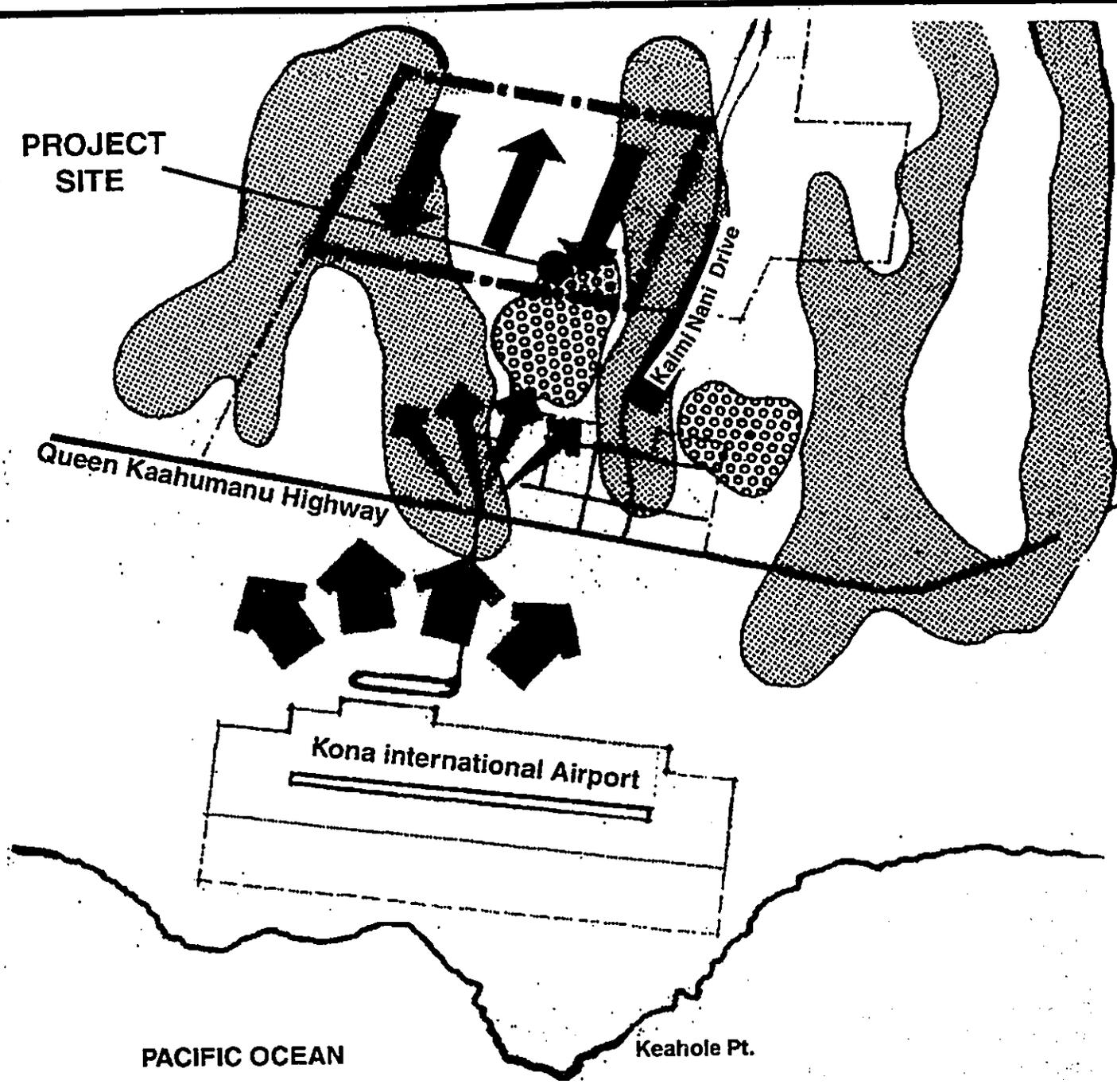
4.10 VISUAL RESOURCES

The majority of the project site is situated within a localized depression on the southwestern slopes of Mt. Hualalai (see Figure 24). The visual character of the site is defined by expanses of pristine lava lands covered by scrub grass, small trees and shrubs that have never before been developed for modern use. The best views of the project site are from the vicinity of the Kona International Airport. On a clear day, the most expansive views from this vantage point span the western slopes of Mt. Hualalai including the project site and scattered pockets of urban development along Mamalahoa Highway and Kaimi Nani Drive.

Two (2) major view objects that are visible from within the project site are Mt. Hualalai and the Pacific Ocean. These features create the mauka/makai viewshed. Makai views are somewhat despoiled by the HELCO power plant, a 0.5-million gallon water tank, and the Keahole Agricultural Park.

4.11 LAND USE

Land use policies, plans, and controls administered by the State of Hawai'i and County of Hawai'i that affect the proposed action are described in the following sections.



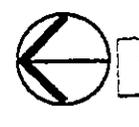
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Figure 24
Visual Character

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- Hawaii State Plan (Chapter 226, HRS). The Hawaii State Plan, Chapter 226, HRS (1995) was developed to serve as a guide for the future growth of the State of Hawaii. The State Plan identifies goals, objectives, policies, and priorities for the development and growth of the State. It provides a basis for prioritizing and allocating the state's limited resources, including public funds, services, human resources, land, energy, water. The State Plan establishes a system for the formulation and program coordination of State and County plans, policies, programs, projects, and regulatory activities and facilitates the integration of all major State and county activities.

Sections of the State Plan that describe the overall theme, goals, objectives, and policies that relate to the proposed action are presented in the following paragraphs.

PART I - GOALS, OBJECTIVES, AND POLICIES

SEC. 226-10 Objective and policies for the economy – potential growth activities.

- (b)(8) Develop, promote, and support research and educational and training programs that will enhance Hawaii's ability to attract and develop economic activities of benefit to Hawaii.

SEC. 226-10.5 Objective and policies for the economy – information industry.

- (b)(5) Provide opportunities for Hawaii's people to obtain job training and education that will allow for upward mobility within the information industry.

SEC. 226-12 Objective and policies for the physical environment – scenic, natural beauty, and historic resources.

- (b)(1) Promote the preservation and restoration of significant natural and historic resources.
- (b)(2) Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

SEC. 226-13 Objective and policies for the physical environment – land, air, and water quality.

- (b)(7) Encourage urban developments in close proximity to existing services and facilities.

SEC. 226-21 Objectives and policies for socio-cultural advancement – education.

- (b)(2) Ensure the provision of adequate and accessible education services and facilities that are designed to meet individual and community needs.
- (b)(4) Promote educational programs which enhance understanding of Hawaii's cultural heritage.
- (b)(5) Provide higher educational opportunities that enable Hawaii's people to adapt to changing employment demands.
- (b)(8) Emphasize quality educational programs in Hawaii's institutions to promote academic excellence.

PART III – PRIORITY GUIDELINES

SEC. 226-107 Quality education. Priority guidelines to promote quality education:

- (5) Increase and improve the use of information technology in education and encourage programs which increase the public's awareness and understanding of the impact of information technologies on our lives.
- (6) Pursue the establishment of Hawaii's public and private universities and colleges as research and training centers of the Pacific.

- State Functional Plans. State Functional Plans are the primary guidelines for implementing the Hawaii State Plan. In contrast to the Hawaii State Plan which establishes long-term objectives, the State Functional Plans serve to establish objectives for shorter-term actions.

Described below are specific sections of State Functional Plans that contain overall themes, goals, objectives, and policies that relate to the proposed action.

STATE HIGHER EDUCATION FUNCTIONAL PLAN

The objective of this functional plan is to specify the objectives, policies, and high priority implementing actions that the State's postsecondary education community will follow. Objectives and policies that relate to project actions are presented below.

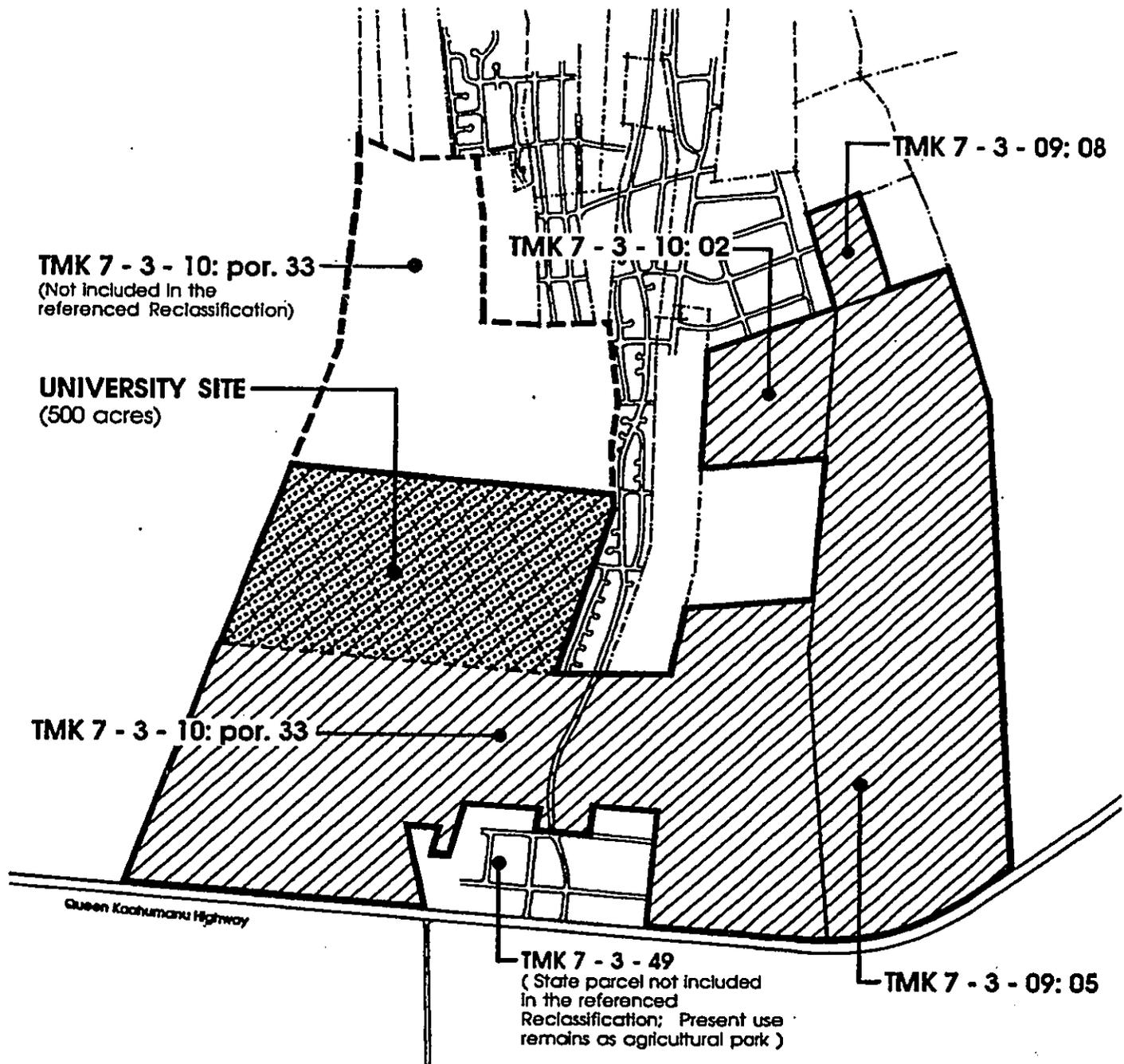
Objective A: A number and variety of postsecondary education institutions sufficient to provide the diverse range of programs required to satisfy individual and societal needs and interests.

Policy A(2): Provide professional and job-related training which responds to the needs of, and opportunities within, the State of Hawaii.

- State Land Use Law (HRS 205). The State of Hawai'i classifies all land into four districts: Urban, Conservation, Agricultural, and Rural. The LUC must approve changes to the boundaries of any conservation district and other districts greater than 15 acres. The county land use authority can approve changes to boundaries of districts other than conservation districts of less than 15 acres.

On December 9, 1993, the LUC issued a Decision and Order to reclassify 2,640 acres of State lands from Agricultural and Conservation District to Urban District (see Figure 25). Urbanization of the area was recommended by the OSP for the purpose of allocating sufficient land for future urban growth in West Hawai'i. This action included the proposed subdivision of the affected State lands into 13 parcels (See Figure 26). The 500-acre Kalaoa site is identified as Parcel 5 of the subdivision. The LUC Decision and Order regarding these State lands contains 34 conditions. Condition 32 specifically designates Parcel 5 for the proposed West Hawai'i campus of the UH System. Appended to this EIS is a report from the OSP indicating the current status of the LUC Decision and Order.

- West Hawai'i Regional Plan. This plan by the OSP, dated November 1989, addresses the long-range planning issues of West Hawai'i. Its main objectives are the coordination of State activities and capital improvements program within the regional planning framework of West Hawai'i. Creation of permanent



-  Area reclassified from Agricultural and Conservation District to Urban District by Land Use Commission Decision and Order of December 9, 1993
-  University Site

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Figure 25

Reclassification of State Lands

prepared by: Wil Chee - Planning, Inc.



University facilities in Kalaoa is listed as one of the action statements in this plan (pg. 50).

- Agricultural Lands of Importance in the State of Hawai'i (ALISH) System. No lands within the project site are included in the ALISH system.
- Hawai'i County General Plan. This is the County of Hawai'i policy document for long-range comprehensive development of the island of Hawai'i. It contains land use maps referred to as "General Plan Land Use Pattern Allocation Guides." The Kalaoa site is within the area designated as "Urban Expansion."
- Keahole to Kailua Development Plan (K to K Plan). The K to K Plan was adopted by the County of Hawai'i in April 1991. This plan emphasizes the siting of major infrastructure intended to serve the region. The K to K Plan depicts a university campus site comprising approximately 500 acres in the vicinity of Keahole Airport, mauka of Queen Kaahumanu Highway and the proposed Mid-Level Road (Figure 3.1: Land Use Plan and pg. 3-12).
- Hawai'i County Zoning. The project site comprises an area designated A-5a Agriculture – minimum 5-acre site. Under Chapter 25 of the Hawai'i County Code, section 25-5-72(d)(7), educational facilities are permitted provided that a "use permit" is issued by the Hawai'i County Planning Commission. A small portion of the 500-acre Kalaoa site near the northern and western property lines is zoned "Open," and university uses are not permitted on these lands (County of Hawai'i Planning Department, 1999). The project site under consideration in this EIS does not lie within lands designated as "Open" (see Figure 27).

4.12 INFRASTRUCTURE

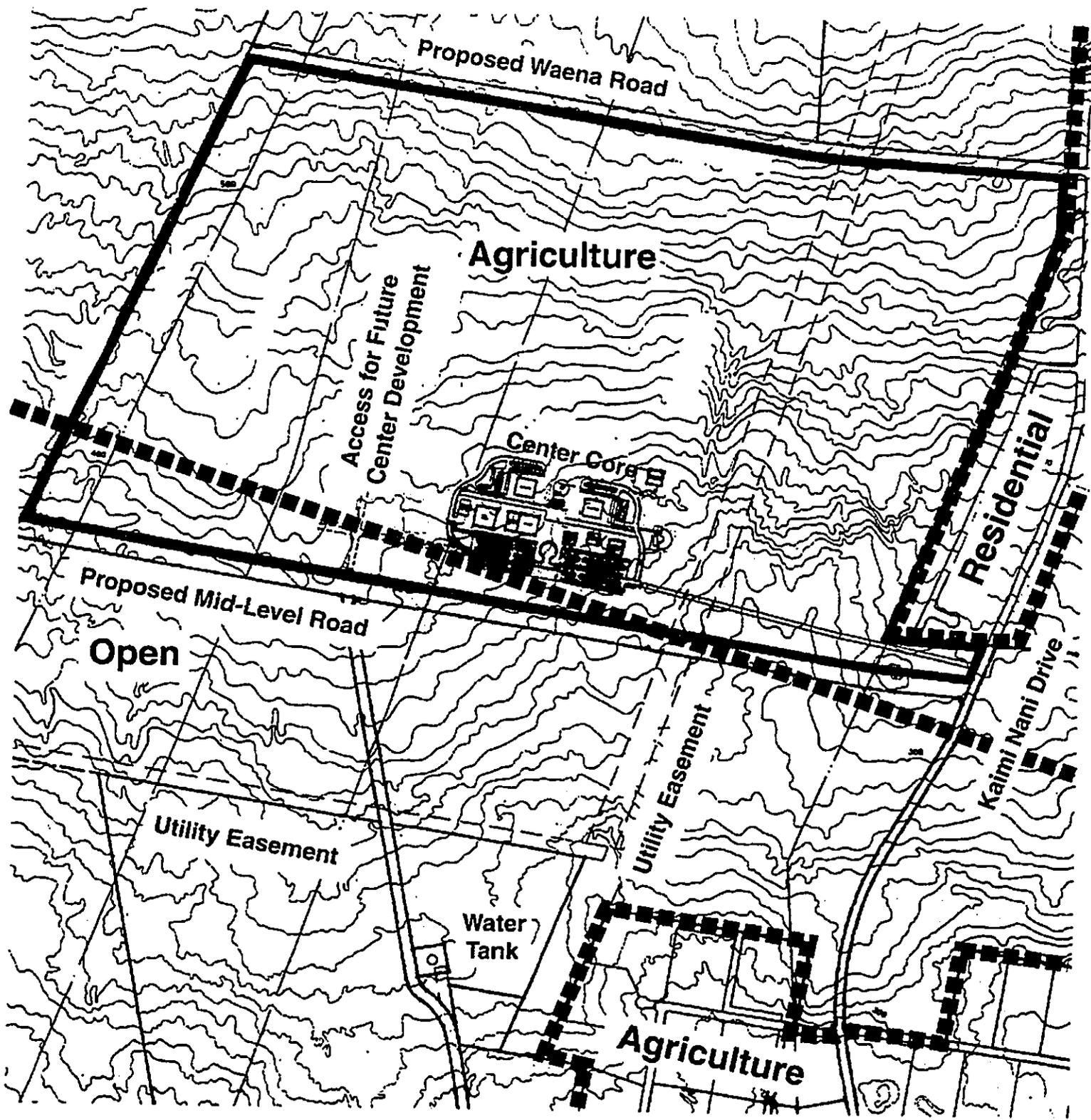
4.12.1 Roadways and Traffic Considerations

Presently, there are no roadways leading up to or within the project site.

Kaimi Nani Drive (a County of Hawai'i roadway) provides the only existing east-west (mauka-makai) roadway proximal to the project site. This roadway connects the Queen Kaahumanu Highway (Route 19) with Mamalahoa Highway (Route 190).

The Queen Kaahumanu Highway provides vehicular access to the project vicinity from other parts of the island. This arterial roadway is a two-lane, Class I state highway that generally parallels the shoreline. Mamalahoa Highway is the only other trans-island roadway that provides access to the project vicinity from other parts of the island. This roadway runs roughly parallel to Queen Kaahumanu Highway and is more inland at the 1,600 to 1,800-foot elevation.

In response to comments from the State of Hawaii, Department of Transportation (DOT) and the Office of Environmental Quality Control (OEQC), the traffic assessment report prepared by Phillip Rowell and Associates, Inc. dated May 3, 2000, that was included in the DEIS was revised. The new report dated October 22, 2000 is appended to this



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Figure 27

Hawaii County Zoning

prepared by: Wil Chee - Planning, Inc.



FEIS. Revisions were made to the earlier report in response to recommendations for the consideration of traffic from cumulative developments planned for the area.

As stated in the traffic report, future traffic growth consists of two elements (p. 11). The first is ambient background growth that is a result of regional growth and cannot be attributed to a specific project. This growth component is calculated from historical traffic counts and growth rates. The second component is calculated from estimated traffic that will be generated by other development projects in the vicinity of the proposed project. A good-faith effort was made to identify future projects in the vicinity of the UHCWH that have been granted permits. Two such projects have been added to the traffic calculations. They include an 80-lot residential subdivision and a golf course immediately to the north of the 500-acre university site. As recommended by DOT, traffic counts for the intersections of Kaimi Nani Drive and Mamalahoa Highway and the intersections of Ahikawa Street and Mamalahoa Highway were added to the calculations (p. 13). The result was that even with these additions, the results of the level-of-service (LOS) analysis were basically unchanged from the May 3, 2000 report.

The traffic impact assessment report (Phillip Rowell and Associates, 2000) assessed the conditions of roadways and intersections in the project area according to the LOS concept. LOS A through F reflect driving conditions, with LOS A representing the best conditions and LOS F representing the worst.

The findings of the traffic impact assessment (refer to Appendix A-6) indicate that Queen Kaahumanu Highway, Kona Airport Road, and Kaimi Nani Drive have adequate capacity for existing traffic volumes at good levels-of-service (pg. 10). The intersections of Queen Kaahumanu Highway with Kona Airport Road and Queen Kaahumanu Highway with Kaimi Nani Drive also operate at good levels-of-service (Ibid). There was a good correlation between the LOS calculations and actual traffic conditions observed during traffic counts (Ibid).

4.12.2 Water System

There is currently no potable water service to the project site because the undeveloped property generates no demand for this service. The nearest water mains are located along Kaimi Nani Drive.

4.12.3 Wastewater System

There is currently no municipal wastewater disposal service for the project site because the undeveloped property generates no demand for this service. The neighboring residential communities use cesspools for wastewater disposal.

4.12.4 Drainage

The project site is currently undeveloped with no man-made drainage systems in place. Natural drainageways are absent on the affected property.

4.12.5 Electrical Power and Communication Systems

The project site receives no electrical power and no communications services because its undeveloped state requires neither service. HELCO currently has an overhead 69 kV transmission line running through the utility easement beyond the southern edge of the project site. The line runs from Mamalahoa Highway to the Keahole Substation located near the Queen Kaahumanu Highway.

4.12.6 Solid Waste Disposal

The project site receives no solid waste disposal service because no demand for this service is generated by the undeveloped property.

4.13 SOCIAL FACTORS

The population of Hawai'i County grew rapidly from 63,468 persons in 1970 to 120,317 persons in 1990 (Department of Business, Economic Development, and Tourism, 1998). Population growth in West Hawai'i, especially in the North Kona District, is largely responsible for this increase. The North Kona District experienced a 184 percent increase between 1970 to 1980, from 4,832 to 13,748 persons, and a 62.1 percent increase between 1980 to 1990, from 13,748 to 22,284 persons (Fukunaga and Associates, Inc., 1994). In 1990, Kailua-Kona had a population of 9,126 persons (Department of Business, Economic Development, and Tourism, 1998).

The total population of the West Hawai'i region—this includes the districts of North Kohala, South Kohala, North Kona, South Kona, and the Western portion of Kau— is expected to grow to almost 100,000 persons by the year 2010 (University of Hawai'i, Hawai'i Community College, 1997, p. 10). The composition of this population includes more persons in the 25 to 39 age group than either Honolulu or Kaua'i, and a larger percentage of persons who have some college as compared to the populations in either Honolulu or Kauai (Ibid). Many individuals who have completed either an associate or baccalaureate degree are professionals working in the region who desire further education to maintain or upgrade existing job skills (Ibid).

According to State projections, the population of the North Kona District is projected at 52,600 by the year 2010, thereby continuing a shift in population growth from East Hawai'i to West Hawai'i (Fukunaga and Associates, Inc., 1994). By this time, it is also

expected that approximately 50 percent of the island's population will be living in West Hawai'i.

The existing location of the UHCWH at Kealahou is considerably south of the geographic center of the region. This fact, coupled with the lack of adequate facilities and necessary infrastructure will continue to interfere with the delivery of quality programs at the UHCWH (University of Hawai'i, Hawai'i Community College, 1997, pg. 15). Community sentiments over the past twenty years indicate the need for increased postsecondary educational opportunities in West Hawai'i (University of Hawai'i, Hawai'i Community College, 1997, pg. 12).

The social character of West Hawai'i in the coming years is expected to transition along with the physical environment. Factors contributing to future change include increased development of resorts along the coastline and residential communities in mauka areas. One potential benefit of the transition may be increased job opportunities in this region. Coordination between the UHCWH and industry will allow a complementary range of training programs and services that foster the skills desired by employers to be provided.

4.14 ECONOMIC FACTORS

Employment trends in Hawaii County generally parallel population growth. Jobs in the service and retail sectors have contributed substantially to the overall increase in jobs; however, these sectors are dominated by lower wage jobs.

Service and sales positions account for 40 percent of the currently available jobs in West Hawai'i (University of Hawai'i, Hawai'i Community College, 1997, pg. 11). In the West Hawai'i region, there is also a prevalence of executive/managerial and professional occupations that require extensive postsecondary education for entry to these fields (Ibid). In the future, more scientific enterprises related to astronomy and ocean engineering may increase the need for professional and graduate education in West Hawai'i (Ibid).

The West Hawaii region has many opportunities to sustain a stable and diversified economy supported by energy resources, high technology research and development, aquaculture, diversified agriculture, commercial and sport fishing, seafood marketing and ocean research. Expansion in these areas will increase diversity and the availability of higher paying jobs.

The South Kohala and North Kona Districts have emerged as the County's principal visitor destination areas, thereby establishing the visitor industry as the major source of economic activity for Hawaii County during the last 20 years. Over the next 20 years, significant development is expected to occur in West Hawaii within the context of major population growth. Ultimately, this growth is the result of policy decisions implemented

over the last 30 years to redirect growth from Oahu to the neighbor islands and supported by major public capital improvements.

In response to the emerging development pressures, State and County governmental planning agencies formulated development guidelines and implementation strategies for West Hawaii in a visionary stance unparalleled for the neighbor islands up to this time.

The Hawaii County General Plan (1989) forecast a three-fold increase in the area's economy as a result of tourism and population growth over the ensuing two decades. In 1989 the County also completed the Keahole to Kailua Development Plan, which covers an area of over 17,000 acres. According to this plan, by the year 2010 there would be a resident population of 16,800 persons between Kailua and Keahole; a 200-acre regional civic and commercial center; 200 acres of industrial development; 575 acres of parks and recreational facilities, and 280 acres of educational institutions.

A 1991 study undertaken for the State Land Use Commission as part of a periodic District Boundary Review cited the need for 3,658 acres of additional residential development in West Hawaii by the year 2010 beyond the approved acreage at the time. It also identified the need for up to 334 more acres for commercial uses, 239 acres for industrial uses, and 968 acres for resort uses.

The West Hawaii Regional Plan (1989) was the defining policy document for the State's regional planning effort in West Hawaii. The Plan identifies sub-regional planning areas to be planned and developed. It recommends clustering the growth of tourism in Resort Destination Nodes in order to minimize adverse social, cultural, and environmental impacts of the proposed developments and to allow the preservation of natural open space and the creation of large public parks along the coastline. The Plan attempts to balance economic development with urban growth, community development, and environmental concerns. It acts as the overall guide and coordinating tool for the CIP within the regional planning framework.

5.0 ENVIRONMENTAL CONSEQUENCES

This chapter is organized according to the resources that may be affected by the actions and alternatives that remain from Chapter 3.0: no action, the project as proposed, and Alternative A. Discussions and evaluations of the environmental consequences for the other alternatives are unnecessary because those alternatives were eliminated from further consideration.

5.1 GEOLOGIC CONDITIONS

No Action. With no action, there would be no impacts to the geologic conditions of the project site so long as the affected property remains in an undeveloped state.

The Proposed Action. The creation of a permanent University Center on the project site would not affect the underlying geologic composition of the affected area because the construction of educational facilities with supporting infrastructure involves primarily surface activities that do not require the excavation or replacement of vast areas of sub-surface resources. No mitigation is therefore proposed or deemed warranted.

Alternative A. This alternative (which includes a revised access road for the University Center) would involve substantively similar activities as the proposed action. No mitigation is proposed or considered warranted because no impacts to the underlying geologic composition of the affected area would occur.

5.2 TOPOGRAPHY AND SOILS

No Action. With no action, there would be no impacts to the topography and soils of the project site so long as the affected property remains undeveloped.

The Proposed Action. Excavation and grading would occur as a result of project actions to construct educational facilities and supporting infrastructure on the vacant, undeveloped property. Localized alterations to the topography of the affected area would occur to create level areas for project elements such as buildings, roadways, parking areas, and pedestrian paths. The overall design of the University Center incorporates the sloping terrain of the project site to facilitate development and minimize grading. County of Hawai'i grading permit requirements would be adhered to by the construction contractor such that no mitigation is proposed or considered warranted.

Construction activities such as clearing, grading, and grubbing disturb and/or expose the earth and soils for the duration of site work periods. Exposed soils are susceptible erosion, especially during periods of heavy rain. Wind erosion may also cause some soil loss during construction, but the greater concern is silt runoff. In the

long-term, the creation of impermeable surface area (i.e., paved surfaces) minimizes erosion and sediment transport.

Project actions would be accomplished using both temporary and permanent erosion and sedimentation control measures as warranted. The absence of surface soil deposits in affected areas of the project site may minimize the need for erosion control devices such as cut-off ditches, detention ponds, temporary ground cover vegetation, and various soil stabilization and protection materials. Landscaping at the site and continued management of the property would contribute to the control of erosion in the long-term. In light of these considerations, no mitigation is proposed or considered warranted.

Alternative A. Project impacts would be the same as for the proposed action. The environmental controls described for the proposed action would be applied such that no mitigation is proposed or deemed warranted.

5.3 CLIMATE

No Action. With no action, there would be no noticeable or measurable impacts to the climate of the project site from the property remaining in an undeveloped state.

The Proposed Action. No noticeable or measurable changes to the climate would result from the construction of the project and the operation of the University Center. Proposed educational facilities would be air conditioned to create a pleasant learning environment in the hot and arid climate of the project site. Consequently, no mitigation is proposed or deemed warranted.

Alternative A. Air conditioning would also be provided with this alternative. Alternative A would generate no noticeable or measurable impacts to the climate of the project site and no mitigation is proposed or considered warranted.

5.4 AIR QUALITY

No Action. With no action, the undeveloped property would make no noticeable or measurable contribution to the air quality of the project area. Vehicular emissions along existing roadways traversed by the UHCWH students, faculty, and staff would continue to be generated with no action as a result of the operation of existing facilities for the UHCWH in Kealahou. The effects of both natural and man-made air pollutants would continue to be experienced by area residents to a degree consistent with each individual's reaction or tolerance to pollutant stimuli.

The Proposed Action. Site work and earthmoving activities may generate fugitive dust and particulate emissions at the project site. Construction vehicle activity may generate pollutant concentrations in the form of vehicular emissions at the project site

as well as along affected existing streets. Anticipated short-term air quality impacts associated with the project would be minimized via the implementation of dust control measures during the construction period. The establishment of a watering program to reduce fugitive dust emissions from unpaved roads and areas of exposed soils is a recommended method of dust control because of its effectiveness in reducing emissions.

Proposed educational facilities would be air-conditioned to create a nurturing learning environment that is relatively unaffected by vog and other pollutant emissions. Both natural and man-made pollutant levels from off-site stationary sources are beyond the control of the UHCWH. Non-stationary sources of vehicular emissions caused by existing traffic congestion attributed to current traffic levels on existing roadways in the project area are similarly beyond the control of project actions.

At completion, the University Center would not be a major stationary source of air pollutant emissions. Air quality impacts to be generated by UHCWH activities at the Kalāoa site would be substantively similar if the same improvements were situated at Kealahou since planned program activities and uses anticipated for the UHCWH would be the same at either site. Therefore, proposed UHCWH activities would generally result in similar air quality impacts to their respective ambient environment. Traffic generated by the project would generate non-stationary sources of pollutants in the form of vehicular emissions along existing roadways traversed by students, faculty, and staff of the UHCWH. These emissions are already being generated as a result of the operation of existing facilities for the UHCWH in Kealahou. In an effort to address potential increased vehicular emissions caused by a larger student enrollment (up to 1,500 students), the University Center would provide parking and loading provisions for shuttles and vans. Ultimately, it would be the responsibility of conscientious students, faculty, and staff to utilize carpools, public transportation, and other more environmentally friendly modes of travel as opposed to the personal automobile. Given these considerations, no mitigation for future non-stationary impacts to air quality is proposed or deemed warranted.

An increased demand for electrical power and the demand for solid waste disposal would generate off-site stationary source impacts in the form of pollutant emissions from the fuel that has to be burned and the movement of heavy equipment for solid waste transport and burial at a municipal landfill. The use of an energy efficient design would lower the electrical power requirements for the University Center. The utilization of recyclable products and the implementation of a recycling program would reduce the offsite solid waste disposal requirements of the University Center. As a result of the above features, no mitigation for offsite impacts to air quality is proposed or deemed warranted.

Alternative A. Alternative A includes air conditioning for constructed facilities to minimize the impacts of natural and man-made air pollutant emission on the educational experience. Short-term air quality controls as described for the proposed action would be implemented during construction to reduce fugitive dust emissions. Alternative A

would generate the same impacts to air quality as the proposed action and include the same parking and loading provisions for shuttles and vans. Furthermore, the same energy efficient features and recycling considerations would be applied with this alternative such that no mitigation for air quality impacts is proposed or considered warranted.

5.5 NOISE QUALITY

No Action. No noise impacts would be generated if the project site remains in an undeveloped state. Background ambient noise levels in the project area would continue to be dominated by the distant sounds from off-site stationary sources such as the airport and the power plant. Non-stationary sources of background noise caused by existing traffic on existing roadways in the project area would also continue to affect noise quality.

The Proposed Action. Construction activities at the project site would generate noise impacts that are temporary in nature. The impacts of noisy construction activities would be experienced by area residents to a degree consistent with each individual's reaction or tolerance to noisy stimuli. Anticipated construction noise would be audible but relatively low at neighboring properties due to a distance of approximately 1,500 to 2,000 linear feet between the project site and the affected residential community. Project actions include the use of properly muffled construction equipment as a means of noise control. The implementation of curfew periods and adherence to construction noise limits established by the State of Hawai'i, Department of Health (DOH) would further minimize the nuisance to the residents of nearby communities in the project area. In light of these considerations, no short-term mitigation for noise impacts is proposed or deemed warranted.

The provision of air conditioning for proposed educational facilities at the University Center would create a learning environment that is relatively unaffected by the distant sounds from Kona International Airport and the Keahole Generating Station. The noise impacts from these off-site stationary sources are beyond the control of the UHCWH. Non-stationary sources of background noise caused by existing traffic on existing roadways in the project area are similarly beyond the control of project actions.

At completion, the University Center would not be major stationary noise source because of the absence of athletic facilities, dormitories, and faculty housing at the project site. The types of noise impacts generated at the Kalaoa site would be substantively similar to the types of impacts currently generated at the Kealakekua site since the uses at either site would be similar in nature. For example, both sites would be affected by commuter traffic during similar hours of operation. There is background noise at both sites; the existing Kealakekua site may in fact have more background noise due to the presence of the shopping center, bar and grill, and surrounding industrial uses. Traffic generated by the project would generate non-stationary noise sources from the movement of vehicles along roadways traversed by students, faculty,

and staff of the UHCWH. In an effort to address potential increased vehicular noise caused by a larger student enrollment (up to 1,500 students), the University Center would provide parking and loading provisions for shuttles and vans. Ultimately, it would be the responsibility of conscientious students, faculty, and staff to utilize carpools, public transportation, and other more environmentally friendly modes of travel as opposed to the personal automobile. Given these considerations, no mitigation for future non-stationary impacts to noise quality is proposed or deemed warranted.

Alternative A. Alternative A includes air conditioning for constructed facilities to minimize noise impacts from the airport and the power plant. The same temporary noise control measures as described for the proposed action would be applied for Alternative A. This alternative would generate the same impacts to noise quality as the proposed action and include the same parking and loading provisions for shuttles and vans such that no mitigation for noise quality impacts is proposed or considered warranted.

5.6 WATER RESOURCES

No Action. With no action, the proposed property would remain in an undeveloped state and no impacts to water resources or water quality would occur.

The Proposed Action. The construction of University Center facilities at the project site would result in the creation of impervious surfaces that would increase localized runoff and decrease the total time of concentration. The loss of localized groundwater recharge is expected to be negligible and inconsequential to the overall function of the natural hydrological system because direct infiltration of overlying rainfall contributes only a small percentage (approximately 10 percent) of the total recharge of the underlying Kona basal aquifer. No mitigation is therefore proposed or considered warranted.

Project actions would include the use of only organic pesticides and herbicides for the maintenance of landscaping features at the project site. In this regard, any runoff from the project site would not carry contaminants to the underlying basal aquifer and no mitigation is proposed or deemed warranted.

The use of temporary and permanent erosion and runoff controls (as necessary) would prevent any potential effect to the pristine nearshore waters that are at a distance of more than 3 miles from the project site. Runoff is not a major concern due to the inherent properties of the site. No drainageways exist on the property and any runoff would percolate into the porous lava rock. No mitigation is therefore deemed warranted.

Alternative A. This alternative would create the same amount of impervious surfaces as the proposed action. Project actions including the use of temporary and permanent erosion and runoff controls, and only organic pesticides and herbicides for

the maintenance of landscaping features at the project site would be the same as for the proposed action such that no mitigation is proposed or considered warranted.

5.7 BIOLOGICAL RESOURCES

5.7.1 Flora

No Action. No impacts to the flora on the project site would occur if the affected property remains in an undeveloped state.

The Proposed Action. Project actions include the clearing of most of the existing grassland and shrubland vegetation on the project site for the creation of buildings, roadways, pedestrian paths, and supporting infrastructure. New landscaping would utilize native species as much as possible if they are appropriate to the terrain and climate of the project site and require a minimal amount of maintenance. Anticipated actions would result in no significant impacts to botanical resources because none of the plant species recorded or observed on the site are protected by state or federal regulations. Consequently, no mitigation is proposed or considered warranted.

Alternative A. Project actions including the clearing of existing vegetation and the use of native species as much as possible for landscaping would be the same as for the proposed action such that no mitigation is proposed or considered warranted.

5.7.2 Fauna

No Action. No impacts to faunal resources would occur if the project site remains in an undeveloped state.

The Proposed Action. Project actions including the installation of exterior lighting at the project site may attract moths and other flying insects that in turn could attract the Hawaiian hoary bat. External lights and man made structures could also contribute to the injury or mortality of Dark-rumped Petrels that may over-fly the site. The creation of parking areas and other open areas may attract migratory shorebirds that are known to frequent coastal areas in North Kona. The destruction of cave habitats from actions such as grading may in turn destroy unique endemic arthropods if any are harbored in those habitats.

Correspondence from the State of Hawai'i, Department of Land and Natural Resources, Division of Forestry and Wildlife dated December 28, 1999 states that the Department is unaware of endangered fauna in the general vicinity of the project site (pg. 1). Nevertheless, there is a possibility that the Hawaiian hawk or Hawaiian bat may roost in the area (Ibid).

MITIGATION. Recommended mitigation for unwanted effects include the shielding of any lights for the University Campus that may disorient the Dark-rumped Petrels (Reed et al., 1985). The shielding may also prevent serious injury to the Hawaiian hoary bat. Efforts to minimize the destruction of cave habitats during grading are also recommended since these habitats could potentially harbor endemic arthropods (David and Guinther, 2000, pg. 10).

Large caves should be preserved and protected. Smaller caves may be retained as part of the landscape where this is practical, but there is no reason to attempt to leave openings in the ground where these would clearly cause difficulty in the placement of roads, buildings, or pedestrian use areas. It is likely that due to the existing terrain, the process of land grading will uncover many more small openings. It may be impractical or physically impossible to visit these small openings; however, should any cave large enough to be easily entered be uncovered, an archaeologist and a biologist should investigate it. Large caves can yield potentially interesting archaeological, paleontological, or ecological finds, and should not be destroyed prior to some exploration of their contents. A qualified biologist (e.g., FWS cave specialist) will be notified and consulted upon the discovery of a cave large enough to be easily entered.

Alternative A. The same project actions as described for the proposed action would occur with this alternative.

MITIGATION. The same mitigation as described for the proposed action would be adopted for this alternative.

5.8 CULTURAL RESOURCES

No Action. With no action, the project site would remain in an undeveloped state. It is presumed that none of the preservation actions described in the historic preservation plan would be accomplished if the UHCWH continues to function from facilities in Kealahou.

The Proposed Action. Numerous archaeological sites within the project site have been given due consideration as evidenced by the *Conceptual Historic Preservation Plan for the Proposed University Center at West Hawai'i, North Kona, Hawai'i Island* (Cleghorn, 2000). Tentative acceptance by the SHPD of the historic preservation plan that allows for the protection and incorporation of archeological features into the design and layout of the University Center has been granted (refer to the letter dated December 18, 2000 in Appendix A-4). Nevertheless, it is recognized that ground disturbing activities have the potential to destroy existing resources.

MITIGATION. In accordance with the conditions of the accepted conceptual historic preservation plan, detailed plans for interpretive venues, vegetation clearance, re-vegetation, and access as described for Preserve 3 would be formulated under the guidance of the Kalaoa Advisory Board and with input from interested University Center

students and interested community members. Additionally, the creation of interpretive venues may follow the guidelines set forth in the *Design Specifications for Outdoor Recreation* authored by the State of Hawai'i Architectural Access Committee in 1994. These guidelines are used by Hawai'i State Parks. The remaining preserves would be established as needs, priorities, and budgetary realities allow. Adherence to the approved historic preservation plan and any additional conditions specified by the SHPD would help to mitigate potential impacts to cultural resources at the project site. Both residents and visitors alike would benefit from the creation of interpretive venues for cultural resources located at the project site.

Other means of experience for inaccessible venues may include an interpretive panel and photo board in a centralized and accessible portion of the campus; brochures or interpretive pamphlets describing inaccessible resources; and/or a video of the resources that may be viewed at the University Center. The goal with respect to cultural resources and interpretive venues is to provide the same or similar life experience to all members of the community. The fulfillment of this goal would be a benefit of the proposed action.

Alternative A. Project actions for Alternative A with respect to cultural resources would be the same as for the proposed action.

MITIGATION. The same mitigation as described for the proposed action would be adopted for this alternative.

5.9 NATURAL HAZARDS

No Action. The project site would be susceptible to volcanic eruptions and earthquakes regardless of its undeveloped state. With no development, no mitigation is proposed or considered warranted.

The Proposed Action. Volcanic eruptions and earthquakes are natural occurrences that may affect the project site. The threat from these hazards would always exist because humans have little control over the frequency and intensity of an unpredictable event.

MITIGATION. There is adequate room above the project site upon which to build lava diversion barriers if the technology for such devices improves and their effectiveness is proven. The construction contractor will adhere to the Uniform Building Code Requirements for Seismic Zone 3 (which includes structural design standards for earthquake resistance) with respect to all proposed buildings and structures on the project site. Following Hawai'i Civil Defense evacuation procedures in the event of emergencies would further minimize the damage to public life and safety.

Alternative A. Project actions for this alternative and conditions pertaining to natural hazards would be the same as those described for the proposed action.

MITIGATION. The same mitigation as described for the proposed action would be adopted for this alternative.

5.10 VISUAL RESOURCES

No Action. No impacts to visual resources in the project area would be generated if the project site remains in an undeveloped state. With no action, the opportunity to reorganize the University Center within a cohesive design framework situated amongst the lava-strewn landscape of Mt. Hualalai would be lost. The creation of a new visual character for the University Center and the elevation of its status would be similarly lost as a result of no action.

The Proposed Action. All buildings for the University Center would be one-story to create a low profile that is compatible with the expansive lava-strewn setting of the project site. This low profile avoids the creation of view obstructions either within the site or from without. Buildings would be intentionally designed to blend into the surroundings of the project site. The character and color of the surrounding lava would be used as a design element that contributes to a Hawaiian sense of place. The new visual character of the University Center within a cohesive design framework is expected to elevate its status as an institution of higher education. In this regard, no negative impacts to visual resources are anticipated and no mitigation is proposed or considered warranted.

Alternative A. Project actions including the creation of low-profile buildings on the project site that purposefully blend into the existing lava-strewn environment would be the same as for the proposed action. No mitigation is proposed or deemed warranted with respect to visual resources.

5.11 LAND USE

No Action. This alternative would result in no change to the use of the affected property despite the supporting statements and policies in state and county plans for a University Center in Kalaoa. No action would ultimately create conflict with these plans.

The Proposed Action. Completion of the proposed action would be compatible with existing state policy documents (i.e., the Hawaii State Plan and Functional Plans) as evidenced by supporting statements encouraging the creation of opportunities for higher education and job training, especially with the integration of information technology in education. Statements that encourage the development of projects that preserve natural, historic, and scenic resources of the physical environment further emphasize compatibility with state policy documents.

Compatibility with state and county policy documents such as the State Land Use Law, West Hawai'i Regional Plan, Hawai'i County General Plan, and K to K Plan is

evidenced by the mention and/or depiction of the University Center in Kalaoa in policy statements and plans. Zoning designations for the project site are consistent with the development of the University Center such that no mitigation is proposed or considered warranted.

Alternative A. The actions and conditions described for the proposed action would be the same for this alternative such that no mitigation is proposed or deemed warranted.

5.12 INFRASTRUCTURE

5.12.1 Roadways and Traffic Considerations

No Action. With no action, the project site would remain in an undeveloped state. No new roadways would be constructed for access to the project site. Traffic projections to 2004 suggest that traffic along Kaimi Nani Drive would not increase significantly (Phillip Rowell and Associates, Inc., 2000, pg. 13).

The Proposed Action. The interim access plan allows for immediate access and egress to the project site via a new roadway from Kaimi Nani Drive. As proposed in the LRDP, this interim access roadway would be situated east of and parallel to the alignment of the Mid-Level Road. The access road would be two-lanes wide, and widening would be provided at intersections to accommodate separate left turn lanes.

The traffic impact assessment indicates that there are no capacity deficiencies at the following intersections during the morning peak hour: Queen Kaahumanu Highway with Kona International Airport, Queen Kaahumanu Highway with Kaimi Nani Drive, and Kaimi Nani Drive with UHCWH Access Road (Phillip Rowell and Associates, Inc., 2000, pg. 25). Two (2) traffic patterns would be negatively affected as a result of project traffic during the afternoon peak period: the southbound through movement at Queen Kaahumanu Highway with Kona Airport Road and the southbound to eastbound left turn at Kaimi Nani Drive (Ibid). From an overall perspective, the intersections operate at an acceptable LOS for urban conditions (Ibid). The intersection of Kaimi Nani Drive with the interim access road should function at adequate capacity with no signalization (Ibid). As a result of these considerations, no mitigation is proposed.

The ultimate access plan for the University Center includes a new roadway connecting the project site with Queen Kaahumanu Highway. The access road would be two-lanes wide, and widening would be provided at intersections to accommodate separate left turn lanes. An existing paved service road begins at the intersection of Keahole Road with Queen Kaahumanu Highway. The service road ends at a 0.5-million gallon water tank west of the Kalaoa site. The proposed future access to the University Center may be provided by extending and widening the service road uphill to the campus core. This new roadway from the project site would then provide direct access

to Queen Kaahumanu Highway, and the existing "T" intersection at the Kona Airport Access Road would become a four-way intersection.

The traffic impact assessment indicates that the northbound through movement at the intersection of Queen Kaahumanu Highway with Kona Airport Road would be negatively affected by project traffic during the morning peak hour as a result of traffic traveling north through the intersection and turning right towards the direction of the University Center (Ibid). From an overall perspective, this intersection operates at an acceptable LOS for urban conditions (Ibid). Some traffic movements at this intersection may even improve as a result of signal phasing to accommodate southbound left turns (Ibid). As a result of these considerations, no mitigation is proposed.

Short-term (or interim) traffic impacts along Queen Kaahumanu Highway may result from project actions because proposed widening of the Queen Kaahumanu Highway by DOT has been delayed since completion of the Traffic Impact Analysis for the UHCWH project. In most cases, short-term effects are not considered as adverse or significant impacts requiring mitigation. As demonstrated in the letter dated December 1, 2000 from Phillip Rowell and Associates (refer to Appendix A-6), the traffic analysis of the actual traffic demand illustrates that anticipated short-term project impacts can be mitigated if DOT modifies the traffic signal timing to provide acceptable LOS (D or better). DOT is the agency that will determine the timing of traffic signals.

As directed by OEQC, the traffic consultant has continued to correspond with DOT on matters pertaining to traffic signal timing at the intersection of Queen Kaahumanu Highway at the Airport Access Road. A written response from DOT was not provided; however, the following excerpt from the letter dated February 8, 2001 from Phillip Rowell and Associates (refer to Appendix A-6) describes DOT's position:

"...HDOT [sic] does not adjust traffic signal timings in anticipation of a project. Signal timing is adjusted in response to specific problems when brought to HDOT's [sic] attention by maintenance staff, police or the public. Therefore, the traffic signal timing would not be adjusted until a problem materializes."

Alternative A. This alternative includes a different alignment for the interim access road in response to the design architects' verbal discussions with the County of Hawai'i Public Works Department that indicate potential disapproval of a major access road so close (approximately 150 feet ±) to the Mid-Level Road. In response to the concerns expressed by County officials, Alternative A includes the construction of a portion of the access road to the University Center within the Mid-Level Road right-of-way. This access road would be realigned to avoid archaeological sites. The access road would be two-lanes wide, and widening would be provided at intersections to accommodate separate left turn lanes.

Alternative A includes the same ultimate plan for direct access to the Queen Kaahumanu Highway. Traffic considerations pertaining to the interim and ultimate

access routes for Alternative A would be essentially the same as for the proposed action. No mitigation is proposed.

5.12.2 Water System

No Action. With this alternative, no water service would be required or extended to the project site.

The Proposed Action. Project actions include the construction of on-site water system features (including a 0.5-million gallon water storage tank to supply the system via gravity feed) and connection to the municipal system. Consultation with the County of Hawai'i Water Supply Department indicates that potable water can be made available to the project site upon completion of the construction of influent and effluent waterlines in addition to the construction of the Keahole 1-million gallon reservoir (County of Hawai'i Department of Water Supply, 2000, pg. 1). Several offsite water system improvements would also have to be completed for the provision of potable water service: construct booster pumps located at the Keahole 1-million gallon reservoir; construct transmission lines capable of delivering water at adequate pressure and volume under peak-flow and fire-flow conditions from the intersection of the Queen Kaahumanu Highway and Hinalani Drive to the Keahole Reservoir, and thence to the UHCWH 0.5-million gallon reservoir; use mains of at least 12 inches in diameter; construct a distribution waterline (with a minimum diameter of 12 inches) capable of delivering water at adequate pressure and volume under peak flow and fire-flow conditions; construct a service lateral that will accommodate the appropriately sized meter; and install a backflow preventer (reduced pressure type) approved by the Department of Water Supply (County of Hawai'i Department of Water Supply, 2000, pgs. 1-2). The offsite improvements and necessary easements would need to be conveyed to the Water Commission of the County of Hawai'i. In light of these considerations and conditional features, no mitigation is proposed.

Alternative A. The same water system features and conditions that apply to the proposed action would apply to this alternative such that no mitigation is proposed.

5.12.3 Wastewater System

No Action. With this alternative, no wastewater service would be required or extended to the project site.

The Proposed Action. Project actions include the construction of septic tanks with underground injection wells and/or leaching fields. The southwestern portion of the project site lies below the underground injection (UIC) line established by the State of Hawai'i Department of Health. Injection wells and leaching fields are allowed in this area such that no mitigation is proposed.

Alternative A. The same wastewater system features that apply to the proposed action would apply to this alternative such that no mitigation is proposed.

5.12.4 Drainage System

No Action. With this alternative, no drainage systems would be required or constructed on the project site.

The Proposed Action. Proposed facilities and structures would be constructed on level elevations (i.e. graded areas) such that storm water would be diverted and deflected around buildings to lower elevations. The drainage characteristics of the site are good (i.e., runoff percolates into porous lava) such that no mitigation is proposed or deemed warranted.

Alternative A. The same drainage system features that apply to the proposed action would apply to this alternative such that no mitigation is proposed.

5.12.5 Electrical Power and Communications

No Action. With no action, no electrical power nor communications service would be required for the undeveloped property.

The Proposed Action. Project actions include the HELCO proposal to extend and build two 12 kV overhead lines from the existing overhead 69 kV transmission line running in the utility easement along the southern boundary of the project site. The anticipated load will be between 750 kVA and 1,500 kVA. Two (2) underground feeders connected to the overhead feeders will supply the system for the University Center. The system will include a primary electrical switching station for housing equipment. Telecommunication lines will connect to existing lines along Kaimi Nani Drive.

Project actions include the utilization of an energy efficient design to lower the electrical power requirements for the University Center. In light of these considerations, no mitigation for offsite impacts is proposed or deemed warranted.

Alternative A. The same electrical power and communication system features that apply to the proposed action would apply to this alternative such that no mitigation is proposed.

5.12.6 Solid Waste Disposal

No Action. With no action, no solid waste disposal service would be required for the undeveloped property.

The Proposed Action. A private disposal company would be utilized for solid waste disposal service at the project site. The utilization of recyclable products and the implementation of a recycling program would reduce the offsite solid waste disposal requirements of the University Center. As a result of the above features, no mitigation for offsite impacts is proposed or deemed warranted.

Alternative A. The same solid waste disposal requirements that apply to the proposed action would apply to this alternative such that no mitigation is proposed.

5.13 SOCIAL FACTORS

No Action. This alternative would fail to address the inadequacies of the existing facilities in Kealahou with respect to population predictions and community concerns for higher education. The opportunity to provide a permanent postsecondary educational facility in Kalaoa would be lost along with the associated benefits to the community.

The Proposed Action. Population predictions for the West Hawai'i region indicate sufficient population to justify the construction of a higher education center serving 1,200 to 1,600 students by year 2010 (University of Hawai'i, Hawai'i Community College, 1997, p. 10). Completion of the University Center at the project site in Kalaoa would be a great benefit to the region by providing a permanent presence for higher education. The Kalaoa site is logical because the State parcel is in close proximity to Keahole Airport, high technology developments (i.e., the Natural Energy Laboratory of Hawai'i, etc.), residential communities, and an array of employment centers in Kailua, Kona and West Hawai'i resorts. No mitigation is proposed or considered warranted.

Alternative A. Project actions for this alternative and conditions pertaining to social considerations would be the same as for the proposed action. No mitigation is proposed or deemed warranted.

5.14 ECONOMIC FACTORS

No Action. With no action, the opportunity to provide a permanent postsecondary educational facility in Kalaoa would be lost. The ramifications of this option include the potential loss in job training for residents of the West Hawai'i region. With limited job skills, these individuals may be inadequately equipped for future jobs in service and sales occupations, executive/managerial and professional occupations and scientific enterprises related to astronomy, ocean engineering, and high technology.

The Proposed Action. In the short-term, the proposed action would generate general excise tax and income tax revenues to the State of Hawai'i from construction employment and material expenses. In the long-term, the proposed action would generate educational benefits that allow the residents of the West Hawai'i region to

pursue careers in service and sales occupations, executive/managerial and professional occupations, and scientific enterprises related to astronomy and ocean engineering.

Alternative A. Project actions for this alternative and the resulting economic benefits would be the same as for the proposed action.

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6.0 RELATIONSHIP TO LAND USE PLANS, POLICIES, AND CONTROLS

This discussion is included as Sections 4.11 and 5.11. To reiterate, the completion of project actions would result in uses on the affected property that are compatible with existing state policy documents (i.e., the Hawaii State Plan and Functional Plans) as evidenced by supporting statements encouraging the creation of opportunities for higher education and job training, especially with the integration of information technology in education. Statements that encourage the development of projects that preserve natural, historic, and scenic resources of the physical environment further emphasize compatibility with state policy documents.

Compatibility with state and county policy documents such as the State Land Use Law, *West Hawai'i Regional Plan*, *Hawai'i County General Plan*, and *K to K Plan* is evidenced by the mention and/or depiction of the University Center in Kalaoa in policy statements and plans. Zoning designations for the project site are consistent with the development of the University Center such that no mitigation is proposed or considered warranted.

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7.0 PERMITS AND APPROVALS REQUIRED

This EIS has been undertaken in accordance with the Environmental Review process (Chapter 343, HRS). The applicant is seeking acceptance and approval of the EIS with its submissions to and continuing coordination with OEQC.

A revised Historic Preservation Plan was submitted to the SHPD for review and approval. The letter from the SHPD dated December 18, 2000 (refer to Appendix A-4) grants tentative approval to the revised conceptual plan.

The remaining permits and approvals listed below will be obtained during the planning and design phases of the project. As of this writing, no permit applications have been submitted to permitting authorities for processing.

<u>Permits or Approvals</u>	<u>Administering Agency</u>
Burial Treatment Plan	Hawai'i Island Burial Council
Use Permit	Hawai'i County Planning Commission
Zone Change (for Open-zoned lands)	Hawai'i County Council
Water Supply System	County of Hawai'i Department of Water Supply
Wastewater System (including U.I.C. permit if injections wells are employed)	State of Hawai'i Department of Health
Construction Permits (Building and Grading)	County of Hawai'i Department of Public Works
Various approvals relating to road improvements, intersections and landscaping	State of Hawai'i Department of Transportation

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8.0 CUMULATIVE IMPACTS

Cumulative impacts may be defined as impacts on the environment that result from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. The impacts discussed in Chapter 5.0 of this document constitute the incremental impact of this project when added to other actions in the past and present.

The following list encompasses the reasonably foreseeable proposed actions in the North Kona project vicinity that were identified at the time of this EIS and considered in the analysis of cumulative impacts.

- Development of the Makalei Estates (a 240±-acre residential subdivision) within the upper portion of the adjacent 1,000-acre Kau property (the former Nansei property);
- Development of an 18-hole golf course within the central portion of the same adjacent 1,000-acre Kau property; and
- Construction of two (2) new main roadways through the developed portions of the Kau property.

No environmental documents (EAs or EISs) pertaining to the reasonably foreseeable actions listed above were known to have been prepared and/or available for review at the time of this writing. Discussions in the subsequent sections are therefore qualitative rather than quantitative since only general assumptions about these future actions may be used for an analysis in lieu of more accurate or relevant site-specific information.

8.1 FUTURE CONDITIONS WITHOUT THE PROPOSED ACTION

- Makalei Estates. The Hiluhilu Development LLC owns the 1,000-acre Kau property situated between Queen Kaahumanu and Mamalahoa Highways. At this preliminary stage, Makalei Estates is proposed to be developed as a residential subdivision of approximately eighty (80) 3.0-acre lots. This development would be situated on the upper portion of the affected property overlooking the proposed 18-hole golf course. This project would entail land clearing and grading to prepare the site, then construction activities to build roads and erect residential structures. Onsite runoff is expected to be controlled at the site with drainage systems. The kinds of drainage provisions or runoff, erosion, siltation and sediment controls to be implemented with the project are not known. The residential subdivision will generate trip traffic and require access to a transportation system. Potable and non-potable water will be needed for domestic and irrigation purposes, respectively. Wastewater will be generated from the residents of the subdivision such that a wastewater collection, treatment and disposal system will be necessary. The project will require solid waste collection and disposal. Demands for electricity and communications are expected. Socio-economic effects include the creation of housing opportunities in the project area.

- An 18-hole golf course. The Hiluhilu Development LLC has obtained a permit for the construction of an 18-hole golf course on the central portion of its 1,000-acre Kau property. No timetable for the construction of this project has been indicated. It is reasonable to assume that this project would entail land clearing and grading to prepare the site, then construction activities to create permanent structures and golf course facilities. Onsite runoff would be controlled at the site and conveyed to drainage systems. The kinds of drainage provisions or runoff, erosion, siltation and sediment controls to be implemented with the project are not known. Herbicides and/or pesticides used to maintain the golf course are another concern with respect to potential runoff. The golf course project will generate trip traffic and require access to a transportation system. Potable and non-potable water will be needed for domestic and irrigation purposes, respectively. Wastewater will be generated from the workers and visitors of the development such that a wastewater collection, treatment and disposal system will be necessary. The project will require solid waste collection and disposal. Demands for electrical power and communications are expected. Anticipated socio-economic effects include the creation of new jobs and recreational amenities.
- Construction of two (2) new main roadways through the Kau property. The development of new main roadways through the affected Kau property to serve the subdivision and golf course would likely require connections to both Mamalahoa and Queen Kaahumanu Highways since these are the two major transportation corridors in the project vicinity. Road development would entail land clearing, grubbing and grading. The new roadways would most likely be constructed to County standards to enable their dedication to the County. Public utility improvements to extend infrastructure service to the developed areas may occur along the alignment of the new roadways. New traffic patterns may be created as a result of new roadway construction; however, these impacts may be largely confined to specific routes independent of the UHCWH site.

8.2 INCREMENTAL IMPACT OF THE PROPOSED ACTION

The impacts of the proposed UHCWH project, combined with the anticipated impacts from foreseeable projects suggest that the natural environment would be affected, but not to a significant extent. Established controls that require developers to consider and manage the undesirable effects attributed to their project should effectively limit and mitigate foreseeable long-term impacts. For example, anticipated potable water requirements and proposed potable water systems for each project must be coordinated with the County of Hawai'i Department of Water Supply to ensure that water resources are available. Wastewater disposal systems must meet State of Hawai'i Department of Health requirements to prevent unintended effects to affected water bodies or water resources. Runoff concerns must be addressed with on-site controls in accordance with County construction permits. Compliance with and adherence to established controls are expected to help lessen the impact on natural resources, and achieve lasting effects in resource protection and conservation. Lastly, the proposed 3.0-acre residences, the golf course, and the UHCWH are expected to generate no significant levels of noise or

air quality impacts due to the relatively quiet and unobtrusive types of activities that shall occur at respective sites.

The man-made environment would be impacted as a result of the proposed project combined with the anticipated impacts from the projects identified in the previous section; however, the developers must abide by established controls and provide appropriate mitigation for project-generated effects such as traffic and utility demands. Incremental traffic increases are likely to occur from specific and incremental developments that generate trip traffic in relative proportion to their scale of activities. Where deemed to be necessary, developers may be required to include signalization, stop signs, and similar features as part of mitigation for project impacts. Demands for water and wastewater services, solid waste disposal, electrical power and communications need to be coordinated with utility providers to ensure adequate service. For economic reasons and as a function of good policy, projects are encouraged to be designed with energy-efficient and energy conservation features.

Socio-economic impacts resulting from the proposed project in addition to the foreseeable projects identified in the previous section are generally expected to be mostly beneficial. Construction will generate employment and economic opportunities. Significant population shifts are not anticipated to occur as a result of the proposed project due to the relatively small scale of the UHCWH (planned for a maximum head count enrollment of 1,500 students) and its stated purpose as a commuter campus that does not contain dormitories, faculty housing, or athletic facilities. Improved access to higher education would generate an employable work force required for a growing economy. The proposed project also includes interpretive venues for educating students, residents, and visitors about Hawaiian history and culture, thereby providing a valuable resource for social and cultural enrichment.

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9.0 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Resources such as fossil fuels and construction materials would be irrevocably committed for the construction of a permanent University Center in Kalaoa. In addition to the fuels and construction materials involved, approximately \$52 million would be committed to the four phases of the project.

Labor would be required for construction, planning, engineering design, landscaping, purchasing, and services. Once used, the labor is irretrievable; however, the expended effort is also monetarily compensated, thereby supporting the economies of the state and county.

The pristine lands that would be developed for the University Center can never be returned to their pristine state. The natural vegetation at the site would be cleared and/or replaced with landscaping as a result of project actions.

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10.0 SUMMARY OF UNRESOLVED ISSUES

The consultation process for this project has yielded substantial input from government agencies, private interest groups, and individuals. Comments received on the DEIS are included in Appendix B-1; comments pertaining to the EIS Preparation Notice are included in Appendix B-2. The comments provided input pertaining to the issues and concerns addressed in this Final EIS.

The UHCWH administration is aware that additional concerns regarding the proposed project may arise in the future, particularly with respect to the preservation, integration, and interpretation of cultural resources. The UHCWH administration will continue to work with the Kalaoa Advisory Council, the SHPD, and interested government officials, area residents, and students of the UHCWH to insure that the final project plans meet project objectives and are responsive to both public and agency concerns. The development of interpretive programs is being deferred until a later date to allow the students and staff of the UHCWH to become directly involved with those actions. The existence of cultural sites on the affected property provides the students and staff of the UHCWH with a unique opportunity to foster their understanding of traditional Hawaiian culture and history in an actual historical setting. Interpretive programs for each site will be coordinated with the SHPD for appropriate review and approval.

The property on which the project lies is owned by the State of Hawai'i and has been determined to comprise ceded lands. As with all ceded lands that are designated as revenue lands, coordination with OHA officials will be required to discuss the issue of compensation to the Hawaiian people.

An interim measure (e.g., adjustment of traffic signal timing at the intersection of Queen Kaahumanu Highway at the Airport Access Road) intended to address potential short-term traffic impacts has been discussed with DOT (refer to the letter dated February 8, 2001 in Appendix A-6). DOT provided no written response; however, the traffic consultant has concluded from discussions with DOT that the traffic signal timing would not be adjusted until a problem materializes and is brought to DOT's attention by maintenance staff, police or the public (Phillip Rowell and Associates, 2001).

Correspondence from the State of Hawaii, Department of Land and Natural Resources, Division of Forestry and Wildlife dated December 28, 1999 indicates that a more intensive plant survey should be conducted if development expands into the shrub land communities or above the 400-foot elevation (pg. 2). The concern is for endangered plants such as *Nothocestrum breviflorum*, *Caesalpinia kavaiensis*, and *Pleomele hawaiiensis*. There is also concern for *Capparis sandwichiana* (a species of concern), *Reynoldsia sandwicensis* (a species of concern), and *Bidens micrantha* spp. *ctenophylla* (candidate species for listing).

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12.0 PREPARERS OF THE EIS

<u>PREPARER</u>	<u>RESPONSIBILITIES</u>	<u>AFFILIATION</u>
Maynard G.P. Young	Director	University of Hawai'i Facilities Planning Office for Community Colleges
Richard S. McGerrow	Project Manager	Wil Chee – Planning, Inc.
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Ivan Tilgenkamp	Illustrator Assistant Production Manager	Wil Chee – Planning, Inc.
Napa Ruttanaphani	Illustrator Production Assistant	Wil Chee – Planning, Inc.
Paul Cleghorn, Ph.D.	Archaeologist	Pacific Legacy, Inc.
Eric B. Guinther	Biologist	
Reginald E. David	Biologist	Rana Productions, Ltd.
Derral Herbst, Ph.D.	Botanist	
Phillip Rowell, P.E.	Traffic Consultant	Phillip Rowell & Associates

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13.0 INTERESTED AND AFFECTED PARTIES WHO WERE CONSULTED

Federal Agencies

Department of the Interior, U.S. Fish and Wildlife Service

State Agencies

Department of Business, Economic Development and Tourism
Department of Health
Department of Environmental Quality Control
Department of Hawaiian Affairs
Department of Hawaiian Home Lands
Department of Land and Natural Resources, Division of Forestry and Wildlife
Department of Land and Natural Resources, Division of Historic Preservation
Department of Transportation
Fifth Representative District
First Senatorial District
Second Senatorial District
Third Senatorial District
University of Hawai'i Center at West Hawai'i
University of Hawai'i, Hawai'i Community College
University of Hawai'i, UHM Environmental Center

County Agencies

Civil Defense Agency
Council Member's Office
Department of Public Works
Fire Department
Mayor's Office
Planning Department
Police Department
Water Supply Department

Other Agencies or Organizations

Hawai'i Electric Light Co., Inc.
Hawaii Tribune Herald
Kona Palisades Estate Community
West Hawaii Today

Interested and Affected Parties Who Submitted Written Comments on the DEIS

U.S. Fish & Wildlife Service
State of Hawai'i Department of Accounting & General Services
State of Hawai'i Department of Health, Environmental Management Division
State of Hawai'i Office of Environmental Quality Control
State of Hawai'i Department of Land and Natural Resources, Division of Forestry and Wildlife
State of Hawai'i Department of Land and Natural Resources, Historic Preservation Division
State of Hawai'i Department of Land and Natural Resources, Historic Preservation Division
State of Hawai'i Department of Transportation
UH Environmental Center
County of Hawai'i Police Department
County of Hawai'i Planning Department
County of Hawai'i Department of Public Works
Kona Palisades Estate Community Association
Nakako O. Zak (area resident)

Summary of Important Issues Discussed at Public Meetings

8/18/98: Presentation of LRDP to UHCWH faculty and staff at Kealakekua campus.
The LRDP was presented to faculty and staff summarizing existing campus conditions, site design alternatives and recommended design guidelines. Questions and comments were received from faculty and staff.

8/18/98: Public Meeting at Kealakehe High School Cafetorium, Kailua-Kona. A public meeting advertised in *West Hawaii Today* summarized work on the LRDP including existing conditions, site design alternatives, and recommended design guidelines. Sandra Sakaguchi, Provost of Hawai'i Community College in Hilo gave a brief overview of the academic program envisioned for the new university center. Public input included

questions regarding the proposed sewage lagoon and the alternative underground injection, suggested use of cold sea water as an alternative to conventional air conditioning, and use of the UHCWH facilities as a hurricane safety center.

9/09/00: Special Presentation for the Kona Palisades Estates Community Association (KPECA). A presentation of the LRDP identical to the one presented at the public meeting at Kealakehe High School was given to the community association that neighbors the UHCWH site. General support was given to the project by the community association, but several concerns were voiced:

- Residents expressed their expectation of a decrease of water pressure due to use of water mains by UHCWH along Kaimi Nani Drive. The planning civil engineer explained that this should not affect community water use because water would be stored in a 500,000 gallon tank on the university site and would only be drawn down during non-peak hours.
- Wind was discussed as it affects air quality and noise quality; however no agreement was reached regarding prevailing wind direction. Residents reported different wind directions in different locations within the community.
- Various alternatives to wastewater (sewage) treatment and disposal were presented and discussed. Residents expressed strong opposition to the proposed sewage lagoon even though the civil engineer explained that it was the most "environment friendly" of the alternatives.
- KPECA stated their need for a parking lot within university property for their meeting hall that will be used as a voting place during elections. A University Center official said that he did not see a problem with their use of the land for a parking lot, but would need to research the legal implications of such an arrangement.

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Appendix A-1
Botanical Survey

Botanical Survey for the University of Hawaii Center at West Hawaii (UHCHWH), Hawaii Community College Long Range Development Plan (LRDP), Island of Hawaii, Hawaii

INTRODUCTION:

On 3 March 1998, a reconnaissance was made of the proposed project site; a detailed survey of the flora and vegetation was conducted from the 10th through the 13th of March, 1998. The purpose of the survey was to assess the botanical resources of the area to determine if any were significant or were protected by local or federal regulations. The project site comprised approximately 125 acres, the south western quarter of the 500 acre parcel set aside by the state for the development of a community college on the western side of Hawaii Island (Map 1, Photo 1).

METHODS:

Prior to conducting the field work, pertinent literature and maps were reviewed to familiarize myself with the area. A walk-through survey method was used, with transects selected which best allowed the sampling of the areas with the greatest potential for supporting protected species and the characterizing of the vegetation communities (Map 1). The area also was scanned with binoculars from elevated vantage points. Observations concerning the flora and vegetation were recorded and a species list was prepared (Appendix 1).

The species list reflects the season and the environmental conditions at the time of the survey. A survey undertaken at a different time of the year or during a wetter year doubtless would yield different results. However, the protected species potentially present on the project site are perennial plants and should be evident regardless of the climatic or environmental conditions.

FLORA:

The vascular flora of the project site comprises a mix of native and introduced species of trees, shrubs, grasses, and forbs; consisting of 35 taxa in 25 families. Thirteen taxa (37.1%) are considered native, but are common species widely distributed throughout the Hawaiian Islands. The remaining 22 taxa (62.9%) are naturalized, non-native species, including 2 which were brought to the islands by the early Polynesian emigrants, and have since become naturalized (Table 1).

Table 1: Status of species

	Native	Naturalized	Total
Plantiflora	1 (3.3%)	2 (66.7%)	3
Monocotyledonae	1 (16.7%)	5 (83.3%)	6
Dicotyledonae	11 (42.3%)	15 (57.7%)	26
TOTAL	13 (37.1%)	22 (62.9%)	35

VEGETATION:

The most recent and complete classification of Hawaiian plant communities is that by Gagne and Cuddihy (1990). Their classification scheme is based upon three nesting regimes: elevation, moisture, and physiognomy; and includes only those communities that the authors consider "natural," that is communities that are not harvested or maintained as monocultures of cultivated species as found in plantations, pastures, orchards, or croplands. According to the Gagne/Cuddihy classification scheme, the entire project site can be designated as a Lowland Vegetation Community with two recognizable vegetation associations: the Lowland Dry Grassland and the Lowland Dry Shrubland. The vegetation of the lower or western part of the project site falls within the Fountain Grass Grassland subtype of the Lowland Dry Grassland Community and is dominated

Botanical Survey for the University of Hawaii Center at West Hawaii (UHCHWH),

Hawaii Community College Long Range Development Plan (LRDP),

Island of Hawaii, Hawaii

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for

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27 March 1998

by fountain grass (*Pennisetum setaceum*), a non-native grass from northern Africa which was introduced into the Kona District in the 1920s as an ornamental, and now dominates much of the arid lava fields of this area. The upper or eastern portion of the project site probably can be considered a modified or degraded 'A'ali Lowland Shrubland vegetative subtype of the Lowland Dry Shrubland, as members characteristic of that community are present, although it is now dominated by fountain grass. The center of the project site is transitional between the two vegetation types.

A brief description of each of the vegetation communities is given below. A list of all the plant species from the project site is given in Appendix 1.

1) Lowland Dry Grassland: On the island of Hawaii, the Lowland Dry Communities occur on the leeward side of the island and in the Puna and Ka'u Districts on the windward side. They typically are areas with hot, dry summers and moist winters. Annual rainfall may be as much as 80 inches, but generally is less than 40 inches, and occurs mostly during the winter months. The substrate ranges from weathered silty loams to stony clay soils; rock ledges with little, shallow soil, or recent, little-weathered lava. The Lowland Dry Grassland communities occur mostly in leeward situations from 100 to 6,500 feet in elevation and comprises mostly alien species. It is possible to further subdivide the vegetation communities based upon the dominant or co-dominant species. The grasslands of this site can be designated a Fountain Grass Grassland following the Gagne/Cuddihy classification system. It consists of a dense growth of fountain grass on *pehoho* and 'a'ala lava substrate. There is a sparse scattering of small shrubs intermixed with the grass, consisting chiefly of *melele* (*Capparis sandwicensis*), *elele*'s (*Psychotria odoratum*), 'a'ali (*Dodonaea viscosa*), and *koa haole* (*Laucaena leucocephala*); less common were *noni* (*Morinda citrifolia*) and *nalo* (*Myoporum sandwicense*). Other grasses and forbs, such as *pili* (*Heteropogon confertus*), *uhalo* (*Waltheria indica*), and hairy spurge (*Chamaesyce hirta*) grow in cracks in exposed patches of *pehoho* lava (Photos 2, 3).

2) Lowland Dry Shrubland: This vegetation community occurs on the leeward side of all the main islands except Nihoa and Kaho'olawe, at elevations ranging from about 300 to 2,000 feet. Annual rainfall is usually 20 to 70 inches, and occurs mostly during the winter months; the summers are hot and dry. The substrate varies from silty loams to relatively unweathered *pehoho* lava. Of the four subtypes of Lowland Dry Shrubland vegetation communities recognized by Gagne and Cuddihy (1990), the vegetation of the project site best matches that of their 'A'ali Lowland Shrubland. On the island of Hawaii, this community occurs on rugged, rocky terrain in the Ka'u and South Kona districts. Low growing, 'a'ali dominates the vegetation, which usually is open, and other native shrubs may be co-dominant. In some areas, alien species of grasses may be present, but are never a dominant element of the vegetation. The shrubland community of the project site is open which has allowed the invasion of fountain grass, and, unlike pristine examples of this vegetation type, is one of the dominant species. There is evidence of a recent fire in the south-eastern part of the site, and fires may have occurred in other parts of the area in the past, destroying native vegetation and favoring the invasion of the grass. Shrubs and small trees which are present include: 'a'ali, *elele*'s, *sourbush* (*Pluchea carolinensis*), *koa haole*, *noni*, *silk oak* (*Grevillea robusta*), *melele*, and *nalo*. The shrubs are taller on the more recent 'a'ala lava flows, where the ground cover is sparser and comprises more native species and less fountain grass (Photos 3, 4).

A collapsed lava tube running parallel to the power-line corridor in the upper part of the project site has several species of plants that are less common in other parts of the area surveyed. This probably is due to the added protection afforded by its rocky walls. These plants are *elele* *wai nui* (*Peperomia leptoclyta*), *huehue* (*Coccoloba frutescens*), and spurge (*Plectranthus parviflorus*).

SPECIES OF SPECIAL CONCERN:

No plants protected by state or federal regulations are known to have been documented from the proposed project site, although the site is within the historic distributional range of several species included on the U.S. Fish and Wildlife Service list of listed and candidate species (U.S. Fish and Wildlife Service 1998). These plants, as well as a candidate species and a species of concern which occur on the list are enumerated in Table 2 below.

Table 2: Listed, Candidate, or Species of Concern occurring or potentially occurring on the project site

Species (common name)	Status
<i>Bidens microantha</i> ssp. <i>cranchii</i> (Sheff) Nagata & Ganders (<i>ko'oko'ole</i>)	Candidate species
<i>Caesalpinia kavaiensis</i> H. Mann (<i>uhulu</i>)	Listed as endangered
<i>Capparis sandwicensis</i> DC (<i>melele</i> , <i>pua pua</i>)	Species of concern
<i>Colubrina oppositifolia</i> Brongn. ex H. Mann (<i>kaule</i>)	Listed as endangered
<i>Hedyotis corymbosa</i> A. Gray (<i>kele</i>)	Listed as endangered
<i>Pisonia hawaiiensis</i> Degener & I. Degener (<i>hale pepe</i>)	Listed as endangered

Only the *melele* was found in the project area. This species is a shrub with stems that usually are spreading to prostrate, and approximately 3 to 15 feet long. The leaves are oval to broadly elliptic in shape, somewhat fleshy, and up to about 2 inches wide and 2.5 inches long; the leaf stalks may be as long as 1.5 inches. The foliage is a light green or grayish green in color and is field when crushed. The flowers are nocturnal, white, fragrant, waxy and turning pink the following day. The stamens are white, numerous; one of the sepals and two of the petals are pouch-shaped. The fruits are somewhat banana-shaped, about two inches long, orange when ripe, and on a short stalk. Seeds are numerous, dark brown to gray in color, and embedded in the field, orange pulp of the fruit (Photo 5).

The first enumeration of rare and endangered plants in the Hawaiian Islands (Fosberg and Herbst 1975) lists *Capparis sandwicensis* var. *cranchii* (the Hawaii Island plants at that time were considered to be in the variety *cranchii*) as "depleted," that is, "...much less common over all or most of its range than formerly, the depletion directly or indirectly the result of human activities." Subsequent lists, including the U.S. Fish and Wildlife Service's (Service) proposed rule of 1976, and its notices of review, have included only the Oahu variety, variety *sandwicensis*, as endangered. In the *Manual of the flowering plants of Hawaii* (Wagner et al. 1990), only one variety of the species is recognized, and it is designated as "vulnerable," an international Union for Conservation of Nature and Natural Resources (IUCN) designation defined as "...taxa likely to become endangered in the near future unless the threats to their survival are removed or reduced." In consideration of the new taxonomic status of the plant, the U.S. Fish and Wildlife Service reclassified the taxa as a category 2 species, that is, a plant "...for which there is some evidence of vulnerability, but for which there is not enough data to support listing proposals at this time." Present the Service informally considers it a "species of concern," as the Service no longer recognizes category 2 species in their notices of review. This designation means that the species may be vulnerable as it is found in areas with high potential for development or other human disturbances, and should be watched. It has no legal standing, but potentially could become threatened or endangered in the future.

In conclusion, no plants which are candidate, proposed, or listed threatened or endangered species as set forth in the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543), were seen during this survey, and none are known historically from the proposed project site (although listed species are known from near-by parcels). None of the trees on the site are, nor could be considered candidates for the county exceptional tree program. The vegetation is not pristine nor unique and is not considered worthy of preservation.

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Appendix 1: Annotated Checklist of the Vascular Plants of the University of Hawaii Center at West Hawaii (UHCHWR), Hawaii Community College Site, Island of Hawaii, Hawaii

The following checklist was compiled from observations made by Herbot on the 10th through the 13th of March, 1998. The entries are arranged alphabetically under their family names and include the scientific name, the common name, the status of the species, and its relative abundance. With a few modifications, the nomenclature follows that of Wagner, Herbst, and Schner (1990) for the higher plants and Wagner and Wagner (1994) for the ferns.

SCIENTIFIC NAME (common name)	1	2
PTERIDOPHYTA		
DRYOPTERIDACEAE (sword fern family)		
<i>Nephrolepis multiflora</i> (Roxb.) Jerrett ex Morton (Asian sword fern)	X	U
POLYPODIACEAE (common fern family)		
<i>Thymosorus scolopendria</i> (N.L. Burm.) Pichi. Sem. (<i>laue</i> , male-scented fern)	X	R
PTERIDACEAE (pteris fern family)		
<i>Doryopteris decora</i> Brack. (<i>wa'wa, manawafua, kumunika</i>)	E	U
MONOCOTYLEDONEAE		
AGAVACEAE (agave family)		
<i>Cordyline fruticosa</i> (L.) A. Chev. (l)	P	R
POACEAE (grass family)		
<i>Eragrostis amabilis</i> (L.) Wight & Arnott (Japanese love grass)	X	U
<i>Heteropogon contortus</i> (L.) P. Beauv. ex Roem. & Schult. (ohe)	U	O
<i>Holcus lanatus</i> L. Beauv. (molasses grass)	X	U
<i>Melinis repens</i> (Willd.) Zizka (Natal redtop)	X	U
Synonym = <i>Rhynchelytrum repens</i> (Willd.) Hubb.		
<i>Pennisetum setaceum</i> (Forssk.) Chiov. (fountain grass)	X	A
DICOTYLEDONAE		
ASTERACEAE (sunflower family)		
<i>Pluchea carolinensis</i> (Jacq.) G. Don (sourbush)	X	O
Synonym = <i>Pluchea symphytifolia</i> (Mill.) Gillis		
ANACARDIACEAE (mango family)		
<i>Schinus molle</i> (L.) Mill. (<i>penani, prickly pear, papai</i>)	X	C
CACTACEAE (cactus family)		
<i>Opuntia ficus-indica</i> (L.) Mill. (<i>penani, prickly pear, papai</i>)	X	R
CAPPARACEAE (caper family)		
<i>Capparis sandwicensis</i> DC (<i>malapalo, palo, pua pua</i>)	E	C
CONVOLVULACEAE (morning-glory family)		
<i>Ipomoea indica</i> (J. Burm.) Merr. (<i>koala'awa, kosal'awakia</i>)	I	O

SCIENTIFIC NAME (COMMON NAME) 1' 2

EBENACEAE (ebony family) E R
Diospyros sandwicensis (A. DC) Fosh. (kama)

EUPHORBIACEAE (spurge family) X U
Chamaesyce hirs (L.) Millsp. (hairy spurge)

FABACEAE (pea family) X U
Acacia forsteriana (L.) Willd. (kū)
Chamaecrista nictitans ssp. *petaloides* var. *gabriata* (Vogel) H. Inwin & Barnaby
 (partridge pea)

Synonym = *Cassia lecheneaultiana* DC
Desmodium tortuosum (Sw.) DC (Florida beggarweed)
Indigofera suffruticosa Mill. (haka, indigo)
Leucaena leucoccephala (Lam.) deWitt (koa heale)

LABIACEAE (mint family) X R
Hypoxis pectinata (L.) Polt. (comb hypts)
Plectranthus perviliflorus Willd. ('alo'alo 'wai nui, spufflower)

MALVACEAE (hibiscus family) I O
Sida fallax Welp. ('āma)

MENISPERMACEAE (moonseed family) I O
Coccoloba thibaudii (Thunb.) DC (huahua)

MYOPORACEAE (naio family) I O
Myoporum sandwicense A. Gray (naio, bastard sandalwood)

PASSIFLORACEAE (passionflower family) X U
Passiflora foetida L. (love-in-a-mist)

PIPERACEAE (pepper family) I U
Peperomia leptostachya Hook. & Arnott ('ala'ala wai nui)

PORTULACACEAE (purslane family) X R
Portulaca oleracea L. (purslane, pigweed)

PROTEACEAE (protea family) X O
Grevillea robusta R. Br. (silik oak)

RUBIACEAE (coffee family) P O
Morinda citrifolia L. (noni, Indian mulberry)
Psychotria odoratum (G. Forster) A.C. Smith & S. Darwin (alahe'e, tohe)

SAPINDACEAE (soapberry family) I C
Dodonaea viscosa Jacq. ('a'ali)

STERCULIACEAE (cocoa family) I C
Waltheria indica L. ('uhoe)

SCIENTIFIC NAME (COMMON NAME) 1' 2
 VERBENACEAE (verbena family) X U
Lantana camara L. (lantana)

*EXPLANATION OF COLUMN HEADINGS AND SYMBOLS:
 Column 1 = STATUS: E = endemic (native to the Hawaiian Islands and not occurring naturally elsewhere), I = indigenous (native to the Hawaiian Islands and elsewhere), P = Polynesian introduction, X = naturalized exotic (non-native species of accidental or deliberate introduction). Column 2 = ABUNDANCE: A = abundant, C = common, O = occasional, U = uncommon, R = rare; these ratings of abundance are based upon the frequency with which the species occurs in the area as compared to all other species present. It does not indicate the abundance of the species throughout the Hawaiian Islands.

Appendix 2: Photographs of Nassau Center at West Nassau, Nassau Community College, Nassau

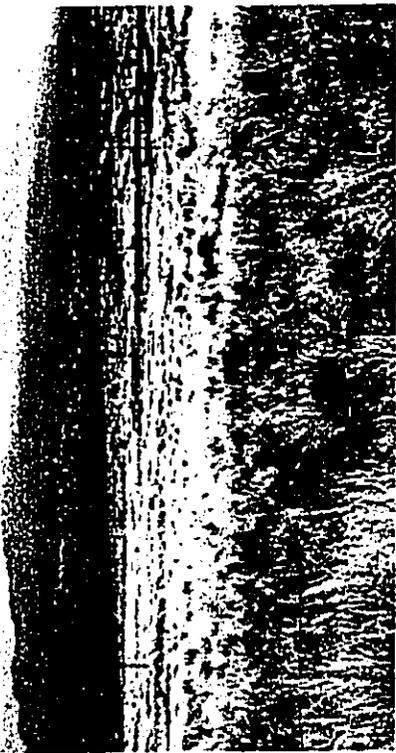


Photo 1: Project site. Taken from the east, up water for a leeching test. The top of the site is just west of the date line of the 1974 test. The date line is the boundary of the photo.



Photo 2: Fountain Grass Grassland vegetation community. The dominant vegetation associated with the site is the grasses in the foreground.

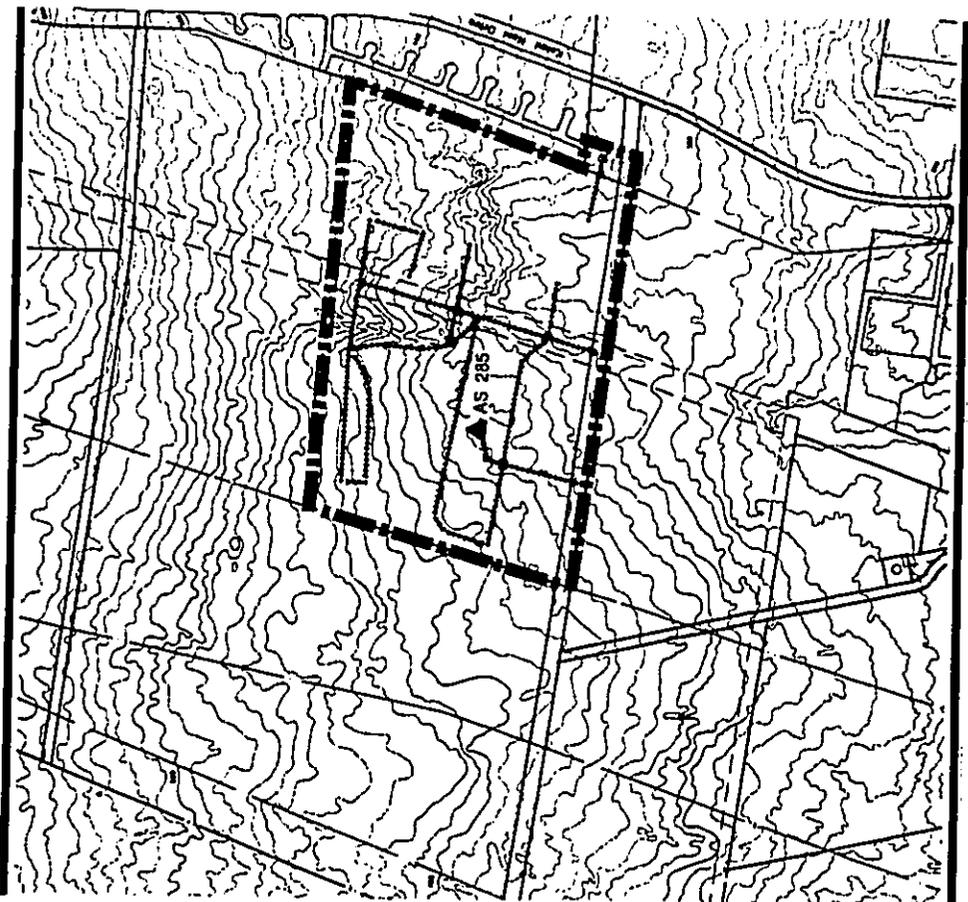


Photo 3: Fountain Grass Grassland vegetation community. The dominant vegetation associated with the site is the grasses in the foreground.



Photo 4: A high Lowland Shrubland vegetation community. The dominant vegetation associated with the site is the shrubs in the foreground.

Map 1: Proposed Project Site and Botanical Survey Transects, of the University of Hawaii Center at West Hawaii, Hawaii Community College Site, Island of Hawaii, Hawaii



Boundary of area surveyed [thick black line]

Approximate location of survey transects [dashed line]



Photo 5: *Capparis sandwicensis* - Macapuu, protected by the U.S. Forest and Wildlife Service, Hawaii



Photo 6: *Schinus terebinthifolius* - Chr 2030, area is one of the most important habitats for the species.



Appendix A-2
Faunal Survey

**Faunal Survey
of Terrestrial Species within the Proposed
University of Hawai'i Center at West Hawai'i Site,
North Kona, Hawai'i.**

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May 2000



Figure 1. Survey location on the Island of Hawaii (inset).

Introduction:

This report summarizes the findings of a two-day faunal survey of the proposed University of Hawaii Center at West Hawaii (UHCWH) site. Fieldwork was conducted on August 16th and 17th 1999. The area surveyed is located approximately 1400 meters (4600 ft) east (up-slope) from the intersection of Queen Ka'ahu-manu Highway and the entrance to the Kona International Airport, in North Kona, Island of Hawaii (Figure 1).

The primary purpose of the survey was to determine if there were any federally listed endangered, threatened, proposed, or candidate animal species on, or in the immediate vicinity of, the proposed development site. In addition, we were asked to assess the probability of any usage of the site by listed species given the habitat available.

Avian phylogenetic order used in this report follows *Birds Of The World: A Checklist 4th Edition* (Clements 1991), and the *1st and 2nd Supplements to Birds Of The World: A Checklist 4th Edition* (Clements and Prindipe, Jr. 1992, Clements 1997); scientific nomenclature follows *The AOU Checklist of North American Birds 7th Edition* (AOU 1998). Mammal scientific names follow *Mammals in Hawaii* (Tomich 1988), and, plant names follow *Manual of the Flowering Plants of Hawaii* (Wagner et al. 1990). Place names follow *Place Names of Hawaii* (Pukui et al. 1976)

General Site Description:

The study site encompasses some 51 hectares (126 acres) of a 200+ hectare (494+ acre) parcel that has been set aside by the State for a facility of higher education. The site is located within portions of the three ahupua'a of Kalaoa 1-4, Hamanamana, and Hale'ohi'u in the district of North Kona (Figure 1). The study site extends from approximately 106 meters to 137 meters (348 to 450 ft) in elevation. The terrain gently slopes from east to west and is composed of a mix of pahoehoe and a lava flow dating from the Holocene and Pleistocene ages (1500 - 3000 years ago) (Wolfe and Morris 1996).

The vegetation within the study site can be best characterized as a Lowland Vegetation Community with two recognizable vegetation associations. The vegetation on the lower or western part of the site falls within the Fountain Grass Grassland subtype of the Lowland Dry Grassland Community. This habitat is dominated by fountain grass (*Pennisetum setaceum*) an alien (introduced to Hawaii by man) African grass. The vegetation on the upper or eastern part of the site can be characterized as a degraded 'A'ali'i Lowland Shrubland subtype of the Lowland Dry Shrubland, although this portion of the study site is also dominated by fountain grass (Gagne and Cuddihy 1990, Wagner et al. 1990, Herbat 1999). During the course of the botanical survey some 35 species were detected, 20 of which are considered alien species (Herbat 1999).

Mammalian Survey Methods:

In an effort to detect the presence of endangered Hawaiian hoary bats (*Lasiurus cinereus semotus*), two stationary remote bat census stations were deployed on August 16 and again, at different locations, on August 17, 1989 for a total of four deployments (Figure 2). Broadband AnaBat II ultrasonic bat detectors coupled to voice activated cassette recorders and remote timing devices were used to detect bat vocalizations. In addition, visual scans were made for bats during crepuscular periods on the evening of the 16th as well as the following morning. Count stations were sampled once. Following techniques developed by Krusic et al. (1986), units were calibrated using a pet ultrasonic flea collar. The tapes were reviewed and the number of bat passes recorded were counted.

All other observations of mammalian species were of an incidental nature. With the exception of the Hawaiian hoary bat, all other terrestrial mammals found on the island of Hawaii are alien species. Most are ubiquitous, no trapping program was proposed or undertaken to quantify the usage by alien mammalian species of the study site. A running tally was kept of all vertebrate species observed and heard while within the boundaries of the site. The survey of mammals other than bats was limited to visual and auditory detection, coupled with observation of scat, tracks and other animal signs.

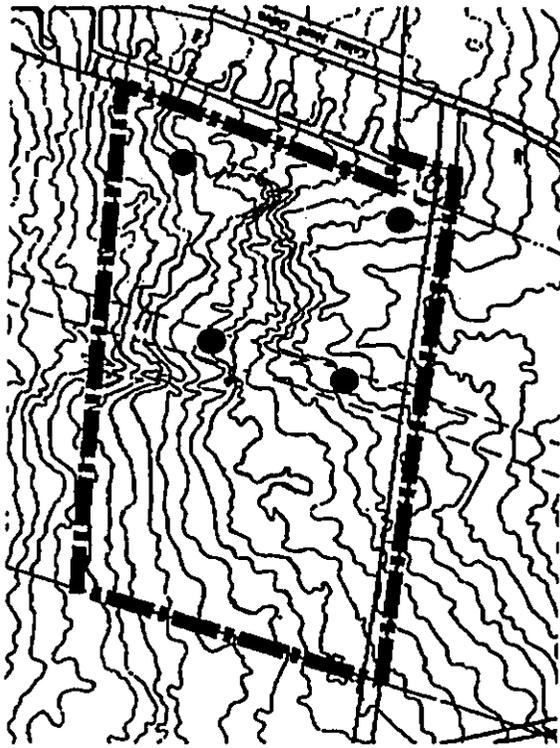


Figure 2. Site map showing the four hoary bat remote census stations for August 16 and 17, 1989.

Avian Survey Methods:

An initial reconnaissance visit was made to the site to identify habitat types present and to ascertain the general nature of the avian species present. Following the initial reconnaissance, 12 count stations were established within the study area. Six-minute unlimited distance counts were made at each station (Reynolds et al. 1980). Count stations were counted once; additionally, a tally was made of birds detected during the census time on site. Field observations were made with the aid of Leitz 10 X 42 binoculars and by listening for vocalizations. Counts were concentrated during the early morning hours between 0800 hrs and 1100 hrs, the peak of daily bird activity. An additional 2 hours were spent on the evening of the 16th of August in an attempt to detect nocturnally flying seabirds and owls overflying the area. Time not spent counting was used to search the site and the surrounding area for species not detected during count sessions.

Invertebrates and Other Vertebrates Survey Methods:

The site was traversed on August 16, 1989 and various habitats noted as present were visited. Collections of insects and other small invertebrates were made using various techniques, including capture with insect nets and hand sorting through litter and loose soil. Several accessible lava tubes were entered and a search made for insects and crustaceans in accessible subterranean areas. All observations were thus of an incidental nature and no trapping of invertebrates was attempted. However, wherever native plants were encountered during the field reconnaissance, these were searched for insects on the assumption that native insects might be attracted to these species. No aquatic habitat of any sort was found on the property during the field survey.

Results:

No mammalian species were seen or heard during the course of this survey. Skeletal remains were found of numerous roof rats (*Rattus r. rattus*) and other unidentified rat species (*Rattus* sp.?). European house mouse (*Mus domesticus*), a lone small Indian mongoose (*Herpestes a. europundelius*), and one feral goat (*Capra h. hircus*). Scat of domestic dog (*Canis f. familiaris*), cat (*Felis catus*), donkey (*Equus a. asinus*), and goat was encountered in numerous places within the site. No live rodents were detected during the course of this survey; however, it is likely that Norway rats (*Rattus norvegicus*) and possibly Polynesian rats (*Rattus exulans hawaiiensis*) utilize the site. Without conducting a trapping program, it is difficult to assess the population densities of these often hard-to-see mammals. All of these introduced mammalian species are deleterious to avian populations. Hawaii's sole endemic terrestrial mammalian species, the endangered Hawaiian hoary bat, or 'Ope'ape'a, was not detected.

A total of three avian species representing two families were detected within the study site. We detected two Spotted Dove (*Streptopelia chinensis*); Zebra Dove (*Geopelia*

striata), and House Finch (*Carpodacus m. mexicanus*). All three species are alien to Hawaii. We also found an old Barn Owl (*Tyto alba*) roost located within a collapsed section of a lava tube known as Archaeological Site #6418 (Cieghorn 1998). In addition to the three aforementioned species we also recovered the skulls of 2 other avian species from the midden under the Barn Owl roost. These were identified as being from a Japanese White-eye (*Zosterops japonica*), and a Nutmeg Manikin (*Lonchura punctulata*). Both of these are common alien species found throughout the lowland areas on the island of Hawaii. No endangered or threatened avian species were detected within the proposed development site (DLNR 1986, Federal Register 1998). The findings of both the avian and mammalian surveys were consistent with the present habitat available on the site.

The only other vertebrate observed on the site was the gecko, *Geyropa mutilata*.

No more than 15 different types of invertebrates were observed or encountered during the survey. Although taxonomic work remains to be completed, all species encountered are believed to be alien species. Most commonly encountered were various wasps (*Polistes* sp. and *Vespa* sp.), honey bee (*Apis mellifera*), and garden orb-weaver spider (*Argiope* sp.). The extreme dryness of the site would explain the relative low numbers of insects encountered. The situation might be somewhat different during wetter months of the year. Several small and one moderately extensive lava tube complex (archaeological Site #6418 in Cieghorn 1998) were explored to assess whether these harbored cave fauna. In general, conditions within these caves were found to be quite dry and only bigheaded ants (*Pheidole megalocera*) and a harvestman spider (Phalangidae or Pholcidae) were collected or observed.

Of invertebrate species listed or proposed for listing under the Endangered Species Act (Federal Register, 1999), only Blackburn's sphinx moth (*Manduca blackburni*) might occur in the project vicinity. This species presently is "proposed for listing as an endangered species" and is thought to no longer be present on the Big Island.

Previous Surveys:

There have only been four comprehensive bat surveys conducted on the island of Hawaii (Jacobs 1984, Cooper et al. 1995, Cooper and David 1985, David 1986). Only one of these surveys addressed lands close the study area addressed in this survey. David Jacobs conducted an island wide survey between 1980-1993 that attempted to ascertain the distribution and abundance of Hawaiian hoary bats by sampling along paved principal roadways around the island of Hawaii (Jacobs 1984). The bulk of the remaining published literature relies heavily on anecdotal and incidental information on bat distribution and abundance on the island (Baldwin 1950, Bryan 1955, Tomich 1986).

The first systematic surveys of the avifauna of Hawaii were undertaken in 1976. Starting in that year and continuing until 1983 the U.S. Fish & Wildlife Service (USFWS) conducted a statewide survey of the avifauna of Hawaii (Scott et al. 1986). During the

course of the Hawaii Forest Bird Surveys program (HFBS) the subject property was not surveyed; it was already so denuded of native forest that it was not thought that any native forest birds could still survive in the habitat present. In recent years there have been several Environmental Impact Statement (EIS) level faunal surveys conducted on lands within the general vicinity of the study site (PBR 1991, CH2M Hill 1992, 1993, David, 1995a, 1995b, 1999a, 1999b). None of these surveys covered invertebrates.

Discussion:

A one time survey can not provide a total picture of the wildlife utilizing any given area. Certain species will not be detected for one reason or another. Seasonal variations in populations coupled with seasonal usage and availability of resources will cause different usage patterns throughout a year or, in fact over a number of years. The project site and most of North Kona has been experiencing drought conditions for the past 3 years.

The findings of the mammalian survey are consistent with other surveys conducted within the lowland areas of North Kona within the recent past (David 1995a, 1995b, 1999a, 1999b). It is likely that Hawaiian hoary bats overfly the project site upon occasion, as they have been seen in numerous lowland areas in North Kona on a seasonal basis (David 1983, R. David unpublished field notes 1975-1999, Jacobs 1994). Currently the site has little to offer a passing bat. There are no suitable roost trees and volant insect life appears, at least from a cursory assessment, to be low. It is likely that following construction of the facility and the installation of outdoor lighting that the lights will attract moths and other volant insects, which may in turn attract bats. Hawaiian hoary bats have regularly been observed harvesting insects attracted to outdoor lighting (Cooper et al., 1995, David 1995c, 1999b).

The low diversity and density of avian species detected during this survey is lower than one would ordinarily expect from the location of the project area. The ongoing drought has greatly impacted many of the lowland alien avian species normally present in this area. Results of recent faunal surveys conducted by the principal author in the lowland grassland areas of the North Kona District have shown greatly reduced avian diversity and density over the last year or so (David 1999a, 1999b, 2000) as compared to earlier surveys and publications covering the same general area (David 1989, 1990, 1991, 1992, 1993, 1994, 1995a, 1995b). The habitats currently found on the site and within the fountain grass dominated lowland areas in North Kona do not provide resources necessary for the sustenance or nesting of native avian species. In a wetter year it is to be expected that additional resident avian species utilize the existing habitat within the project site. It is likely that following the construction of the facility and the installation of irrigated landscaping that many of the commonly occurring alien species currently found in North Kona will be recorded on the site. The installation of parking lots and other open areas may also attract a number of migratory shorebirds between the months of September and May each year. Many of the more than 80 species of migratory and extralimital avian species that have been recorded from Hawaii have been recorded from coastal areas in North Kona (Pyle et al. 1988, David 1991, Pyle 1982, 1997). The

commoner of these are Pacific Golden Plover (*Pluvialis fulva*), Ruddy Turnstone (*Arenaria interpres*), and the Wandering Tattler (*Heteroscoptes incanatus*).

It is possible that small numbers of the endangered endemic Hawaiian subspecies of the Dark-rumped Petrel (*Pterodroma phaeopygia sandwicensis*), or 'Ua'u over-fly the project site between the months of May and October (Banko 1980, Harrison 1990). This species was formerly common on the island of Hawaii (Wilson & Evans 1890-1899). This pelagic seabird reportedly nested in large numbers on the slopes of Mauna Loa and in the saddle area between Mauna Loa and Mauna Kea (Henshaw 1902), as well as the mid to high elevations of Mount Hualalai. It has, within recent historic times, been reduced to relicta breeding colonies located at high elevations on Mauna Loa and possibly Mount Hualalai (Banko 1980, Harrison 1990, Cooper & David 1985, Cooper et al. 1985, R. David unpubl. field notes for 1986-1985, 1989).

The primary cause of mortality in Dark-rumped Petrels is thought to be predation by alien mammalian species at the nesting colonies (Day and Cooper 1997, Cooper and Day 1994). Collision with utility structures is considered to be the second most significant cause of mortality of this seabird species in Hawaii. Nocturnally flying seabirds, especially fledging birds, can become disoriented by exterior lighting on their way to sea in the Summer and Fall. When disoriented, seabirds often collide with manmade structures and, if not killed outright, the dazed or injured birds are easy targets of opportunity for feral mammals (Ainley and Podolsky 1993, Ainley et al. 1994, Cooper and Day 1994, Day and Cooper 1997, Cooper and Day 1998, Podolsky et al. 1998). There is no suitable nesting habitat within the project site for this species. The principal potential impact that construction of the proposed project poses to Dark-rumped Petrels is the increased threat of the downing of birds disoriented by exterior lighting which may be required in conjunction with the new campus.

There is currently no habitat present on the project site necessary to support either Hawaiian Hawk (*Buteo solitarius*) or Hawaiian hoary bat (*Lasiurus cinereus semotus*). Any usage of the project site by either of these endangered species is best qualified as "incidental foraging". There is a possibility that when construction is completed, external lighting may attract volant insects, which in turn may provide additional foraging opportunities for bats. Hawaiian hoary bats have been known to forage on introduced insects attracted to external lighting on both Hawaii and Kauai.

Recommendations:

In the interest of reducing the potential for unwanted interactions between nocturnally flying Dark-rumped Petrels with external lights and man made structures, it is recommended that any lights planned for the campus be shielded (Reed et al. 1985).

Although no significant cave fauna was observed during the brief survey of the site, this habitat has potential to harbor unique endemic arthropods. For example, Kauai cave amphipod (*Speleorchestia kobena*) and Kauai cave wolf spider (*Adelocosa anops*) are now regarded as

proposed for listing as endangered species by USFWS (Federal Register 1999). The volcanoes cave cricket (*Thaurmalogyllis cavicola*) found on the Big Island is listed as a species of concern (SOC). Therefore, it is prudent to minimize destruction of this habitat during grading of the site. In general, the largest lava tubes with the most extensive underground spaces are either documented because of archaeological remains associated with them or are hidden from view. Nothing specific was encountered by the invertebrates survey that would require additional consideration beyond that anticipated to preserve archaeological sites.

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Appendix A-3

Archaeological Investigations

ABSTRACT

Archaeological investigations were conducted in a ca. 275 acre study area that is a portion of a 500 acre designated for the development of a University Center at West Hawaii, in North Kona, Hawaii. Fourteen archaeological sites are present in the 275 acre study area. These are described, discussed, and assessed for their significance in the present report. Five archaeological preserves are recommended to be established and managed. Four of these preserves can be developed into interpretive and educational venues, and one of the preserves should be protected from public visitation because of the presence of human burials. Accessibility to the archaeological site preserves is discussed and strategies for providing experiences to the different interpretive venues by all members of the community are explored. Finally, recommendations are provided regarding the final disposition of the archaeological resources in the study area.

ARCHAEOLOGICAL INVESTIGATIONS FOR THE PROPOSED UNIVERSITY CENTER AT WEST HAWAII NORTH KONA, HAWAII ISLAND

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145-004

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1.0 INTRODUCTION

Under contract to Wil Chee Planning (WCP), Pacific Legacy conducted archaeological investigations in approximately 275 acres of the 500 acre parcel designated for the development of the University Center at West Hawai'i (Figure 1). This study area was selected during pre-field investigation meetings with WCP personnel as being the most feasible for campus development because of topographic and terrain considerations. Field work was conducted during the period of March 9 - 20 1998. Field personnel consisted of James Head and Warren Wulzen. Paul Cleghorn joined the crew on the first day of field work in order to become familiar with the project area and to clearly develop the scope of work for the field investigations. The project area had been archaeologically surveyed previously (see below), so field investigations were designed to build upon the previous work. Specifically, field investigations had the following objectives:

- relocate and conspicuously mark with surveyors flagging tape all previously recorded archaeological sites in the study area;
- determine the current condition of the archaeological sites and compare this with the previously described condition;
- evaluate the original significance assessments and recommendations for the previously recorded sites;
- revise evaluations and recommendations as warranted;
- determine methods and contexts for site preservation as needed; and
- provide realistic estimates for further work if appropriate.

In addition to studying the previously recorded archaeological sites in the ca. 275 acre study area, the proposed alignment for an access road was surface surveyed for the presence of archaeological sites. This access road corridor measures ca. 900 by 30 m and extends from Ka'imani Street along the western boundary of the project area (Figure 1).

Finally, the previous investigations in the project area documented two clusters of sensitive archaeological sites that were revisited for the purpose of obtaining information from which realistic management recommendations could be developed. These clusters are: (1) a concentration of four sites along the eastern edge of the 500 acre parcel that were originally recommended for preservation (sites 276, 292, 295, and 296);

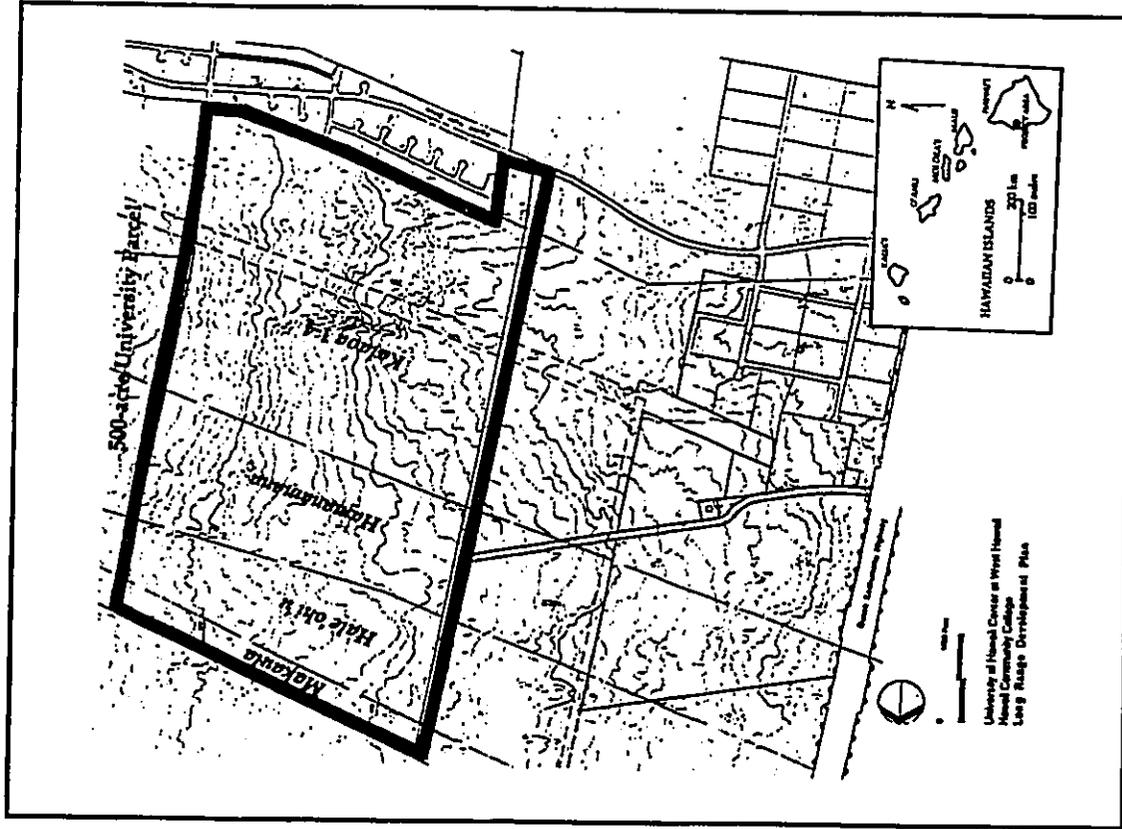


Figure 1. Location of Project Area

and (2) the two large lava tube sites in the northern portion of the 500 acre parcel (sites 298 and 302). The lava tube sites contain human burials and possible ceremonial areas that will need to be protected from curious individuals; recommendations will be presented in the present report regarding the protection of these sites. The present report will also present recommendations regarding the preservation and interpretation of the cluster of sites along the eastern edge of the 500 acre parcel.

1.1 Location and Environmental Setting

The study area encompasses the three *aliupua'a* of Kalaoa 1-4, Hamanamana, and Haleohiu in the district of North Kona on the leeward side of the island of Hawai'i. The study area extends from about the 350 foot (106.7 m) elevation to the 450 foot (137.2 m) elevation.

The study area consists of gently east to west sloping terrain that is composed of two terrain types - aa and pahoehoe lava flows that are dissected by lava tube systems that are primarily oriented *mauka-makai* (from the mountains to the shore), which is east to west in the study area.

Pahoehoe flows are the dominant terrain type within the study area. According to Sato et al. (1973:34) pahoehoe lava flows have "a billowy, glassy surface that is relatively smooth . . . in some areas, however the surface is rough and broken, and there are hummocks and pressure domes." Barren aa lava flows are prominent landscape features in the project area. Sato et al. (1973:34) describe this lava as "a mass of clinkery, hard, glassy, sharp pieces piled in tumbled heaps."

The primary vegetation in the study area is fountain grass (*Pennisetum setaceum*), with interspersed and scattered shrubs. Shrubs include: *ali'i* (*Dodonaea viscosa*), *noni* (*Morinda citrifolia*), *koa hiale* (*Leucaena leucocephala*), and Christmas-berry (*Schinus molle*).

The area is warm and relatively dry, receiving 20 to 30 inches (510 to 760 mm) of rainfall per year (Armstrong 1983:63). The mean low annual temperature is 60 to 65 degrees Fahrenheit (15.6 - 18.3 °C), and the mean high annual temperature is 80 to 82 degrees Fahrenheit (26.7 - 27.8 °C) (Armstrong 1983:64).

1.2 Previous Archaeological Research

Numerous archaeological investigations have been conducted in the vicinity of the project area, and the 500 acre project area has been the subject of an extensive archaeological inventory survey (Head and Rosendahl 1993). Head and Rosendahl (1993:4-16) provide an extensive review of previous archaeological studies in the area

and provide *aliupua'a* and environmental settlement models for the area. Several pertinent findings are provided:

- most of the archaeological sites that have been recorded in the vicinity of the project area are close to the coast, between the 0 - 40 foot (0 - 12.2 m) elevations which is probably due in large part to the rich marine resources of the area;
- site types found in the coastal zone include temporary and permanent habitation sites, religious sites, burial sites, trails, quarries, etc.;
- the weathered and generally unvegetated aa and pahoehoe lava flows located inland of the coastal zone, to about the 400 foot (121.9 m) elevation, contain low numbers of sites;
- site types found in this intermediate zone include trails temporary habitation shelters, and quarries; and
- the upland zone, from about 400 to 2,000 feet (121.9 - 609.6 m), contains isolated agricultural features such as rock mounds, terraces, and modified outcrops, as well as temporary habitation shelters.

From these findings, Head and Rosendahl (1993:16) predicted that they would encounter numerous archaeological sites within the 500 acre project area, including abundant agricultural features, temporary habitation features, trails, and lava tube sites.

The Head and Rosendahl (1993) survey covered the 500 acre parcel slated for the proposed development of the University Center at West Hawai'i. Head and Rosendahl (1993) identified and recorded 43 archaeological sites within this 500 acre parcel. These sites included temporary habitation sites, agricultural sites, trails, burials, religious sites, and petroglyphs. It appeared, based on their findings, that the project area may mark the northern extension of the extensive and intensive Kona Field System.

Limited test excavations by Head and Rosendahl (1993) within the 500 acre parcel produced five charcoal samples that were radiocarbon dated. These dates provide initial information on the chronology of use in this area of North Kona. It appears that the sites in this area date to the late prehistoric and early historic periods, possibly from ca. AD 1487 to the late 1800s (Head and Rosendahl 1993:45-46, 64).

Within the current 275 acre study area, Head and Rosendahl identified and recorded 13 archaeological sites. These sites are summarized in Table 1. Head and Rosendahl's site location map (1993: Figure 3) shows 15 archaeological sites within the study area. However, two of the sites plotted (267 and 301) do not appear to be archaeological sites, as they are not tabulated, described, or evaluated within the report.



The sites previously recorded in the study area represent a variety of formal and functional types. These include temporary habitation in shelters and lava tubes; possible water catchment in a lava tube; agricultural features such as mounds, excavations, and clearings; a *papaui* (or playing board for the game of *konaie* or Hawaiian checkers); and an enclosure that was used for habitation or possibly a religious shrine.

An earlier survey by Davis (1977) extended into the area of the proposed road alignment. Davis recorded a lava tube site that contained petroglyphs along the tube walls (site 6418). This site was relocated during the current investigations and is described in the results section below.

1.3 Methods

The proposed access road was surface surveyed by three archaeologists. Spacing during the pedestrian survey between the surveyors was between 10 and 20 meters depending on vegetation coverage (spacing was closer where the vegetation is denser). Surface archaeological sites encountered were recorded by standard archaeological methods-- their locations were plotted on a USGS topographic map; a plan view map was drawn; written descriptions were made; and black-and-white 35 mm photographs were taken.

In the area previously surveyed by Head and Rosendahl (1993), the previously recorded sites were relocated and examined in order to meet the field investigation objectives set forth in Section 1.0.

No subsurface testing, sampling, or surface collecting were conducted.

Table 1. Previously Recorded Archaeological Sites with Original Recommendations (Head and Rosendahl 1993).

Site No.	Site Type	No. of Features	No. Further Work	Further Collection	Preservation	Comments
15283	Mod. Depression	1	x			A pahoehoe channel filled with boulders and boulders.
15284	Complex	2	x			Two pahoehoe outcrops modified into shelters.
15285	Mod. Depression	1	x			A pahoehoe crater filled with boulders.
15286	Walls	2	x			Two roughly parallel walls with possible cleared area between them.
15287	Complex	5			x	Temporary habitation complex with assoc. Ag. features; no cultural deposits present, but good example of temp. hab. Site assoc. with Ag. features.
15288	Lava Tube	1		x		A small lava blister with a collapse allowing access into a shelter; concrete slabs on interior surface; no deposit.
15289	Complex	72		x		This complex consists of 4 terraces (A, C, E, G) with (B, D, F, H) and (I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z) lava alignments (R).
15290	Lava Tube	1		x		Modification include an alignment and possible cleared area; may be additional shelter; no artifacts or cultural deposits found.
15291	Complex	2		x	x	One enclosure with a collapsed by NE corner; 1 pc. of platform (A) and 1 pc. of platform (B). Head and Rosendahl interpret site as a habitation feature, it may be a religious site.
15292	Complex	2		x		Complex consists of 1 mod. outcrop and a lava tube (A) and 1 wall (B). Head and Rosendahl interpret site as a habitation feature, it may be a religious site.
15293	Complex	2		x		Complex consists of 1 mod. outcrop and a lava tube (A) and 1 wall (B). Head and Rosendahl interpret site as a habitation feature, it may be a religious site.
15294	Papaui and wall	1	x			A papaui with an associated wind break wall.
15295	Calim	1	x			Amorphous calim
15296	Lava Tube	1		x		Lava collapse lava tube forming a shelter, consisting thin soil layer with scattered burned fluid mud frags.



2.0 RESULTS

2.1 Archaeological Sites Within the Study Area

Fifteen archaeological sites were investigated within the study area. All but one of these sites were recorded previously. The location of these sites is shown in Figure 2 and summary data are presented in Table 2. More detailed descriptions of these sites are presented below.

Site 50-10-28-6418¹ This site is a lava tube complex that was originally recorded by Davis (1997). This lava tube complex consists of three tube portions that are described below, a washer was found in Section 3 (see below) that had the number 6418 inscribed on it.

Section 1 is a large collapsed section of tube (ca. 35 by 30 m) that has several utilized areas.

Feature A is an area (ca. 12.5 by 8.5 m) with several concentrations of *opitii* shells.

Feature B is a J-shaped stone alignment (ca. 2.5 by 1.5 m).

Feature C is a 3.0 m long section of wall that is 0.3 m high.

Feature D is a small (2.0 by 0.7 m) overhang shelter that has a maximum internal height of 0.7 m.

Feature E is a small overhang shelter (1.2 by 0.7 m) with a maximum internal height of 0.7 m.

Feature F is a small excavation (ca. 1.0 by 0.7 by 0.7 m deep) in the pahoehoe lava flow with an associated 0.5 m high rock wall.

Feature G is a small (ca. 1.5 by 0.7 m) overhang shelter.

Section 2 is a section of lava tube that measures ca. 45 by 20 m that contains a large platform (ca. 9.0 by 8.0 m by 1.2 to 2.5 m high) directly beneath the skylight. The platform is roughly paved with basalt cobbles and pebbles and has an alignment of stone

¹ State Historic Preservation Division numbering system where 50=Island of Hawai'i; 10=Island of Hawai'i; 28=USGS Kailua, Hawai'i Quadrangle Map.

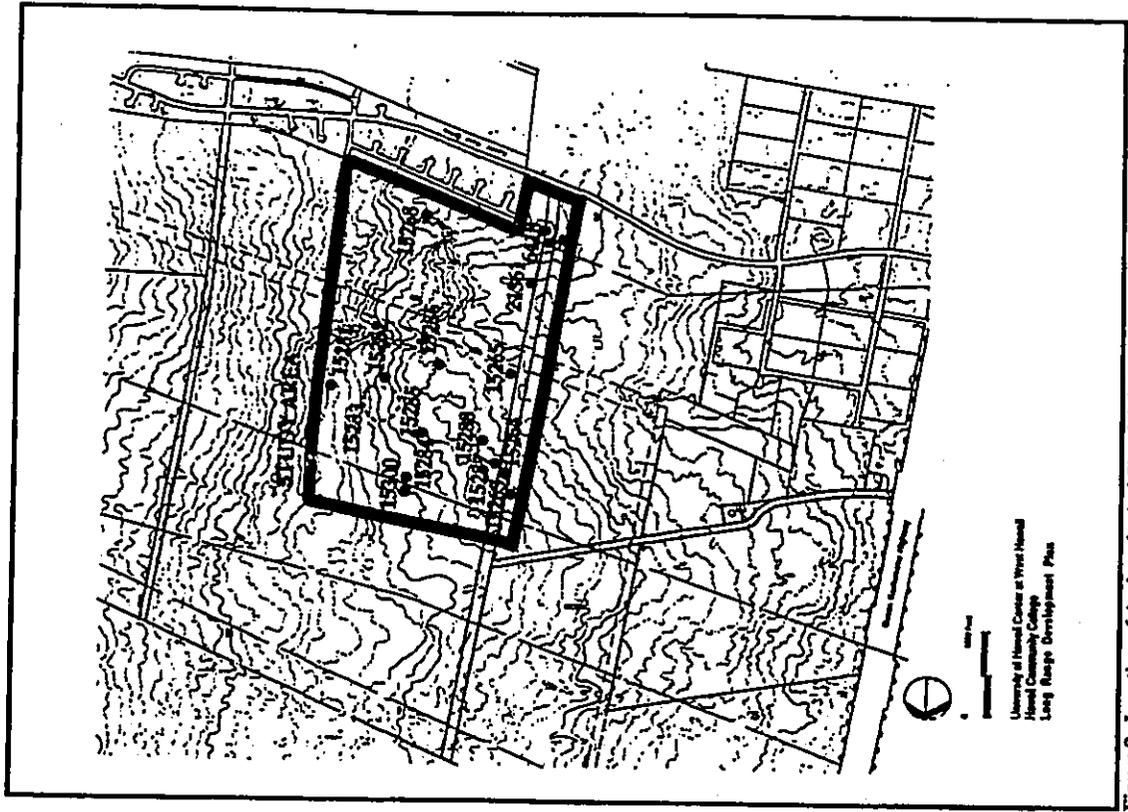


Figure 2. Location of Archaeological Sites Within the Study Area



Table 2. Summary of Archaeological Sites in Project Area

Site No./Type	Condition	Description	Current Recommendations
262. Lava Tube with Petroglyphs	Good	This site was previously recorded by Bert Davis in 1977. It is a large lava tube with approximately 40 petroglyphs carved into the walls of the tube. Midden and an ash deposit are present as well. This site was recorded as T-4 in the field.	This site has good excavation potential and the petroglyphs should be recorded. The site should be preserved.
. Utilized Sinkhole	Fair to Poor	This is a large sinkhole that contains eight features, including a midden, an alignment, a wall, 3 overhang shelters and an excavation. The site has been mapped, described and photographed. This site was not previously recorded, but appears to be part of the same tube system; it was recorded as T-1 in the field.	No further work is necessary.
. Utilized lava tube	Good	This is a large lava tube with a large platform under the skylight. Cultural materials observed include: several large opih shells (ca. 80 mm in diameter), coral, and an ash deposit. Evidence of owl, goat, and human children present in the lava tube. This site was not previously recorded, but appears to be part of the same tube system; it was recorded as T-2 in the field.	There is good excavation potential here, that would aid in determining the chronology of use in the area. The site should be preserved.

Site No./Type	Condition	Description	Current Recommendations
15263: Modified depression	Good	This is a palohoe channel that has been partially filled with cobbles and boulders. No artifacts or cultural deposits observed.	No further work is necessary for this site.
15264: Complex of two modified outcrops	Good	This site consists of two modified outcrops. Feature A is a crevice in a palohoe pressure ridge that has been partially filled with cobbles and boulders. The crevice opens into a small lava tube that contains no cultural material. Feature B is a cleared hole in the palohoe.	No further work is necessary.
15265: Modified depression	Good	This is a crevice in palohoe that has been filled with cobbles and boulders creating a relatively flat surface.	No further work is necessary.
15268: Two parallel walls	Good	This site contains two roughly parallel walls with the between area being possibly cleared. This is a possible trail segment across as lava. It may be of recent construction.	No further work is necessary.
15281: Temporary habitation site complex	Good	This site consists of five features that probably functioned as a temporary habitation complex. The features include a modified lava tube, an alignment atop a palohoe flow, a circular alignment, an excavation in the palohoe, and a modified depression.	This site should be preserved and interpreted as a temporary habitation complex. The site will need to be cleared of vegetation and mapped in detail. The resulting map could be used in interpreting the site.

Site No./Type	Condition	Description	Current Recommendations
15282; Utilized lava blister	Good	This is a small lava blister containing a slight scatter of coverie shell that was probably used for temporary shelter or storage.	No further work is necessary.
15283; Agricultural Complex	Good	This is an agricultural complex of 72+ features. Features present include terraces, walls, modified outcrops, and mounds. One of the modified outcrops (feature N) appears to be a sealed crevice or lava tube entrance, which we suspect may contain human burial remains.	A sample of clustered features in the central portion of the complex (in the vicinity of Features A, B, and N) should be cleared and mapped in detail. This portion of the complex should be preserved and interpreted as an example of the agricultural pursuits that took place here prehistorically.
15284; Utilized lava tube	Good	This small lava tube contains a possible alignment along one wall and a thin deposit of soil near the opening. No charcoal, middens, or artifacts were observed.	No further work is necessary.
15285; Enclosure	Good	This is a small roughly square stone enclosure located on an elevated point of land. There is a possible cupboard in the NE corner and one piece of branch coral was observed on the exterior side of the eastern wall near the SE corner. While the original interpretation was that this was a habitation site, it may have been a religious site.	This site should be cleared of vegetation, so that the surface of the feature and the surrounding ground can be carefully examined for cultural materials. A plane table map should be drawn and the site should be preserved and interpreted.

Site No./Type	Condition	Description	Current Recommendations
15286; Temporary habitation complex	Good	This site complex consists of a small lava tube that contains an alignment, a possible water catchment support feature, and a shallow soil deposit; and two modified outcrops.	A detailed map of the lava tube needs to be made, and the soil deposit should be excavated to recover charcoal that would assist in determining when the features in the project area were utilized. The site probably does not need to be preserved after the above data are collected.
15287; Papanu with associated semicircular alignment of stone	Good	The <i>papanu</i> consists of a grid of 150 holes (10 x 15) pecked into the pahoehoe lava flow. The alignment may have been the beginnings of a wind break wall.	While no further work is necessary at this site, it should be preserved and incorporated into an interpretive plan.
15288; cairn	Poor	This cairn was probably a marker of some sort and was probably circular or square in plan view.	No further work is necessary.
15300; Overhang shelter	Good	A large collapsed lava tube contains a small overhang shelter that contains a shallow deposit of soil containing burned and broken <i>lului</i> endocarp fragments.	The soil deposit could be excavated for the purpose of obtaining dateable material to address chronological questions.
21361; Stepping stone trail	Good	This is a short (ca. 15 m) section of trail, formed of pahoehoe slabs, on a lava. The trail ends in the middle of the lava flow.	No further work is necessary.

that divides it roughly in half. Concentrations of ash, *opihii* shell, and *kukui* endocarp were observed, as was a single piece of coral.

Section 3 is a collapsed section of lava tube that has a panel of petroglyphs in the eastern wall of the collapse. Approximately 40 petroglyph figures are located here. Some of these figures are partially buried by an artificially constructed floor. Davis (1977) conducted test excavations here, but the results have not been reported (Davis 1977:28; SHPD library and GIS inventory search). Four features were recorded during the current investigations:

Feature A is the 15 m long panel of petroglyphs (Figures 3, 4, and 5).

Feature B is a 6 m long alignment of stone along a natural ramp that leads into the north side of the collapse.

Feature C is a roughly paved area (3.5 by 2.5 m) on the west side of the collapse. Nearby is an entrance to another tube, which was investigated and showed no evidence of human use.

Feature D is a soil and midden deposit along the east side of the collapse adjacent to the petroglyph panel; cowrie, sea urchin and *opihii* were observed.

Site 50-10-28-15263 This site measures ca. 3.5 by 2.5 m and consists of a filled depression across a swale in the pahoehoe lava flow. The fill, consisting of pahoehoe cobbles and boulders ranging in size from 0.06 to 0.8 m, creates a level surface across the swale. There is a hole in the SW portion of the filled area that measures ca. 0.8 by 0.6 by 0.9 m deep with a thin deposit (ca. 1-2 cm) of soil. No cultural material was observed.

The condition of the site appears unchanged since it was originally recorded in 1992 (Head and Rosendahl 1993:A-2). There does not seem to be any additional data to be recovered from this site, so no further work is recommended. This site has low interpretive potential.

Site 50-10-28-15264 This site consists of two modified outcrops and a lava tube in an area measuring ca. 17.3 by 7.5 m.

Feature A is a pressure ridge with a split top that has been filled with cobbles and boulders. Below this split is a lava tube (Feature C).

Feature B is an excavation in the pahoehoe lava flow that measures ca. 1.7 by 1.1 m. The rocks that were removed were placed into an alignment that partially encloses the excavated area on the N, E, and S sides.



Figure 3. Site 6418 - Overview of Petroglyph Panel



Figure 4. Site 6418 - Close-up of Petroglyphs



Figure 5. Site 6418 - Close-up of Petroglyphs

Feature C is a low lava tube that extends from the NE to the SW. Although the tube is very low (ca. 0.6 m) it is about 20 m long with three openings. The interior was carefully inspected for human remains and other cultural material. No human remains or other cultural material were observed, although minimal aeolian soil deposits were observed near the tube entrances.

This site remains in good condition although Feature B is covered with fountain grass. No additional data appear to be present in these features, so no further work is recommended. While this site has low interpretive potential, it could be incorporated into a landscaping design and interpreted as an example of temporary habitation features of the area.

Site 50-10-28-15265 This is a modified depression that measures ca. 3.5 by 3.0 m. Modifications consist of filling the depression with large pahoehoe cobbles and small boulders.

The condition of this site is unchanged since it was originally recorded in 1992 (Head and Rosendahl 1993: A-3). No further data appear to be present, so no further work is recommended. This site has a low interpretive potential.

Site 50-10-28-15268 This site consists of two parallel walls with an intervening cleared area situated atop an aa ridge. The walls are ca. 6.7 m long and less than 0.5 m high, with a 1.8 m cleared area between the walls.

The condition of this site is unchanged since it was originally recorded in 1992 (Head and Rosendahl 1993: A-4). No further data appear to be present, so no further work is recommended. This site has a low interpretive potential.

Site 50-10-28-15281 This is a complex of five features that probably functioned as a temporary habitation complex.

Feature A is a small pahoehoe blister (Figure 6) that has been modified by the placement of pahoehoe slabs to form possible storage areas within the blister. Overall, the feature measures 8.7 by 3.7 by 1.0 m high, is oval in plan view and domed-shaped in profile. A single *Echinoid* spine was observed within the shelter.

Feature B is a 1.9 m long alignment of pahoehoe cobbles and boulders atop a pahoehoe lava flow.

Feature C is a roughly circular alignment of pahoehoe cobbles and boulders that measures ca. 2.6 by 1.8 by 0.3 m high.

Feature D is a small excavation in the pahoehoe lava flow.

Feature E is a depression in the pahoehoe lava flow that has been filled with cobbles and boulders creating a relatively flat surface.

The condition of the site appears unchanged since it was originally recorded in 1992 (Head and Rosendahl 1993:A-24-25). There does not seem to be any additional data to be recovered from this site, so no further work is recommended. This site has good potential to be interpreted as an example of temporary habitation in the area.

Site 50-10-28-15282. This is a small collapsed lava blister with a 0.5 by 0.4 m opening at the top. Originally cowrie shell was described as being scattered on the surface of the interior (Head and Rosendahl 1993: A-25), but none was present when recently re-examined. No modifications of the blister are evident.

No further data appear to be present, so no further work is recommended. This site has a low interpretive potential.

Site 50-10-28-15283. This is a complex of more than 72 features in an area that measures ca. 150 by 150m. These features were probably associated with agricultural pursuits in this area. The original account of this complex (Head and Rosendahl 1993: A-25 - A-30) described 4 terraces, 3 walls, 53 modified outcrops, 6 mounds, 1 lava tube, 1 modified depression, 2 excavations, and 1 alignment.

The current investigations recorded an additional feature (Feature N) which is a modified outcrop. This appears to be the opening to a lava tube that has been sealed by stacking cobbles and boulders in the opening. While the function of this feature is unknown, it is possible that it opens into a lava tube which may have been used as a burial site.

The condition of this site is unchanged since it was originally recorded in 1992 (Head and Rosendahl 1993: A-25 - A-30). Three major features (A-terrace; B-wall, and N-modified outcrop) are clustered in the central portion of the complex. These features, along with a small sample of the other features in the immediate vicinity should be preserved and interpreted as an example of the agricultural activities that took place in this area. This concentration of features should be cleared of vegetation, and mapped and fully documented as a representative sample of this site complex. The map and description can be used to develop the interpretive potential of this site. Further recording and investigations should also take place at Feature N. If it is to be preserved, we recommend that no excavations take place. However, if preservation is not feasible, the opening should be investigated to determine the function of this site and whether or not it contains human burials.



Figure 6. Site 15281, Feature A - Lava Blister

Site 50-10-28-15284 This site is a modified lava tube that measures ca. 16.0 by 3.5 by 0.7 m high. There is a rough alignment of 12 boulders on the east side of the tube, that extends north-south. The original description of this site (Head and Rosendahl 1993: A-30) noted a charred area, but closer examination during the current investigations indicate that this is natural sediment.

No further data appear to be present, so no further work is recommended. This site has a low interpretive potential.

Site 50-10-28-15285 This site is a stone enclosure situated on a rise of pahoehoe lava (Figure 7). The enclosure measures ca. 10.0 by 8.0 by 1.6 m high that has a cupboard in the interior NE corner of the enclosure. The walls of the enclosure are constructed of stacked pahoehoe slabs ranging from two to six courses high. The interior enclosed space measures ca. 4.0 by 3.6 m. A single piece of non-weathered, non-waterworn branch coral is present on the exterior side of the eastern wall near the SE corner.

The original interpretation (Head and Rosendahl 1993:A-31 - A-32) was that this feature was a habitation site. While this may be true, there is a strong possibility that this site was a religious shrine for the following reasons:

- 1) its location on an elevated rise, in association with a large agricultural complex (Site 15283);
- 2) the relative substantial nature of the structure's construction, which is not a common attribute of other features in the vicinity;
- 3) the presence of branch coral that probably had been harvested as a live specimen prior to its placement on this structure (evidenced by its non-weathered and non-waterworn appearance)n suggests that this was a religious or ceremonial offering;
- 4) the placement of the branch coral along the eastern wall may have religious or ceremonial implications as Kirch has begun to argue for late prehistoric religious sites in leeward Maui (Patrick Kirch personal communication); and
- 5) the lack of any habitation debris such as shell midden lithic artifacts, etc.

The condition of this site is unchanged since it was originally recorded in 1992 (Head and Rosendahl 1993: A-30 - A-31). The site has excellent interpretive potential. As part of the interpretive process, the structure should be cleared of vegetation so that interior features and deposits can be investigated and a detailed map should be made. Some stabilization of walls and interpretive signage may be necessary.



Figure 7. Site 15285 - Stone Enclosure

Site 50-10-28-15286 This is a complex of two features, a modified outcrop and a utilized lava tube. The modified outcrop is amorphous in shape and found near the opening of the lava tube. The lava tube is ca. 12.0 m long and contains a 6.0 m long stone alignment along the east side of the tube. The tube also contains three pahoehoe slabs placed in a way that suggests that they may have supported a vessel used in water catchment. A concentration of charcoal flecks is present near the opening that was originally described as a midden deposit (Head and Rosendahl 1993: A-31 - A32).

The condition of this site is unchanged since it was originally recorded in 1992. Further work recommended for this site includes some mapping and excavation/ collection of the charcoal present. The charcoal should be submitted for radiocarbon dating to provide more information on the chronology of the area's use.

Site 50-10-28-15287 This site is a *papamu*, or game board for the Hawaiian checker game of *konane*. It consists of a grid of 150 holes pecked into the pahoehoe lava flow. The 10 rows of 15 holes are spaced about 5 cm apart and have maximum depths of about 1 cm. A short semi-circular alignment of seven cobbles and boulders is adjacent to the *papamu*. This game board may be associated with the nearby temporary habitation site of 15264.

The condition of the site appears unchanged since it was originally recorded in 1992 (Head and Rosendahl 1993: A-32). There does not seem to be any additional data to be recovered from this site, so no further work is recommended. This site should be preserved and has good potential to be interpreted in conjunction with the temporary habitation site at 15264.

Site 50-10-28-15288 This site is an *ahu* or cairn that is in poor condition. It may have been square or roughly circular in plan, but has deteriorated into an amorphous shape. The cairn measures ca. 2.1 by 1.8 by 0.9 m. While this type of site may mark the existence of a *miniaka-makai* trail, no such trail was found in the vicinity of this site.

The condition of the site appears unchanged since it was originally recorded in 1992 (Head and Rosendahl 1993: A-33). There does not seem to be any additional data to be recovered from this site, so no further work is recommended.

Site 50-10-28-15300 This is a small overhang shelter located in a large collapsed lava tube. The shelter is formed in a small north facing overhang and measures ca. 1.9 by 0.6 by 0.9 m high. The floor of the shelter contains a thin (1-3 cm) layer of soil that contains burned *kukui* endocarp fragments.

The condition of the site appears unchanged since it was originally recorded in 1992 (Head and Rosendahl 1993: A-71). Limited excavation is recommended to obtain a sample of the carbonized material for dating purposes. This site has low interpretive potential.



Site 50-10-28-21361 This is a newly discovered segment of stepping stone trail atop an aa lava flow (Figure 8). The trail segment is ca. 15.0 m long and consists of about 20 pahoehoe lava slabs. The trail begins at the edge of the aa lava flow and abruptly ends in the middle of the flow.

2.2 Archaeological Sites Outside of Study Area Requiring Management

Two additional clusters of sites outside of the study area, but within the 500-acre project parcel, were examined (Figure 9). These sites consist of an eastern cluster of temporary habitation sites and a northern cluster of large and complex lava tube sites. Each of these site clusters has special management concerns that are discussed below.

2.2.1 Eastern Site Cluster

The eastern cluster is composed of eight sites that probably functioned as temporary habitation sites (sites 15290, 15291, 15292, 15193, 15294, 15295, 15296, and 15297). This site cluster consists of two extensively modified lava tubes (sites 15292 and 15297), several platforms, enclosures, terraces, and pavements.

The two lava tube sites contain terraces, pavements, walls, and enclosures. The extensive modifications appear to have been made to convert these natural lava tubes into temporary habitation shelters.

One of the surface platforms (site 15290) also has an adjoining stone enclosure. It is possible that this may be a ceremonial site because of the complexity of the site and the presence of two possible upright stones in these features.

One of the other surface platforms (site 15295) is reported to possibly contain a human burial (Head and Rosendahl 1993: A-39). This site needs to be preserved and protected.

2.2.2 Northern Site Cluster

The northern cluster of sites consists of two lava tube complexes (sites 15298 and 15302).

Site 15298 is a habitation and refuge cave that is approximately 700 m long and contains over 165 features, including at least four human burials. It is accessed by two collapse areas at the *makai* (22.0 by 8.0 m) and *mauka* (ca. 30.0 by 8.0 m) ends of the tube. The main habitation area (ca. 24.0 by 16.0 m) is located at the western (*mauka*) end of the complex and includes numerous terraces, walls, pavements, and middens. The possible refuge area is about 140 m long located in the central portion of the tube with modified roof-fall collapses on either side of this area.



Site 15302 is a large habitation cave that may have also had ceremonial functions associated with its use. The lava tube consists of two levels, the upper level measures approximately 120 m long and the lower level measures approximately 110 m long. Access into the lava tube is gained through a collapse at the eastern edge of the tube. A skylight (ca. 6 x 4 m) near the west end of the tube provides light to a complex portion of the cave. One of the previously recorded features (Feature BF1) was recorded as ceremonial because of the presence of a large upright boulder (1.2 x 0.9 x 0.5 m) which is placed against the N wall of the tube in association with two contiguous enclosures. Shell midden, charcoal, ash, a water worn cobble, and a piece of coral are present in the immediate vicinity of this feature. No human remains were observed within this site.

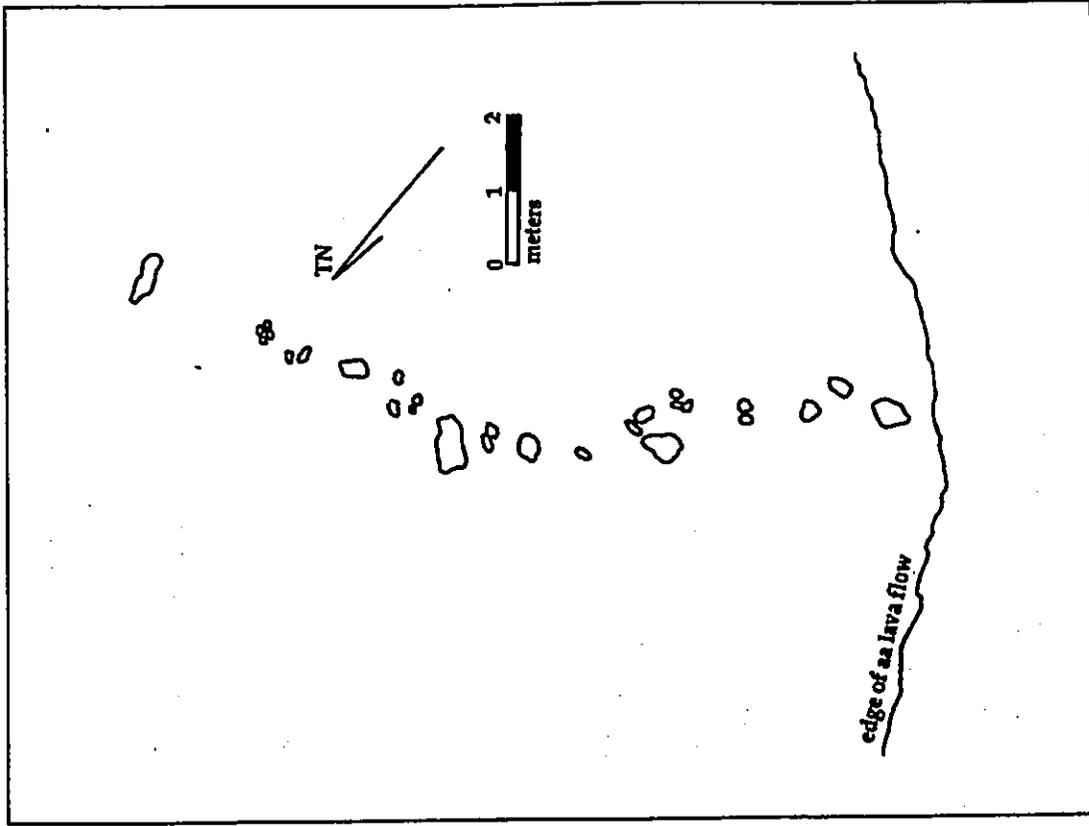


Figure 8. Site 21361 - Stepping Stone Trail



3.0 HISTORIC SIGNIFICANCE ASSESSMENTS

The National Historic Preservation Act of 1966 (as amended) authorizes the Secretary of Interior to expand and maintain a National Register of Historic Places (NRHP) that contains a listing of districts, sites, buildings, structures and objects significant in American history, architecture, archaeology, engineering and culture. A property may be listed in the NRHP if it meets criteria for evaluation defined at 36 CFR 60.4:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and

- (a) That are associated with events that have made a significant contribution to the broad patterns of our history; or
- (b) That are associated with the lives of persons significant in our past; or
- (c) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- (d) That have yielded, or may be likely to yield, information important in prehistory or history.

The previous archaeological investigations (Head and Rosendahl 1993) failed to assess the significance of these archaeological sites based strictly on the above criteria, though it is possible to determine what these assessments would be based upon their PHRI evaluations. Table 3 presents our explicit assessments of the significance for the archaeological sites that are present within the ca. 275 acre study area. The sites that are assessed as being "not significant" may have originally been significant for their information content, but all feasible informational data have already been recorded, either during the original phase of archaeological investigations (Head and Rosendahl 1993) or during the current investigations, so that these resources are no longer judged to be significant.

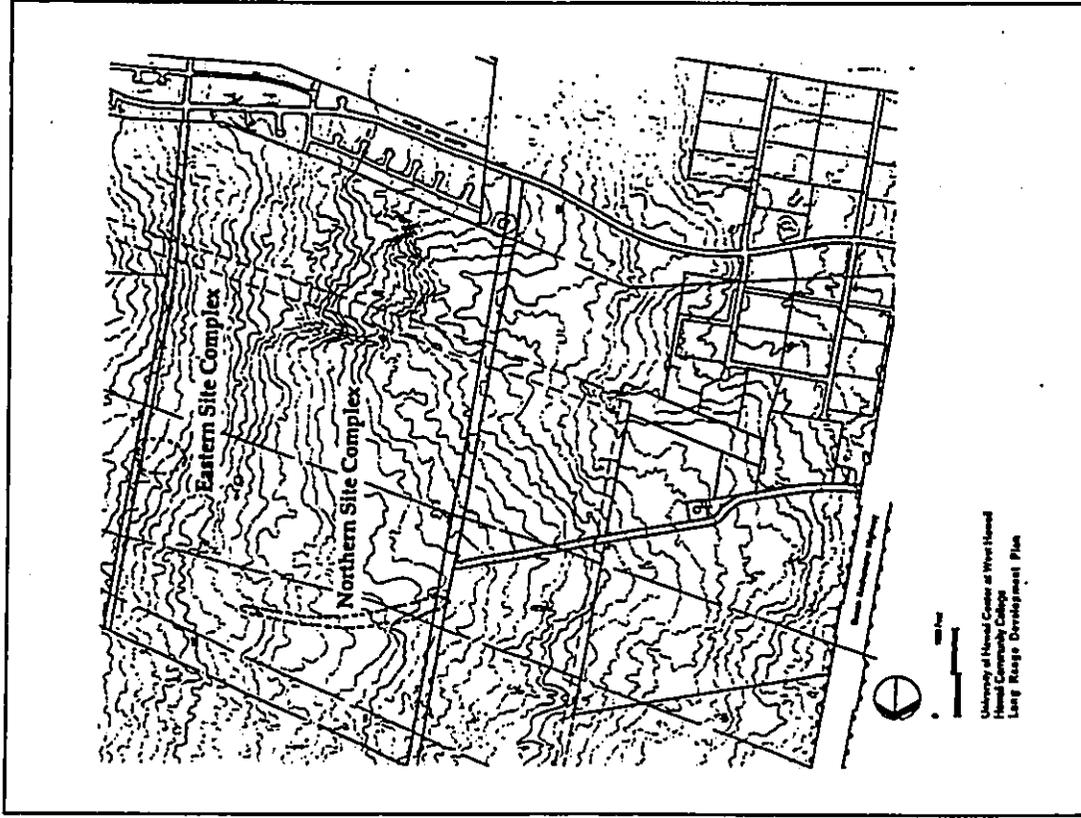


Figure 9. Location of Northern and Eastern Site Complexes

TABLE 3.
HISTORIC SIGNIFICANCE ASSESSMENTS

SITE NO.	SIGNIFICANCE CRITERIA				NOT SIGNIFICANT
	A	B	C	D	
6418				X	X
15263					X
15264					X
15265					X
15268					X
15281					X
15282					X
15283					X
15284				X	X
15285			X		
15286			X		
15287			X		
15288				X	X
15300					
21361				X	X

4.0 SUMMARY AND DISCUSSION

The present report described the results of an archaeological assessment that was conducted in a ca. 275 acre study area, which is part of a larger 500 acre parcel of State of Hawai'i lands. The ca. 275 acre study area is being studied for the purpose of long range planning for the development of a University Center at West Hawai'i. A previous archaeological study of the 500 acre parcel resulted in recording 43 archaeological sites. Fourteen of these previously recorded sites are located within the present study area. The present archaeological assessment had the following specific objectives that were originally presented in Section 1.0 of the present report:

- relocate and conspicuously mark with surveyors flagging tape all previously recorded archaeological sites in the study area;
- determine the current condition of the archaeological sites and compare this with the previously described condition;
- evaluate the original significance assessments and recommendations for the previously recorded sites;
- revise evaluations and recommendations as warranted;
- determine methods and contexts for site preservation as needed; and
- provide realistic estimates for further work if appropriate.

These sites were marked in the field, and described and evaluated in the previous sections of this report. The purpose of this section is to summarize and discuss these results and present ideas on the development of archaeological preserves and interpretive facilities.

As shown above, the study area consists of a harsh environment. The land area generally consists of sloping and undulating lavas, with little or no soil development. While relatively smooth pahoehoe lava flows predominate, large sections of rough aa lava are also present. Rainfall is low and temperatures are high. The terrain combined with the climate support a sparse and limited vegetation consisting primarily of introduced grasses.

Despite the harsh environmental conditions that are present, there are numerous late prehistoric sites present in the study area. The archaeological sites present in the study area and described in the present report appear to be a portion of an extremely



extensive and intensive agricultural complex in the Kona region referred to as the "Kona Field System." Archaeological sites within the study area take the form of lava tubes, modified outcrops, walls, and excavations in the pahoehoe lava flows. Activities that probably took place here primarily included agricultural pursuits and temporary shelter. Ceremonial activities probably also took place here, and the dead were buried in selected areas.

The archaeological sites in the study area provide strong testimony to the adaptability of the early Hawaiians in the area. These residents found this harsh and forbidding land, and transformed it into a productive area. The transformations included modifying lava tubes and outcrops into shelters and habitation areas. Surfaces of relatively thin pahoehoe lava flows were broken and roughly circular pits were formed for planting areas. Stone rubble on the surface of the flows were mounded into concentrations for planting areas. The agricultural pursuits that probably took place here probably centered on the cultivation of acid-tolerant plants such as sweet potato and gourds.

The sites in the study area have great interpretive value. These sites have the potential to educate the current and future residents and visitors of Kona about the hardiness and adaptiveness of the original inhabitants of the area. It is recommended that five archaeological preserves be established and managed (Figure 10):

- Preserve 1:** This is the eastern site cluster composed of sites 15290, 15291, 15292, 15293, 15294, 15295, and 15296. This cluster consists of two extensively modified lava tubes (15292 and 15297), and several platforms, enclosures, terraces, and pavements. This site cluster is an excellent example of how temporary habitations were situated and constructed in the area. This complex should be accessed by a walking trail from the proposed University Center Campus, and developed (using signs, brochures, etc.) into an interpretive and educational venue.
- Preserve 2:** This is the northern site cluster composed of sites 15298 and 15302, which are two extensively modified lava tubes. Because these sites contain human burials (15298) and possible ceremonial areas (15302), they should be barricaded or sealed, and protected from public access.
- Preserve 3:** This is a cluster of features in the central portion of the proposed campus. The cluster consists of site 15281, a linear portion of site 15283, site 15282, and site 15285. Sites 15281 and 15282 are temporary habitation areas, and site 15285 is a possible religious shrine. Site 15283 is a large complex of agricultural features. It is proposed that a linear preserve extending from site 15281, through the southern portion of site 15283, and incorporating sites 15282 and 15285 be established in the central portion of the proposed

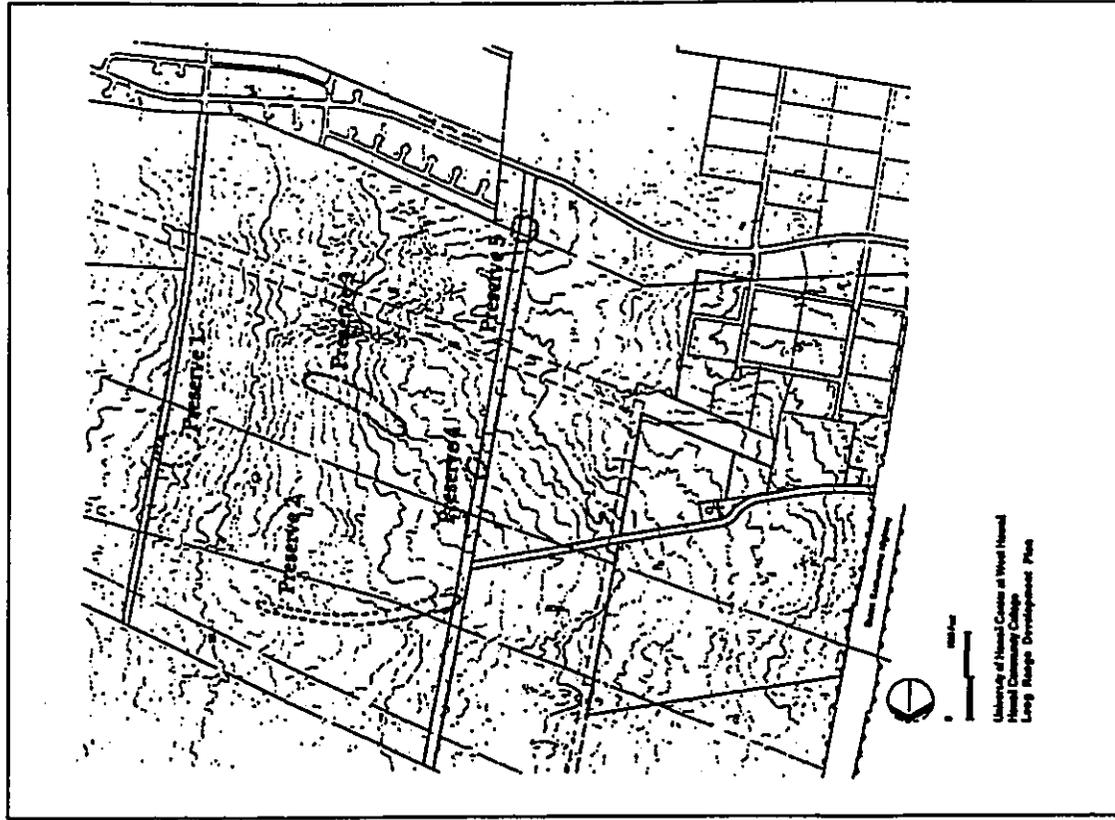


Figure 10. Location of recommended Archaeological Preserves.

campus. The sites could be accessed from sidewalks and other walkways in the campus and have interpretive signage explaining the function and antiquity of the sites and how they exemplify the original Hawaiian adaptation to this area.

Preserve 4: This is a small cluster of two sites (15264 and 15287) located on the west edge of the study area. The cluster consists of a small temporary habitation complex and a *papaui*, or game board for *konane*, or Hawaiian checkers. This small complex could be incorporated into the campus landscaping and identified with appropriate signage.

Preserve 5: This is a complex of lava tubes (site 6418) at the SW corner of the study area. This complex consists of three sections - a collapsed section of lava tube, a lava tube containing a large stone platform, and a lava tube section with a platform and panels of petroglyphs. The original plans showed an access road to be constructed over these sites. It is recommended that the road be rerouted to avoid these sites and that they be preserved. Interpreting these features by means of established walkways and interpretive signs may be the most feasible way of preserving these sites and protecting them from vandalism. Petroglyphs are extremely fragile and can be destroyed by even well-intentioned visitors.

An important concern regarding the development of interpretive venues is creating access to these resources. Accommodating persons with disabilities needs to be taken into consideration. The overriding concern in the development of these interpretive venues is to provide the same life experience to all that would like to experience this portion of Hawaii's historical heritage.

With this in mind, staff members of the Hawaii State Division of State Parks were contacted to determine what guidelines and regulations were available to provide direction in the development of these interpretive venues. It appears that relevant guidelines continue to evolve. The most recent set of guidelines are entitled *Design Specifications for Outdoor Recreation*, which were written in 1994 by the State of Hawaii's Architectural Access Committee and are still in draft form. These are the guidelines that are being followed by Hawaii State Parks.

Three different challenge levels, or degree of developed land can be defined:

- 1) urban - developed land;
- 2) suburban - immediately adjacent to developed land; and
- 3) bush - isolated areas, removed from developed land.



Interpretive venues within urban areas should be accessible to all segments of the community. Trails and walkways should be designed so that individuals with disabilities can access the venues. At a minimum, key points, such as overlooks with interpretive signage need to be accessible, so that the preserve can be experienced. Preserves 3 and 4 are within this challenge level.

Interpretive venues in suburban areas should be accessible to all segments of the community if this is feasible. If the distance from the main thoroughfare to the interpretive venue is relatively short and the terrain to be traversed is relatively smooth, then every effort should be made to design and develop a trail that is accessible to all segments of the community. If the distance is great, and the terrain is rough and broken then an alternative means of experiencing suburban interpretive venues need to be considered (see below). Preserve 5 appears to be in a suburban challenge area.

Interpretive venues in bush areas are the most difficult to access. The distance to be traversed tends to be great and the terrain is difficult. Access to these types of venues tends to be restricted to the more physically fit and mobile members of the community. Preserve 1 is in a bush challenge level.

For those venues that can not be accessed by all members of the community, alternative means of experience need to be designed. Essentially, if we can not get the people to the historic resource, we need to bring the essence of the resource to the people. This can be done by designing an interpretive panel and photo board in the central and accessible portion of the campus; preparing brochures or interpretive pamphlets about the inaccessible resources; and possibly creating a video of the resources that can be viewed on campus. These alternatives will aid us in providing the same or similar life experiences to all members of our community.



5.0 RECOMMENDATIONS

Four alternative treatments are recommended for the archaeological resources described and discussed in the present report: no further work and no preservation; further archaeological investigations and no preservation; preserve and interpret; preserve and protect from public visitation. The sites that are recommended to be treated in each of these different manners are listed below.

No Further Work and No Preservation

15263
15265
15268
15282
15284
15287
15288
21361

Further Archaeological Investigations and No Preservation

15283 clearing, mapping, and possibly some excavation; an estimated 10 person days will be required to complete this task
15285 clearing and mapping; 4 person days will be required to complete this task
15286 clearing, mapping, and possibly some excavation; 3 person days will be required to complete this task
15300 clearing, mapping, and excavation; 3 person days will be required to complete this task

Preserve and Interpret

6418
15264
15281
15283
15285
15287
Eastern Site Complex (sites 15290-15297)

Preserve and Protect

Northern Site Complex (sites 15298 and 15302)

It is recommended that a Historic Preservation Plan (HPP) be developed to guide the above treatments of these resources. This HPP will provide a set of procedures to be implemented to manage these resources in a manner to mitigate any adverse effects of the proposed development. This HPP, once developed, will be submitted to the State Historic Preservation Division for review and comment.



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Appendix A-4

Historic Preservation Plan

BENJAMIN L. CAYSTIAN
GOVERNOR OF HAWAII



STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
Kalahele Building, Room 918
401 Kalia Road
Honolulu, Hawaii 96816

THURTY E. JAMES, CHAIRMAN
BOARD OF LAND AND NATURAL RESOURCES
COMMISSIONER OF THE HISTORIC PRESERVATION DIVISION

DEPUTY
JANE L. LAMOND
UNIT, HONOLULU

ASIANIC MONUMENTS
BOATING AND OCCUPY REGULATIONS
CORPORATION AND RESOURCES
DISPOSABLE RIGHT
CONSERVATION
HISTORIC PRESERVATION
LAND
STATE PARKS
WATER RESOURCES MANAGEMENT

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PLANNING

LOG NO: 28880
DOC NO: 0012PM05

December 18, 2000

Mr. Maynard Young, Director
Physical Facilities, Planning and Construction
Office of the Senior Vice President
University of Hawaii and Chancellor for Community Colleges
4303 Diamond Head Road, Manele Building
Honolulu, Hawaii 96816

Dear Mr. Young:

SUBJECT: Conceptual Historic Preservation Plan for the Proposed University of
Hawaii Center at West Hawaii, Kilauea, North Kona, Hawaii Island
TMK: 7-3-10; Por. 33

Thank you for your letter of October 23, 2000 and the revised historic preservation plan (HPP) for the proposed University of Hawaii Center at West Hawaii for our review and approval.

The revised plan was prepared to respond to the comments in our review letter of May 25, 2000 on the first draft. One of our concerns was that the plan, which calls for the creation of five historic preserves in the roughly 275 acre parcel, did not contain details concerning long-term preservation measures and interpretation. We indicated that you could either prepare a complete, detailed preservation plan, or resubmit the plan as a conceptual plan, with the understanding that the rest of the plan would be developed at a later date. Your letter indicates that the preference of the Kilauea Advisory Council, which assisted in the preparation of the draft plan, is to defer completion of the plan to allow the students and staff of the center to participate in the process. The title of the plan has been changed accordingly to indicate that it is fundamentally a conceptual plan.

The revised conceptual plan meets with our tentative approval, but as indicated in our May 5, 2000 letter, final approval of the historic preservation plan for the proposed center will require a decision by the Hawaii Island Burial Council concerning the burials in Preserve 2. This will entail the development and submittal of a Burial Treatment Plan to the Council. Your letter acknowledges the need to develop and implement such a plan.

Young
2

If you or your consultant have any questions about our review comments please contact our Hawaii Island archaeologist, Patrick McCoy (892-8028).

Aloha,

DON HIBBARD, Administrator
State Historic Preservation Division

PM:amk

c: Paul Cleghorn, Pacific Legacy, Inc.

UNIVERSITY OF HAWAII

Office of the Senior Vice President, University of Hawaii, and Chancellor for Community Colleges
Physical Facilities, Planning and Construction

October 23, 2000

Mr. Don Hibbard, Administrator
State Historic Preservation Division
Department of Land and Natural Resources
State of Hawaii
Kakuhihewa Building, Room 555
501 Karmokila Boulevard
Kapolei, Hawaii 96707

Dear Mr. Hibbard:

Subject: Draft Historic Preservation Plan for the Proposed
University of Hawaii Center at West Hawaii (UHCWH)
Kalaoa, North Kona, Hawaii Island
TMK: 7-3-10; Por. 33

Thank you for reviewing the subject draft historic preservation plan.

OPTIONS FOR COMPLETION OF THE HISTORIC PRESERVATION PLAN

In your letter of 5/25/00 you presented two options to complete the plan:

- (1) have your consultant address all of our review comments and prepare a complete plan
- (2) have your consultant complete the plan, except for the development of an interpretive program (which would have a specified date for completion), which as suggested in the draft plan could be implemented sometime in the future.

We wish to exercise option (2) above. As you may know, the draft historic preservation plan was compiled by project archaeologist, Dr. Paul Cleghorn, with the direct participation of a group of civic leaders and University staff known as the University of Hawaii Center at West Hawaii Advisory Council on Kalaoa Cultural Site Preservation (Kalaoa Advisory Council). The members of the council strongly feel that the existence of cultural sites on the University property presents a unique opportunity for students to become directly involved with the interpretation of their history and culture. This is especially true for students enrolled in Hawaiian studies courses. Their involvement will not be possible until Phase 1 construction is completed and the University Center has begun operation at Kalaoa. For this reason the Advisory Council wishes to postpone development of interpretive programs for sites on the University property until the University Center's students and staff can be fully included in the process. Interpretive programs for each site will be sent to your office for review and approval as they are completed.

4303 Diamond Head Road • Maunaloa Building • Honolulu, Hawaii 96816
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Mr. Don Hibbard, Administrator
October 23, 2000
Page 2

As to specifying a date for completion of the interpretive programs, an exact date would be difficult to determine at the present time. Although master planning has been completed, the project must still progress through design and construction phases. Considering the size of the project, the new UHCWH facility may not be able to begin operation until 2004-05 when Phase 1 construction is estimated to be complete.

BURIAL COUNCIL / TREATMENT PLAN

We acknowledge your statement that, "...final approval of the [historic preservation] plan will require a decision by the Hawaii Island Burial Council concerning the burials in Preserve 2. This will entail the development and submittal of a Burial Treatment Plan to the Council." The current UHCWH Long Range Development Plan (LRDP) avoids all known burial areas on the overall 500-acre Kalaoa site, including those in Preserve 2. Therefore, by definition the LRDP treatment is to avoid burial areas. As with the interpretive program discussed above, a burial treatment plan for burial council delimitation (§ 13-300-33) would be similarly accomplished in conjunction with the completion of the HPP and in advance of any construction or improvement permits and approvals. It would follow that council delimitation would also be requested if any burials not presently known are discovered in the course of work under the current LRDP.

REVISIONS TO THE DOCUMENT

Your letter of 05/25/00 listed three specific areas that need to be added to complete the historic preservation plan:

- (1) Proposed specific buffer zones for each preserve. A map of each preserve showing the locations of the constituent sites and buffer around the preserve should be included. Also, a map of each site needs to go along with the descriptions. There are no standard buffers for sites; they vary dependent on functional type of site and terrain.
- (2) Interim protection measures.
- (3) Long range plan, including such elements as maintenance, public access if sites are interpreted or to be accessible (parking, trails), details of the appearance of trails, signs and trash cans (to ensure no adverse visual effects), signage (ext to evaluate scientific accuracy). Maps can be used to convey much of this information.

After discussions with Mr. Patrick McCoy of your department, Paul Cleghorn has revised the document to include items (1) and (2) above. Item (3) includes the required elements of an interpretive program. As discussed previously, we wish to defer development of the interpretive program until Phase 1 of UHCWH has been completed.

Mr. Don Hibbard, Administrator
October 23, 2000
Page 3

A copy of the revised historic preservation plan dated July 2000 is enclosed for your review and approval. The title of the document has been changed to "Conceptual" historic preservation plan to indicate that the plan is incomplete and an interpretive program still needs to be developed.

We trust that the revised document will meet the requirements of the State Historic Preservation Division. Please be assured that we fully intend to cooperate with the division in completing the interpretive plans for UHCWH sites when this becomes possible. If you have any questions regarding the historic preservation plan, please feel free to contact myself at 734-9771, or project archaeologist Paul Cleghorn at 263-4800.

Thank you for your time and interest in the subject project.

Sincerely,



Maynard Young
Director

MY:ikt
Enclosure

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Appendix A. Members of the University of Hawai'i Center at West Hawai'i Advisory Council
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CONCEPTUAL
HISTORIC PRESERVATION PLAN
FOR THE PROPOSED
UNIVERSITY CENTER AT WEST HAWAII
NORTH KONA, HAWAII ISLAND

Prepared by:

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Prepared for:

Will Chee Planning, Inc.
1400 Rycroft Street, Suite 928
Honolulu, Hawai'i 96826

revised
July 2000

145-009

Historic Preservation Plan
University Center at West Hawai'i
July 2000



1.0 INTRODUCTION

Under contract to Will Chase Planning (WCP), Pacific Legacy has prepared the following conceptual historic preservation plan (HPP) for the ca. 275 acre parcel chosen for the development of the University Center at West Hawai'i. This HPP is an outgrowth of archaeological investigations that were conducted in this parcel by Clegghorn (1998) and was formulated with considerable input from the University of Hawai'i Center at West Hawai'i Advisory Council on Kalaoa Cultural Site Preservation (Kalaoo Advisory Council). Appendix A lists the members of the Kalaoo Advisory Council.

The Kalaoo Advisory Council spent numerous hours during three afternoon sessions sharing their beliefs and concerns regarding the cultural resources of the area. These concerns are enumerated in Section 1.4 below. Two recurring themes punctuated our discussion meetings: (1) Kalaoo Advisory Council members prefer the term cultural resource rather than archaeological site, as the former has a living connotation and the latter seems to be associated with the non-living; and (2) they prefer the terms conservation and protection rather than preservation, because the former two terms tend to be associated with active and living actions, and the latter associated with passive actions and the dead (preservation brought to mind the notion of dead specimens "pickled" in jars). Members of the Kalaoo Advisory Council rather pointedly declared that one generally has to kill something before it can be preserved. While this may be a bit of an over-statement regarding historic preservation activities, one can also appreciate the sentiment that the "killing" of one's culture in order to preserve it is not to be appreciated.

However, the reader must excuse the author, who as an archaeologist is trained to use the terms archaeological site and preservation. These terms are codified in the literature and the laws, and are used in this document with a sensitivity understanding of the concerns of the Kalaoo Advisory Council.

This HPP is offered as a guide to the protection of the cultural resources that are located on the subject property. The material remains left here by the Hawaiians that lived here centuries ago are viewed more as cultural resources with an emphasis on living and active use by current and future inhabitants of the area, rather than as archaeological sites that tend to be associated with things dead and long gone. The Kalaoo Advisory Council is resolute that the cultural resources that are present on the property need to be protected and incorporated into all aspects of the University Center. It is believed that these cultural resources provide a context for present and future activities in the area.

This HPP is viewed as a living document that will continue to benefit from review and input from future students and community members. As new knowledge is obtained (especially that from *kupuna* or new archaeological survey), it needs to be incorporated into the HPP and into all planning processes. It will be seen below (Section 2) that many of the decisions regarding specific actions to be taken within the preserves will await input from students and community

Historic Preservation Plan
University Center at West Hawai'i
July 2000



members. This is intentional. It is believed that interpretive and protective details must be made by the people (students and community members) who are actively using the resources.

Appendix B provides several maps contained in the Draft Environmental Impact Statement that show the conceptual model of the University Center. These maps show the proposed layout of University Center Buildings in relationship to the archaeological preserves.

1.1 LOCATION AND ENVIRONMENTAL SETTING

The ca. 275 acre parcel is part of a larger 500 acre area that was originally slated for development of the University Center at West Hawai'i (Figure 1). The 500 acre area encompasses portions of seven *ahupua'a* of Kalaoo 1-4, Hamanamana, Haleohi'u, and Maka'uila in the district of North Kona on the leeward side of the island of Hawai'i; the ca. 275 acre parcel encompasses portions of Kalaoo 1-4 and Hamanamana. The ca. 275 acre parcel extends from about the 350 foot to the 450 foot elevation.

The parcel consists of gently east to west sloping terrain that is composed of two terrain types - aa and pahoehoe lava flows that are dissected by lava tube systems that are primarily oriented *mauka-makai* (from the mountains to the shore), which is east to west in the study area.

Pahoehoe flows are the dominant terrain type within the parcel. According to Salo et al. (1973:34) pahoehoe lava flows have "a billowy, glassy surface that is relatively smooth... in some areas, however the surface is rough and broken, and there are hummocks and pressure domes." Barron et al. (1973:34) describe this lava as "a mass of clinkery, hard, glassy, sharp pieces piled in tumbled heaps."

The primary vegetation in the parcel is fountain grass (*Pennisetum setaceum*), with interspersed and scattered shrubs. Native species present in the area include: *kahi* (*Dodonaea viscosa*), *noni* (*Morinda citrifolia*), *pili* (*Heteropogon contortus*), *ilialii* (*Santalum ellipticum*), *naio* (*Myoporum laetifolium*), *uakale* (*Canthium odoratum*), *hucine* (*Coccoloba ferruginea*), *lilina* (*Sida fallax*), and *lilaloo* (*Waltheria americana*) (Hannah Springer is acknowledged for identifying the majority of these species). Alien shrubs observed include: *koa huale* (*Leucaena leucocephala*), and Christmas-berry (*Schinus molle*).

The area is warm and relatively dry, receiving 20 to 30 inches (510 to 760 mm) of rainfall per year (Armstrong 1983:63). The mean low annual temperature is 60 to 65 degrees Fahrenheit (15.6 - 18.3° C), and the mean high annual temperature is 80 to 82 degrees Fahrenheit (26.7 - 27.8° C) (Armstrong 1983:64).

1.2 PREVIOUS ARCHAEOLOGICAL RESEARCH

Numerous archaeological investigations have been conducted in the vicinity of the project area, and the larger 500 acre parcel encompassing the proposed University Center parcel has been the subject of an extensive archaeological inventory survey (Fleiss and Rosendahl 1993). Fleiss and Rosendahl (1993:4-16) provide an extensive review of previous archaeological studies in the

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July 2000



The sites in the ca. 275 acre parcel have great interpretive value. These sites have the potential to educate the current and future residents and visitors of Kona about the hardiness and adaptiveness of the original inhabitants of the area. Based on the findings of the archaeological investigations (Cleghorn 1998), it was recommended that five archaeological preserves be established and managed (Figure 2). Figure 3 provides additional details of these five preserves, including approximate proposed buffer zones. The five preserve areas are described as follows:

- Preserve 1:** This is the eastern site cluster composed of sites 15290, 15291, 15292, 15293, 15294, 15295, and 15296. This cluster consists of two extensively modified lava tubes (15292 and 15297), and several platforms, enclosures, terraces, and pavements. This site cluster is an excellent example of how temporary habitations were situated and constructed in the area. This complex should be accessed by a walking trail from the proposed University Center Campus, and developed (using signs, brochures, etc.) into an interpretive and educational venue.
- Preserve 2:** This is the northern site cluster composed of sites 15298 and 15302, which are two extensively modified lava tubes. Because these sites contain human burials (15298) and possible ceremonial areas (15302), they should be barricaded or sealed, and protected from public access.
- Preserve 3:** This is a cluster of features in the central portion of the proposed campus. The cluster consists of site 15281, a linear portion of site 15283, site 15282, and site 15285. Sites 15281 and 15282 are temporary habitation areas, and site 15285 is a possible religious shrine. Site 15283 is a large complex of agricultural features. It is proposed that a linear preserve extending from site 15281, through the southern portion of site 15283, and incorporating sites 15282 and 15285 be established in the central portion of the proposed campus. The sites could be accessed from sidewalks and other walkways in the campus and have interpretive signage explaining the function and antiquity of the sites and how they exemplify the original Hawaiian adaptation to this area.
- Preserve 4:** This is a small cluster of two sites (15264 and 15287) located on the west edge of the study area. The cluster consists of a small temporary habitation complex and a *papamā* or game board for *kāhuna*, or Hawaiian checkers. This small complex could be incorporated into the campus landscaping and identified with appropriate signage.
- Preserve 5:** This is a complex of lava tubes (site 6418) at the SW corner of the study area. This complex consists of three sections - a collapsed section of lava tube, a lava tube containing a large stone platform, and a lava tube section with a platform and panels of petroglyphs. The original plans showed an access road to be constructed over these sites. It is recommended that the road be rerouted to avoid these sites and that they be preserved. Interpreting these features by means of established walkways and interpretive signs may be the most feasible

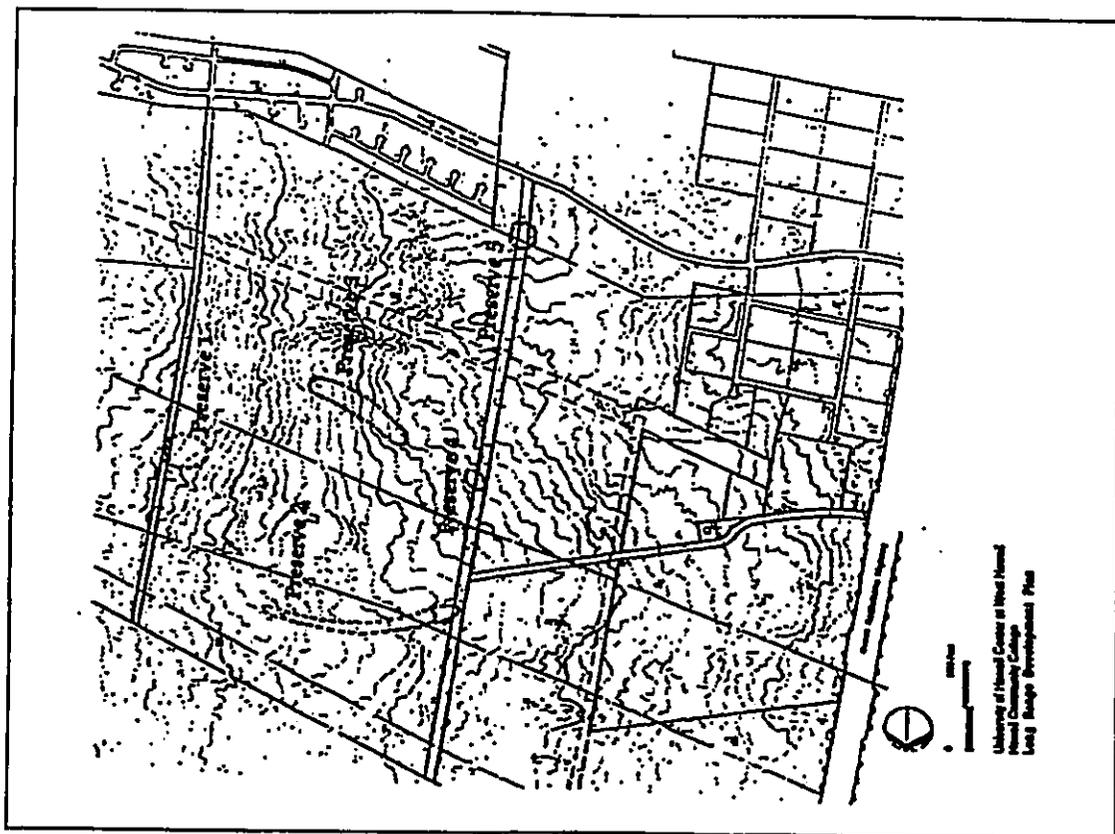


Figure 2. Location of Preserve Areas.

way of preserving these sites and protecting them from vandalism. Petroglyphs are extremely fragile and can be destroyed by even well-intentioned visitors.

1.3 HISTORIC PRESERVATION PLAN REQUIREMENTS

The overall purpose of historic preservation is concisely stated in the National Historic Preservation Act of 1966, as amended:

the historical and cultural foundations of the Nation should be preserved as a living part of our community life and development in order to give a sense of orientation to the American people [16 U.S.C. § 470:1 (b)(2)]; and

the preservation of this irreplaceable heritage is in the public interest so that its vital legacy of cultural, educational, esthetic, inspirational, economic, and energy benefits will be maintained and enriched for future generations of Americans [16 U.S.C. § 470:1 (b)(4)].

The preservation of historic and cultural sites provide current and future generations of people with tangible evidence of our past. This tangible evidence links us with our past and provides us with a solid foundation upon which to understand our current circumstances and our future choices.

The State Historic Preservation Division (SHPD) has produced draft rules governing the minimal requirements for archaeological site preservation and development (§ 13-277) (dated 12/12/96). Generally, the preservation of an archaeological site falls into one of two forms:

- (1) avoidance and protection (conservation); and
- (2) exhibition (interpretation) (§ 13-277-3a)

It is noted that use of traditional properties can continue within both forms of preservation.

The SHPD rules outline four steps that are required in the preservation of archaeological sites:

- 1) preparation of a preservation plan, which need not be lengthy, but which includes plans for each site;
- 2) review and approval of the plan by the SHPD prior to the start of preservation work;
- 3) execution of the preservation plan; and
- 4) verification by the SHPD that the plan has been successfully executed (§ 13-277-3b).

The detailed preservation plan functions as a scope of work to guide the execution of site preservation. Following the SHPD rules, the plan shall:

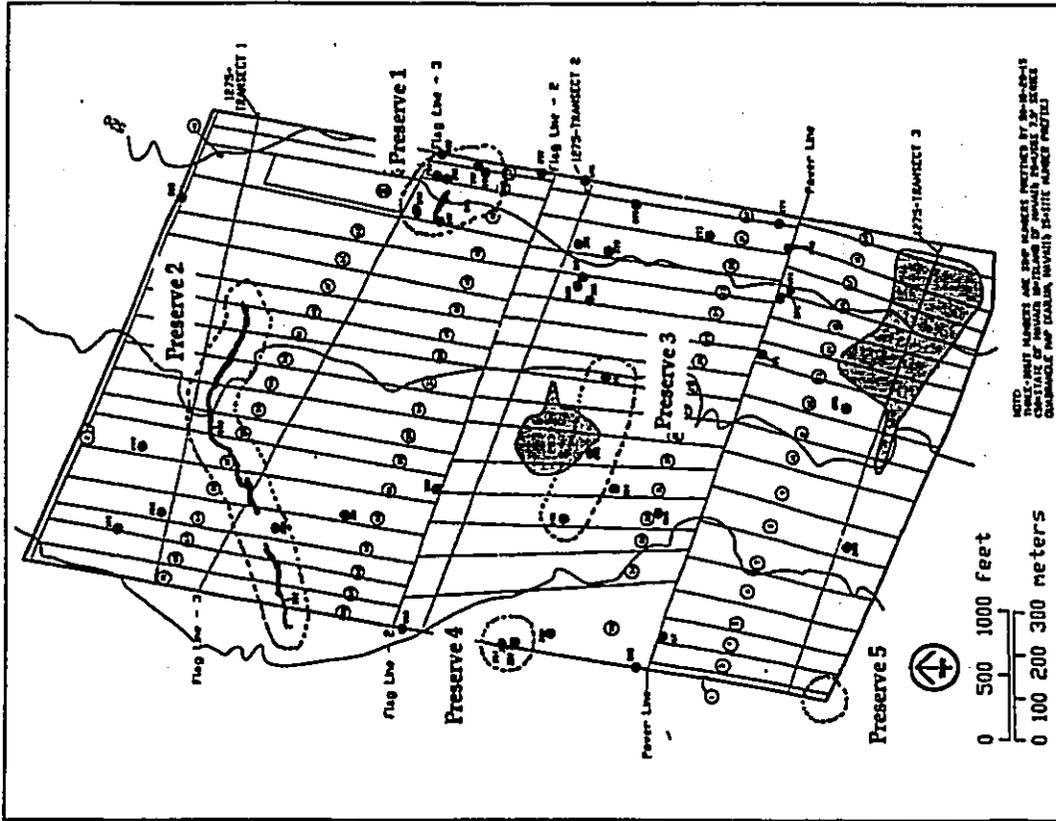


Figure 3. Detail of Preserve Areas with Dashed Lines Demarcating Buffer Zones (adapted from Head and Rosendahl 1993; Figure 3)



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- 3) execution of the preservation plan; and
- 4) verification by the SHPD that the plan has been successfully executed (§ 13-277-3b).

The detailed preservation plan functions as a scope of work to guide the execution of site preservation. Following the SHPD rules, the plan shall:



- 1) identify for each historic property whether preservation will take the form of conservation or exhibition;
- 2) specify the buffer zones around each historic property;
- 3) provide short-term protection measures for each historic property within or near a construction area;
- 4) consider, for properties with traditional cultural significance, input from members of relevant ethnic groups in the local community, and from OHA for any native Hawaiian properties; and
- 5) detail the specific preservation tasks to be undertaken at each historic property (§ 13-277-4).

2.0 COMMUNITY CONCERNS

The community as represented by members of the Kalaoa Advisory Council, has agreed upon a number of general guidelines for the HPP. These guidelines are meant to direct all cultural protection activities within the University Center parcel. These are:

- 1) It is important that the HPP is perpetuated throughout the history of the University Center. The Kalaoa Advisory Council does not want to see preservation plans having to change to accommodate future growth of the University Center.
- 2) A means to continue the mechanism that has been established where feedback from the Kalaoa Advisory Council is provided to the University Center regarding how community concerns can be incorporated into various planning and construction decisions.
- 3) While the membership of the Kalaoa Advisory Council may change through time, it is envisioned that this advisory body as a representative of the larger community will continue to function and oversee protection and conservation activities, and various implementation activities.
- 4) A partnership between the University Center and interested community group(s) needs to be developed and fostered to preserve and protect the archaeological sites and cultural resources of the area. While this partnership should be led by the University of Center, input and direction should come from the interested community group(s).
- 5) One of the community groups that needs to be identified and recognized is a group of contemporary *hula* weavers who can provide input on the planting, cultivation, and harvesting of *hala*. The intent is to ensure that appropriate varieties of *hala* are planted and that these trees become an important community resource that forms a living bridge to the traditional past.
- 6) Cultural resources need to receive proper recognition for their importance from the beginning.
- 7) It is firmly believed that the responsibility for the protection of the cultural resources on the University Center parcel resides on the local level, and the Kalaoa Advisory Council is prepared to assist the Center with that responsibility. The core of enforcing the protection of these cultural resources lies in education of these persons, companies, and agencies that may come into contact with these resources. These people include planners, educators, staff, students, and community members. The education of these people will emphasize values and



respect. Value the past for what it can teach you and respect the past and the original culture of this area.

- 8) Guidelines need to be developed regarding what appropriate behaviors and activities can be conducted at or in the vicinity of different sites.
- 9) The HPP should take view plains into effect. These view plains should be both from the cultural resources and towards the cultural resources. The concern is that modern structures should not be built in such a way that the view plains are obscured. Buildings and other constructed facilities should be built so that they blend in with the surrounding landscape; particular attention needs to be paid to building height, roof color, types of walls, and shape of buildings.

- 10) Any interpretation of cultural resources in the parcel should focus on *maufofmafof* distribution of sites, and traditional cultural practices; the location of a site within a specific *ahupua'a* needs to be included and stressed.

- 11) Use of native vegetation is important to the protection of sites in the parcel. There is a strong concern that landscaping needs to be minimized, so that the area's natural "feel" is retained. Choices of vegetation should reflect various aspects of the area's history. Plant succession through time can be pursued as an educational tool of the Center.

- 12) It is important that the cultural resources that are being protected and conserved be used for educational purposes, with the generalized theme of traditional practice. It is important to teach respect for things that happened in our past.

- 13) Rather than conceiving the sites as preserved specimens, the Kalaoa Advisory Council wants these cultural resources to be conceived of as sustained or cultivated sites that are viewed as tangible aspects of the traditional activities that once took place in this area and that continue to function as regenerators of this traditional spirit.

- 14) There is a strong need to identify members of the general Kalaoa community (including the four *ahupua'a* that make up the University Center parcel), and especially the *kūpuna* of this community. These members need to be approached regarding the cultural resources that are present in the area and the functions of these resources. Furthermore, these *kūpuna* can assist in identifying the on-the-ground boundaries of the *ahupua'a*. It would be beneficial to the aims of protecting and conserving the cultural resources to have these *kūpuna* form a Cultural Sites Council that can provide advice to the University Center and provide specific information about the cultural resources within the University Center parcel.

- 15) The natural pahoehoe and aa lava landscape is an extraordinarily important aspect of the parcel. It provides the natural context for all of the activities that



have taken place and will take place here. Every effort needs to be taken to preserve the integrity of this landscape. In this regard strict controls need to be exercised with bulldozing activities that will be needed during construction activities on the parcel. All bulldozing activities need to be restricted to only those specific areas that are to be developed.

- 16) A preconstruction briefing by an archaeologist to all construction personnel needs to be held discussing the sensitivity of cultural resources, how they are marked in the field, etc (see Section 3.0 for further details).

- 17) A protocol needs to be developed for construction crews to follow if any new cultural resources (including human burials) are encountered during the course of construction. Recommendations for such a protocol are offered in Section 4, number 6.

- 18) The Kalaoa Advisory Council views their current role to ensure that archaeological and cultural resources are preserved with appropriate buffers surrounding them for protective purposes. The development of these preserve areas into educational and cultural resources is to be done in the future with the Kalaoa Advisory Council acting as the active overseeing body. Educational and interpretive developments are to be done by students, University Center staff, and interested and concerned community members. Any interpretive plans that are needed will be generated at the time preserve areas are developed into interpretive and educational venues.



3.0 PRESERVATION PLANS

The following preservation plans should be viewed as conceptual preservation plans. Numerous details regarding the interpretation of several of these preserves remain to be worked out. It was the strong opinion of the Kalaoa Advisory Council that details regarding how sites are interpreted, where trails should be created, what signage should be established, etc., should be decided by the people using the University Center. In other words, when the University Center is firmly established, students, faculty, and interested community members should make the detailed decisions, because these are the people who will be using these resources. The following plans are offered to provide the conceptual base for subsequent preservation development.

3.1 PRESERVE 1

3.1.1 Site Descriptions

Preserve 1 consists of numerous cultural resources that have been recorded as seven archaeological sites: 15290 - 15296, that cover an approximate area measuring 100 by 200 meters. Each of these sites is summarized below:

Site 15290 consists of four structural features: an alignment of stones, a mound, an enclosure, and a platform that probably date to the pre-Contact period and had various habitation functions.

Site 15291 consists of two features, a wall and an enclosure that probably date to the pre-Contact period and are of indeterminate function.

Site 15292 consists of eight features: an enclosure, three terraces, a pavement, a wall, a cleared area, and an excavation in the pahoehoe lava that probably date to the pre-Contact period had various functions.

Site 15293 consists of a platform that probably dates to the pre-Contact period and had a habitation function.

Site 15294 consists of an enclosure that probably dates to the Pre-Contact period and has an indeterminate function.

Site 15295 consists of five features: a platform, two terraces, and two enclosures that probably date to the Pre-Contact period and are of indeterminate function.

Site 15296 consists of eight features, within and adjacent to small lava tubes: a stepping stone trail, a terrace, three enclosures, an excavated area, a cupboard, and an alignment that probably date to the pre-Contact period had various functions.

3.1.2 Recommended Form of Protection

This archaeological site complex should be protected and conserved as an interpretive venue, where educational and interpretive facilities can be developed to augment the educational experience at the University Center. These educational and interpretive facilities must be sensitive to traditional cultural practices.

3.1.3 Buffer Zone

It is recommended that a buffer zone of 30 to 50 m (100 to 165 feet) be established around this site complex. This buffer zone shall follow the natural topography of the land incorporating natural features as appropriate. The proposed buffer zone is presented as a range (30-50 m) because it will follow the natural contours of the area. Prior to any construction activities in the area, the boundaries of the buffer zone will be physically staked and approved by a SHPD representative, who will perform a field check for this purpose. No construction or other mechanized land altering activities should take place within this buffer zone.

3.1.4 Short-term Protection Measures During Construction

The outer margins of the buffer area should be conspicuously flagged with highly visible surveyor's flagging tape prior to any construction activities in the area. Surveyor's flagging tape should be tied onto low trees, bushes, and grass.

3.1.5 Potential Uses of the Sites in the Preserve

This site preserve should ultimately be developed into an educational and interpretive venue, with a trail system, interpretive signage, etc. However, it is realized that this may not be economically feasible in the near future. It is recommended that this area be protected with the recommended buffer in its present form until detailed plans can be developed and implemented. It is suggested that interested University Center students, the Kalaoa Advisory Council, and interested members of the community work together to formulate the detailed plans.

3.1.6 Re-vegetation Plan

The ultimate goal is to eradicate all alien vegetation from the preserve and to plant native and Polynesian introduced species that are adapted to the environmental conditions present in this area. It is recognized that removing alien vegetation needs to be done carefully so that archaeological and physical features are not damaged in the process. A detailed vegetation clearance and re-vegetation plan will be developed concurrently when the interpretive plans are developed.

3.1.7 Access and Accessibility to the Sites in the Preserve

This preserve will be accessed from the University Center by a foot trail over the natural undulating terrain. A trail system will be developed within the preserve to allow viewing access of various archaeological features. This trail system will be developed concurrently with the interpretive plan and the re-vegetation plan.

3.2 PRESERVE 2

3.2.1 Site Descriptions
Preserve 2 consists of two archaeological sites: 15298 - 15302, that cover an approximate area measuring 800 by 50 meters. Each of these sites is summarized below:

Site 15298 is a complex of over 165 features associated with a long lava tube; 57 of the features are surface features located within the lava tube, 12 of the features are surface or sink features associated with the lava tube, and the remaining ca. 100 features are located on adjacent pahoehoe lava. These features included three pavements, five modified outcrops, six mounds, nine terraces, three cupboards, eleven piles of rock, six enclosures, six petroglyphs and one papamū, two pecked stones, one excavated area, ninety midden scatters, nine walls, five alignments, one platform, one stepping stone trail, one cairn, one cleared area, and one modified depression. Most of the features are associated with habitation or refuge, though four human burials are also present. These features probably date to the pre-Contact period had various functions. This site has been assessed to be culturally significant.

Site 15302 is a complex of over 31 features within a 136 m long lava tube. The features include ten piles of rock, two stone alignments, five enclosures, three walls, one cairn, eight midden scatters, one modified depression, and one terrace. These features probably date to the pre-Contact period had various functions, including possible ceremonial functions.

3.2.2 Recommended Form of Protection

Because this site has been assessed to be culturally significant, it is recommended that the site be protected with no public access, with the exception of visitation by lineal descendants, if any are located.

3.2.3 Buffer Zone

It is suggested that a minimum buffer of 50 meters (165 feet) be established around this preserve. However, guidance regarding an appropriate buffer should be sought from the Hawai'i Island Burial Council.

3.2.4 Short-term Protection Measures During Construction

Since this preserve is far removed from the proposed University Center construction, it seems that protection measures may not be that essential. However, it is better to be conservative and mark the outer margins of the buffer zone with highly visible surveyor's flagging tape prior to any construction activities in the area. Surveyor's flagging tape should be tied onto low trees, bushes, and grass.

3.2.5 Potential Uses of the Sites in the Preserve

Since of the potential cultural sensitivity of this preserve, the only possible use of the site in the preserve would be for familial visitation should any lineal descendants be located. No other activities should take place at or in the vicinity of this preserve.



3.2.6 Re-vegetation Plan for the Preserve

The area within this preserve should be left as is, with no vegetation clearing or re-vegetative activities.

3.2.7 Access and Accessibility to the Sites in the Preserve

There should be no access to this preserve, with the exception of any possible lineal descendants that may be found. Accessibility to the area should be denied. The possibility of building a stone wall around the circumference of the preserve, and sealing the portions of the lava tube that contain human remains should be explored with the Hawai'i Island Burial Council and any lineal descendants that are located.

3.3 PRESERVE 3

3.3.1 Site Descriptions

Preserve 3 consists of four archaeological sites: 15281, 15282, a linear portion of 15283, and 15285 that cover an approximate area measuring 420 by 90 meters. Each of these sites is summarized below:

Site 15281 is a complex of five features a modified lava tube, a stone alignment, a modified outcrop, an excavated area, and a modified depression that probably dates to the pre-Contact period and primarily had a habitation function.

Site 15282 is a lava blister that may have been used for shelter or storage of materials during the pre-Contact period.

Site 15283 is a complex of 72 features consisting of four terraces, three walls, 53 modified outcrops, six mounds, one modified depression, two excavations, and one alignment. While there are multiple functions represented by these features, the dominant function appears to have agricultural. The features probably date to the pre-Contact period.

Site 15285 is a stone enclosure containing a cupboard in an interior corner, and a piece of branch coral on the exterior wall. Originally the function of this feature was interpreted to be for habitation (Head and Rosendahl 1993:A-30), though more recently it has been suggested that it may have had a ceremonial or religious function (Cleghorn 1996:19). The site probably dates to the pre-Contact period.

3.3.2 Recommended Form of Protection

This archaeological site complex should be protected and conserved as an interpretive venue, where educational and interpretive facilities can be developed to augment the educational experience at the University Center.

3.3.3 Buffer Zone

It is recommended that a buffer zone of 30 to 50 m (100-165 feet) be established around this site complex. This buffer zone shall follow the natural topography of the land incorporating natural features as appropriate. The proposed buffer zone is presented as a range (30-50 m) because it will follow the natural contours of the area. Prior to any construction activities in the area, the



boundaries of the buffer zone will be physically staked and approved by a SHPD representative, who will perform a field check for this purpose. No construction or other mechanized land altering activities should take place within this buffer zone.

3.3.4 Short-term Protection Measures During Construction

Since this preserve is close to the area where construction activities will take place, the outer margins of the buffer area should be fenced off with metal fence posts and bright orange plastic construction fencing prior to any construction activities in the area.

3.3.4 Potential Uses of the Sites in the Preserve

This site preserve should ultimately be developed into an educational and interpretive venue, with a trail system, interpretive signage, etc. It is suggested that interested University Center students as well as interested members of the community work together to formulate the detailed plans.

3.3.5 Re-vegetation Plan

The ultimate goal is to eradicate all alien vegetation from the preserve and to plant native and Polynesian introduced species that are adapted to the environmental conditions present in this area. It is recognized that removing alien vegetation needs to be done carefully so that archaeological and physical features are not damaged in the process. A detailed vegetation clearance and re-vegetation plan will be developed concurrently when the interpretive plans are developed.

3.3.6 Access and Accessibility to the Sites in the Preserve

This preserve will be accessed from the University Center by a foot trail over the natural undulating terrain. A trail system will be developed within the preserve to allow viewing access of various archaeological features. This trail system will be developed concurrently with the interpretive plan and the re-vegetation plan.

3.4 PRESERVE 4

3.4.1 Site Descriptions

Preserve 4 consists of two sites: 15264 and 15287 that cover an approximate area measuring 200 by 300 meters. Each of these sites is summarized below:

Site 15264 is a complex of two features consisting of two modified outcrops that may have been used for temporary habitation or shelter purposes.

Site 15287 is a *papa'u*, which is a gaming board for the traditional Hawaiian checker game of *kāne*. The *papa'u* consists of ca. 150 holes pecked into the natural pahoehoe lava flow in a grid of 10 by 15 holes.

3.4.2 Recommended Form of Protection

This archaeological site complex should be protected and conserved as an interpretive venue, where educational and interpretive facilities can be developed to augment the educational

Historic Preservation Plan
University Center at West Hawaii
July 2000



experience at the University Center. These educational and interpretive facilities must be sensitive to traditional cultural practices.

3.4.3 Buffer Zone

It is recommended that a buffer zone of 30 to 50 m (100 - 165 feet) be established around this site complex. This buffer zone shall follow the natural topography of the land incorporating natural features as appropriate. The proposed buffer zone is presented as a range (30-50 m) because it will follow the natural contours of the area. Prior to any construction activities in the area, the boundaries of the buffer zone will be physically staked and approved by a SHPD representative, who will perform a field check for this purpose. No construction or other mechanized land altering activities should take place within this buffer zone.

3.4.4 Short-term Protection Measures During Construction

The outer margins of the buffer area should be conspicuously flagged with highly visible surveyor's flagging tape prior to any construction activities in the area. Surveyor's flagging tape should be tied onto low trees, bushes, and grass.

3.4.4 Potential Uses of the Sites in the Preserve

This site preserve should ultimately be developed into an educational and interpretive venue, with a trail system, interpretive signage, etc. However, it is realized that this may not be economically feasible in the near future. Thus, it is recommended that this area be protected with the recommended buffer in its present form until detailed plans can be developed and implemented. It is suggested that interested University Center students, the Kalaoa Advisory Council, and interested members of the community work together to formulate the detailed plans.

3.4.5 Re-vegetation Plan

The ultimate goal is to eradicate all alien vegetation from the preserve and to plant native and Polynesian introduced species that are adapted to the environmental conditions present in this area. It is recognized that removing alien vegetation needs to be done carefully so that archaeological and physical features are not damaged in the process. A detailed vegetation clearance and re-vegetation plan will be developed concurrently when the interpretive plans are developed.

3.4.6 Access and Accessibility to the Sites in the Preserve

This preserve will be accessed from the University Center by a foot trail over the natural undulating terrain. A trail system will be developed within the preserve to allow viewing access of various archaeological features. This trail system will be developed concurrently with the interpretive plan and the re-vegetation plan.

3.5 PRESERVE 5

3.5.1 Site Description

Preserve 5 consists of one archaeological site which covers an area of approximately 350 by 250 meters. This site is summarized below:

Historic Preservation Plan
University Center at West Hawaii
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Site 6418 This site is a lava tube complex that was originally recorded by Davis (1977). This lava tube complex consists of three tube sections that are described below.

Section 1 is a large collapsed section of tube (ca. 35 by 30 m) that has several utilized areas: an area with several concentrations of *Opili* shells, a J-shaped stone alignment, a section of wall, three small overhang shelters, and a small excavation in the pahoehoe lava flow with an associated wall.

Section 2 is a section of lava tube that measures ca. 45 by 20 m that contains a large platform (ca. 9.0 by 8.0 m by 1.2 to 2.5 m high) directly beneath the skylight. The platform is roughly paved with basalt cobbles and pebbles and has an alignment of stone that divides it roughly in half. Concentrations of ash, *Opili* shell, and *Kukui* endocarp were observed, as was a single piece of coral.

Section 3 is a collapsed section of lava tube that has a panel of petroglyphs in the eastern wall of the collapse. Approximately 40 petroglyph figures are located here. Some of these figures are partially buried by an artificially constructed floor. Davis (1977) conducted test excavations here, but the results have not been reported (Davis 1977:28; SHPD library and GIS inventory search).

3.5.2 Recommended Form of Protection

This archaeological site complex should be protected and conserved as an interpretive venue, where educational and interpretive facilities can be developed to augment the educational experience at the University Center. These educational and interpretive facilities must be sensitive to traditional cultural practices.

3.5.3 Buffer Zone

It is recommended that a buffer zone of 30 to 50 m (100 - 165 feet) be established around this site complex. This buffer zone shall follow the natural topography of the land incorporating natural features as appropriate. The proposed buffer zone is presented as a range (30-50 m) because it will follow the natural contours of the area. Prior to any construction activities in the area, the boundaries of the buffer zone will be physically staked and approved by a SHPD representative, who will perform a field check for this purpose. No construction or other mechanized land altering activities should take place within this buffer zone.

3.5.4 Short-term Protection Measures During Construction

The outer margins of the buffer area should be conspicuously flagged with highly visible surveyor's flagging tape prior to any construction activities in the area. Surveyor's flagging tape should be tied onto low trees, bushes, and grass.

3.5.4 Potential Uses of the Sites in the Preserve

This site preserve should ultimately be developed into an educational and interpretive venue, with a trail system, interpretive signage, etc. However, it is realized that this may not be economically feasible in the near future. Thus, it is recommended that this area be protected with the recommended buffer in its present form until detailed plans can be developed and implemented. It is suggested that interested University Center students, the Kalaea Advisory

Council, and interested members of the community work together to formulate the detailed plans. It is further suggested that a possible teaming arrangement be developed with the Pacific Palisades subdivision to care for this site.

3.5.5 Re-vegetation Plan

The ultimate goal is to eradicate all alien vegetation from the preserve and to plant native and Polynesian introduced species that are adapted to the environmental conditions present in this area. It is recognized that removing alien vegetation needs to be done carefully so that archaeological and physical features are not damaged in the process. A detailed vegetation clearance and re-vegetation plan will be developed concurrently when the interpretive plans are developed.

3.5.6 Access and Accessibility to the Sites in the Preserve

This preserve will be accessed from the University Center by a foot trail over the natural undulating terrain. A trail system will be developed within the preserve to allow viewing access of various archaeological features. This trail system will be developed concurrently with the interpretive plan and the re-vegetation plan.

4.0 RECOMMENDATIONS

The following recommendations are offered to the University Center as a means of complying with the intent and spirit of Historic Preservation in the State of Hawai'i. These recommendations will assist the University Center in protecting and conserving the cultural resources that are their responsibility.

- 1) Recognize and institute a formal University of Hawaii Center at West Hawaii Advisory Council on Kalaooa Cultural Resources Protection. This Kalaooa Advisory Council shall continue to advise the University Center on all matters relating to the protection and use of cultural resources at the University Center.
- 2) The University Center must retain a qualified archaeologist to assist the Center in matters regarding the protection and conservation of cultural resources associated with the Center.
- 3) Prior to land altering activities, the University Center shall hire a licensed land surveying firm to survey the boundaries of all cultural resource preserves and their respective boundaries. This land survey shall be accomplished with the aid of the retained archaeological consultant.
- 4) At the initiation of the construction phase, the retained archaeologist shall brief all construction personnel on the importance and sensitivity of the cultural resources in the area. The briefing will include a description of how archaeological sites have been marked in the field (see Section 2). A discussion shall also be presented outlining the steps required if any unanticipated archaeological finds are encountered (see no. 5 below). All construction personnel shall be required to attend this briefing and sign an affidavit affirming their attendance and understanding of the materials presented. This briefing should be recorded on video, so that new construction personnel can view this briefing video and sign an attendance and understanding affidavit.
- 5) The University Center shall maintain a close coordinating relationship with the State Historic Preservation Division (SHPD) on all matters relating to the cultural resources under the University Center's jurisdiction.
- 6) The University Center, with input from the Kalaooa Advisory Council, students, staff, and other interested community members shall prepare a detailed interpretive plan for each of the preserves prior to developing interpretive uses for these preserves. This interpretive plan shall include: location and appearance of trails, signs, benches, and trash cans (to ensure no damage or adverse visual effects); and signage text (to ensure scientific accuracy). These plans shall be submitted to the SHPD for approval.
- 7) The following protocol is recommended to be followed if the construction crew encounters an inadvertent find, which can include structural features such as a mound or a wall, archaeological deposits including artifacts and or marine shell midden, or human burial(s):



- a) Upon encountering an inadvertent find, all construction activity in the immediate vicinity of the find should halt and the retained archaeologist should be notified;
- b) the archaeologist should inspect the possible find to determine if it is a cultural resource;
- c) if it is not a cultural resource, construction activities may resume;
- d) if it is a cultural resource, the Kalaooa Advisory Council and the SHPD will be notified, and an on-site meeting will be held within 24 hours of the notification;
- e) the results of that consultation will guide appropriate treatments to the resource which may consist of documentation, data recovery, avoidance and preservation; and
- f) if the resource encountered is a human burial, the SHPD burial staff will be immediately notified, and their guidance will be followed.



5.0 REFERENCES CITED

- Cleghorn, Paul L.
1998 Archaeological Investigations for the Proposed University Center at West Hawaii's North Kona, Hawaii's North Kona, Hawaii's Island. On file at the State Historic Preservation Division.
- Davis, Bertell D.
1977 Archaeological survey of the Proposed Agricultural Park at Ke-Ahole, North Kona, Hawaii's Island. On file in the State Historic Preservation Division Library, Honolulu.
- Head, James A. and Paul H. Rosendahl
1993 Archaeological Inventory Survey, Kailua to Keahole Region State Lands, LUC Project - 500-Acre University Site. On file at the State Historic Preservation Division.

APPENDIX A.

Members of the
University of Hawaii's Center at West Hawaii's
Advisory Council on Kalaoca Cultural Site Preservation

The following members of the Kalaoa Advisory Council participated in various levels in the development of the Historic Preservation Plan:

Sebastian Albot
Rosemary Burnett
Wendell Davis
Kathy Damon
Ed Karahela
Hermaun Kunewa
Iris Napaepae-Kunewa
Gene Leslie
Leina'ala Lightner
Eli Nahulu
Angel Pllago
Sandra Toponcer Sakaguchi
Hannah Kihalani Springer
Curtis Tyler

APPENDIX B.

MAPS SHOWING THE RELATIONSHIP BETWEEN
THE UNIVERSITY CENTER
AND THE
ARCHAEOLOGICAL PRESERVES

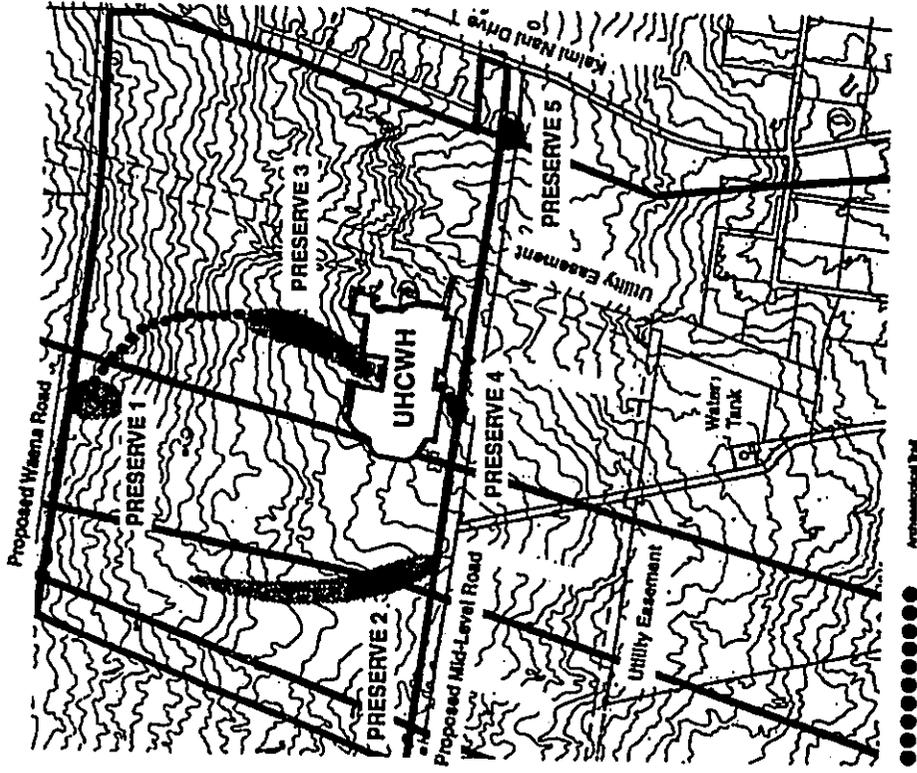


Figure 19
Preserve Areas and Features
 prepared for: WT Chee - Perrineo, Inc.
 31A

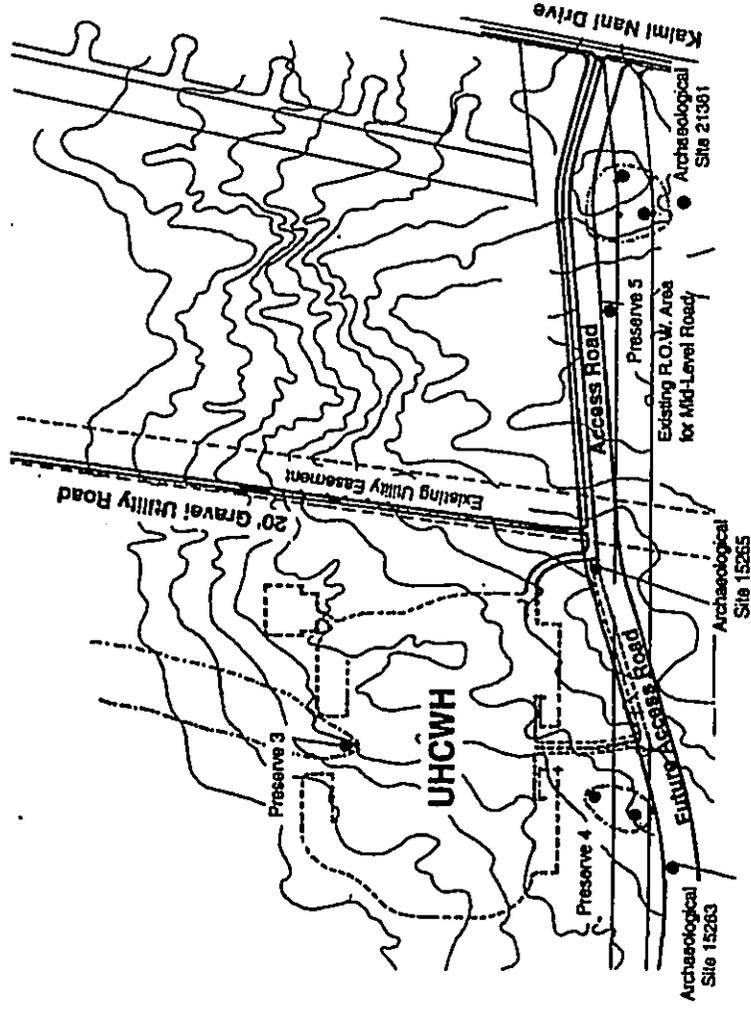


Figure 16
Revised Access Road
 prepared for: WT Chee - Perrineo, Inc.
 31A



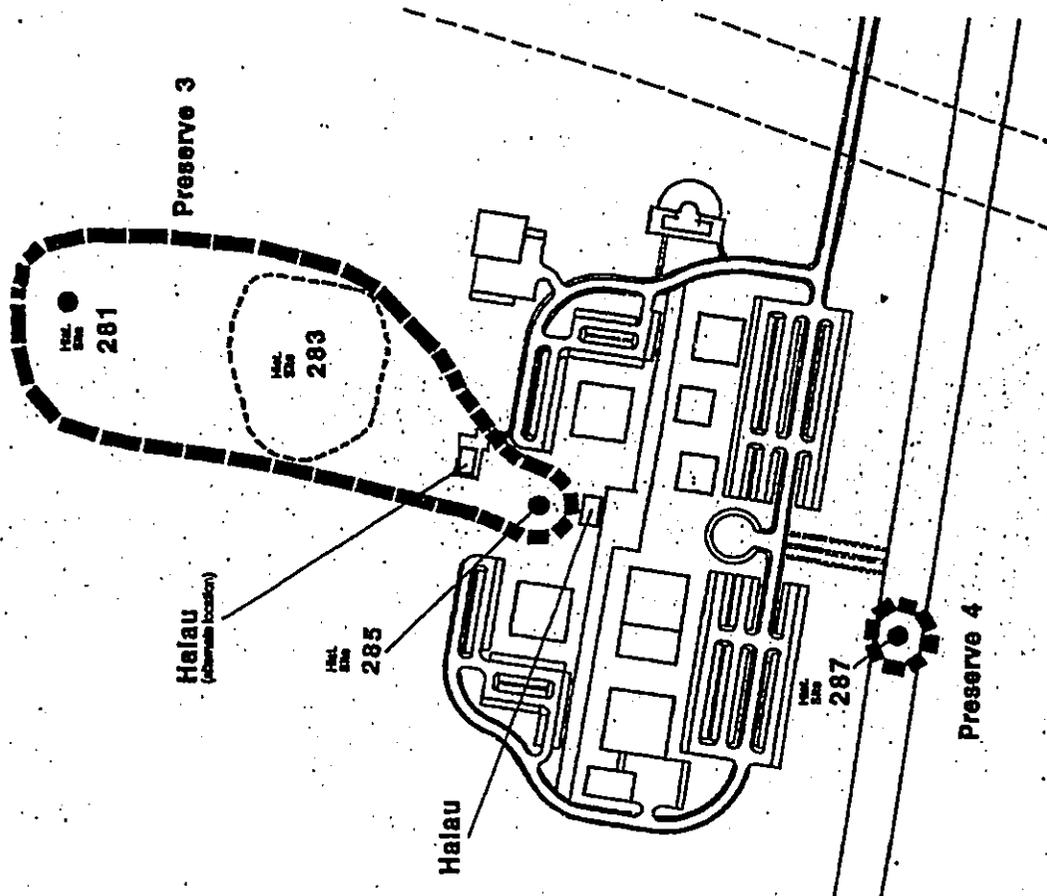


Figure 20
Preserves Near the Project Site

ENVIRONMENTAL IMPACT STATEMENT
FOR THE
UNIVERSITY OF HAWAII CENTER AT WEST HAWAII
Kalaheo, Island of Kauai, Hawaii
prepared for: University of Hawaii Planning Office for
Community Change
Honolulu, Hawaii
prepared by: WET Group - Honolulu, Inc.

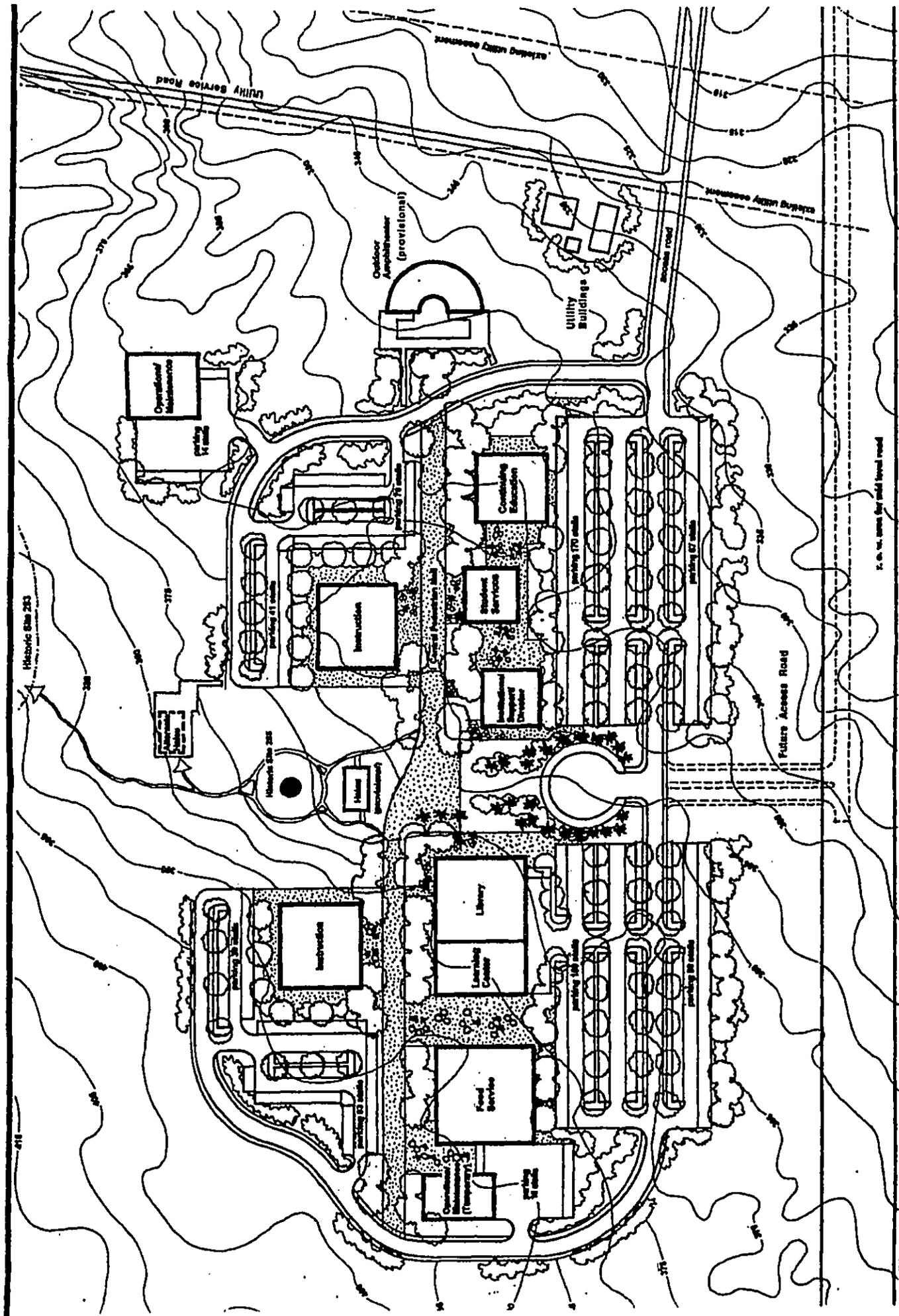


Figure 5
Ultimate Site Plan

ENVIRONMENTAL IMPACT STATEMENT
FOR THE
UNIVERSITY OF HAWAII CENTER AT WEST HAWAII
Kalaheo, Island of Hawaii, Hawaii

Prepared for: University of Hawaii Facilities Planning Office for
Community Colleges
Honolulu, Hawaii

Created by: WJ Chee - Planning, Inc.

▨ Paved Areas

Appendix A-5

Current Status of the LUC Decision and Order



**DEPARTMENT OF BUSINESS,
ECONOMIC DEVELOPMENT & TOURISM**

OFFICE OF PLANNING

235 South Beretani Street, 8th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2352, Honolulu, Hawaii 96804

ISLAHAMI J. CAVEDANO
DIRECTOR
SELI F. HATA, Ph.D.
DIRECTOR
BRADLEY J. MCGHEE
DIRECTOR
DAVID W. BLANE
DIRECTOR, OFFICE OF PLANNING

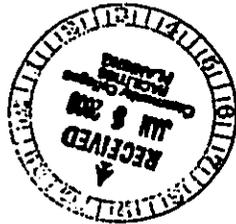
Telephone: (808) 587-2048
Fax: (808) 587-2824

Ms. Esther Ueda
Page 2
December 30, 1999

CCFPO Distribution: 01/07/00
cc: VWL Chee - Planning

Ref. No. P-8412

December 30, 1999



To: Esther Ueda, Executive Officer
Land Use Commission

From: David W. Blane
Director, Office of Planning

Subject: Sixth Annual Report for LUC Docket No. BR92-685
Office of State Planning/Keahole to Kailua State Lands

Pursuant to Condition No. 30 of the Findings of Fact, Conclusions of Law, and Decision and Order issued on December 9, 1992, for the subject docket, we are providing you with an original and two copies of the Sixth Annual Report for the above-referenced boundary amendment. Included with the report are maps generated from our Geographic Information System (maps A and B) showing all of the parcels covered by the proposed subdivision, and the proposed site plan for the University of Hawaii parcel. Also enclosed are an original and two copies for each of the seven (7) exhibits which include:

- Approved Subdivision of the Government Lands of Kalaheo 1-4, and Ooma 1st into Parcels 1 to 13 inclusive (Exhibit No. 1);
- Map and survey description for the University of Hawaii parcel (parcel 5) (Exhibit No. 2);
- Map and survey description for the tank site (parcel 6) and easements 2, 3, 4, & 5 (Exhibit No. 3);
- Maps and survey descriptions for three of the four parcels (parcels 1, 2, and 3) to be transferred to the Department of Hawaiian Home Lands (Exhibit Nos. 4, 5, and 6);
- Map for Parcel 4 is not covered under Docket BR92-685, and is still under discussion (Exhibit No. 7).

Further note that there have been no changes from 1998 in the Petitioner's/Developer's compliance with the conditions of the Land Use Commission. If you have any questions, please call Judith Henry at 587-2803.

Enclosures
cc: (without the DAGS survey maps and descriptions Exhibit Nos. 1-7)

Mr. Allan Ah San, Vice Pres. Admin.
UH-Manoa

Mr. Michael Uebasami
Vice Chancellor Admin. Affairs
Community Colleges

Mr. Kerwin Iwamoto
Interim Vice Chancellor
UH-Hilo

✓ Mr. Maynard Young, Director
Physical Facilities Planning and Construction Office for Community Colleges
4303 Diamond Head Road
Maalele Bldg. - Rm. 103
Honolulu, Hawaii 96816

Department of Accounting and General Services
Randall M. Hashimoto, State Land surveyor
Attn. Stanley Hasegawa

Mr. Raymond Soon, Chairman
DHHL

Attn. Darrell Yagodich, Administrator
DLNR

Mr. Timothy Johns, Chairman
DLNR
Attn. Andrew Menden, Project Planning, DLNR
Attn. Dean Uchida, Land Division - DLNR

Mr. Kazu Hayashida, Director
DOT

Attn: Ronald (Ron) F. Tsuruki, Head Planning Engineer, DOT
Attn: Robert Teira, Engineer, Hwys. Div. Hawaii District Office, DOT

Ms. Esther Ueda
Page 3
December 30, 1999

Ms. Virginia Goldstein, Director
Planning Department, County of Hawaii

Mr. Royden Yamamoto
Planning Department
County of Hawaii
Kona Office
75-5706 Kuakini Highway - Ste. 108 Kailua-Kona 96740

Mr. Milton Pavao, Manager
Department of Water Supply-Hawaii County

I
STATUS OF THE PROJECT

The Land Division, Engineering Branch, Department of Land and Natural Resources (DLNR), continues to coordinate the water needs of all State agencies with property interests in North Kona. The University of Hawaii-West Hawaii, together with other agencies, signed a Memorandum of Understanding (MOU), to jointly fund water improvement facilities.

The status of the six Phase I projects approved by the 1995 Legislature is as follows:

- General obligation bond funds (DLNR CIP appropriation request) and special funds (from the Department of Transportation (DOT)), were released for the planning, design and construction phases for the Keahole Reservoir. Bid opening was held on June 25, 1998, with a construction start date scheduled for January 1999, and completion date scheduled for January 2000. At its March 12, 1999 meeting, the Board of Land and Natural Resources approved of and voted to recommend to the Governor the set aside of 1.74 acres, together with access and utility easements, to the Water Commission, County of Hawaii, for two (2) reservoirs (Parcel 6) (Exhibit No. 3). A water storage tank and a 0.5 mg reservoir have already been constructed on the site, and the 1.0 mg reservoir is currently under construction. The County of Hawaii Department of Water Supply operates and maintains these facilities. Upon completion, the larger reservoir will be dedicated to the County of Hawaii. The larger reservoir will provide potable and fire protection water to the Kona International Airport at Keahole, Natural Energy Laboratory of Hawaii and the Department of Agriculture's, Keahole Agricultural Park.
- General obligation bond funds (DLNR CIP appropriation request) and special funds (from DOT), were released for the planning and design phases for the Hina Lani Drive Water Transmission Line and Reservoir. Funds for the construction phase are scheduled to be released prior to bid opening. Bid opening is scheduled for December 1999 with a construction start date scheduled for March 2000 and completion date scheduled for February 2001.
- Construction for the Hualalai Well Development and Support Facilities was completed January 1999.
- Construction on the Keopsa Exploratory Well Project is scheduled to start in January 2000, with a completion date scheduled for December 2000.
- Additional general obligation bond funds were released to cover the special funds portion that were to be provided by the Housing & Community Development Corporation of Hawaii (HCDCH) for the North Kona Well Sites Planning and Land Acquisition Study. The planning study to identify land parcels to accommodate water wells, reservoirs, access roads, and a HELCO Substation is scheduled to be completed by September 2000.
- The planning, design and construction phases for the Palani Road Water Transmission Line and Reservoir have not been initiated because HCDCH has deferred water system development expenditures until the ceded land issue has been resolved, and land title and conveyance have been finalized.

* The Long Range Development Plan (LRDP) for the University of Hawaii Center-West Hawaii (UHCWH) was approved by the Board of Regents in November, 1998. An Environmental Impact Statement prepared by Will Chee and Associates will be completed by the end of 1999. A request was made for CIP funds in the Fiscal Biennium 1999-2001 Budget to begin the planning and design for the new University of Hawaii Center-West Hawaii. The University received an appropriation in accordance with Act 91, SLH 99 for planning and design funds totaling \$1,438,000.

The Plan Development Report (PDR) for UHCWH is being prepared by Kober/Hausman/Mitchell Architects. The PDR for the first phase of development consists of site work improvements (roadway, utilities infrastructure, parking); Instructional Food Service Building, Learning Resource Center (learning skills, library, telecommunications/media) Building; and Interim Operations Maintenance Building (Exhibit No. 2). The PDR is scheduled to be completed by December 1999, followed by the design phase for these projects.

The Hawaii Long Range Land Transportation Plan, May 1998, Final Report, proposes four highway improvement projects within or adjacent to the project area. They are as follows:

- DOT widening of Queen Kaahumanu Highway to four lanes;
- County extension of Henry Street as a new two-lane "mid-level" highway (Kaiminani Drive to Palani Road);
- County extension of Kealahou Street as a new two-lane "upper-level" highway (Kaiminani Drive to Palani Road); and
- County widening of Kaiminani Drive to four lanes (Queen Kaahumanu Highway to the Henry Street extension).

The Queen Kaahumanu Highway widening from the Kona International Airport to Henry Street is in the design phase. The design will be completed by mid-1999. The construction schedule is undetermined and dependent on funding. Various projects to serve the project area will require work within the Queen Kaahumanu Highway right-of-way.

Agencies with jurisdiction to develop the project area have not yet formally requested DOT to review and comment on proposed road improvements envisioned for their parcels. DOT is concerned with the alignment of Parcel 11 in relation to the entrance to Keahole International Airport.

The proposed consolidation and re-subdivision of the Government Lands of Kaloa 1-4 and Oona 1st into parcels 1-13 was approved by the Hawaii County Planning Department in August, 1999 (Exhibit 1). The Department of Hawaiian Home Lands (DHHL) has a property interest of approximately 353 acres located within the area covered by Docket No. BR02-685 (Parcels 1, 2, and 3 and Exhibit Nos. 4, 5, & 6). The legal documents and description of the certified maps identifying the location and ownership of the Department of Hawaiian Home Lands, University of Hawaii Center-West Hawaii, and Hawaii County Department of Water Supply parcels have been prepared. These deeds are being prepared for the purposes of recordation with the State Bureau of Conveyances. The Department of Hawaiian Home Lands and the Department of Land and Natural Resources are in the process of resolving issues related

to the eighty-foot wide easement which transverses Parcel 4 (Exhibit No. 7). Until these issues are resolved, DHHL has requested that the transfer of parcel 4 be held in abeyance.

The Long Range Transportation Plan, May 1998, Final Report proposes the widening of Queen Kaahumanu Highway. Design of the first increment, from Henry Street to the Kona International Airport at Keahole Access Road, is anticipated to be completed in 2000.

Construction of the Queen Kaahumanu Highway widening project will be incremental due to funding limitations. The Statewide Transportation Program for 2000 through 2002, recently submitted to FHWA for approval, includes the following amounts for the Queen Kaahumanu widening in 2002:

- \$8,000,000 for right of way acquisition
- \$25,000,000 for construction of Increment 1, Phase 1, from Henry Street to Kealahou Parkway.

The Department of Hawaiian Home Lands concurs with the Department of Transportation's recommendation to amend an access permitted designation along Queen Kaahumanu Highway. The access is identified as a perpetual non-exclusive access easement granted to HELCO on June 6, 1997. The existing designation will be realigned opposite the Hawaii Ocean Science and Technology park access road within TMK 7-3-43:42 to promote the future consideration of a fully signalized intersection at this location with the planned Queen Kaahumanu Highway widening project.

II

PROGRESS IN COMPLYING WITH LUC CONDITIONS OF THE DECISION AND ORDER

1. The developer and/or landowner of the subject Property shall provide affordable housing opportunities for low, low-moderate, and gap group income residents of the State of Hawaii to the satisfaction of the State Housing Finance and Development Corporation in accordance with the Affordable Housing Guidelines, adopted by the Housing Finance and Development Corporation, effective July 1, 1992, as periodically amended. The location and distribution of the affordable housing or other provisions for affordable housing shall be under such terms as may be mutually agreeable between the developer and/or landowner of the subject Property and the State Housing Finance and Development Corporation and the County of Hawaii. Agreement by the HFDC on the provision of affordable housing shall be obtained prior to the developer and/or landowner applying for county zoning or prior to the developer and/or landowner applying for county building permits if county rezoning is not required.*

The developer and/or landowner of the Property will abide by this condition and provide affordable housing opportunities for low, low-moderate, and gap group income residents of the State of Hawaii and obtain an agreement by the HFDC on the provision of

affordable housing. There has been no change from 1998 in the willingness of the developer and/or landowner to comply with this condition. There have been no changes in the Petitioner's/Developer's compliance with this condition.

2. "The developer and/or landowner of the subject Property shall contribute to the development, funding and/or construction of school facilities, on a pro-rata basis, as determined by and to the satisfaction of the Department of Education (DOE). Agreement by DOE on the level of funding and participation shall be obtained prior to the developer and/or landowner applying for county zoning or prior to the developer and/or landowner applying for county building permits if county zoning is not required."

"The developer and/or landowner of the Property will abide by this condition and will contribute to the development, funding and/or construction of school facilities, on a pro-rata basis, as determined by and to the satisfaction of the Department of Education (DOE). There has been no change from 1998 in the developer's and/or landowner's compliance with this condition."

3. "The developer and/or landowner of the subject Property shall prepare a Traffic Impact Analysis Report prior to applying for county zoning or prior to the developer and/or landowner applying for county building permits if county zoning is not required. The landowner and/or developer shall also participate in the funding and construction of local and regional transportation improvements and programs including dedication of rights-of-way as determined by the State Department of Transportation and the County Department of Public Works. Agreement by the State Department of Transportation on the level of funding and participation shall be obtained prior to the developer and/or landowner applying for county zoning or prior to the developer and/or landowner applying for county building permits if county zoning is not required."

The developer and/or landowner of the Property will abide by this condition and when appropriate, prior to applying for county zoning or county building permits, will prepare a Traffic Impact Analysis Report and participate in the funding and construction of local and regional transportation improvements and programs including dedication of rights-of-way as determined by the State Department of Transportation and the County Department of Public Works.

There has been no change from 1998 in the developer's and/or landowner's compliance with this condition.

4. "The developer and/or landowner of the subject Property shall monitor the traffic attributable to the project at on-site and off-site locations and shall undertake subsequent mitigative measures that may be reasonably required. These activities shall be coordinated with and approved by DOT."

The developer and/or landowner of the Property will abide by this condition and will monitor the traffic attributable to the project at on-site and off-site locations

and shall undertake subsequent mitigative measures that may be reasonably required.

There has been no change from 1998 in the developer's and/or landowner's compliance with this condition.

5. "The developer and/or landowner of the subject Property, at no cost to the State, shall appoint a permanent transportation manager whose function is the formulation, use, and continuation of alternative transportation opportunities that would optimize the use of existing and proposed transportation systems. In the alternative, the developer and/or landowner of the subject Property may participate in a regional program for transportation management with other developers and/or landowners. This program shall address the transportation opportunities that would optimize the use of existing and proposed transportation systems. Either option will continue to be in effect unless otherwise directed by the State Department of Transportation prior to implementation. The transportation manager or developer and/or landowner of the subject Property shall conduct periodic evaluations of the program's effectiveness and shall make reports of these evaluations available to the State Department of Transportation for review."

The developer and/or landowner of the Property will abide by this condition and will appoint a permanent transportation manager or participate in a regional program for transportation management with other developers and/or landowners.

There has been no change from 1998 in the developer's and/or landowner's compliance with this condition.

6. "The developer and/or landowner of the subject Property shall participate in the funding and construction of adequate wastewater transmission and disposal facilities, on a pro-rata basis, as determined by the State Department of Health and the County Department of Public Works."

The developer and/or landowner of the Property will abide by this condition and will participate in the funding and construction of adequate wastewater transmission and disposal facilities, on a pro-rata basis, as determined by the State Department of Health and the County Department of Public Works.

There has been no change from 1998 in the developer's and/or landowner's compliance with this condition.

7. "The developer and/or landowner of the subject Property shall fund the design and construction of drainage improvements required as a result of the development of the Property to the satisfaction of the appropriate State and County agencies."

The developer and/or landowner of the Property will abide by this condition and will fund the design and construction of drainage improvements required as a

result of the development of the Property to the satisfaction of the appropriate State and County agencies.

There has been no change from 1998 in the developer's and/or landowner's compliance with this condition.

8. "The developer and/or landowner of the subject Property shall have an archaeological inventory survey conducted for those areas of the Property not already the subject of an inventory survey by a professional archaeologist prior to submitting an application to the County of Hawaii for rezoning or prior to applying for a building permit if county rezoning is not required. The findings of such survey(s) shall be submitted to the State's Historic Preservation Division in report format for adequacy review. The Division must verify that the survey report is acceptable, must approve significance evaluations, and must approve mitigation commitments for significant historic sites prior to the landowner and/or developer submitting an application to the county for rezoning or prior to applying for a building permit if county rezoning is not required."

The developer and/or landowner of the Property will abide by this condition and will have an archaeological inventory survey conducted for those areas of the Property not already the subject of an inventory survey by a professional archaeologist prior to submitting an application to the County of Hawaii for rezoning or prior to applying for a building permit.

There has been no change from 1998 in the developer's and/or landowner's compliance with this condition.

9. "If significant historic sites are present, then the developer and/or landowner of the subject Property shall agree to develop and execute a detailed historic preservation mitigation plan prior to any ground altering construction in the area. The State's Historic Preservation Division must approve this plan, and that Division must verify in writing to the Land Use Commission that the plan has been successfully executed."

The developer and/or landowner of the Property will abide by this condition and develop and execute a detailed historic preservation mitigation plan approved by the State's Historic Preservation Division, prior to any ground altering construction in the area.

There has been no change from 1998 in the developer's and/or landowner's compliance with this condition.

10. "Should any human burials or any historic sites such as artifacts, charcoal deposits, or stone platforms, pavings or walls be found, the developer and/or landowner of the subject Property shall stop work in the immediate vicinity and contact the State Historic Preservation Division. The significance of these finds shall then be determined and approved by the Division, and an acceptable mitigation plan shall be approved by the Division (if needed). The Division must verify that the fieldwork portion of the mitigation

plan has been successfully executed prior to work proceeding in the immediate vicinity of the find. Burials must be treated under specific provisions of Chapter 6E, Hawaii Revised Statutes."

The developer and/or landowner of the Property will abide by this condition and will stop work in the immediate vicinity and contact the State Historic Preservation Division should any human burials or any historic sites such as artifacts, charcoal deposits, or stone platforms, pavings or walls be found on the subject property.

There has been no change from 1998 in the developer's and/or landowner's compliance with this condition.

11. "The developer and/or landowner of the subject Property shall conduct a flora survey and prepare and agree to execute a mitigation plan which meets the requirements of the Department of Land and Natural Resources prior to the developer and/or landowner applying for county zoning or prior to the developer and/or landowner applying for county building permits if county rezoning is not required. The Department of Land and Natural Resources must approve the plan, and a copy of the approved plan must be submitted to the Land Use Commission prior to the developer and/or landowner applying for county zoning or prior to the developer and/or landowner applying for county building permits if county rezoning is not required."

The developer and/or landowner of the Property will abide by this condition and will conduct a flora survey and prepare and agree to execute a mitigation plan which meets the requirements of the Department of Land and Natural Resources prior to the developer and/or landowner applying for county zoning or prior to the developer and/or landowner applying for county building permits if county rezoning is not required.

There has been no change from 1998 in the developer's and/or landowner's compliance with this condition.

12. "The developer and/or landowner of the subject Property shall fund and construct adequate civil defense measures as determined by the County and State Civil Defense agencies."

The developer and/or landowner of the Property will abide by this condition and will fund and construct adequate civil defense measures as determined by the County and State Civil Defense agencies.

There has been no change from 1998 in the developer's and/or landowner's compliance with this condition.

13. "The developer and/or landowner of the subject Property shall not construct residential or condominium units within areas exposed to noise levels of 60 Ldn or greater."

The developer and/or landowner of the Property will abide by this condition and not construct residential or condominium units within areas exposed to noise levels of 60 Ldn or greater.

There has been no change from 1998 in the developer's and/or landowner's compliance with this condition.

14. The developer and/or landowner of the subject Property shall grant to the State of Hawaii an aviation (right of flight) and noise easement in the form prescribed by the State Department of Transportation on any portion of the Property subject to noise levels exceeding 55 Ldn.

The developer and/or landowner of the Property will abide by this condition and will grant to the State of Hawaii an aviation (right of flight) and noise easement in the form prescribed by the State Department of Transportation on any portion of the Property subject to noise levels exceeding 55 Ldn.

There has been no change from 1998 in the developer's and/or landowner's compliance with this condition.

15. The developer and/or landowner of the subject Property shall attenuate the noise in guest (living) suites and other noise sensitive areas within commercial and hotel development areas exposed to exterior noise levels of 60 Ldn (day-night average sound level) by a minimum of 25 decibels (A-weighted).

The developer and/or landowner of the Property will abide by this condition and attenuate the noise in guest (living) suites and other noise sensitive areas within commercial and hotel development areas exposed to exterior noise levels of 60 Ldn (day-night average sound level) by a minimum of 25 decibels (A-weighted).

There has been no change from 1998 in the developer's and/or landowner's compliance with this condition.

16. The developer and/or landowner of the subject Property shall participate in an air quality monitoring program as specified by the State Department of Health.

The developer and/or landowner of the Property will abide by this condition and participate in an air quality monitoring program as specified by the State Department of Health.

There has been no change from 1998 in the developer's and/or landowner's compliance with this condition.

17. The developer and/or landowner of the subject Property shall cooperate with the State Department of Health and the County of Hawaii Department of Public Works to conform to the program goals and objectives of the Integrated Solid Waste Management Act,

Chapter 342G, Hawaii Revised Statutes, and the County's approved integrated solid waste management plans in accordance with a schedule and time frame satisfactory to the Department of Health.

The developer and/or landowner of the Property will abide by this condition and cooperate with the State Department of Health and the County of Hawaii Department of Public Works to conform to the program goals and objectives of the Integrated Solid Waste Management Act, Chapter 342G, Hawaii Revised Statutes, and the County's approved integrated solid waste management plans in accordance with a schedule and time frame satisfactory to the Department of Health.

There has been no change from 1998 in the developer's and/or landowner's compliance with this condition.

18. The developer of the subject Property shall maintain, to the extent required by the State Department of Health, on-site facilities to ensure that the nearshore, offshore and deep ocean waters remain in pristine condition. The developer of the subject Property shall also participate in a water quality monitoring program with the Natural Energy Laboratory of Hawaii and the Hawaii Ocean and Science Technology Park. This program shall be submitted for review to the State Department of Health.

The developer and/or landowner of the Property will abide by this condition and maintain on-site facilities to ensure that the nearshore, offshore and deep ocean waters remain in pristine condition and participate in a water quality monitoring program with the Natural Energy Laboratory of Hawaii and the Hawaii Ocean and Science Technology Park.

There has been no change from 1998 in the developer's and/or landowner's compliance with this condition.

19. The developer and/or landowner of the subject Property shall, to the satisfaction of the State Department of Health, keep wastewater ponds holding effluent for irrigation of golf courses at a sufficient distance from residential areas to prevent odor and insect nuisances.

The developer and/or landowner of the Property will abide by this condition if a golf course included in the development of the property.

There has been no change from 1998 in the developer's and/or landowner's compliance with this condition.

20. If the development of the Property includes a golf course(s), the developer and/or landowner of the Property shall engage the services of a qualified golf course manager to oversee the irrigation of the golf course and application of fertilizers and pesticides to the golf course within the Property and who shall be qualified in the application of fertilizers and pesticides on those areas.

The developer and/or landowner of the Property will abide by this condition if a golf course included in the development of the property.

There has been no change from 1998 in the developer's and/or landowner's compliance with this condition.

21. "If a golf course(s) is included in the development of the Property, the developer and/or landowner of the Property shall comply with the State Department of Health's conditions for new golf course developments."

The developer and/or landowner of the Property will abide by this condition if a golf course is included in the development of the property.

There has been no change from 1998 in the developer's and/or landowner's compliance with this condition.

22. "The developer and/or landowner of the Property shall be responsible for implementing sound attenuation measures to bring noise levels from vehicular traffic in the Property down to levels acceptable to the State Department of Health and the State Department of Transportation."

The developer and/or landowner shall abide by this condition and assume responsibility for implementing sound attenuation measures to bring noise levels from vehicular traffic in the Property down to levels acceptable to the State Department of Health and the State Department of Transportation.

There has been no change from 1998 in the developer's and/or landowner's compliance with this condition.

23. "The developer and/or landowner of the Property shall notify all prospective buyers of property of the potential odor, noise, and dust pollution resulting from surrounding Agricultural District land."

The developer and/or landowner shall abide by this condition and notify all prospective buyers of property of the potential odor, noise, and dust pollution resulting from surrounding Agricultural District land.

There has been no change from 1998 in the developer's and/or landowner's compliance with this condition.

24. "The developer and/or landowner of the Property shall notify all prospective buyers of property that the Hawaii Right-to-Farm Act, Chapter 165, Hawaii Revised Statutes, limits the circumstances under which pre-existing farming activities may be deemed a nuisance."

The developer and/or landowner shall abide by this condition to notify all prospective buyers of the Hawaii Right to Farm Act, Chapter 165, HRS.

There has been no change from 1998 in the developer's and/or landowner's compliance with this condition.

25. "If the future development of the Property includes a golf course, the developer and/or the landowner shall conduct an environmental risk assessment to analyze possible impacts that might occur as the result of the application of pesticides and fertilizers to the course prior to the developer and/or landowner applying for county zoning or prior to the developer and/or landowner applying for county building permits if county rezoning is not required."

The developer and/or landowner shall abide by this condition if the future development of the property includes a golf course.

There has been no change from 1998 in the developer's and/or landowner's compliance with this condition.

26. "Once specific land uses for the Property have been identified, the developer and/or landowner shall work closely with HELCO to identify any potential health hazards that might be present as the result of proximity to the transmission lines now found within the Property. The identification of potential health hazards shall be done prior to any application for County zoning or prior to any application for a County building permit."

The developer and/or landowner shall work closely with HELCO, prior to any application for County zoning or prior to any application for a County building permit, to identify any potential health hazards which may result from the proposed development's proximity to the transmission lines.

There has been no change from 1998 in the developer's and/or landowner's compliance with this condition.

27. "The developer and/or landowner of the subject Property shall establish a buffer zone on the subject Property between the adjacent Keahole Agricultural Park and uses on the subject Property to the satisfaction of the State Department of Agriculture."

Plans for the development of the property will include a buffer zone on the property between the adjacent Keahole Agricultural Park and uses on the subject Property to the satisfaction of the State Department of Agriculture.

There has been no change from 1998 in the developer's and/or landowner's compliance with this condition.

28. "The Petitioner and/or developer shall comply with all applicable County land use and permitting approvals, including the County's zoning process."

As appropriate, the Petitioner and/or developer will comply with all applicable County land use and permitting approvals, including the County's zoning process.

There has been no change in this condition.

29. "The developer and/or landowner of the subject Property shall develop the Property in substantial compliance with the representations made to the Commission. Failure to so develop the Property may result in reversion of the Property to its former classification, or change to a more appropriate classification."

As planning progresses, the landowner will include plans which are in compliance with the representations made to the Commission.

There has been no change from 1998 in the developer's and/or landowner's compliance with this condition.

30. "The developer and/or landowner of the subject Property shall promptly provide without any prior notice, annual reports to the Land Use Commission, the Office of State Planning, and the County of Hawaii Planning Department in connection with the status of the subject project and the developer's and/or landowner's progress in complying with the conditions imposed."

The Office of Planning has complied with the above condition and has submitted its Fifth Annual Report to the Land Use Commission.

There has been no change from 1998 in the developer's and/or landowner's compliance with this condition.

31. "The Land Use Commission may fully or partially release these conditions as to all or any portion of the Property upon timely motion and upon the provision of adequate assurance of satisfaction of these conditions by the developer and/or landowner of the subject Property."

The developer and/or landowner shall abide by this condition which would allow the Land Use Commission to fully or partially release these conditions to all or any portion of the Property upon a timely motion and provision of adequate assurance of satisfaction of these conditions by the developer and/or landowner.

There has been no change from 1998 in the developer's and/or landowner's compliance with this condition.

32. "The developer and/or landowner of the subject Property shall give notice to the Commission of any intent to sell, lease, assign, place in trust, or otherwise voluntarily alter

the ownership interests in the Property, prior to the completion of the development of the Property."

The developer and/or landowner shall abide by this condition and give notice to the Commission of any intent to sell, lease, assign, place in trust, or otherwise voluntarily alter the ownership interests in the Property, prior to the completion of the development of the Property.

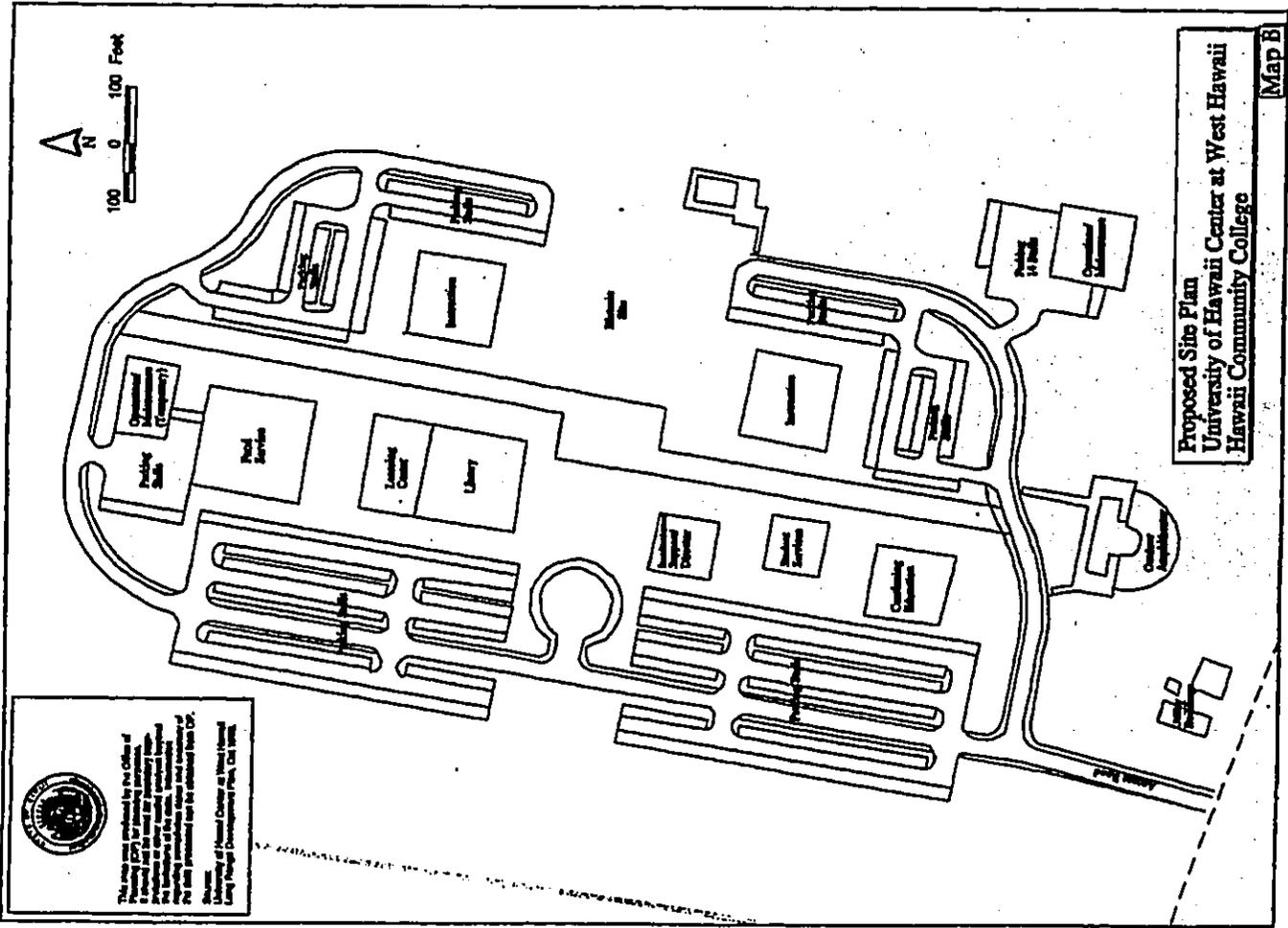
The consolidation/re-subdivision application submitted by DLNR creating 13 parcels within the Government Lands of Kalaheo 1-4 and Oona 1" was submitted to the County for the purpose of establishing, and subsequently, transferring certain lands to the Department of Hawaiian Home Lands to satisfy a portion of the 16,518 acres the State agreed to convey to DHHL. Eleven of these parcels (parcels 1,2,3,5,6, 7, 8, 9, 11,12, and 13) are within the area covered by Docket BR92-685. Three hundred and fifty-three (353) acres (parcel 1 (200 acres), parcel 2 (127 acres), and parcel 3 (26 acres)), included under Docket BR92-685 have not been conveyed to the Department of Hawaiian Home Lands pending County approval of the consolidation/re-subdivision application. Parcel 4 (130 acres), outside of the area covered by Docket BR92-685, and within the State Agricultural District, will also be conveyed to the Department of Hawaiian Home Lands as a part of this agreement. Parcel 10, also outside of the area covered by BR92-685, will remain Government lands. Parcel 6, will be increased from 1.010 acres to 1.742 acres to accommodate the construction of a 1.0 mg. reservoir. When completed, parcel 6 will be set aside to the County Department of Water Supply for water and tank purposes. Boundary adjustments to parcels immediately adjacent to parcel 6, to accommodate the increase, are being determined.

33. "Within 7 days of the issuance of the Commission's Decision and Order for the subject reclassification, Petitioner shall 1) record with the Bureau of Conveyances a statement to the effect that the Property is subject to conditions imposed by the Land Use Commission in the reclassification of the Property; and 2) shall file a copy of such recorded statement with the Commission."

The statement of Imposition of Conditions imposed by the Land Use Commission for the real property at Keahole, North Kona, was filed with the Bureau of Conveyances-Regular System, December 15, 1993.

34. "Petitioner shall record the conditions imposed by the Commission with the Bureau of Conveyances pursuant to Section 15-15-92, Hawaii Administrative Rules."

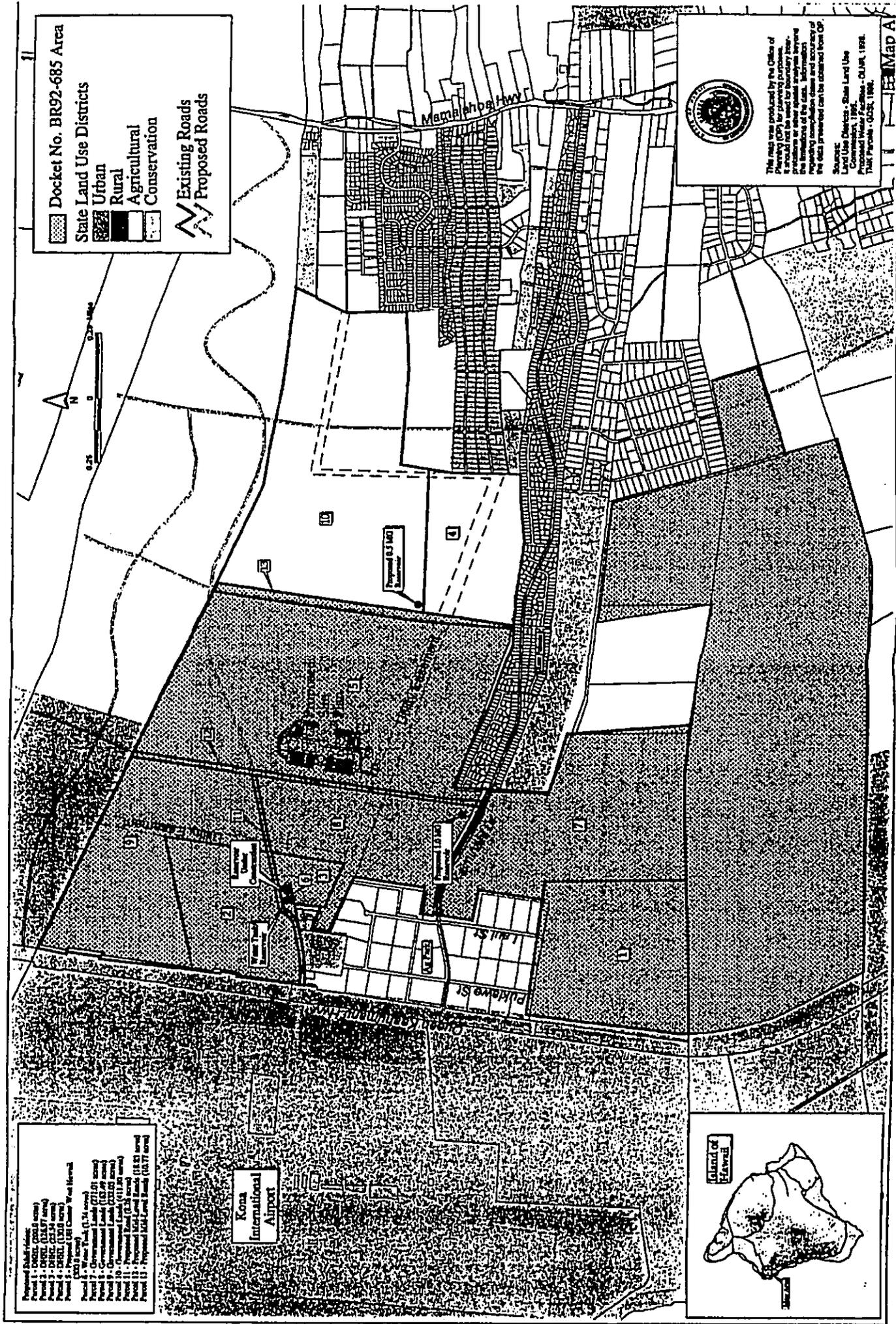
The Declaration of Conditions imposed by the Land Use Commission for the real property at Keahole, North Kona, was filed with the Bureau of Conveyances-Regular System, on February 9, 1994.



The map is published by the Office of Planning and Development, University of Hawaii, West Hawaii Center, for planning purposes only. It is not intended to be used as a legal document. The University of Hawaii, West Hawaii Center, is not responsible for any errors or omissions in this map. The University of Hawaii, West Hawaii Center, is not responsible for any damages or liabilities arising from the use of this map. The University of Hawaii, West Hawaii Center, is not responsible for any claims or damages arising from the use of this map.

Proposed Site Plan
 University of Hawaii Center at West Hawaii
 Hawaii Community College

Map B



Appendix A-6

Traffic Impact Assessment

Phillip Rowell and Associates

47-273 'D' Hui Iwa Street Kapaeha, Hawaii 96741 Phone: (808) 236-8208 FAX: (808) 236-4175 Email: prowell@psa.net

February 8, 2001

Wil Chee Pfandring, Inc.
1400 Ryercraft, Suite 928
Honolulu, HI 96814

Attn: Mr. Richard McGerrow

Re: UH Center at West Hawaii

Dear Richard:

The following is my response to OEQC's comment No. 5E dated January 23, 2001, relative to traffic signal timing at the intersection of Queen Kaahumanu Highway at the Airport Access Road.

I forwarded the comment to HDOT on January 25, 2001, immediately after I received a copy from you with a request for direction in preparing a response. HDOT was to contact me with the name of a person to coordinate a response with. As of Thursday, February 2, I had not received a response, so I talked with Mr. Robert Taira of Hilo District Office of HDOT while in Hilo. The Hilo office would probably be responsible for implementation of any modifications.

Based on that conversation, it is my understanding that HDOT does not adjust traffic signal timings in anticipation of a project. Signal timing is adjusted in response to specific problems when brought to HDOT's attention by maintenance staff, police or the public. Therefore, the traffic signal timing would not be adjusted until a problem materializes.

This is a logical approach since the conditions examined in the traffic impact report is a worse-case scenario (peak hour of project added to peak hour of the roadway) with maximum enrollment at the campus.

I hope this will address the comment from OEQC. If you need additional information, please call.

Very truly yours,

PHILLIP ROWELL AND ASSOCIATES

PS Rowell

Phillip J. Rowell, P.E.
Principal

PHILLIP ROWELL AND ASSOCIATES

BENJAMIN J. CAYETAHO
DIRECTOR



STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

200 SOUTH KUAHAKA STREET
SUITE 703
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4186
FACSIMILE (808) 586-4188

CONRYVEE BALMORSON
DIRECTOR

Maynard Young
January 23, 2001
Page 2

FAX MEMORANDUM

DATE: January 23, 2001
TO: Maynard Young, UH Facilities Planning Office (fax: 734-9430)
copy: Richard McGerrow, Wai Chee Planning (fax: 942-1851)
FROM: Nancy Heimrich, OBQC, ph: 586-4185; fax: 586-4186 *Nancy Heimrich*
SUBJECT: Final EIS, UH Center West Hawaii, additional changes needed

This follows up my memo dated November 20th, 2000 and Richard McGerrow's response of January 5th, 2001, which was submitted along with a corrected copy of the final EIS.

I've first listed corrected items which need no further action, then items which need additional action. Items numbers below correspond to item numbers in both memos.

NO FURTHER ACTION

- 1 to 3: permit list, applicant's signature/statement on title page, FEIS text changes. These items are now correct.
- 5.B - 5.D ceded land, historical perspective, local & regional perspectives, secondary impact, SHPD concurrence with preservation plan; these items are now correct.
- 5.F 1 - 2: UH Env. Center letter) curriculum description, distance learning; these items are now correct.
- 5.G: Attachment to KPECA letter; this is now correct.
- 6: List of DEIS commenters; this is now correct.

FURTHER ACTION REQUIRED

- 4. Responses to commenters: If you choose to send copies of the final EIS to those whose comments have resulted in changes to the FEIS text, indicate in the cover letters the section names or numbers of the affected text.

5.A. FWS comments on impacts to cave habitats/mitigation measures: as a mitigation measure add definitive language about consultation with a qualified biologist upon the discovery of caves large enough to enter, or indicate in definitive language that the FWS cave specialist will be contacted in this situation.

5.E. Intention road improvements: In its July 25th, 2000 letter DOT states clearly that the assumption of the widening of Queen Kaahumanu Highway to mitigate traffic impacts is "clearly not the case." A follow-up TIAR concludes that a change in the signal phasing by DOT at the intersection of Queen K Highway and the Airport Road will mitigate impacts. Until the applicant has a consultation process in place with DOT to decide what road improvements will be carried out and which agency will be responsible we cannot recommend acceptance of this FEIS.

5.F. 3: UH Env. Center letter) Uniform Building Code: in section 5.9 state in definitive language that the applicant (or applicant's contractor) will adhere to the UBC to mitigate earthquake hazards.

Call me if you have questions on any of the above.

Phillip Rowell and Associates

47-273 'D' Hui Ave Street Kaneohe, Hawaii 96744 Phone: (808) 238-6208 FAX: (808) 239-4175 Email:prowell@ps.net

December 1, 2000

W4 Chee Planning Inc.
1400 Rycroft Street
Suite 928
Honolulu, HI 96814

Attn: Mr. Richard McGerrow

Re: Traffic Study for UH Center at West Hawaii

Dear Richard:

The following is my response to questions relative to interim improvements to mitigate the traffic impacts along Queen Kaahumanu Highway resulting from the UH Center at West Hawaii (UHCVH).

The level-of-service analysis for cumulative plus project conditions concluded that the level-of-service for the southbound through movement at the intersection of Queen Kaahumanu Highway at Kona Airport Road would be E and the southbound left turn from Queen Kaahumanu Highway to Kaimi Nani Drive would be F. No mitigation was recommended because these intersections are expected to operate at overall Levels-of-Service D and B, respectively.

The issue is to identify improvements that will mitigate these Levels-of-Service until Queen Kaahumanu Highway is widening, which has been delayed since completion of the Traffic Impact Assessment for the project. I have attached a copy of Table 8 from the report modified to illustrate the levels-of-service resulting from modification of the traffic signal timing at the two subject intersections. As shown the southbound through movement at the intersection of Queen Kaahumanu Highway at Kona Airport Road will improve from E to D. The overall intersection Level-of-Service is expected to be C, which is an improvement from Level-of-Service D expected without mitigation.

The southbound left turn at the intersection of Queen Kaahumanu Highway at Kaimi Nani Drive is improved from Level-of-Service F to C upon modification of the signal timing. The overall intersection Level-of-Service will remain B.

This analysis shows that the modification of the signal timing will provide acceptable Levels-of-Service (D or better) and will therefore mitigate the traffic impacts of the project along Queen Kaahumanu Highway pending widening of the highway from two to four lanes. It should be noted that the traffic signals at these intersections actuated and therefore respond to actual traffic demand. The State will be the agency to determine the timing of the signals. The above analysis illustrates that the project's impacts can be mitigated if the State modifies the signals.

If you require additional information, please contact me.

Very truly yours,



PHILLIP ROWELL AND ASSOCIATES
Phillip J. Rowell, P.E.
Principal

Table 8 Level-of-Service Analysis for Alternates 1 Weekday Peak Hour Conditions

Intersection and Movement	Cumulative			Cumulative Plus Project			Cumulative Plus Project With Mitigation		
	VC ^a	Delay	LOS ^b	VC	Delay	LOS	VC	Delay	LOS
Queen Kaahumanu Hwy at Kona Airport Rd	0.824	17.2	C	0.881	29.8	D	0.807	12.5	C
Eastbound Left	0.124	19.4	C	0.124	19.4	C	0.000	0.0	C
Eastbound Right	0.100	8.8	B	0.274	8.8	B	0.021	0.1	B
Westbound Left	0.754	23.3	C	0.771	24.1	C	0.817	0.8	C
Westbound Through	0.282	1.9	A	0.286	1.9	A	0.223	0.0	A
Southbound Left	0.843	23.4	C	1.050	49.2	E	0.807	24.9	C
Southbound Right	0.811	2.1	A	0.811	2.1	A	0.000	0.0	A
Queen Kaahumanu Hwy at Kaimi Nani Dr.	0.795	8.2	B	0.795	13.9	B	0.650	5.7	B
Westbound Left	0.376	16.1	C	0.682	16.8	C	0.228	2.8	C
Westbound Right	0.194	14.9	B	0.211	15.4	B	0.127	0.5	B
Eastbound Left	0.608	5.5	B	0.608	6.6	B	0.000	0.1	B
Eastbound Right	0.224	6.9	B	0.817	7.7	B	0.293	1.7	B
Southbound Left	0.486	19.7	C	1.094	64.1	F	0.608	48.4	F
Southbound Through	0.728	3.7	B	0.728	3.7	B	0.001	0.0	B
Kaimi Nani Drive at UH Access Road									
Southbound Left	DOES NOT EXIST			0	1.9	A	NA	NA	NA
Southbound Right	DOES NOT EXIST			0	19.9	C	NA	NA	NA
Eastbound Left	DOES NOT EXIST			0	3.7	A	NA	NA	NA
Eastbound Right	DOES NOT EXIST			0	3.6	A	NA	NA	NA
Phase II Drive at Hamakua Highway									
Eastbound Left & Right	0	2.4	A	0	4.4	A	NA	1.0	A
Westbound Left	0	21.8	D	0	26.8	D	NA	5.8	D
Westbound Right	0	4.4	A	0	4.7	A	NA	0.3	A

^a VC = Peak hour volumes adjusted for "load" and/or "unload", which is the hour of the peak hour of the relevant road plus the peak hour of the project.
^b LOS = Level of Service.
^c VC = Number of vehicles in service.
^d Delay = Average delay per vehicle.
^e LOS is based on delay.
^f Values in brackets indicate that the intersection is not included in the Level-of-Service analysis.

TRAFFIC IMPACT ASSESSMENT

**UNIVERSITY OF HAWAII CENTER
AT WEST HAWAII**

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IN KAILUA-KONA, HAWAII

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1. INTRODUCTION

Phillip Rowell and Associates has been retained by WJI Chae Planning, Inc., of Honolulu to perform a traffic impact analysis for the proposed University of Hawaii Center at West Hawaii, which will be in the Kailua-Kona area on the island of Hawaii. The purpose of this study is to analyze the traffic impacts of the proposed project. This report will most likely be incorporated into an environmental assessment of the project.

The following report has been prepared to describe the traffic and parking characteristics of the proposed project and likely impacts to the adjacent roadway network. This introductory chapter discusses the location of the project, the proposed development, and the study methodology.

Project Location and Description

The proposed project is described as follows:

1. The project will be a community-type college serving commuter students. There will be no dormitories on campus.
2. The maximum capacity is 1,500 students.
3. The project will be located mauka of Queen Kaahumanu Highway across from Kona International Airport. See Figure 1.
4. Initially, access to the campus will be provided via a new roadway from the campus to Kaimi Nani Drive. This access scenario is referred to as Alternate 1. See Figure 2.

5. Ultimately, a new roadway will link the campus with Queen Kaahumanu Highway, intersecting Queen Kaahumanu Highway at the intersection with Kona Airport Road. These are referred to as Alternates 2.

Study Methodology and Order of Presentation

1. Analysis of Existing Traffic Conditions

Existing traffic volumes at the study intersections were determined from traffic counts performed during September and October, 1999. Intersection configurations and traffic control information were also collected in the field at the time of the traffic counts. Other data collected included speed limits and traffic signal phasing.

Using the data collected, existing traffic operating conditions in the vicinity of the project were determined. The methodology for signalized and unsignalized intersections described in the 1997 Highway Capacity Manual (HCM)¹ was used to determine the level-of-service (LOS) at the study intersections.

Existing traffic conditions, the LOS concept and the results of the LOS analysis for existing conditions are presented in Chapter 2.

2. Determination of Cumulative Traffic Projections

The year 2004 was used as the design year. This does not necessarily represent the project completion date. It represents occupancy for purposes of conducting the impact analysis. Cumulative traffic conditions are defined as future traffic conditions without the proposed project. A description of the process used to estimate 2004 cumulative traffic volumes and the resulting cumulative traffic projections is presented in Chapter 3.

3. Analysis of Project-Related Traffic Impacts

The next step in the traffic analysis was to estimate the peak-hour traffic that would be generated by the proposed project. This was done using standard trip generation rates obtained from the Institute of Transportation Engineers. The procedure is discussed in Chapter 4.

These trips were distributed based on the available approach and departure routes. The project-related traffic was then superimposed on 2004 cumulative traffic volumes at the subject intersections. The HCM methodology was used again to conduct a LOS analysis for cumulative plus project conditions. The results of this analysis were compared to 2004 cumulative conditions to determine the incremental impacts of this project.

The 2004 cumulative plus project traffic projections are presented in Chapter 4. The analysis of the project-related impacts and the conclusions of the analyses are presented in Chapter 5.

¹ Highway Capacity Manual, Institute of Transportation Engineers, Washington, D.C., 1997

2. ANALYSIS OF EXISTING CONDITIONS

This chapter presents the existing traffic conditions on the roadways adjacent to the proposed project. The level-of-service (LOS) concept and the results of the LOS analysis for existing conditions are also presented. The purpose of this analysis is to establish the base conditions for determination of the impacts of the project which are described in a subsequent chapter.

Description of Existing Streets and Intersection Controls

The following is summary of the major roadways in the study area:

Queen Kaahumanu Highway

Queen Kaahumanu Highway in the vicinity of the proposed project is a two-lane, two-way highway. The highway runs north-south. The intersections with Kona Airport Road and Kalimi Nani Drive are signalized. There are separate left and right turn lanes on the Queen Kaahumanu Highway approaches. The average daily traffic (ADT) is approximately 17,200 vehicles per day (vpd). The posted speed limit between Kona Airport Road and Kalimi Nani Drive is 45 miles per hour (mph).

Kalimi Nani Drive

Kalimi Nani Drive is also a two-lane, two-way roadway that forms a "T" intersection with Queen Kaahumanu Highway. Kalimi Nani Drive currently links Queen Kaahumanu Highway with residential areas marks of the highway. There are a few commercial uses immediately adjacent to Queen Kaahumanu Highway. The ADT, estimated from peak hour counts, is approximately 4,000 vpd. The posted speed limit adjacent to Queen Kaahumanu Highway is 25 mph.

Kona Airport Road

Kona Airport Road links Queen Kaahumanu Highway to Kona International Airport. The roadway is a two-lane, two-way roadway. The ADT is approximately 9,000 vpd and the speed limit is 25 mph.

The roadway characteristics are summarized in Table 1.

Table 1 Existing Traffic Characteristics⁽¹⁾

Roadway Location	Queen Kaahumanu Highway		Kona Airport Road		Kaiwi Nani Drive	
	North of Kona Airport Road	South of Kona Airport Road	West of Queen Kaahumanu Hwy	East of Queen Kaahumanu Hwy	East of Queen Kaahumanu Hwy	West of Queen Kaahumanu Hwy
Direction	NB	SB	WB	EB	WB	EB
ADT ⁽²⁾	8,663	9,516	4,442	4,005	NOT AVAILABLE	NOT AVAILABLE
AM Peak Hour	7:00 AM to 8:00 AM	7:00 AM to 8:00 AM	8:00 AM to 9:00 AM	7:00 AM to 8:00 AM	7:00 AM to 8:00 AM	7:00 AM to 8:00 AM
AM Peak Volume	680	403	251	339	85	435
K (%)	7.9	4.7	5.8	7.4		
D (%)		63.67		40.57	1.763	
PM Peak Hour	3:30 PM to 4:30 PM	3:00 PM to 4:00 PM	3:00 PM to 4:00 PM	4:15 PM to 5:15 PM		
PM Peak Volume	593	265	308	260	320	185
K (%)	6.9	10.0	6.9	5.8		
D (%)		41.59		53.47		65.34

⁽¹⁾ SOURCE: Hawaii Department of Transportation, May 1991
⁽²⁾ ADT is Average Daily Traffic

The intersections analyzed and existing lane configurations are shown on Figure 3. Photographs of the study intersections serving the project are presented as Appendix A.

Existing Peak Hour Traffic Volumes

The AM and PM peak hour traffic volumes at the study intersections serving the project are shown in Figure 3. The traffic volumes include large trucks, buses and motorcycles. They do not include mopeds or bicycles.



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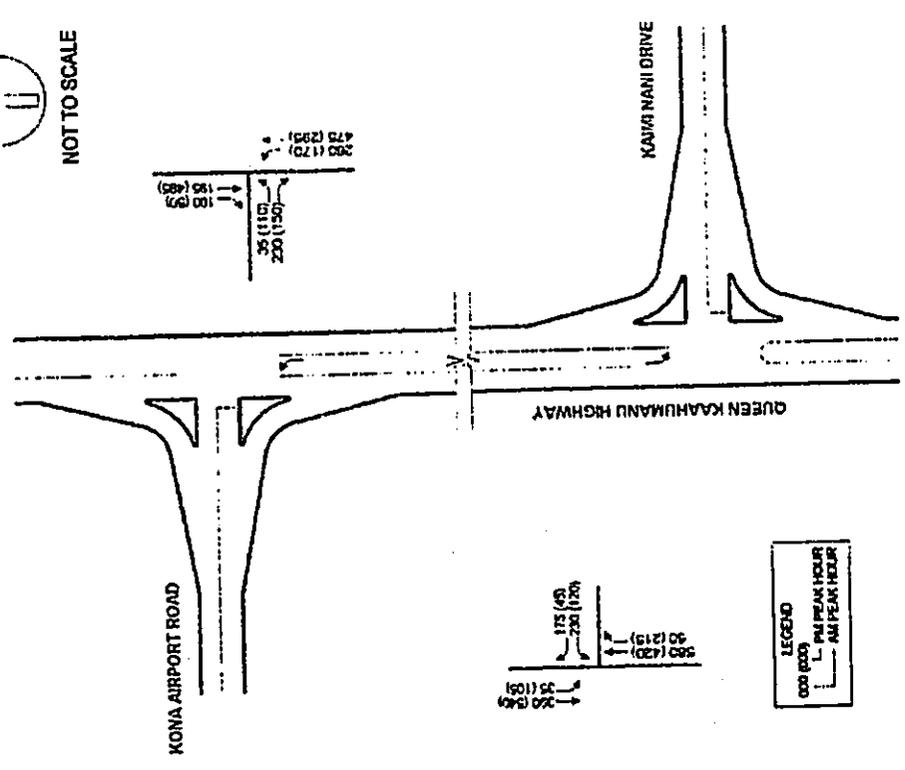


Figure 3

EXISTING LANE CONFIGURATIONS AND 1999 PEAK HOUR TRAFFIC VOLUMES

Level-of-Service Concept

Signalized Intersections

The operations method described in the 1997 Highway Capacity Manual (HCM) was used to analyze the operating efficiency of the signalized intersections adjacent to the study site. This method involves the calculation of a volume-to-capacity (V/C) ratio and average vehicle delay which is related to a level-of-service.

"Level-of-Service" is a term which denotes any of an infinite number of combinations of traffic operating conditions that may occur on a given lane or roadway when it is subjected to various traffic volumes. Level-of-service (LOS) is a qualitative measure of the effect of a number of factors which include space, speed, travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience.

There are six levels-of-service, A through F, which relate to the driving conditions from best to worst, respectively. The characteristics of traffic operations for each level-of-service are summarized in Table 2. In general, LOS A represents free-flow conditions with no congestion. LOS F, on the other hand, represents severe congestion with stop-and-go conditions. Level-of-service D is typically considered acceptable for peak hour conditions in urban areas.

Corresponding to each level-of-service shown in the table is a volume/capacity ratio. This is the ratio of either existing or projected traffic volumes to the capacity of the intersection. Capacity is defined as the maximum number of vehicles that can be accommodated by the roadway during a specified period of time. The capacity of a particular roadway is dependent upon its physical characteristics such as the number of lanes, the operational characteristics of the roadway (one-way, two-way, turn prohibitions, bus stops, etc.), the type of traffic using the roadway (trucks, buses, etc.) and turning movements.

Table 2 Level-of-Service Definitions for Signalized Intersections⁽¹⁾

Level of Service	Interpretation	Volume-to-Capacity Ratio ⁽²⁾	Stopped Delay (Seconds)
A, B	Uncongested operations; all vehicles clear in a single cycle.	0.000-0.700	<15.0
C	Light congestion; occasional backups on critical approaches	0.701-0.800	15.1-25.0
D	Congestion on critical approaches but intersection functional. Vehicles must wait through more than one cycle during short periods. No long standing lines formed.	0.801-0.900	25.1-40.0
E	Severe congestion with some standing lines on critical approaches. Blockage of intersection may occur if signal does not provide protected turning movements.	0.901-1.000	40.1-60.0
F	Total breakdown with stop-and-go operation	>1.001	>60.0

Notes:

- (1) Source: Highway Capacity Manual, 1997.
- (2) This is the ratio of the calculated critical volume to Level-of-Service E Capacity.

Unsignalized Intersections

Like signalized intersections, the operating conditions of intersections controlled by stop signs can be classified by a level-of-service from A to F. However, the method for determining level-of-service for unsignalized intersections is based on the use of gaps in traffic on the major street by vehicles crossing or turning through that stream. Specifically, the capacity of the controlled legs of an intersection is based on two factors: 1) the distribution of gaps in the major street traffic stream, and 2) driver judgement in selecting gaps through which to execute a desired maneuver. The criteria for level-of-service at an unsignalized intersection is therefore based on delay of each turning movement. Table 3 summarizes the definitions for level-of-service and the corresponding delay.

Table 3 Level-of-Service Definitions for Unsignalized Intersections⁽¹⁾

Level of Service	Expected Delay to Minor Street Traffic	Delay (Seconds)
A	Little or no delay	>5
B	Short traffic delays	5.1 to 10.0
C	Average traffic delays	10.1 to 20.0
D	Long traffic delays	20.1 to 30.0
E	Very long traffic delays	30.1 to 45.0
F	See note (2) below	>45.1

Note:

- (1) Source: Highway Capacity Manual, 1997.
- (2) When general volume exceeds the capacity of the legs, extreme delays will be encountered with queuing which may cause severe congestion affecting other traffic movements in the intersection. This condition usually warrants improvement of the intersection.

Level-of-Service Analysis of Existing Conditions

The results of the Level-of-Service analysis are shown in Table 4. The calculation worksheets are presented in Attachment C.

Table 4 Existing Levels-of-Service

Intersection and Movement	AM Peak Hour			PM Peak Hour		
	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS
Queen Kaahumanu Highway at Kaneohe Airport Road	0.339	7.4	B	0.554	9.2	B
Eastbound Left	0.120	15.6	C	0.490	18.6	C
Eastbound Right	0.172	5.5	B	0.159	8.9	B
Northbound Left	0.544	14.3	B	0.534	17.6	C
Northbound Through	0.385	2.7	A	0.205	1.7	A
Southbound Through	0.318	10.4	B	0.580	8.8	B
Southbound Right	0.071	3.8	A	0.011	2.1	A
Queen Kaahumanu Highway at Kalaheo Drive	0.589	10.3	B	0.441	7.5	B
Westbound Left	0.723	21.9	C	0.378	16.1	C
Westbound Right	0.401	16.3	C	0.104	14.9	D
Northbound Through	0.646	9.1	B	0.485	7.4	B
Northbound Left	0.000	0.0	A	0.224	6.0	B
Southbound Left	0.165	17.5	C	0.406	19.7	C
Southbound Through	0.332	2.7	A	0.460	3.2	A
Kalaheo Drive at Maunaloa Highway	(4)	2.4	A	(4)	2.4	A
Eastbound Left & Right	(4)	8.8	B	(4)	11.4	C
Northbound Left	(4)	5.0	A	(4)	3.6	A

NOTE:
 (1) V/C denotes ratio of volume to capacity. See Appendix C for calculations.
 (2) Delay is in seconds per vehicle.
 (3) LOS denotes Level-of-Service categories using the conventional method presented in Highway Capacity Manual.
 (4) Volume-Capacity Ratio is not calculated for unsignalized intersections.

The conclusions of this analysis are:

1. There appears adequate capacity to accommodate existing traffic volumes at good levels-of-service and all intersections operate at good levels-of-service.
2. The LOS calculations accurately reflect traffic conditions observed in the field during the traffic counts.

3. PROJECTED CUMULATIVE TRAFFIC CONDITIONS

The purpose of this chapter is to discuss the assumptions and data used to estimate 1999 cumulative traffic conditions. Cumulative traffic conditions are defined as the traffic conditions resulting from background growth and related projects.

Future traffic growth consists of two components. The first is ambient background growth that is a result of regional growth and cannot be attributed to a specific project. The second component is estimated traffic that will be generated by other development projects in the vicinity of the proposed project.

Background Traffic Growth

The background growth rate of traffic in the study area was estimated from historical traffic counts along Queen Kaahumanu Highway and Maunaloa Highway performed by Hawaii Department of Transportation. Growth rates of morning and afternoon peak hour traffic were calculated for the period between 1992 and 1998 for Queen Kaahumanu Highway and between 1965 and 1988 for Maunaloa Highway. The growth analysis is shown in Tables 5 and 6.

Table 5 Traffic Growth Analysis Along Queen Kaahumanu Highway

Year	ADT		AM Peak Hour		PM Peak Hour	
	NB	SB	NB	SB	NB	SB
1992	6,178	6,149	398	481	483	486
1998	8,653	5,846	680	403	599	655
Annual Growth Rate ⁽¹⁾	5.8%	-0.8%	9.4%	-2.2%	4.4%	9.9%

NOTE:
(1) Compounded annual growth rate.
(2) Use growth rate of northbound AM traffic of 8.4%.

Table 6 Traffic Growth Analysis Along Kona Airport Road

Year	ADT		AM Peak Hour		PM Peak Hour	
	EB	WB	EB	WB	EB	WB
1992	3,415	3,388	188	232	288	180
1998	4,442	4,805	251	339	306	209
Annual Growth Rate ⁽¹⁾	4.5%	5.2%	4.0%	6.5%	2.4%	8.9%

NOTE:
(1) Compounded annual growth rate.

Related Projects

The second component in estimating background traffic volumes is traffic generated by other proposed projects in the vicinity. Related projects are defined as those projects that are under construction or have been approved for construction and would significantly impact traffic in the study area. No projects were identified.

2004 Cumulative Traffic Projects

2004 cumulative traffic projections are calculated by expanding existing traffic volumes by the appropriate growth rates and then superimposing traffic generated by related projects. The assumptions used to estimate the cumulative traffic volumes are:

1. A growth rate of 9.4% per year was used for northbound and southbound morning peak hour traffic along Queen Kaahumanu Highway.
2. Growth rates of 4.4% and 9.9% per year were used to estimate northbound and southbound, respectively, afternoon peak hour traffic along Queen Kaahumanu Highway.
3. Growth rates of 4.0% and 6.5% per year were used to estimate eastbound and westbound, respectively, morning peak hour traffic along Kona Airport Road.
4. Growth rates of 2.4% and 8.9% per year were used to estimate eastbound and westbound,

5. respectively, afternoon peak hour traffic along Kona Airport Road.
6. Traffic along Keimi Nam Drive will not increase significantly.
7. The growth rate of traffic along Mameloa Highway was estimated to be 3.85% per year.
8. Traffic generated by the Keu development north of the proposed site was estimated and added to the background traffic to calculate cumulative peak hour traffic volumes.

The resulting 2004 cumulative peak hour traffic volumes are shown in Figure 4.



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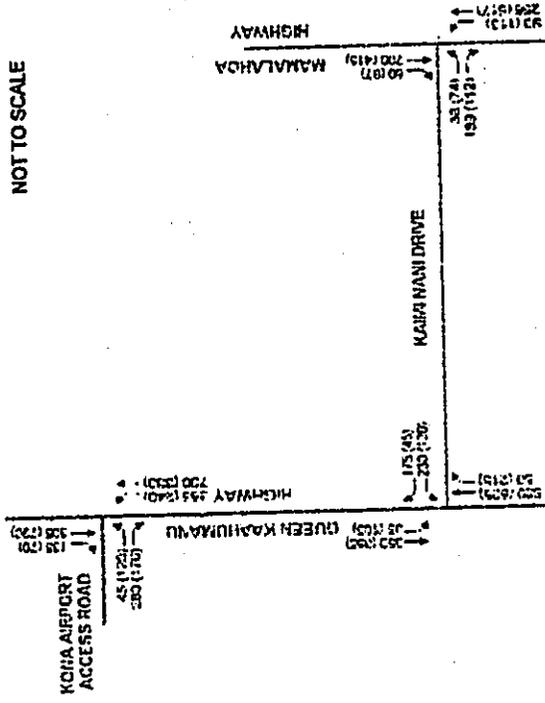


Figure 4
2004 CUMULATIVE
PEAK HOUR TRAFFIC VOLUMES

Page 14

4. PROJECT-RELATED TRAFFIC CONDITIONS

This chapter discusses the methodology used to identify the traffic-related impacts of the proposed project. Generally, the process involves the determination of weekday peak-hour trips that would be generated by the proposed project, distribution and assignment of these trips on the approach and departure routes, and finally, determination of the levels-of-service at affected intersections and driveways subsequent to implementation of the project.

Project Trip Generation

Future traffic volumes generated by a project are typically estimated using trip generation rates contained in Trip Generation published by the Institute of Transportation Engineers. After review of the trip generation calculations, it was determined that the PM peak hour estimate of trips was low considering the nature of the existing facility. The existing campus primarily serves working people attending school after working at a daytime job. Therefore, it is expected that there would be more inbound trips during the PM peak hour than was estimated using the trip generation rates presented in Trip Generation.

To compensate, the PM peak hour trips were estimated using the following assumptions:

1. The total enrollment is 1,500 students.
 2. 40% of the students attend class on a typical weekday evening
 3. 80% of the students arrive during the peak hour.
 4. One student per vehicle, and
 5. 75% of the peak hour trips are inbound. This is consistent with the directional distribution presented in Trip Generation.
- The calculated number of AM and PM peak hour trips is shown in Table 7.

Table 7 Trip Generation Summary⁽¹⁾

Time Period	Direction		Trips
	Inbound	Outbound	
AM Peak Hour			233
			7
	Total		240
PM Peak Hour			360
			120
	Total		480

NOTES:
(1) Calculations are based on 1500 students.

Trip Distribution

The project-related trips were distributed along the anticipated approach routes to the project site. This information was obtained from previously conducted traffic studies in the area, which have been generally accepted by the reviewing agencies.

The approach and departure distributions are:

Percent	Inbound		Per Cent	Outbound	
	Direction	Direction		Direction	Direction
25%	Southbound along Queen Kaahumanu Highway		25%	Northbound along Queen Kaahumanu Highway	
60%	Northbound along Queen Kaahumanu Highway		80%	Southbound along Queen Kaahumanu Highway	
5%	Eastbound from Kona Airport		5%	Westbound to Kona Airport	
10%	Westbound Along Kalimi Nani Drive		10%	Eastbound along Kalimi Nani Drive	
100%	Total		100%	Total	

Trip Assignments

Using the trip generation and trip distribution previously discussed, project-related traffic was assigned to the various traffic movements at the intersections studied. Trips were assigned for two access scenarios. The first is the interim access plan in which traffic will access and egress the site via a new roadway from the campus to Kalimi Nani Drive. All campus related traffic will utilize the Kalimi Nani Drive-Queen Kaahumanu Highway intersection. This scenario is referred to as Alternative A.

The second access plan is for a new roadway connecting the campus with Queen Kaahumanu Highway. This roadway will intersect Queen Kaahumanu Highway at the Kona Airport Access Road. The existing T-intersection will be modified to a four-legged intersection. This access plan is referred to as Alternative B.

The project related trip assignments are shown in Figure 5.

2004 Cumulative Plus Project Projections

Cumulative plus project traffic conditions are defined as 2004 background traffic conditions plus project related traffic. The incremental difference between cumulative and cumulative plus project is the traffic impact of the project under study.

2004 cumulative plus project traffic volumes with the project were estimated by superimposing the project-generated traffic on the 2004 cumulative traffic volumes presented in Chapter 3. The resulting peak hour traffic volumes for 2004 cumulative plus project are shown on Figure 6.

The traffic projection worksheets are presented as Appendix B.



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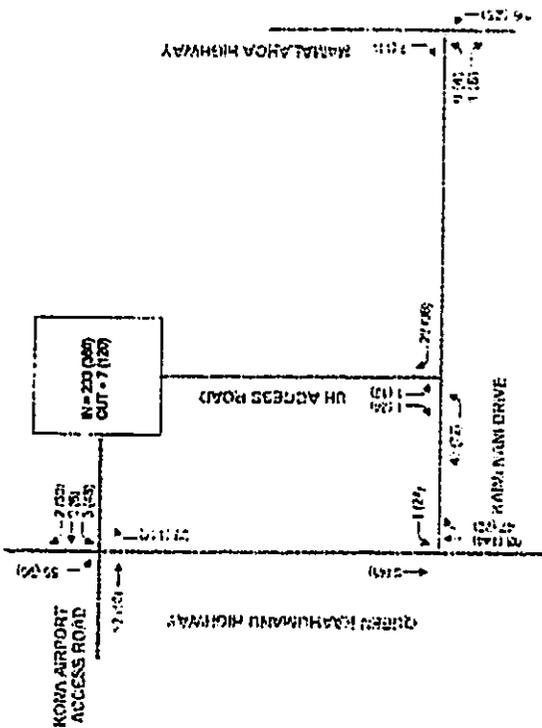


Figure 6

PROJECT GENERATED TRIPS
ALTERNATE 2
LONG RANGE ACCESS PLAN



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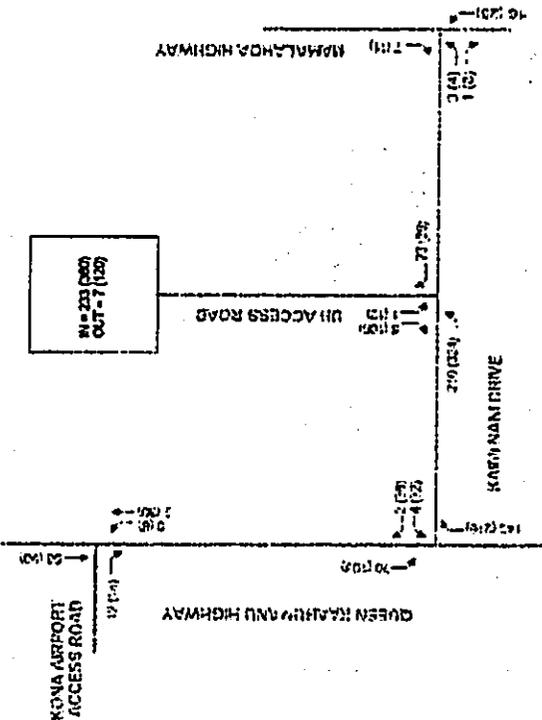


Figure 5

PROJECT GENERATED TRIPS
ALTERNATE 1
INTERIM ACCESS PLAN



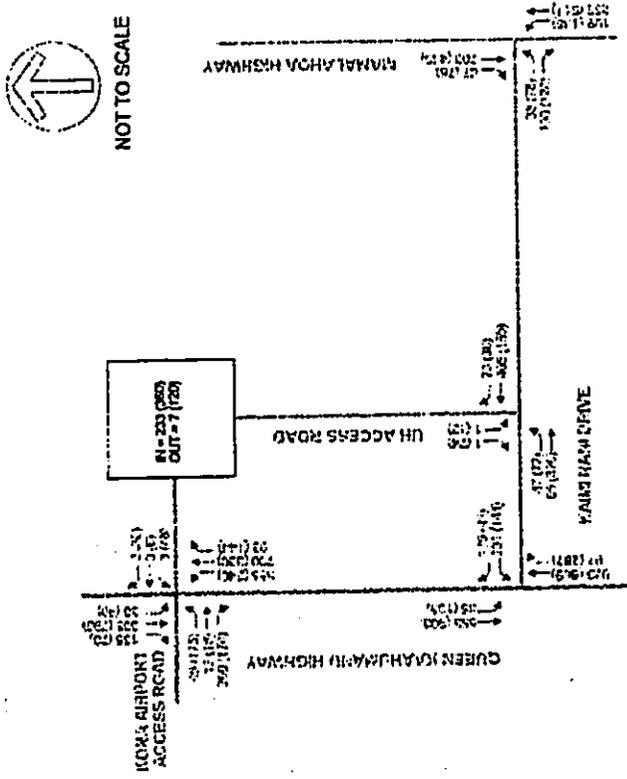


Figure 6
2004 CUMULATIVE PLUS PROJECT
PEAK HOUR TRAFFIC VOLUMES
ALTERNATE 2 LONG RANGE ACCESS PLAN

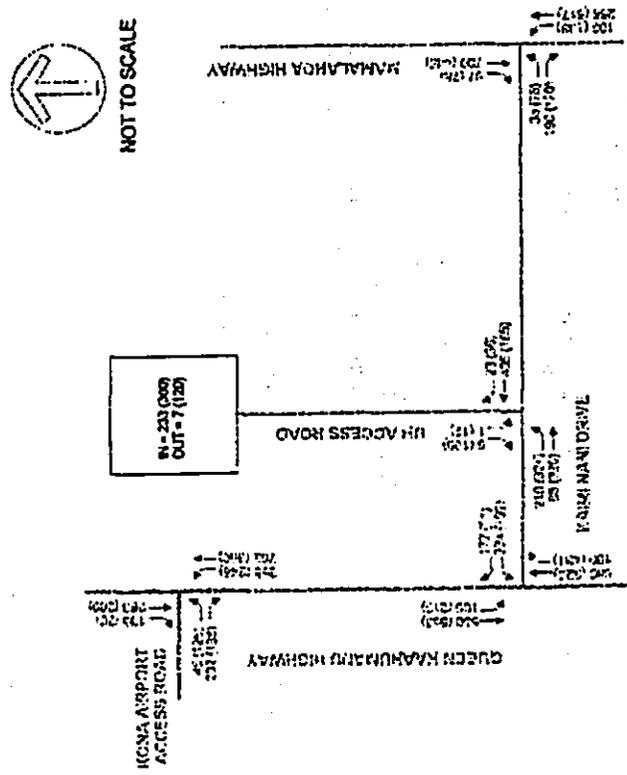


Figure 7
2004 CUMULATIVE PLUS PROJECT
PEAK HOUR TRAFFIC VOLUMES
ALTERNATE 1 INTERIM ACCESS PLAN

Table 8 Level-of-Service Analysis for Alternate 1 Weekday Peak Hour Conditions¹⁾

Intersection and Approach	V/C ²⁾		Delay ³⁾		LOS ⁴⁾		Change	
	VD ⁵⁾	VD ⁶⁾	VD ⁷⁾	VD ⁸⁾	VD ⁹⁾	VD ¹⁰⁾	VD ¹¹⁾	VD ¹²⁾
Green Kahuakua Hwy at Kona Airport Rd	0.486	0.7	B	15.7	B	0.000	0.0	0.000
Eastbound Left	0.194	15.7	C	0.194	15.7	B	0.000	0.0
Eastbound Right	0.237	6.7	B	0.292	5.8	B	0.015	0.1
Northbound Left	0.742	18.2	C	0.742	18.2	C	0.000	0.0
Northbound Thru	0.843	3.8	A	0.844	3.8	A	0.001	0.0
Southbound Left	0.418	11.7	B	0.480	12.7	B	0.064	1.0
Southbound Right	0.112	2.9	A	0.112	2.9	A	0.000	0.0
Green Kahuakua Hwy at Kona Airport Rd	0.814	17.8	C	0.868	17.8	C	0.054	0.0
Westbound Left	0.368	34.4	D	0.462	26.1	D	0.014	1.7
Westbound Right	0.481	18.3	C	0.490	18.5	C	0.012	0.2
Northbound Thru	0.855	23.1	C	0.855	23.1	C	0.000	0.0
Northbound Right	0.000	0.0	A	0.178	6.1	B	0.178	6.1
Southbound Left	0.166	17.5	C	0.496	19.7	C	0.331	2.2
Southbound Thru	0.447	2.8	A	0.447	2.8	A	0.000	0.0
Kahui Road Drive at UH Access Road	DOES NOT EXIST			1.4	A	-0.000	1.4	
Southbound Left	DOES NOT EXIST			19	13.3	C	-0.000	13.3
Southbound Right	DOES NOT EXIST			19	4.8	A	-0.000	4.8
Eastbound Left	DOES NOT EXIST			19	4.7	A	-0.000	4.7
Kahui Road Drive at Mamalahou Highway	(1)	2.8	A	(1)	3.1	A	NA	0.2
Eastbound Left & Right	(1)	14.5	C	(1)	15.1	C	NA	0.6
Northbound Left	(1)	8.4	B	(1)	8.7	B	NA	0.3
Green Kahuakua Hwy at Kona Airport Rd	0.824	17.3	C	0.891	29.8	D	0.067	12.5
Eastbound Left	0.374	18.4	C	0.524	18.4	C	0.000	0.0
Eastbound Right	0.180	8.9	B	0.224	9.0	B	0.031	0.1
Northbound Left	0.754	23.3	C	0.771	24.1	C	0.017	0.8
Northbound Thru	0.200	1.8	A	0.206	1.8	A	0.072	0.0
Southbound Left	0.843	23.4	C	1.050	48.2	E	0.197	24.8
Southbound Right	0.831	2.1	A	0.831	2.1	A	0.000	0.0
Green Kahuakua Hwy at Kona Airport Rd	0.820	8.2	B	0.750	13.9	B	0.000	3.7
Westbound Left	0.378	18.1	C	0.462	18.6	C	0.226	2.5
Westbound Right	0.104	14.9	B	0.231	15.4	B	0.127	0.5
Northbound Thru	0.806	8.5	B	0.806	8.5	B	0.000	0.1
Northbound Right	0.274	8.0	B	0.517	7.7	B	0.260	1.7
Southbound Left	0.498	18.7	C	1.004	64.1	F	0.506	46.4
Southbound Thru	0.778	3.7	B	0.778	3.7	B	0.000	0.0
Kahui Road Drive at UH Access Road	DOES NOT EXIST			(1)	1.9	A	NA	NA
Southbound Left	DOES NOT EXIST			(1)	19.8	C	NA	NA
Southbound Right	DOES NOT EXIST			(1)	3.7	A	NA	NA
Eastbound Left	DOES NOT EXIST			(1)	3.6	A	NA	NA
Kahui Road Drive at Mamalahou Highway	(1)	3.4	A	(1)	4.4	A	NA	1.0
Eastbound Left & Right	(1)	21.0	D	(1)	26.8	D	NA	5.8
Northbound Left	(1)	4.4	A	(1)	4.7	A	NA	0.3

5. CONCLUSIONS AND RECOMMENDATIONS

The purpose of this chapter is to summarize the results of the level-of-service analysis, which identifies the project-related impacts. In addition, any mitigation measures necessary and feasible are identified and other access, ingress and circulation issues are discussed.

Definition of Significant Impacts

Criteria for determining if a project has a significant traffic impact for which mitigation measures must be investigated have been established based on traffic impact study guidelines used in other traffic studies. Generally, the criteria are as follows: if the level-of-service (LOS) without the project is E, F and the volume/capacity (V/C) ratio changes less than 0.020, the project's traffic impacts are considered insignificant. However, if the V/C ratio change is greater than 0.020, then mitigation measures which will reduce the V/C ratio change to less than 0.020 must be identified. If the LOS with the project is D or better, then no mitigation measures need to be identified.

Project Related Traffic Impacts and Mitigation Measures

The results of the LOS analysis for the intersections studied are shown in Tables 8 and 9, respectively.

¹⁾ LOS
²⁾ V/C
³⁾ Delay in seconds per vehicle
⁴⁾ LOS
⁵⁾ V/C
⁶⁾ Delay in seconds per vehicle
⁷⁾ V/C
⁸⁾ Delay in seconds per vehicle
⁹⁾ V/C
¹⁰⁾ Delay in seconds per vehicle
¹¹⁾ V/C
¹²⁾ Delay in seconds per vehicle

Table 9 Level-of-Service Analysis for Alternate 2 Weekday Peak Hour Conditions

Intersection and Movement	V/C ^a		LOS ^b		Cumulative Peak Project		Changes	
	AM	PM	AM	PM	Delay	LOS	V/C	Delay
Queen Kaahumanu Hwy at Kona Airport Rd	0.08	0.04	B	B	11.3	B	0.100	2.8
Eastbound Left & Thru	0.14	0.17	C	C	0.213	C	0.050	0.8
Eastbound Right	0.27	0.37	B	B	0.421	B	0.154	7.5
Westbound Left & Thru	0.74	0.82	C	C	0.020	C	-0.168	-4.3
Westbound Right	0.83	0.88	A	A	0.186	A	0.113	4.0
Northbound Thru	0.49	0.54	B	B	0.434	B	0.050	1.5
Northbound Right	0.11	0.14	A	A	0.271	A	0.065	1.9
Southbound Left	0.88	0.91	D	D	0.871	D	0.055	17.3
Southbound Right	0.41	0.41	C	C	0.481	C	0.003	0.4
Northbound Thru	0.95	0.95	E	E	1.025	E	0.000	0.0
Northbound Right	0.00	0.00	A	A	0.060	A	0.000	0.0
Southbound Left	0.16	0.17	C	C	0.185	C	0.000	0.0
Southbound Thru	0.47	0.49	A	A	0.449	A	0.000	0.0
Queen Kaahumanu Hwy at Kaimi Nani Drive	0.00	0.00	A	A	0.000	A	0.000	0.0
Westbound Left	0.00	0.00	A	A	0.000	A	0.000	0.0
Westbound Right	0.00	0.00	A	A	0.000	A	0.000	0.0
Eastbound Left	0.00	0.00	A	A	0.000	A	0.000	0.0
Eastbound Right	0.00	0.00	A	A	0.000	A	0.000	0.0
Kaimi Nani Drive at Kona Airport Rd	0.00	0.00	A	A	0.000	A	0.000	0.0
Eastbound Left & Right	0.00	0.00	A	A	0.000	A	0.000	0.0
Northbound Left	0.00	0.00	A	A	0.000	A	0.000	0.0
Northbound Right	0.00	0.00	A	A	0.000	A	0.000	0.0
Queen Kaahumanu Hwy at Kaimi Nani Drive	0.00	0.00	A	A	0.000	A	0.000	0.0
Eastbound Left & Thru	0.24	0.27	C	C	0.281	C	0.043	7.4
Eastbound Right	0.34	0.34	B	B	0.481	B	0.217	21.4
Westbound Left & Thru	0.10	0.08	B	B	0.180	B	-0.008	4.0
Westbound Right	0.74	0.73	C	C	0.156	C	-0.181	-4.5
Northbound Left	0.93	0.93	E	E	0.803	E	0.046	3.1
Northbound Right	0.00	0.00	A	A	0.311	A	0.000	0.0
Southbound Left	0.94	0.94	E	E	0.878	E	0.087	14.8
Southbound Right	0.01	0.01	A	A	0.046	A	0.015	4.5
Queen Kaahumanu Hwy at Kaimi Nani Drive	0.00	0.00	A	A	0.000	A	0.000	0.0
Westbound Left	0.37	0.41	C	C	0.482	C	0.048	7.4
Westbound Right	0.10	0.10	B	B	0.104	B	0.000	0.0
Northbound Thru	0.82	0.82	D	D	0.773	D	0.188	3.1
Northbound Right	0.74	0.74	C	C	0.321	C	0.087	0.5
Southbound Left	0.46	0.46	B	B	0.498	B	0.000	0.0
Southbound Thru	0.17	0.17	C	C	0.189	C	0.041	0.8
Kaimi Nani Drive at Kaimi Nani Drive	0.00	0.00	A	A	0.000	A	0.000	0.0
Eastbound Left	0.00	0.00	A	A	0.000	A	0.000	0.0
Eastbound Right	0.00	0.00	A	A	0.000	A	0.000	0.0
Westbound Left	0.00	0.00	A	A	0.000	A	0.000	0.0
Westbound Right	0.00	0.00	A	A	0.000	A	0.000	0.0

NOTES:
1. Peak hour conditions analyzed are "worst-case" conditions, which is the sum of the peak hour of the adjacent street plus the peak hour of the generator.
2. V/C is the ratio of volume to capacity.
3. Delay is in seconds per vehicle.
4. LOS Analysis Level-of-Service calculated using the operations method described in Highway Capacity Manual. LOS is based on delay.
5. Values in parenthesis are not calculated for unsignalized intersections.

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The assumptions used for the LOS analysis are:

1. The access road between Kaimi Nani Drive and the campus (Alternate 1) is a two-lane, two-way roadway. At the intersection with Kaimi Nani Drive, there are separate left and right turn lanes. There are no separate turn lanes along Kaimi Nani Drive. The intersection is unsignalized.
2. The access road between the campus and Queen Kaahumanu Highway (Alternate 2) is a two-lane undivided roadway. At the intersection with Queen Kaahumanu Highway, the left turn and through movements share one lane for the eastbound and westbound approaches. There are separate turn lanes for northbound and southbound traffic along Queen Kaahumanu Highway. Left turns are protected.
3. The 2004 configuration of the intersection of Queen Kaahumanu Highway at Kaimi Nani Drive is the same as the existing configuration. The intersection is signalized.

The conclusions of the LOS analysis for 2004 conditions are:

Alternate 1 - Access via Kaimi Nani Drive

1. There are no capacity deficiencies at the study intersections during the morning peak hour.
2. During the afternoon peak hour the southbound through movement at Queen Kaahumanu Highway at Kona Airport Road and the southbound to eastbound left turn at Kaimi Nani Drive will operate at Level-of-Services E and F, respectively. This is a change from Level-of-Services C for cumulative conditions and is the result of traffic destined for the project. However, the intersections operate at acceptable level of service overall for urban conditions.

Alternate 2 - Access via Kona Airport Road Extension

3. At the intersection of Queen Kaahumanu Highway at Kaimi Nani Drive, the northbound through movement will operate at Level-of-Services E during the morning peak hour. This is the result of traffic traveling north through this intersection and then turning right at Kona Airport Road. Overall, the intersection operates at level of service D which is acceptable for urban conditions.
4. At the intersection of Queen Kaahumanu Highway at Kona Airport Road, the level-of-service of some movements will improve as a result of modifications to the signal phasing to accommodate the southbound left turns.

Conclusions

1. There are some capacity deficiencies for both alternatives. However, the intersections are only slightly over capacity and, therefore, would be eliminated upon improvement of Queen Kaahumanu Highway from two to four lanes. The timetable for this improvement by HDOT is not firm at this point. The conclusion is that maximum capacity of the campus can be accommodated with minor capacity deficiencies pending widening Queen Kaahumanu Highway.
2. The access road to the campus, either Alternate 1 or 2, should be two-lanes wide. Widening should be provided at intersections to accommodate separate left turn lanes.
3. The intersection of the access road and Kaimi Nani Drive can be unsignalized and still provide adequate capacity. However, if not-project traffic along Kaimi Nani increases significantly as a

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result of other development, the warrants for a traffic signal should be monitored. The lane configuration described earlier will be adequate, especially since this is an interim access.

4. At the intersection of Queen Kaahumanu Highway at Kona Airport Road, the lane configuration and signal phasing discussed earlier will provide adequate capacity.

5. There is no change in the level-of-service at the intersection of Kaimi Nani Drive at Mamatohoa Highway as a result of the proposed project.

APPENDIX A

PHOTOGRAPHS OF STUDY INTERSECTIONS

result of other development, the warrants for a traffic signal should be monitored. The lane configuration described earlier will be adequate, especially since this is an interim access.

4. At the intersection of Queen Kaahumanu Highway at Kona Airport Road, the lane configuration and signal phasing discussed earlier will provide adequate capacity.

5. There is no change in the level-of-service at the intersection of Kaimi Nani Drive at Mamalahoa Highway as a result of the proposed project.

APPENDIX A

PHOTOGRAPHS OF STUDY INTERSECTIONS

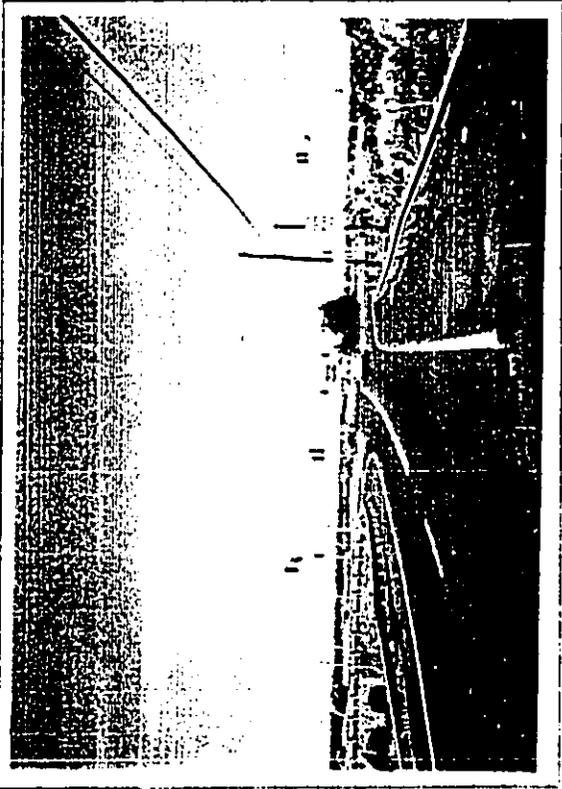


Figure A-1 Looking west along Kamehamehi Drive toward Queen Kaahumanu Highway

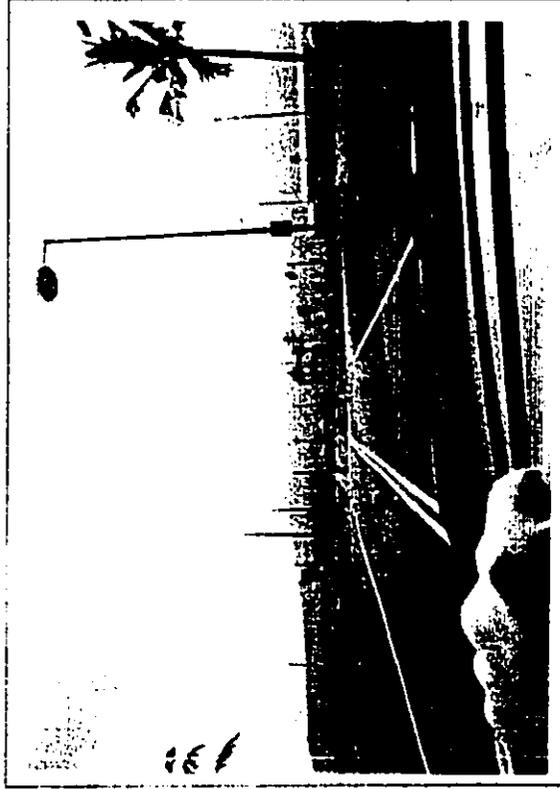


Figure A-2 Looking east along Kona Airport Road toward Queen Kaahumanu Highway

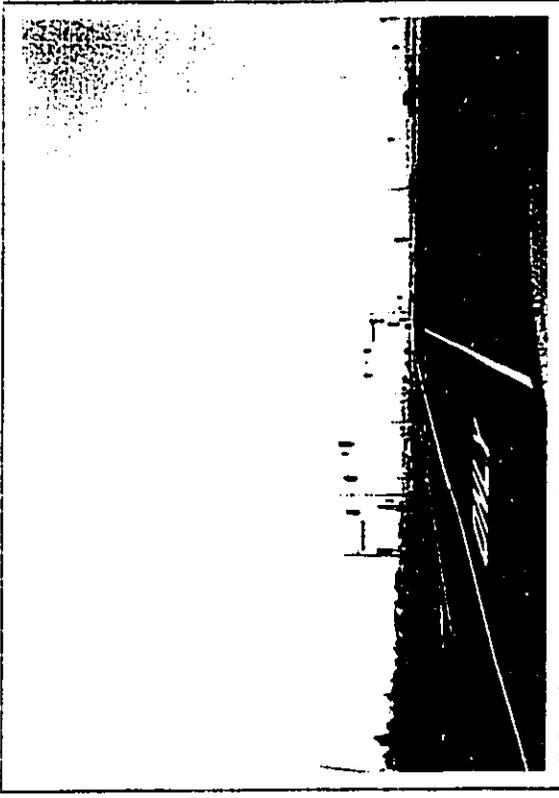


Figure A-3 Looking south along Queen Kaahumanu Highway toward Kona Airport Road

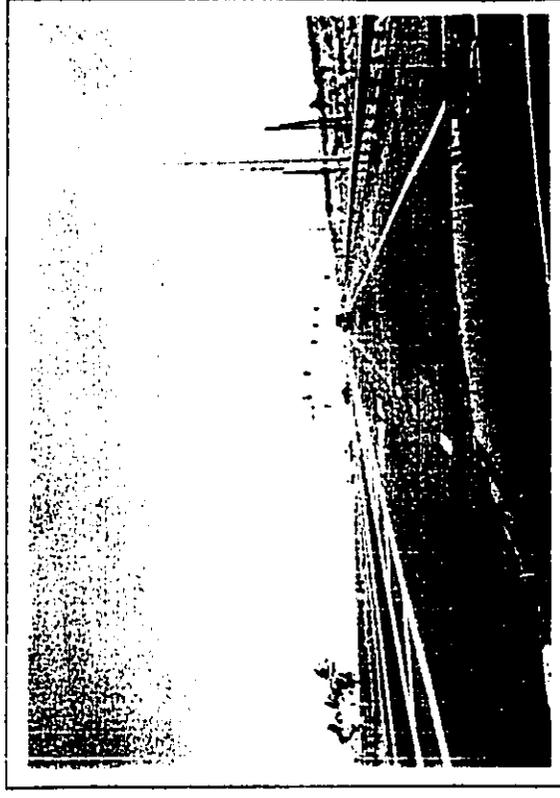


Figure A-4 Looking north along Queen Kaahumanu Highway toward Kona Airport Road

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Part 4.1
TRIP ASSIGNMENT AND PROJECTION WORKSHEET
UH Center at West Hialeah
September 1998

Intersection No. 1
Intersection of Queen Kukulmeu Highway & Kona Airport Road

No	Approach A/M	1999 Background		Background Growth		Revised Project		Cumulative		Project Time		Cumulative Plus Project	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	N- RT	100	50	135	70	135	70	135	70	58	90	135	70
2	TH	196	495	305	790	305	790	305	790	58	90	363	880
3	LT	0	0	0	0	0	0	0	0	0	0	0	0
4	E- RT	0	0	0	0	0	0	0	0	0	0	0	0
5	TH	0	0	0	0	0	0	0	0	0	0	0	0
6	LT	0	0	0	0	0	0	0	0	0	0	0	0
7	S- RT	0	0	0	0	0	0	0	0	0	0	0	0
8	TH	475	295	700	300	700	300	700	300	2	30	702	390
9	LT	260	170	355	240	355	240	355	240	0	6	355	246
10	W- RT	230	190	280	170	280	170	280	170	12	18	292	188
11	TH	0	0	0	0	0	0	0	0	0	0	0	0
12	LT	35	110	45	125	45	125	45	125	0	0	45	125
TOTAL		1296	1270	1820	1725	0	0	1820	1725	72	144	1892	1869

APPENDIX B

TRAFFIC PROJECTIONS WORKSHEETS

Approach	From North		From East		From South		From West		Total
	AM	PM	AM	PM	AM	PM	AM	PM	
From North	295	545	0	0	0	0	0	0	840
From East	0	0	440	860	0	0	0	0	1300
From South	735	465	1055	570	0	0	1055	570	2325
From West	265	280	325	295	0	0	325	295	1165
Total	1296	1270	1820	1725	0	0	1820	1725	6921
To North	510	405	745	455	0	0	745	455	1615
To East	0	0	0	0	0	0	0	0	0
To South	425	645	685	960	0	0	685	960	2715
To West	300	220	490	310	0	0	490	310	1320
Total	1296	1270	1820	1725	0	0	1820	1725	6921
Leg Totals	North		East		South		West		
North	805	950	1195	1315	0	0	1195	1315	3305
East	0	0	0	0	0	0	0	0	0
South	1160	1110	1640	1530	0	0	1640	1530	4440
West	625	480	815	605	0	0	815	605	2525
Total	2590	2540	3640	3450	0	0	3640	3450	14005

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Part 1.2
TRIP ASSIGNMENT AND PROJECTION WORKSHEET
UH Center at West Hawaii
September 1999

Intersection No. 2
Intersection of: Queen Kaahumanu Highway at Kamae Drive

No.	Approach S, L, M, T	1999 Background		Background Growth		Related Projects		Cumulative		Project Trips		Cumulative Plus Project	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	N-	0	0	0	0	0	0	0	0	0	0	0	0
2	TH	300	540	550	855	0	0	550	855	0	0	550	855
3	LT	35	105	35	105	70	105	105	213	70	105	175	318
4	E-	175	45	175	45	0	0	175	45	0	0	175	45
5	TH	0	0	0	0	0	0	0	0	0	0	0	0
6	LT	230	120	230	120	4	72	230	192	4	72	234	192
7	RT	50	215	50	215	140	215	190	431	140	215	190	431
8	TH	650	420	650	525	0	0	650	525	0	0	650	525
9	LT	0	0	0	0	0	0	0	0	0	0	0	0
10	W-	0	0	0	0	0	0	0	0	0	0	0	0
11	TH	0	0	0	0	0	0	0	0	0	0	0	0
12	LT	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		1440	1445	1920	1865	0	0	1920	1865	216	432	2136	2287

Approach Totals

From North	425	645	585	980	0	0	585	980	70	108	655	1088
From East	405	165	405	165	0	0	405	165	6	106	411	273
From South	610	635	930	740	0	0	930	740	140	218	1070	958
From West	0	0	0	0	0	0	0	0	0	0	0	0
Total	1440	1445	1920	1865	0	0	1920	1865	216	432	2136	2287
To North	735	465	1065	570	0	0	1065	570	2	35	1067	605
To East	85	320	85	320	0	0	85	320	210	324	295	644
To South	620	660	780	975	0	0	780	975	4	72	784	1047
To West	0	0	0	0	0	0	0	0	0	0	0	0
Total	1440	1445	1920	1865	0	0	1920	1865	216	432	2136	2287
Leg Totals	1160	1110	1640	1530	0	0	1640	1530	72	144	1712	1874
North	400	485	400	485	0	0	400	485	216	432	705	917
East	1230	1295	1710	1715	0	0	1710	1715	144	295	1854	2003
South	0	0	0	0	0	0	0	0	0	0	0	0
West	0	0	0	0	0	0	0	0	0	0	0	0
Total	2660	2690	3640	3730	0	0	3640	3730	432	864	4272	4594

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Part 1.3
TRIP ASSIGNMENT AND PROJECTION WORKSHEET
UH Center at West Hawaii
September 1999

Intersection No. 3
Intersection of: Kaula Nani Drive at UH West Access Road

No.	Approach S, L, M, T	1999 Background		Background Growth		Related Projects		Cumulative		Project Trips		Cumulative Plus Project	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	N-	0	0	0	0	0	0	0	0	0	0	0	0
2	TH	0	0	0	0	0	0	0	0	0	0	0	0
3	LT	0	0	0	0	0	0	0	0	0	0	0	0
4	E-	0	0	0	0	0	0	0	0	0	0	0	0
5	TH	405	165	405	165	0	0	405	165	0	0	405	165
6	LT	0	0	0	0	0	0	0	0	0	0	0	0
7	RT	0	0	0	0	0	0	0	0	0	0	0	0
8	TH	0	0	0	0	0	0	0	0	0	0	0	0
9	LT	0	0	0	0	0	0	0	0	0	0	0	0
10	W-	85	320	85	320	0	0	85	320	0	0	85	320
11	TH	0	0	0	0	0	0	0	0	0	0	0	0
12	LT	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		490	495	490	495	0	0	490	495	240	480	730	985

Approach Totals

From North	0	0	0	0	0	0	0	0	0	0	0	0
From East	405	165	405	165	0	0	405	165	0	0	405	165
From South	0	0	0	0	0	0	0	0	0	0	0	0
From West	85	320	85	320	0	0	85	320	0	0	85	320
Total	490	495	490	495	0	0	490	495	240	480	730	985
To North	0	0	0	0	0	0	0	0	0	0	0	0
To East	85	320	85	320	0	0	85	320	0	0	85	320
To South	0	0	0	0	0	0	0	0	0	0	0	0
To West	405	165	405	165	0	0	405	165	0	0	405	165
Total	490	495	490	495	0	0	490	495	240	480	730	985
Leg Totals	0	0	0	0	0	0	0	0	0	0	0	0
North	400	485	400	485	0	0	400	485	24	48	514	533
East	0	0	0	0	0	0	0	0	0	0	0	0
South	0	0	0	0	0	0	0	0	0	0	0	0
West	490	495	490	495	0	0	490	495	216	432	705	917
Total	890	970	890	970	0	0	890	970	480	960	1460	1530

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Part 4.4
TRIP ASSIGNMENT AND PROJECTION WORKSHEET
UH Center at West Haven
September 1999

Intersection No. 4
Intersection of: Kauli Merrill Drive at Marmaloshon Highway

No.	Approach & Mt.	1999 Existing		Background Growth		Raised Protrusion		Cumulative		Projected Trips		Cumulative Plus Project	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	N- RT	80	87	0	0	0	0	0	0	7	11	7	11
2	TH	536	304	643	365	57	50	700	415	7	11	707	415
3	LT	0	0	0	0	0	0	0	0	0	0	0	0
4	E- RT	0	0	0	0	0	0	0	0	0	0	0	0
5	TH	0	0	0	0	0	0	0	0	0	0	0	0
6	LT	0	0	0	0	0	0	0	0	0	0	0	0
7	G- RT	0	0	0	0	0	0	0	0	0	0	0	0
8	TH	186	381	228	457	30	60	256	617	18	25	256	517
9	LT	93	113	0	0	0	0	0	0	18	25	18	25
10	W- RT	189	112	0	0	0	0	0	0	1	8	1	8
11	TH	0	0	0	0	0	0	0	0	0	0	0	0
12	LT	36	74	0	0	0	0	0	0	0	4	0	4
TOTAL		1104	1051	869	822	87	110	956	932	24	48	980	980

Approach Totals

From North	595	371	643	365	57	50	700	415	7	11	707	428
From East	0	0	0	0	0	0	0	0	0	0	0	0
From South	281	494	228	467	30	60	256	517	18	25	272	542
From West	227	186	0	0	0	0	0	0	1	12	1	12
Total	1104	1051	869	822	87	110	956	932	24	48	980	980
To North	226	455	228	457	30	60	256	517	0	4	256	521
To East	0	0	0	0	0	0	0	0	0	0	0	0
To South	725	418	643	365	57	50	700	415	1	8	701	423
To West	153	180	0	0	0	0	0	0	23	36	23	36
Total	1104	1051	869	822	87	110	956	932	24	48	980	980
Lag Totals	522	626	869	822	87	110	956	932	7	15	963	947
North	0	0	0	0	0	0	0	0	0	0	0	0
East	0	0	0	0	0	0	0	0	0	0	0	0
South	1008	910	869	822	87	110	956	932	17	33	973	965
West	300	300	0	0	0	0	0	0	24	48	24	48
Total	2208	2102	1738	1644	174	220	1912	1864	48	96	1960	1960

Traffic Alternatives 1.w63

Part 4.1
TRIP ASSIGNMENT AND PROJECTION WORKSHEET
UH Center at West Haven
September 1999

Intersection No. 1
Intersection of: Queen Koshunamu Highway at Kona Airport Road

No.	Approach & Mt.	1999 Existing		Background Growth		Raised Protrusion		Cumulative		Projected Trips		Cumulative Plus Project	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	N- RT	100	50	136	70	0	0	136	70	0	0	136	70
2	TH	196	496	306	790	0	0	306	790	0	0	306	790
3	LT	0	0	0	0	0	0	0	0	0	0	0	0
4	E- RT	0	0	0	0	0	0	0	0	0	0	0	0
5	TH	0	0	0	0	0	0	0	0	0	0	0	0
6	LT	0	0	0	0	0	0	0	0	0	0	0	0
7	S- RT	0	0	0	0	0	0	0	0	0	0	0	0
8	TH	476	296	700	300	0	0	700	300	0	0	93	144
9	LT	200	170	365	240	0	0	365	240	0	0	700	300
10	W- RT	200	150	200	170	0	0	200	170	0	0	200	170
11	TH	0	0	0	0	0	0	0	0	0	0	0	0
12	LT	36	110	45	125	0	0	45	125	0	0	12	18
TOTAL		1295	1270	1820	1725	0	0	1820	1725	168	168	336	1988

Approach Totals

From North	295	545	440	860	0	0	440	860	0	0	59	90
From East	0	0	0	0	0	0	0	0	0	0	0	0
From South	735	465	1025	570	0	0	1025	570	0	0	5	84
From West	265	260	325	295	0	0	325	295	0	0	12	18
Total	1295	1270	1820	1725	0	0	1820	1725	168	168	336	1988
To North	510	405	745	455	0	0	745	455	2	30	747	485
To East	0	0	0	0	0	0	0	0	0	0	0	0
To South	425	645	695	900	0	0	695	900	0	0	163	252
To West	360	220	400	310	0	0	400	310	0	0	3	48
Total	1295	1270	1820	1725	0	0	1820	1725	168	168	336	1988
Lag Totals	805	950	1185	1315	0	0	1185	1315	60	120	1245	1435
North	0	0	0	0	0	0	0	0	0	0	0	0
East	0	0	0	0	0	0	0	0	0	0	0	0
South	1160	1110	1040	1330	0	0	1040	1330	96	192	1736	1722
West	625	480	815	625	0	0	815	625	12	24	827	629
Total	2590	2540	3640	3450	0	0	3640	3450	336	672	3876	4172

File: Traffic-AM2.w63

Part 4.2
TRIP ASSIGNMENT AND PROJECTION WORKSHEET
 UH1 Center at West I Avenue
 September 1999

Intersection No. 2
 Intersection of: Queen Kahuamoa Highway at Kamehameha Drive

No.	Approach & Mov.	1999 Existing		Background		Related Projects		Cumulative		Estimated Trips		Cumulative Plus Project	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	N- RT	0	0	0	0	0	0	0	0	0	0	0	0
2	N- LT	300	540	500	655	0	0	500	655	0	0	500	655
3	E- RT	35	105	35	105	0	0	35	105	0	0	35	105
4	E- LT	175	45	175	45	0	0	175	45	0	0	175	45
5	S- TH	0	0	0	0	0	0	0	0	0	0	0	0
6	S- RT	230	120	230	120	0	0	230	120	0	0	230	120
7	S- LT	50	215	50	215	0	0	50	215	0	0	50	215
8	W- TH	590	420	590	420	0	0	590	420	0	0	590	420
9	W- RT	0	0	0	0	0	0	0	0	0	0	0	0
10	W- LT	0	0	0	0	0	0	0	0	0	0	0	0
11	TH	0	0	0	0	0	0	0	0	0	0	0	0
12	LT	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		1440	1445	1920	1955	0	0	1920	1955	141	240	2061	2105

Approach Totals

From North	425	645	565	560	0	0	565	560	0	0	565	560
From East	405	165	405	165	0	0	405	165	0	0	405	165
From South	610	635	930	740	0	0	930	740	140	215	1070	955
From West	0	0	0	0	0	0	0	0	0	0	0	0
Total	1440	1445	1920	1955	0	0	1920	1955	141	240	2061	2105
To North	735	405	1055	570	0	0	1055	570	93	144	1148	714
To East	85	320	85	320	0	0	85	320	47	72	132	392
To South	620	660	790	975	0	0	790	975	1	24	791	999
To West	0	0	0	0	0	0	0	0	0	0	0	0
Total	1440	1445	1920	1955	0	0	1920	1955	141	240	2061	2105
Lag Totals	1100	1110	1540	1530	0	0	1540	1530	93	144	1733	1674
North	430	485	490	485	0	0	490	485	43	36	536	591
East	0	0	0	0	0	0	0	0	141	240	1651	1995
South	0	0	0	0	0	0	0	0	0	0	0	0
West	0	0	0	0	0	0	0	0	0	0	0	0
Total	2060	2060	3640	3730	0	0	3640	3730	262	400	4122	4210

File: Traffic-A12.wb3

Part 4.3
TRIP ASSIGNMENT AND PROJECTION WORKSHEET
 UH1 Center at West I Avenue
 September 1999

Intersection No. 3
 Intersection of: Kaimali Road at Mid-Level Road

No.	Approach & Mov.	1999 Existing		Background		Related Projects		Cumulative		Estimated Trips		Cumulative Plus Project	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	N- RT	0	0	0	0	0	0	0	0	0	0	0	0
2	N- LT	0	0	0	0	0	0	0	0	0	0	0	0
3	E- RT	0	0	0	0	0	0	0	0	0	0	0	0
4	E- LT	0	0	0	0	0	0	0	0	0	0	0	0
5	S- TH	405	165	405	165	0	0	405	165	0	0	405	165
6	S- RT	0	0	0	0	0	0	0	0	0	0	0	0
7	S- LT	0	0	0	0	0	0	0	0	0	0	0	0
8	W- TH	0	0	0	0	0	0	0	0	0	0	0	0
9	W- RT	0	0	0	0	0	0	0	0	0	0	0	0
10	W- LT	0	0	0	0	0	0	0	0	0	0	0	0
11	TH	85	320	85	320	0	0	85	320	0	0	85	320
12	LT	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		490	485	490	485	0	0	490	485	72	144	562	629

Approach Totals

From North	0	0	0	0	0	0	0	0	0	0	0	0	0
From East	405	165	405	165	0	0	405	165	0	0	405	165	
From South	0	0	0	0	0	0	0	0	0	0	0	0	
From West	85	320	85	320	0	0	85	320	47	72	132	392	
Total	490	485	490	485	0	0	490	485	72	144	562	629	
To North	0	0	0	0	0	0	0	0	0	0	0	0	
To East	85	320	85	320	0	0	85	320	1	12	86	332	
To South	0	0	0	0	0	0	0	0	0	0	0	0	
To West	405	165	405	165	0	0	405	165	1	24	406	189	
Total	490	485	490	485	0	0	490	485	72	144	562	629	
Lag Totals	0	0	0	0	0	0	0	0	0	0	0	0	
North	490	485	490	485	0	0	490	485	0	0	490	485	
East	0	0	0	0	0	0	0	0	0	0	0	0	
South	0	0	0	0	0	0	0	0	0	0	0	0	
West	400	405	490	485	0	0	490	485	48	96	538	591	
Total	900	970	980	970	0	0	980	970	144	288	1124	1258	

File: Traffic-A12.wb3

Part 45
TRIP ASSIGNMENT AND PROJECTION WORKSHEET
UH Center at West Havel
September 1999

Intersection No: 5
Intersection Of: Kaimali Hill Drive at Maimaha Highway

No	Approach & LVA	1999 Background		Background Growth		Realized Projects		Cumulative		Project/Tran		Cumulative Plus Project	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	R	60	87	0	0	0	0	0	0	0	0	0	0
2	L	536	304	54	365	57	60	700	415	7	11	707	415
3	T	0	0	0	0	0	0	0	0	0	0	0	0
4	R	0	0	0	0	0	0	0	0	0	0	0	0
5	L	0	0	0	0	0	0	0	0	0	0	0	0
6	T	0	0	0	0	0	0	0	0	0	0	0	0
7	R	0	0	0	0	0	0	0	0	0	0	0	0
8	L	188	351	23	457	30	60	258	617	18	25	258	517
9	T	63	113	0	0	0	0	0	0	0	0	18	25
10	R	180	112	0	0	0	0	0	0	1	6	1	6
11	L	0	0	0	0	0	0	0	0	0	0	0	0
12	T	36	74	0	0	0	0	0	0	0	4	0	4
TOTAL		1104	1051	59	622	87	110	928	932	24	48	950	980

APPENDIX C

LEVEL-OF-SERVICE CALCULATIONS

Approach	From North		From East		From South		From West		Total			
	AM	PM	AM	PM	AM	PM	AM	PM				
From North	508	371	64	385	57	60	700	415	7	11	707	426
From East	0	0	0	0	0	0	0	0	0	0	0	0
From South	291	424	23	467	30	60	258	617	18	25	272	542
From West	227	188	0	0	0	0	0	0	1	12	1	12
Total	1104	1051	89	822	87	110	968	932	24	48	980	980
To North	226	465	23	457	30	60	258	617	0	4	256	521
To East	0	0	0	0	0	0	0	0	0	0	0	0
To South	725	416	64	365	57	60	700	415	1	6	701	423
To West	153	180	0	0	0	0	0	0	23	36	23	36
Total	1104	1051	89	822	87	110	968	932	24	48	980	980
Lag Totals												
North	622	625	89	822	87	110	968	932	7	15	953	947
East	0	0	0	0	0	0	0	0	0	0	0	0
South	1006	610	89	822	87	110	968	932	17	30	973	905
West	380	395	0	0	0	0	0	0	24	48	24	48
Total	2208	2102	178	1694	174	220	1912	1864	48	98	1980	1980

Streets: (E-W) Kona Airport Road (N-S) Queen Kaahumanu Hwy
 Analyst: Rowell File Name: LMKX.HC9
 Area Type: Other 10-7-99 AM
 Comment: 1999 Existing

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	0	1	0	0	0	1	1	0	0	1	1
Volumes	35	230	260	475	195	100	12.0	12.0	0	12.0	12.0	40
Lane W (ft)	12.0	12.0	12.0	12.0	12.0	0	13.00	3.00	3.00	3.00	3.00	3.00
RTOR Vols	100	100	100	100	100	100	100	100	100	100	100	100
Lost Time	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

Phase Combination 1 2 Signal Operations
 EB Left 1 1 1 1 1 1 1 1 1 1 1 1
 Thru 1 1 1 1 1 1 1 1 1 1 1 1
 Right 1 1 1 1 1 1 1 1 1 1 1 1
 Peds 1 1 1 1 1 1 1 1 1 1 1 1
 WB Left 1 1 1 1 1 1 1 1 1 1 1 1
 Thru 1 1 1 1 1 1 1 1 1 1 1 1
 Right 1 1 1 1 1 1 1 1 1 1 1 1
 Peds 1 1 1 1 1 1 1 1 1 1 1 1
 NB Right 1 1 1 1 1 1 1 1 1 1 1 1
 SB Right 1 1 1 1 1 1 1 1 1 1 1 1
 Green 10.0P 4.0
 Yellow/AR 21.0P 21.0P
 Cycle Length: 60 secs Phase combination order: #1 #5 #6

Intersection Performance Summary

Lane Group	Adj Sat	Flow	Ratio	v/c	g/c	Delay	LOS	Approach
EB L	324	1770	0.120	0.183	15.6	C	7.6	B
EB R	844	1583	0.172	0.533	5.5	B	6.8	B
NB L	531	1770	0.544	0.300	14.3	B	8.9	B
NB T	1335	1863	0.395	0.717	2.7	A	3.8	A
SB T	683	1863	0.318	0.367	10.4	B	8.9	B
SB R	950	1583	0.071	0.600	3.8	A	3.8	A

Intersection Delay = 7.4 sec/veh Intersection LOS = B
 Lost Time/Cycle, L = 6.0 sec Critical v/c(w) = 0.339

Streets: (E-W) Kaimulani Road (N-S) Queen Kaahumanu Hwy
 Analyst: Rowell File Name: LMKX.HC9
 Area Type: Other 10-7-99 PM
 Comment: 1999 Existing

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	0	1	0	0	0	1	1	0	0	1	1
Volumes	110	150	170	295	495	50	12.0	12.0	0	12.0	12.0	40
Lane W (ft)	12.0	12.0	12.0	12.0	12.0	0	13.00	3.00	3.00	3.00	3.00	3.00
RTOR Vols	60	60	60	60	60	60	60	60	60	60	60	60
Lost Time	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

Phase Combination 1 2 Signal Operations
 EB Left 1 1 1 1 1 1 1 1 1 1 1 1
 Thru 1 1 1 1 1 1 1 1 1 1 1 1
 Right 1 1 1 1 1 1 1 1 1 1 1 1
 Peds 1 1 1 1 1 1 1 1 1 1 1 1
 WB Left 1 1 1 1 1 1 1 1 1 1 1 1
 Thru 1 1 1 1 1 1 1 1 1 1 1 1
 Right 1 1 1 1 1 1 1 1 1 1 1 1
 Peds 1 1 1 1 1 1 1 1 1 1 1 1
 NB Right 1 1 1 1 1 1 1 1 1 1 1 1
 SB Right 1 1 1 1 1 1 1 1 1 1 1 1
 Green 9.0P 15.0P 30.0P
 Yellow/AR 3.0
 Cycle Length: 60 secs Phase combination order: #1 #5 #6

Intersection Performance Summary

Lane Group	Adj Sat	Flow	Ratio	v/c	g/c	Delay	LOS	Approach
EB L	266	1770	0.460	0.150	18.6	C	14.2	B
EB R	633	1583	0.158	0.400	8.8	B	7.5	B
NB L	354	1770	0.534	0.200	17.6	C	8.7	B
NB T	1397	1863	0.235	0.750	1.7	A	2.1	A
SB T	932	1863	0.590	0.500	8.8	B	8.7	B
SB R	1108	1583	0.011	0.700	2.1	A	2.1	A

Intersection Delay = 9.2 sec/veh Intersection LOS = B
 Lost Time/Cycle, L = 9.0 sec Critical v/c(w) = 0.554

FILE: SIGNALIZED INTERSECTION SUMMARY Version 2.4g 10-07-1999
 Phillip Rowell And Associates
 Streets: (E-W) Kaimani Road (N-S) Queen Kaahumanu Hwy
 Analyst: Rowell File Name: ZPMEX.HC9
 Area Type: Other 10-7-99 AY
 Comment: 1999 Existing

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	0	0	1	0	1	0	1	0	1	1	0
Volumes	230	175	12.0	560	501	350	12.0	12.0	12.0	12.0	12.0	12.0
RTOR Vols	601	501	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Lost Time												

Phase Combination 1 2 3 4 5 6 7 8
 EB Left Thru Right Peds Left Thru Right Peds
 WB Left Thru Right Peds
 NB Right
 SB Right
 Green 12.0P
 Yellow/AR 3.0
 Cycle Length: 60 secs Phase combination order: #1 #5 #6

Intersection Performance Summary

Lane Group	Adj Sat	Flow	Ratio	v/c	g/c	Delay	LOS	Approach
WB L	354	1770	0.723	0.200	0.200	21.9	C	20.1 C
WB R	317	1583	0.401	0.200	0.200	16.3	C	9.1 B
WB T	963	1863	0.646	0.517	0.517	9.1	A	4.0 A
SB L	236	1770	0.165	0.133	0.133	17.5	C	2.7 A
SB T	1304	1863	0.332	0.700	0.700	2.7	A	Intersection Delay = 10.3 sec/veh Intersection LOS = B
Lost Time/Cycle, L = 9.0 sec Critical v/c(x) = 0.589								

FILE: SIGNALIZED INTERSECTION SUMMARY Version 2.4g 10-07-1999
 Phillip Rowell And Associates
 Streets: (E-W) Kaimani Road (N-S) Queen Kaahumanu Hwy
 Analyst: Rowell File Name: ZPMEX.HC9
 Area Type: Other 10-7-99 AY
 Comment: 1999 Existing

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	0	0	1	0	1	0	1	0	1	1	0
Volumes	120	12.0	12.0	451	420	215	105	540	12.0	12.0	12.0	12.0
RTOR Vols	151	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Lost Time												

Phase Combination 1 2 3 4 5 6 7 8
 EB Left Thru Right Peds Left Thru Right Peds
 WB Left Thru Right Peds
 NB Right
 SB Right
 Green 12.0P
 Yellow/AR 3.0
 Cycle Length: 60 secs Phase combination order: #1 #5 #6

Intersection Performance Summary

Lane Group	Adj Sat	Flow	Ratio	v/c	g/c	Delay	LOS	Approach
WB L	354	1770	0.376	0.200	0.200	16.1	C	15.9 C
WB R	317	1583	0.104	0.200	0.200	14.9	B	7.0 B
WB T	963	1863	0.485	0.517	0.517	7.4	B	5.9 B
SB L	236	1770	0.224	0.517	0.517	6.0	B	Intersection Delay = 7.5 sec/veh Intersection LOS = B
SB T	1304	1863	0.460	0.700	0.700	3.2	A	Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.441

Streets: (E-W) Kaimihani Road (N-S) Queen Kaahumanu Hwy
 Analyst: Rowell File Name: 1PHCUM.HCS
 Area Type: Other 10-7-99 PM
 Comment: 2004 Cumulative

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	0	1	0	0	0	1	1	0	0	1	1
Volumes	125	170					240	330			790	70
Lane W (ft)	12.0	12.0					12.0	12.0			12.0	12.0
RTOR Vols		60								0		40
Lost Time	3.00	3.00					3.00	3.00			3.00	3.00

Phase Combination 1 2 3 4 5 6 7 8
 EB Left Thru Right NB Left Thru Right
 Right Peds Peds
 WB Left Thru Right SB Left Thru Right
 Right Peds Peds
 NB Right SB Right
 Green 9.0P Yellow/AR 15.0P 30.0P
 Yellow/AR 3.0
 Cycle Length: 60 secs Phase combination order: #1 #5 #6

Intersection Performance Summary

Lane Group	Adj Sat	v/c	Ratio	Delay	LOS	Approach
EB L	265	1770	0.524	19.4	C	14.5 B
EB R	633	1583	0.400	8.9	B	
NB L	354	1770	0.200	23.3	C	10.8 B
NB T	1397	1863	0.750	1.8	A	
SB T	931	1863	0.943	23.4	C	22.6 C
SB R	1108	1583	0.031	2.1	A	

Lost Time/Cycle, L = 9.0 sec Critical v/c(x) = 0.824

Streets: (E-W) Kona Airport Road (N-S) Queen Kaahumanu Hwy
 Analyst: Rowell File Name: 1MCTM.HCS
 Area Type: Other 10-7-99 AM
 Comment: 2004 Cumulative

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	0	1	0	0	0	1	1	0	0	1	1
Volumes	45	280					355	700			305	135
Lane W (ft)	12.0	12.0					12.0	12.0			12.0	12.0
RTOR Vols		100								0		40
Lost Time	3.00	3.00					3.00	3.00			3.00	3.00

Phase Combination 1 2 3 4 5 6 7 8
 EB Left Thru Right NB Left Thru Right
 Right Peds Peds
 WB Left Thru Right SB Left Thru Right
 Right Peds Peds
 NB Right SB Right
 Green 10.0P Yellow/AR 21.0P 21.0P
 Yellow/AR 4.0
 Cycle Length: 60 secs Phase combination order: #1 #5 #6

Intersection Performance Summary

Lane Group	Adj Sat	v/c	Ratio	Delay	LOS	Approach
EB L	324	1770	0.154	15.7	C	7.7 B
EB R	844	1583	0.533	5.7	B	
NB L	531	1770	0.300	18.2	C	8.5 B
NB T	1335	1863	0.717	3.6	A	
SB T	683	1863	0.367	11.7	B	9.8 B
SB R	950	1583	0.600	3.9	A	

Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.495

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4g 10-07-1999
 Phillip Rowell and Associates
 Streets: (E-W) Kaiminani Road (N-S) Queen Kaahumanu Hwy
 Analyst: Rowell File Name: 2AMCUM.HCS
 Area Type: Other 10-7-99 AM
 Comment: 2004 Cumulative

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	0	0	1	0	1	1	0	1	1	1	0
Volumes				230	175	930	50	35	550			
Lane W (ft)				12.0	12.0	12.0	12.0	12.0	12.0			
RTOR Vols				60			50					40
Lost Time				3.00	3.00	3.00	3.00	3.00	3.00			

Phase Combination 1 2 3 4
 Signal Operations
 EB Left Thru Right
 Peds
 MB Left Thru Right
 Peds
 NB Right
 SB Right
 Green 12.0P
 Yellow/AR 3.0
 Cycle Length: 60 secs Phase combination order: #1 #5 #6

Intersection Performance Summary

Lane Group	Adj Sat	v/c	g/c	Ratio	Delay	LOS	Approach
WB L	354	1770	0.723	0.200	21.9	C	20.1 C
WB R	317	1583	0.401	0.200	16.3	C	
WB T	963	1863	1.073	0.517	55.9	E	55.9 E
SB L	236	1770	0.000	0.517	17.5	C	4.1 A
SB T	1304	1863	0.469	0.700	3.3	A	

Intersection Delay = 33.0 sec/veh Intersection LOS = D
 Lost Time/Cycle, L = 9.0 sec Critical v/c(s) = 0.848

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4g 10-07-1999
 Phillip Rowell and Associates
 Streets: (E-W) Kaiminani Road (N-S) Queen Kaahumanu Hwy
 Analyst: Rowell File Name: 2PNCUM.HCS
 Area Type: Other 10-7-99 PM
 Comment: 2004 Cumulative

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	0	0	1	0	1	1	0	1	1	1	0
Volumes				120	45	525	215	105	855			
Lane W (ft)				12.0	12.0	12.0	12.0	12.0	12.0			
RTOR Vols						15	50					40
Lost Time				3.00	3.00	3.00	3.00	3.00	3.00			

Phase Combination 1 2 3 4
 Signal Operations
 EB Left Thru Right
 Peds
 MB Left Thru Right
 Peds
 NB Right
 SB Right
 Green 12.0P
 Yellow/AR 3.0
 Cycle Length: 60 secs Phase combination order: #1 #5 #6

Intersection Performance Summary

Lane Group	Adj Sat	v/c	g/c	Ratio	Delay	LOS	Approach
WB L	354	1770	0.376	0.200	16.1	C	15.9 C
WB R	317	1583	0.104	0.200	14.9	B	
WB T	963	1863	0.606	0.517	8.5	B	8.0 B
SB L	236	1770	0.224	0.517	6.0	B	
SB T	1304	1863	0.496	0.133	19.7	C	7.2 D

Intersection Delay = 8.2 sec/veh Intersection LOS = B
 Lost Time/Cycle, L = 6.0 sec Critical v/c(s) = 0.659

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4g 10-07-1999
 Phillip Rowell and Associates
 Streets: (E-W) Kona Airport Road (N-S) Queen Kaahumanu Hwy
 Analyst: Rowell File Name: IAWALTI.HC9
 Area Type: Other 10-7-99 AM
 Comment: 2004 Alternate 1

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	0	1	0	0	0	1	1	0	0	1	1
Volumes	45	292			355	702			363	135		
Lane W (ft)	12.0	12.0			12.0	12.0			12.0	12.0		
RTOR Vols		100				0				40		
Lost Time	3.00				3.00				3.00	3.00		

Phase Combination 1 2 3 4
 EB Left Thru Right Peds
 WB Left Thru Right Peds
 NB Right Peds
 SB Right
 Green 10.0P
 Yellow/AR 4.0
 Cycle Length: 60 secs Phase combination order: #1 #5 #6
 Intersection Delay = 9.0 sec
 Critical v/c(x) = 0.550

Intersection Performance Summary

Lane Group	Adj Sat	Flow	Ratio	v/c	g/c	Delay	LOS	Approach
EB L	324	1770	0.154	0.183	15.7	C	7.7	B
EB R	844	1583	0.252	0.533	3.8	B		
NB L	531	1770	0.742	0.300	18.2	C	8.5	B
NB T	1335	1863	0.584	0.717	3.6	A		
SB T	683	1863	0.590	0.367	12.7	B	10.8	B
SB R	550	1583	0.112	0.600	3.9	A		

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4g 10-07-1999
 Phillip Rowell and Associates
 Streets: (E-W) Kona Airport Road (N-S) Queen Kaahumanu Hwy
 Analyst: Rowell File Name: IAWALTI.HC9
 Area Type: Other 10-7-99 AM
 Comment: 2004 Alternate 1

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	0	1	0	0	0	1	1	0	0	1	1
Volumes	125	189			246	360			880	70		
Lane W (ft)	12.0	12.0			12.0	12.0			12.0	12.0		
RTOR Vols		60				0				40		
Lost Time	3.00				3.00				3.00	3.00		

Phase Combination 1 2 3 4
 EB Left Thru Right Peds
 WB Left Thru Right Peds
 NB Right Peds
 SB Right
 Green 9.0P
 Yellow/AR 3.0
 Cycle Length: 60 secs Phase combination order: #1 #5 #6
 Intersection Delay = 29.8 sec/veh
 Intersection LOS = D
 Lost Time/Cycle, L = 9.0 sec Critical v/c(x) = 0.891

Intersection Performance Summary

Lane Group	Adj Sat	Flow	Ratio	v/c	g/c	Delay	LOS	Approach
EB L	266	1770	0.524	0.150	19.4	C	14.2	B
EB R	633	1583	0.224	0.400	9.0	B		
NB L	354	1770	0.771	0.200	24.1	C	10.9	B
NB T	1397	1863	0.286	0.750	1.8	A		
SB T	932	1863	1.050	0.500	48.2	E	46.7	E
SB R	1108	1583	0.031	0.700	2.1	A		

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4g 10-07-1999
 Phillip Rowell And Associates
 Streets: (E-W) Kaiminani Road (N-S) Queen Kaahumanu Hwy
 Analyst: Rowell File Name: 2AVALT1.HC9
 Area Type: Other 10-7-99 AM
 Comment: 2004 Alternate 1

	Eastbound			Westbound			Northbound			Southbound			
	L	T	R	L	T	R	L	T	R	L	T	R	
No. Lanes	0	0	0	1	0	1	0	1	0	1	1	1	0
Volumes				234	177	880	190	105	550				
Lane W (ft)				12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
RTOR Vols				60	60	50	50	50	40				
Lost Time				13.00	3.00	3.00	3.00	3.00	3.00				

Phase Combination 1 2 3 4
 EB Left Thru Right Peds Left Thru Right Peds
 WB Left Thru Right Peds Left Thru Right Peds
 NB Right Peds Left Thru Right Peds
 SB Right Peds Left Thru Right Peds
 Green 12.0P Yellow/AR 0.0 3.0
 Cycle Length: 60 secs Phase combination order: #1 #5 #6

Intersection Performance Summary

Lane Group	Adj Sat	v/c	g/c	Approach
Mvmts	Cap	Flow	Ratio	Delay LOS
WB L	354	1770	0.734	22.4 C
WB R	317	1583	0.411	16.4 C
WB T	963	1863	1.016	37.3 D
SB L	236	1770	0.190	5.9 B
SB T	1304	1863	0.469	19.7 C

Intersection Delay = 22.0 sec/veh Intersection LOS = C
 Lost Time/Cycle, L = 9.0 sec critical v/c(k) = 0.868

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4g 10-13-1999
 Phillip Rowell And Associates
 Streets: (E-W) Kaiminani Road (N-S) Queen Kaahumanu Hwy
 Analyst: Rowell File Name: 2AVALT1.HC9
 Area Type: Other 10-7-99 PM
 Comment: 2004 Alternate 1

	Eastbound			Westbound			Northbound			Southbound			
	L	T	R	L	T	R	L	T	R	L	T	R	
No. Lanes	0	0	0	1	0	1	0	1	0	1	1	1	0
Volumes				192	12.0	12.0	431	213	855				
Lane W (ft)				12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
RTOR Vols				60	60	50	50	40					
Lost Time				13.00	3.00	3.00	3.00	3.00	3.00				

Phase Combination 1 2 3 4
 EB Left Thru Right Peds Left Thru Right Peds
 WB Left Thru Right Peds Left Thru Right Peds
 NB Right Peds Left Thru Right Peds
 SB Right Peds Left Thru Right Peds
 Green 12.0P Yellow/AR 0.0 3.0
 Cycle Length: 60 secs Phase combination order: #1 #5 #6

Intersection Performance Summary

Lane Group	Adj Sat	v/c	g/c	Approach
Mvmts	Cap	Flow	Ratio	Delay LOS
WB L	354	1770	0.602	18.6 C
WB R	317	1583	0.073	14.8 B
WB T	963	1863	0.606	8.6 B
SB L	236	1770	0.517	7.7 A
SB T	1304	1863	0.133	66.1 F

Intersection Delay = 13.8 sec/veh Intersection LOS = B
 Lost Time/Cycle, L = 6.0 sec critical v/c(k) = 0.700

Phillip Rowell And Associates
 47-273 'D' Rui Iwa Street
 Kaneohe, HI 96744-
 Ph: (808) 239-8206

Streets: (N-S) UH Center Access Rd (E-W) Kaimihani Drive
 Major Street Direction: EW
 Length of Time Analyzed: 15 (min)
 Analyst: Phillip Rowell
 Date of Analysis: 0/0/0
 Other Information: 2004 Alternata 1, AM Peak Hour
 Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	> 1	0	0	1	< 0	0	0	0	1	0	1
Stop/Yield			N			N						
Volumes	210	85		404	231					1		6
PHF	.9	.9		.9	.9					.9		.9
Grade		0		0							0	
MC's (%)												
SU/RV's (%)												
PCE's	1.10									1.10		1.10

Adjustment Factors

Vehicle Maneuver	Critical Gap (cg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TASC Intersection

Step 1: RT from Minor Street	MB	SB
Conflicting Flows: (vph)	462	
Potential Capacity: (pcph)	808	
Movement Capacity: (pcph)	808	
Prob. of Queue-Free State:	0.99	
Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)		475
Potential Capacity: (pcph)		1018
Movement Capacity: (pcph)		1018
Prob. of Queue-Free State:		0.75
TR Saturation Flow Rate: (pcphpl)		1700
MT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:		0.73
Step 4: LT from Minor Street	MB	SB
Conflicting Flows: (vph)	789	
Potential Capacity: (pcph)	370	
Major LT, Minor TH Impedance Factor:		0.73
Adjusted Impedance Factor:		0.73
Capacity Adjustment Factor due to Impeding Movements		0.73
Movement Capacity: (pcph)		272

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	Approach Delay (sec/veh)
SB L	1	272	13.3	0.0	C	
SB R	8	808	4.5	0.0	A	5.8
EB L	256	1018	4.7	1.1	A	3.4

Intersection Delay = 1.4 sec/veh

Worksheet for TWSC Intersection

Step 1: RT from Minor Street NB SB
 Conflicting Flows: (vph) 203
 Potential Capacity: (pcph) 1093
 Movement Capacity: (pcph) 1093
 Prob. of Queue-Free State: 0.88
 Step 2: LT from Major Street WB EB
 Conflicting Flows: (vph) 223
 Potential Capacity: (pcph) 1342
 Movement Capacity: (pcph) 1342
 Prob. of Queue-Free State: 0.70
 TR Saturation Flow Rate: (pcphpl) 1700
 RT Saturation Flow Rate: (pcphpl) 1700
 Major L: Shared Lane Prob. of Queue-Free State: 0.63
 Step 4: LT from Minor Street NB SB
 Conflicting Flows: (vph) 919
 Potential Capacity: (pcph) 311
 Major L: Minor TR
 Impedance Factor: 0.63
 Adjusted Impedance Factor: 0.63
 Capacity Adjustment Factor due to Impeding Movements: 0.63
 Movement Capacity: (pcph) 195

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Queue Delay (sec/veh)	Queue Length (veh)	IOI	Approach Delay (sec/veh)
SB L	14	195	19.9	0.1	C		5.4
SB R	132	1093	3.7	0.4	A		
EB L	396	1342	3.8	1.4	A		1.9

Intersection Delay = 1.9 sec/veh

Phillip Rowell and Associates

47-273 'D' Hui Iwa Street
 Kaneohe, HI 96744
 Ph: (808) 239-8206
 Streets: (N-S) UH Center Access Rd (E-W) Kaiminani Drive
 Major Street Direction: EW
 Length of Time Analyzed: 15 (min)
 Analyst: Rowell
 Date of Analysis: 0/0/0
 Other Information: 2004 Alternate 1, PM Peak Hour
 Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound			
	L	T	R	L	T	R	L	T	R	L	T	R	
No. Lanes	0	> 1	0	0	1	< 0	0	0	0	0	1	0	1
Stop/Yield			N			N			N			N	
Volumes		324	320		165	361			12		108		
PHF		.9	.9		.9	.9			.9		.9		
Grade		0	0		0	0			0		0		
MC's (S)													
SU/RV's (V)													
CV's (S)													
PCE's		1.10							1.10		1.10		1.10

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Streets: (N-S) Mamelahoa Highway (E-W) Kaimi Nani Drive
 Major Street Direction... NS
 Length of Time Analyzed... 15 (min)
 Analyst... EJR
 Date of Analysis... 07/07
 Other Information... AM Peak Hour Cumulative Plus Project
 Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	> 1	0	0	1	< 0	1	0	1	0	0	0
Stop/Yield							N					
Volume	109	256		700	67	38	190					
PHF	.9	.9		.9	.9	.9	.9					
Grade		0		0		0						
NC's (S)												
SU/RV's (S)												
CV's (S)												
PCE's	1.10			1.10		1.10	1.10					

Adjustment Factors

Vehicle Maneuver	Critical Gap (fg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TMSI Intersection

Step 1: RT from Minor Street WB EB

Conflicting Flows: (vph) 815
 Potential Capacity: (pcph) 535
 Movement Capacity: (pcph) 535
 Prob. of Queue-Free State: 0.57

Step 2: LT from Major Street SB NB

Conflicting Flows: (vph) 852
 Potential Capacity: (pcph) 673
 Movement Capacity: (pcph) 673
 Prob. of Queue-Free State: 0.80
 TH Saturation Flow Rate: (pcphpl) 1700
 RT Saturation Flow Rate: (pcphpl)
 Major LT Shared Lane Prob. of Queue-Free State: 0.76

Step 4: LT from Minor Street NB EB

Conflicting Flows: (vph) 1220
 Potential Capacity: (pcph) 208
 Major LT, Minor TH
 Impedance Factor:
 Adjusted Impedance Factor: 0.76
 Capacity Adjustment Factor due to Impeding Movements: 0.76
 Movement Capacity: (pcph) 159

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Total Delay (sec/veh)	Queue Length (veh)	LOS	Approach Delay (sec/veh)
EB L	46	159		31.6	1.1	E	
EB R	232	535		11.0	2.3	C	15.1
NB L	133	673		6.7	0.8	R	2.0

Intersection Delay = 3.1 sec/veh

Worksheet for TWSC Intersection

Step 1: RT from Minor Street WB ED
 Conflicting Flows: (vph) 504
 Potential Capacity: (pcph) 769
 Movement Capacity: (pcph) 769
 Prob. of Queue-Free State: 0.81

Step 2: LT from Major Street SB NB
 Conflicting Flows: (vph) 548
 Potential Capacity: (pcph) 940
 Movement Capacity: (pcph) 940
 Prob. of Queue-Free State: 0.82
 TH Saturation Flow Rate: (pcphpl) 1700
 RT Saturation Flow Rate: (pcphpl)
 Major LT Shared Lane Prob. of Queue-Free State: 0.73

Step 4: LT from Minor Street WB EB
 Conflicting Flows: (vph) 1232
 Potential Capacity: (pcph) 205
 Major LT, Minor TH
 Impedance Factor: 0.73
 Adjusted Impedance Factor: 0.73
 Capacity Adjustment Factor due to Impeding Movements: 0.73
 Movement Capacity: (pcph) 150

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Total Delay (sec/veh)	Queue Length (veh)	95% Queue Length (veh)	Approach Delay (sec/veh)
EB L	96	150	150	59.1	3.1	F	26.8
EB R	146	769	769	5.8	0.8	B	
NB L	168	940	940	4.7	0.7	A	1.0

Intersection Delay = 4.4 sec/veh

Worksheet for TWSC Intersection

Phillip Rowell and Associates
 47-273 '3' Hul Iwa Street
 Kaneohe, HI 96744
 Ph: (808) 239-8206

Streets: (N-S) Mamalahoa Highway (E-W) Kaimi Mani Drive
 Major Street Direction... NS
 Length of Time Analyzed... 15 min
 Analyst... RJR
 Date of Analysis... 0/0/0
 Other Information... PM Peak Hour Cumulative Plus Project
 Two-Way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	> 1	0	0	1	< 0	1	0	1	0	0	0
Stop/Yield			N			N						
Volumes	138	517		415	78	78	120					
PHF	.9	.9		.9	.9	.9	.9					
Grade		0		0		0						
MC's (%)												
SU/RV's (%)												
PCF's (%)	1.10			1.10		1.10	1.10					

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4g 10-07-1999
 Phillip Rowell And Associates
 Streets: (E-W) Kona Airport Road (N-S) Queen Kaahumanu Hwy
 Analyst: Rowell File Name: IAPAL72.HCS
 Area Type: Other 10-7-99 AM
 Comment: 2004 Alternate 2

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	>	1	1	0	>	1	1	1	1	1	1
Volumes	45	12	280	3	1	21	355	700	93	58	305	135
Lane W (ft)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
RTOR Vols	100	0	0	0	0	0	0	0	0	0	0	0
Lost Time	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

Phase Combination 1 2 3 4

Signal Operations

EB Left Thru Right Peds Left Thru Right Peds

WB Left Thru Right Peds Left Thru Right Peds

NB Right Peds Left Thru Right Peds

Green 10.0P Yellow/AR 3.0

Cycle Length: 60 secs Phase combination order: #1 #5 #6 #7

Intersection Performance Summary

Lane Group	Adj Sat	v/c	Ratio	Delay	LOS	Approach
EB LT	296	1777	0.213	16.5	C	14.0 B
EB RT	475	1583	0.421	13.2	B	15.9 C
WB LT	281	1688	0.014	15.9	C	9.8 B
WB RT	264	1583	0.008	13.9	B	13.7 B
NB LT	620	1770	0.636	10.9	B	
NB RT	1118	1863	0.696	10.9	B	
SB LT	528	1583	0.195	10.9	B	
SB RT	621	1863	0.546	13.2	B	
Lost Time/Cycle, L = 6.0 sec	528	1583	0.201	10.9	B	

Intersection Delay = 11.3 sec/veh Intersection LOS = B
 Critical v/c(x) = 0.604

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4g 10-07-1999
 Phillip Rowell And Associates
 Streets: (E-W) Kona Airport Road (N-S) Queen Kaahumanu Hwy
 Analyst: Rowell File Name: IAPAL72.HCS
 Area Type: Other 10-7-99 AM
 Comment: 2004 Alternate 2

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	>	1	1	0	>	1	1	1	1	1	1
Volumes	45	12	280	3	1	21	355	700	93	58	305	135
Lane W (ft)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
RTOR Vols	100	0	0	0	0	0	0	0	0	0	0	0
Lost Time	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

Phase Combination 1 2 3 4

Signal Operations

EB Left Thru Right Peds Left Thru Right Peds

WB Left Thru Right Peds Left Thru Right Peds

NB Right Peds Left Thru Right Peds

Green 10.0P Yellow/AR 3.0

Cycle Length: 60 secs Phase combination order: #1 #5 #6 #7

Intersection Performance Summary

Lane Group	Adj Sat	v/c	Ratio	Delay	LOS	Approach
EB LT	296	1777	0.213	16.5	C	14.0 B
EB RT	475	1583	0.421	13.2	B	15.9 C
WB LT	281	1688	0.014	15.9	C	9.8 B
WB RT	264	1583	0.008	13.9	B	13.7 B
NB LT	620	1770	0.636	10.9	B	
NB RT	1118	1863	0.696	10.9	B	
SB LT	528	1583	0.195	10.9	B	
SB RT	621	1863	0.546	13.2	B	
Lost Time/Cycle, L = 6.0 sec	528	1583	0.201	10.9	B	

Intersection Delay = 11.3 sec/veh Intersection LOS = B
 Critical v/c(x) = 0.604

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4g 10-07-1999
Phillip Rowell And Associates

Streets: (E-W) Kaiminani Road (M-S) Queen Kaahumanu Hwy
Analyst: Rowell File Name: 2004ALTR2.HC9
Area Type: Other 10-7-99 AM
Comment: 2004 Alternate 2

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	0	0	1	0	1	1	0	1	1	1	1
Volumes	231	1751	973	971	35	553	12.0	12.0	12.0	12.0	12.0	12.0
RTOR Vols	60	50	50	50	50	50	3.00	3.00	3.00	3.00	3.00	3.00
Lost Time												

Phase Combination 1 2 3 4 | Signal Operations

EB Left Thru Right Peds
WB Left Thru Right Peds
NB Right
SB Right
Green 10.0P
Yellow/AR 3.0
Cycle Length: 60 secs Phase combination order: #1 #5 #6

Intersection Performance Summary

Lane Group	Adj Sat	v/c	Ratio	g/c	Delay	LOS	Approach
WB L	295	1770	0.871	0.167	34.8	D	D
WB R	264	1583	0.481	0.167	18.3	C	C
WB T	1025	1863	1.055	0.550	47.7	E	E
SB L	236	1770	0.060	0.550	4.8	A	A
SB T	1366	1863	0.449	0.133	17.5	C	C

Intersection Delay = 30.1 sec/veh Intersection LOS = D
Lost Time/Cycle, L = 9.0 sec Critical v/c(N) = 0.879

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4g 10-07-1999
Phillip Rowell And Associates

Streets: (E-W) Kaiminani Road (M-S) Queen Kaahumanu Hwy
Analyst: Rowell File Name: 2PHALTR2.HC9
Area Type: Other 10-7-99 PM
Comment: 1999 Alternate 2

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	0	0	1	0	1	1	0	1	1	1	1
Volumes	144	144	45	669	287	105	12.0	12.0	12.0	12.0	12.0	12.0
RTOR Vols	30	30	30	30	30	30	3.00	3.00	3.00	3.00	3.00	3.00
Lost Time												

Phase Combination 1 2 3 4 | Signal Operations

EB Left Thru Right Peds
WB Left Thru Right Peds
NB Right
SB Right
Green 10.0P
Yellow/AR 3.0
Cycle Length: 60 secs Phase combination order: #1 #5 #6

Intersection Performance Summary

Lane Group	Adj Sat	v/c	Ratio	g/c	Delay	LOS	Approach
WB L	295	1770	0.542	0.167	19.0	C	C
WB R	264	1583	0.064	0.167	16.0	C	C
WB T	1025	1863	0.725	0.550	9.5	B	B
SB L	236	1770	0.302	0.550	5.6	B	B
SB T	1366	1863	0.496	0.133	19.7	C	C

Intersection Delay = 8.3 sec/veh Intersection LOS = B
Lost Time/Cycle, L = 6.0 sec Critical v/c(N) = 0.699

Philip Rowell and Associates
 47-273 'D' Hui Iwa Street
 Kaneohe, HI 96744
 Ph: (808) 239-8206

Streets: (N-S) UK Center Access Rd (E-W) Kaiminani Drive
 Major Street Direction... EW
 Length of Time Analyzed... 15 (min)
 Analyst... Rowell
 Date of Analysis... 0/0/0
 Other Information... 2004 Alternate 2, AM Peak Hour
 Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound			
	L	T	R	L	T	R	L	T	R	L	T	R	
No. Lanes	0	> 1	0	0	1	<	0	0	0	0	1	0	1
Stop/Yield			N			N							
Volumes	47	85		405	231		1			1			.9
PIF	.9	.9		.9	.91								0
Grade		0		0									
MC's (s)													
SU/RV's (s)													
PCE's	1.10						11.10						1.10

Adjustment Factors

Vehicle Maneuver	Critical Cap (tq)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.30
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NS	SB
Conflicting Flows: (vph)		463
Potential Capacity: (pcph)		807
Movement Capacity: (pcph)		807
Prob. of Queue-Free State:		1.00
Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)		476
Potential Capacity: (pcph)		1017
Movement Capacity: (pcph)		1017
Prob. of Queue-Free State:		0.94
TH Saturation Flow Rate: (pcphpl)		1700
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:		0.94
Step 4: LT from Minor Street	NS	SB
Conflicting Flows: (vph)		609
Potential Capacity: (pcph)		470
Major LT, Minor TH Impedance Factor:		0.94
Adjusted Impedance Factor due to Impeding Movements		0.94
Movement Capacity: (pcph)		442

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Total Delay (sec/veh)	Queue Length (veh)	LOS	Approach Delay (sec/veh)
SB L	1	442		6.2	0.0	B	
SB R	1	807		4.5	0.0	A	6.3
EB L	57	1017		3.7	0.0	A	1.3

Intersection Delay = 0.3 sec/veh

Phillip Rowell and Associates
 47-273 'D' Hui Iwa Street
 Kaneohe, HI 96744-
 Ph: (808) 239-8206

Streets: (N-S) UH Center Access Rd (E-W) Kaiminani Drive
 Major Street Direction... EW
 Length of Time Analyzed... 15 (min)
 Analyst... Rowell
 Date of Analysis... 0/0/0
 Other Information... 2004 Alternate 2, PM Peak Hour
 Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	>	1	0	0	1	0	0	0	0	0	1
Stop/Yield												
Volumes	72	320	N	165	361	N	12	24	24			
PHF	.9	.9		.9	.9		.9	.9	.9			
Grade				0					0			
MC's (%)												
SU/RV's (%)												
PCE's	1.10						1.10			1.10		1.10

Adjustment Factors

Vehicle Maneuver	Critical Gap (cg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWS Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)		203
Potential Capacity: (pcph)		1093
Movement Capacity: (pcph)		1093
Prob. of Queue-Free State:		0.97
Step 2: LT from Major Street	MB	EB
Conflicting Flows: (vph)		223
Potential Capacity: (pcph)		1342
Movement Capacity: (pcph)		1342
Prob. of Queue-Free State:		0.93
TH Saturation Flow Rate: (pcphpl)		1700
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:		0.92
Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)		639
Potential Capacity: (pcph)		452
Major LT, Minor TH		
Impedance Factor:		0.92
Adjusted Impedance Factor:		0.92
Capacity Adjustment Factor due to Impeding Movements		0.92
Movement Capacity: (pcph)		415

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Total Delay (sec/veh)	95% Queue Length (veh)	IOI	Approach Delay (sec/veh)
SB L	14	415	9.0	0.0	B		
SB R	30	1093	3.4	0.0	A		5.3
EB L	88	1342	2.9	0.1	A		0.5

Intersection Delay = 0.6 sec/veh

HCS: Unsignalized Intersections Release 2.1g 4ANEX.HCO Page 1
 Phillip Rowell and Associates
 47-273 'D' Hul Iva Street
 Kamehameha, HI 96744-
 Ph: (808) 239-8236

Streets: (N-S) Mamalahou Highway (E-W) Kaimi Mani Drive
 Major Street Direction... NS
 Length of Time Analyzed... 15 (min)
 Analyst... EJR
 Date of Analysis... 8/0/0
 Other Information... AM Peak Hour Existing
 Two-Way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	> 1	0	0	1	< 0	1	0	1	0	0	0
Stop/Yield												
Volumes	93	188		536	60	38	189					
PIF	.9	.9		.9	.9	.9	.5					
Grade		0		0		0						
NC's (%)												
SU/RV's (%)												
CV's (%)												
PCF's	1.10			1.10		1.10	1.10					

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Times (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

HCS: Unsignalized Intersections Release 2.1g 4ANEX.HCO Page 2

Worksheet for TWS Intersection

Step 1: RT from Minor Street	MB	EB
Conflicting Flows: (vph)		630
Potential Capacity: (pcph)		664
Movement Capacity: (pcph)		664
Prob. of Queue-Free State:		0.65
Step 2: LT from Major Street	SB	NB
Conflicting Flows: (vph)		663
Potential Capacity: (pcph)		828
Movement Capacity: (pcph)		828
Prob. of Queue-Free State:		0.66
RT Saturation Flow Rate: (pcphpl)		1700
Major LT Shared Lane Prob. of Queue-Free State:		0.84
Step 4: LT from Minor Street	MB	EB
Conflicting Flows: (vph)		942
Potential Capacity: (pcph)		302
Major LT, Minor TH Impedance Factor:		0.84
Adjusted Impedance Factor:		0.94
Capacity Adjustment Factor due to Impeding Movements:		0.84
Movement Capacity: (pcph)		255

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	Queue Length (veh)	LOS	Approach Delay (sec/veh)
EB L	46	255		17.2	0.6	C	
EB R	231	664		8.3	1.7	B	9.8
NB L	113	828		5.0	0.5	B	1.7

Intersection Delay = 2.4 sec/veh

Philip Rowell and Associates
 47-273 'D' Hui Iwa Street
 Kaneohe, HI 96744-
 Pnt: (808) 239-8206

Streets: (N-S) Mamalahou Highway (E-W) Kaimi Nani Drive
 Major Street Direction: NS
 Length of Time Analyzed: 15 (min)
 Analyst: FJR
 Date of Analysis: 07/07/00
 Other Information: PM Peak Hour Existing
 Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	>	1	0	1	<	0	1	0	1	0	0
Stop/Yield												
Volumes	113	381		304	67	74	112					
PHF	.9	.9		.9	.9	.9	.9					
Grade		0		0		0						
HC's (s)												
SU/RV's (s)												
CV's (%)												
PCE's	11.10			11.10	1.10	1.10						

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TMSI Intersection

Step 1: RT from Minor Street	YB	EB
Conflicting Flows: (vph)		375
Potential Capacity: (pcph)		894
Movement Capacity: (pcph)		894
Prob. of Queue-Free State:		0.85
Step 2: LT from Major Street	SB	NB
Conflicting Flows: (vph)		412
Potential Capacity: (pcph)		1091
Movement Capacity: (pcph)		1091
Prob. of Queue-Free State:		0.87
TH Saturation Flow Rate: (pcphpl)		1700
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:		0.83
Step 4: LT from Minor Street	YB	EB
Conflicting Flows: (vph)		924
Potential Capacity: (pcph)		309
Major LT, Minor TH Impedance Factor:		0.83
Adjusted Impedance Factor:		0.83
Capacity Adjustment Factor due to Impeding Movements:		0.83
Movement Capacity: (pcph)		257

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	Approach Delay (sec/veh)
EB L	90	257		21.4	1.5	D
EB R	136	894		4.7	0.6	A
NB L	139	1091		3.8	0.4	A

Intersection Delay = 2.4 sec/veh

Phillip Rowell And Associates
 47-273 'D' Hill Iwa Street
 Kaneohe, HI 96744-
 Ph: (808) 239-8236

Streets: (H-S) Mahaloan Highway (E-W) Kaimi Nani Drive
 Major Street Direction... NS
 Length of Time Analyzed... 15 (min)
 Analyst..... PJR
 Date of Analysis..... 0/0/9
 Other Information..... AM Peak Hour Cumulative
 Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	> 1	0	0	1	< 0	1	0	1	0	0	0
Stop/Yield												
Volumes	93	256		700	60	38	189					
FFV	.9	.3		.9	.9	.9	.9					
Grade		0		0			0					
KC's (N)												
SU/RV's (%)												
CV's (%)												
PCE's		1.10				1.10					1.10	

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TMSI Intersection

Step 1: RT from Minor Street	WB	EB
Conflicting Flows: (vph)		812
Potential Capacity: (pcph)		537
Movement Capacity: (pcph)		537
Prob. of Queue-Free State:		0.57
Step 2: LT from Major Street	SB	NB
Conflicting Flows: (vph)		845
Potential Capacity: (pcph)		678
Movement Capacity: (pcph)		678
Prob. of Queue-Free State:		0.83
TI Saturation Flow Rate: (pcphpl)		1700
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:		0.80
Step 4: LT from Minor Street	NB	EB
Conflicting Flows: (vph)		1198
Potential Capacity: (pcph)		214
Major LT, Minor TI Impedance Factor:		0.80
Adjusted Impedance Factor:		0.80
Capacity Adjustment Factor due to Impeding Movements:		0.80
Movement Capacity: (pcph)		171

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Delay (sec/veh)	95% Queue Length (veh)	LCS	Approach Delay (sec/veh)
EB L	46	171	171	28.6	1.0	D	
EB R	231	537	537	11.7	2.2	C	14.5
NB L	113	678	678	6.4	0.6	E	1.7

Intersection Delay = 2.9 sec/veh

Phillip Rowell And Associates
 47-273 'D' Hul Iwa Street
 Kaneohe, HI 96744
 Ph: (808) 239-8206

Streets: (N-S) Maunaloa Highway (E-W) Kaimi Nani Drive
 Major Street Direction: NS
 Length of Time Analyzed: 15 (min)
 Analyst: FJR
 Date of Analysis: 0/0/0
 Other Information: PM Peak Hour Cumulative
 Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	>	1	0	1	<	0	1	0	1	0	0
Stop/Yield	113	517	N				415	671	74	112		
Vol/turn	.9	.9					.9	.9	.9	.9		
Grade		0			0			0				
PC's (t)												
SU/RV's (t)												
CV's (t)												
PCE's	11.10						11.10			1.10		

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.50
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TMS Intersection

Step 1: RT from Minor Street WB EB
 Conflicting Flows: (vph) 498
 Potential Capacity: (pcph) 774
 Movement Capacity: (pcph) 774
 Prob. of Queue-Free State: 0.82

Step 2: LT from Major Street SB NB
 Conflicting Flows: (vph) 535
 Potential Capacity: (pcph) 953
 Movement Capacity: (pcph) 953
 Prob. of Queue-Free State: 0.85
 TH Saturation Flow Rate: (pcphp) 1700
 RT Saturation Flow Rate: (pcphp) 1700
 Major LT Shared Lane Prob. of Queue-Free State: 0.78

Step 4: LT from Minor Street WB EB
 Conflicting Flows: (vph) 1198
 Potential Capacity: (pcph) 214
 Major LT, Minor TH
 Impedance Factor:
 Adjusted Impedance Factor:
 Capacity Adjustment Factor:
 due to Impeding Movements
 Movement Capacity: (pcph) 167

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Delay (sec/veh)	95% Queue Length (veh)	Approach Delay (sec/veh)
WB L	50	167	167	44.3	2.5	21.0
WB R	136	774	774	5.6	0.7	U
NB L	139	953	953	4.4	0.5	A

Intersection Delay = 3.4 sec/veh

Appendix B-1

DEIS Comment Letters and Responses

Stephen K. Yamashiro
Mayor



Virginia Goldstein
Director
Russell Kokubun
Deputy Director



WIL CHEE - PLANNING, INC.

County of Hawaii
PLANNING DEPARTMENT
25 Auunani Street, Room 109 • Hilo, Hawaii 96720-4353
(808) 961-8288 • Fax: (808) 961-8762

July 14, 2000

Mr. Maynard Young
Facilities Planning Office for Community Colleges
University of Hawaii
Manele Building, Room 103
4303 Diamond Head Road
Honolulu, Hawaii 96816

Dear Mr. Young,

SUBJECT: Draft Environmental Impact Statement for the University of Hawaii Center at West Hawaii

Thank you for the opportunity to comment on the draft environmental impact statement for the University of Hawaii Center at West Hawaii. The County of Hawaii Planning Department has no comment at this time.

However, if you have any questions, please feel free to call the Planning Department at (808) 961-8288.

Sincerely,

Virginia Goldstein
VIRGINIA GOLDSTEIN
Planning Director

NK:pak
W:\mail\Normal\Letter\0007\University of Hawaii West Hawaii DEIS.doc

c: Ma. Genevieve Salmonson, OEQC
Mr. Richard McGerrow, Wil Chee Planning Inc.

October 24, 2000

Ms. Virginia Goldstein, Planning Director
Planning Department
County of Hawaii
25 Auunani Street, Room 109
Hilo, Hawaii 96720-4252

Dear Ms. Goldstein:

Subject: Draft Environmental Impact Statement (DEIS) for the Proposed University of Hawaii Center at West Hawaii (UHCWH)
Tax Map Key: 7-3-10-33 (portion)

On behalf of the University of Hawaii Facilities Planning Office, thank you for reviewing the subject DEIS. Your time and interest in the project and participation in the EIS process are greatly appreciated.

Sincerely,

Richard McGerrow
Senior Planner



Stephen K. Yamashiro
Mayor

County of Hawaii
DEPARTMENT OF PUBLIC WORKS
211 Aupuni Street, Room 202 • Hilo, Hawaii 96720-1151
(808) 961-4321 • Fax (808) 961-4630

Jiro A. Sasaki
Deputy Chief Engineer

August 30, 2000

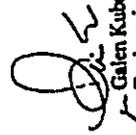
Maynard Young, Director
U.H. Facilities Planning Office for Community Colleges
Manele Building, Room 103
4303 Diamond Head Road
Honolulu, HI 96816

Subject: Draft Environmental Impact Statement
University of Hawaii Center at West Hawaii
TMK: 7-3-010: 033 (portion)

We reviewed the subject draft and have the following comments:

1. All development generated runoff shall be disposed of on-site and shall not be directed toward any adjacent properties.
2. A drainage study shall be prepared, and the recommended drainage system shall be constructed meeting with the approval of DPW.
3. Solid waste management shall conform to the rules and regulations of the DPW, Solid Waste Division. The developer shall prepare a solid waste management plan.
4. For reasons stated in the draft, we prefer the Alternate A access plan if archeology and horizontal alignment issues can be resolved.

If you have any questions, please feel free to contact Kiran Emiler of our Kona office at 327-3530.


Kiran Emiler
Galen Kuba, Division Chief
Engineering Division

KE
cc: Engineering- Hilo
CEQC - Genevieve Salmonson
W/1 Chec Planning, Inc.- Richard McGerrow



W/1 CHE • PLANNING, INC.

October 24, 2000

Mr. Galen Kuba, Division Chief, Engineering Division
Department of Public Works
County of Hawaii
25 Aupuni Street, Room 202
Hilo, Hawaii 96720-4252

Dear Mr. Kuba:

Subject: Draft Environmental Impact Statement (DEIS) for the Proposed
University of Hawaii Center at West Hawaii (UHCWH)

On behalf of the University of Hawaii Facilities Planning Office, thank you for reviewing the subject DEIS. Your comments (in Italics) from your letter of 8/30/00 and our responses are listed below.

1. All development-generated runoff shall be disposed of on-site and shall not be directed toward any adjacent properties.
Will comply.
2. A drainage study shall be prepared, and the recommended drainage system shall be constructed meeting with the approval of DPW.
Will comply.
3. Solid waste management shall conform to the rules and regulations of the DPW, Solid Waste Division. The developer shall prepare a solid waste management plan.
Will comply.
4. For reasons stated in the draft, we prefer the Alternate A access plan if archeology and horizontal alignment issues can be resolved.
Your preference is acknowledged and the project civil engineers will continue to work with your department in designing the access road.

Thank you for your time and interest in the project.

Sincerely,


Richard McGerrow
Senior Planner

Land Use Planners and Environmental Consultants
HNSA Center • 1400 Mycail Street • Suite 728 • Honolulu, Hawaii 96814 • Phone 808-935-6600 • Fax 808-935-1031 • E-Mail wcp@hnsa.net

Stephen K. Yamashiro
Mayor



Wayne G. Carvalho
Police Chief
James S. Correa
Deputy Police Chief



WIL CHEE - PLANNING, INC.

County of Hawaii
POLICE DEPARTMENT

349 Kapikalani Street • Hilo, Hawaii 96720-3798
(808) 935-3111 • Fax (808) 961-2722

June 22, 2000

Mr. Maynard Young
Director
University of Hawaii Facilities Planning
Office for Community Colleges
Manele Building, Room 103
4303 Diamond Head Road
Honolulu, HI 96816

Dear Mr. Young:

**SUBJECT : DRAFT ENVIRONMENTAL IMPACT STATEMENT
UNIVERSITY OF HAWAII CENTER AT WEST HAWAII
TAX MAP KEY: 7-3-10:33 (PORTION)**

Staff has reviewed the above-referenced document and believes that the plans adequately address traffic concerns.

Thank you for the opportunity to comment.

Sincerely,

WAYNE G. CARVALHO
POLICE CHIEF


THOMAS J. HICKCOX
ASSISTANT POLICE CHIEF
FIELD OPERATIONS BUREAU

DAF:ik

cc: Office of Environmental Quality Control
Wil Chee - Planning, Inc.

October 24, 2000

Chief Wayne G. Carvalho
Police Department
County of Hawaii
349 Kapikalani Street
Hilo, Hawaii 96720-3988

Dear Chief Carvalho:

Subject Draft Environmental Impact Statement (DEIS) for the Proposed
University of Hawaii Center at West Hawaii (UHCWH)
Tax Map Key: 7-3-10:33 (portion)

ATT: Thomas J. Hickcox, Assistant Police Chief
Field Operations Bureau

On behalf of the University of Hawaii Facilities Planning Office, thank you for reviewing the subject DEIS. Your time and interest in the project and participation in the EIS process are greatly appreciated.

Sincerely,



Richard McGarrow
Senior Planner



United States Department of the Interior
FISH AND WILDLIFE SERVICE
Pacific Islands Ecoregion
300 Ala Moana Blvd, Rm 3-122
Box 50088
Honolulu, HI 96850

In reply refer to: MSR

Richard McGerrow
Wil Chee Planning, Inc.
HMSA Center, Suite 928
1400 Rycroft St.
Honolulu, HI 96814

Re: University of Hawaii Center at West Hawaii, North Kona, Hawaii

JUN 21 2000

Page 2: University of Hawaii Center at West Hawaii, North Kona, Hawaii

3) Best Management Practices to be followed during all stages of the project to help prevent and minimize environmental degradation due to erosion, soil and water contamination, and other project-related impacts.

The Service believes the Final EIS should describe a complete contingency plan to protect lava tube habitat during all phases of the project. Furthermore, the project contractor should immediately contact our office if any lava tubes or underground voids are encountered during grading or other construction activities. A Service biologist will promptly visit the site to survey the cave and determine if there is an impact to native cave species that needs to be avoided or minimized.

The Service appreciates your concern for environmental values and the opportunity to review the proposed project. If you have any questions regarding these comments, please contact Fish and Wildlife Biologist Mike Richardson at (808) 541-3441 or by facsimile transmission at (808) 541-3470.

Sincerely,


Paul Henson,
Field Supervisor
Ecological Services

Dear Mr. McGerrow:

The U.S. Fish and Wildlife Service (Service) has reviewed the Draft Environmental Impact Statement (Draft EIS) for the University of Hawaii Center at West Hawaii, North Kona, Hawaii. The project sponsor is the University of Hawaii Facilities Planning Office for Community Colleges. The Service offers the following comments for your consideration.

The proposed project involves the creation, of a permanent physical facility for higher education on approximately 33 acres within the southwestern portion of a 500-acre State-owned parcel at Kalaooa in the West Hawaii region of the Island of Hawaii. This facility will be used to transition existing university programs currently operating in leased facilities in the Kealakua Business Plaza, and to provide sufficient expansion capability for projected future growth of student enrollment within the area. The project site is located three miles mountainward of Keahole Airport and approximately midway between Mammalahoa Highway and Queen Kaahumanu Highway.

The Service believes the Draft EIS adequately describes the proposed action and identifies reasonable project alternatives. We believe the preferred action for the proposed project is the Least Environmentally Damaging Practicable Alternative under consideration in the Draft EIS. Furthermore, the Service supports the implementation of several mitigation measures described in the Draft EIS, including:

- 1) Efforts to minimize the destruction of cave habitats caused by grading activities during construction.
- 2) The proper shielding of night lighting to minimize potential injury to bats and the disorienting effects on the dark-rumped petrel.



MR. CHEE - PLANNING, INC.

October 24, 2000

Mr. Paul Henson, Field Supervisor, Ecological Services
Fish and Wildlife Service
Pacific Islands Ecoregion
United States Department of the Interior
300 Ala Moana Blvd., Rm. 3-122,
Box 50088
Honolulu, Hawaii 96850

Dear Mr. Henson:

Subject: Draft Environmental Impact Statement (FEIS) for
University of Hawaii Center at West Hawaii (UHCHWH)

On behalf of the University of Hawaii Facilities Planning Office for Community Colleges, thank you for reviewing the Draft Environmental Impact Statement (DEIS) for the subject project.

We are in receipt of your letter of 6/21/00 regarding the DEIS. We are gratified that your department considers the subject draft EIS to adequately describe the proposed action and identify reasonable alternatives.

In response to your comment on the need for a contingency plan to protect lava tube habitats, we offer the following discussion, which will be added to the FEIS.

Cave habitats occur on the site in a variety of sizes from very small to quite large (comparable to a several room house). Although several were explored, especially those larger ones that offered some potential to harbor possible unique troglobites (cave dwelling species), nothing was found. However, all of the larger caves have potential archaeological interest as well. These caves should be preserved and protected. Smaller caves may be retained as part of the landscape where this is practical, but there is no reason to attempt to leave openings in the ground where these would clearly cause difficulty in the placement of roads, buildings, or pedestrian use areas. We suspect that, due to the existing terrain, the process of land grading will uncover many more small openings. It would be impractical to show concern over these. However, should any cave large enough to easily enter be uncovered, an archaeologist and a biologist should check it. Large caves can yield potentially interesting archaeological, paleontological, or ecological finds, and should not be destroyed prior to some exploration of their contents.

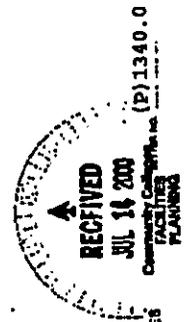
Your time and interest in the project and participation in the EIS process are greatly appreciated.

Sincerely,


Richard S. McGerrow
Senior Planner

Attachment A

1. pg. 6 Replace: Department of Natural Resources with Department of Land and Natural Resources
2. Section 2.3: Why isn't the Project Development Report (PDR) prepared by Kober/Hansen/Mitchell Architects, Inc. (dated February 2000) not referenced under the project scope?
Construction Phase 1: What about the site work and construction work within Phase 3's section?
3. Section 3.3: Explain why Sites 3 and 4 were not chosen during the site selection process by the Board of Regents.
Clarify what is meant by: within a "reasonable" distance of water, roadway, and other infrastructure? (pg. 19)
4. What are the metes and bounds for the 500 acre site? Figure 23 (pg. 36A) or Figure 24 (pg. 36B)? If Figure 24 is the correct representation of the site, how did we acquire the section of land in the southwest corner connecting to Kaimi Nani Drive?
5. The long range development plan (LRDP, pg.20) indicates that the 500 acre parcel is "ceded" lands. Is this correct? If so, was this taken into account during the site selection process by the Board of Regents? See Attachment B.
6. The PDR shows the 0.5 MC reservoir to be outside of the 500 acre site. Is this correct? Is an easement required? We understand the state owns the land but who is occupying the site? Please attach a site plan illustrating the location of the reservoir.
7. Provide a copy of the State Land Use Commission's - Decision and Order within the appendix of the report.
8. We understand that the Department of Land and Natural Resources (DLNR) is currently subdividing the 2,640 acre parcel into thirteen (13) parcels. What is the current status of the subdivision? (If applicable) What is the status on Executive Order to the UH for the 500 acre parcel?
9. Does UH have a list of possible uses for the balance of the 500 acre site?



STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
PLANNING
PO BOX 111, HONOLULU, HAWAII 96811

JUL 11 2000

TO: Mr. Maynard Young, Director
Facilities Planning Office for
Community Colleges
University of Hawaii

SUBJECT: Draft Environmental Impact Statement (EIS) Comments for
the University of Hawaii Center at West Hawaii

We have reviewed the draft EIS for the University of Hawaii Center at West Hawaii and provide our comments on Attachment A. Should there be any questions, please have your staff contact Mr. Brian Ima of the Planning Branch at 586-0484.

Gordon Matsuo
GORDON MATSUORA
Public Works Administrator

BI/RH:mc
Attachment
c: Ms. Genevieve Salmonson w/attachment, OSQC
Mr. Richard McGerrow w/attachment, Wil Chee - Planning, Inc.



STATE OF HAWAII
 DEPARTMENT OF LAND & NATURAL RESOURCES
 LAND MANAGEMENT DIVISION
 PAGE B24

STATE LAND INVENTORY

TAX MAP KEY	PLT	PAR	HPR	SUB	ZONING	COUNTY	LB	ENCUMB	DOCUMENT	NAME OF USER	EXT	DISTRICT	TITLE
DIS	2-9	PLT	PAR	HPR	SUB	ST	CTV	GN	PLN	CL	TYPE	NUMBER	STAT
3	7-3-006-003-0000	000	000	000	AD	56		VAC		KOHANAIKI HKSTDS	11.940	N. KONA	B
3	7-3-006-028-0000	000	000	000	AD	56		VAC		KOHANAIKI HKSTDS	5.290	N. KONA	B
3	7-3-007-000-0000	002	000	000	AD	0		VAC		OLD ROAD FAP F10 REM A	0.151	N. KONA	A
3	7-3-007-000-0000	002	000	000	AD	0		VAC		OLD ROAD FAP F10 REM B	0.153	N. KONA	B
3	7-3-007-000-0000	003	000	000	AD	0		VAC		OLD ROAD FAP F10 REM C	0.169	N. KONA	B
3	7-3-007-000-0000	003	000	000	AD	0		VAC		OLD ROAD FAP F10 REM D	0.120	N. KONA	B
3	7-3-007-000-0000	003	000	000	AD	0		VAC		OLD ROAD FAP F10(5) REM 5	0.185	N. KONA	B
3	7-3-007-000-0000	003	000	000	AD	0		VAC		OLD ROAD FAP F10(5) REM 7	0.136	N. KONA	B
3	7-3-007-000-0000	003	000	000	AD	0		VAC		OLD ROAD FAP F10(5) REM 8	0.070	N. KONA	B
3	7-3-007-000-0000	003	000	000	AD	0		VAC		OLD ROAD FAP F10(5) REM 9	0.078	N. KONA	B
3	7-3-007-000-0000	003	000	000	AD	0		VAC		OLD ROAD FAP F10(5) REM 12	0.489	N. KONA	B
3	7-3-008-023-0000	000	000	000	AD	51		VAC		DOT HWY DIV N KONA BASEYARD	1.465	N. KONA	B
3	7-3-009-005-0000	002	000	000	AD	0		VAC		KOHANAIKI, NORTH KONA	803.789	N. KONA	B
3	7-3-009-005-0000	002	000	000	AD	0		VAC		DOT HWY DIV N KONA BASEYARD	0.951	N. KONA	D
3	7-3-009-005-0000	002	000	000	AD	0		VAC		HIGH TECHNOLOGY DEVEL CORP	44.211	N. KONA	B
3	7-3-009-005-0000	003	000	000	AD	0		VAC		AMERICAN TRUST	0.887	N. KONA	B
3	7-3-009-005-0000	003	000	000	AD	0		VAC		AMERICAN TRUST	0.025	N. KONA	B
3	7-3-009-005-0000	003	000	000	AD	0		VAC		AMERICAN TRUST	83.000	N. KONA	B
3	7-3-010-000-0000	001	000	000	AD	56		VAC		STATE-HI DOT KAILUA HWY	44.970	N. KONA	B
3	7-3-010-000-0000	001	000	000	AD	56		VAC		STATE-HI DOT KAILUA HWY	82.210	N. KONA	B
3	7-3-010-000-0000	001	000	000	AD	56		VAC		STATE-HI DOT KAILUA HWY	34.976	N. KONA	B
3	7-3-010-000-0000	001	000	000	AD	56		VAC		STATE-HI DOT KAILUA HWY	118.600	N. KONA	B
3	7-3-010-000-0000	001	000	000	AD	56		VAC		STATE-HI DOT KAILUA HWY	2,333.503	N. KONA	B

STATE OF HAWAII
DEPARTMENT OF LAND & NATURAL RESOURCES
LAND MANAGEMENT DIVISION
STATE LAND INVENTORY

REPORTING DISTRICT	REPORTING DATE	COUNTY OF HAWAII	TAX MAP KEY	ZONING	COUNTY LB	ENGINE DOCUMENT	NAME OF USER	LAND AREA	EXT USE	DISTRICT	TITLE STAT
3	7-3-010-033-0000	AD	003	1	AD	05176	U H UNIVERSITY OF HAWAII	0.008	A05	N. KONA	B
3	7-3-010-033-0000	AD	004	1	AD	05176	U H UNIVERSITY OF HAWAII	0.008	A05	N. KONA	B
3	7-3-010-033-0000	AD	005	1	AD	05176	U H UNIVERSITY OF HAWAII	4.000	D06	N. KONA	B
3	7-3-010-033-0000	AD	006	1	AD	05176	U H UNIVERSITY OF HAWAII	65.217	D06	N. KONA	B
3	7-3-017-031-0000	AD	000	1	AD	05176	U H UNIVERSITY OF HAWAII	0.099	A	N. KONA	A
3	7-3-017-031-0000	AD	001	1	AD	05176	U H UNIVERSITY OF HAWAII	0.027	A	N. KONA	A
3	7-3-017-031-0000	AD	002	1	AD	05176	U H UNIVERSITY OF HAWAII	0.020	B	N. KONA	B
3	7-3-043-001-0000	CD	61	91	CD	03074	STATE DOT KEAHOLE AIRPORT	1,174.600	A17	N. KONA	B
3	7-3-043-001-0000	CD	61	91	CD	03074	STATE DOT KEAHOLE AIRPORT	317.700	A17	N. KONA	X
3	7-3-043-001-0000	CD	61	91	CD	03074	STATE DOT KEAHOLE AIRPORT	2,668.512	A17	N. KONA	B
3	7-3-043-003-0000	UD	001	1	UD	04717	NATURAL ENERGY LABORATORY	314.066	B02	N. KONA	B
3	7-3-043-003-0000	UD	002	1	UD	04717	NATURAL ENERGY LABORATORY	421.120	F11	N. KONA	B
3	7-3-043-003-0000	UD	003	1	UD	04717	NATURAL ENERGY LABORATORY	7.734	A17	N. KONA	E
3	7-3-043-003-0000	UD	004	1	UD	04717	NATURAL ENERGY LABORATORY	7.734	B02	N. KONA	B
3	7-3-043-004-0000	UD	001	1	UD	03074	STATE DOT KEAHOLE AIRPORT	12.194	A17	N. KONA	B
3	7-3-043-004-0000	UD	002	1	UD	03074	STATE DOT KEAHOLE AIRPORT	7.278	A52	N. KONA	B
3	7-3-049-001-0000	AD	000	000	AD	03379	STATE-HI DOA GL 4681 LOT 1	4.551	A52	N. KONA	B
3	7-3-049-001-0000	AD	001	000	AD	03379	STATE-HI DOA GL 4681 LOT 2	5.007	A52	N. KONA	B
3	7-3-049-001-0000	AD	002	000	AD	03379	STATE-HI DOA GL 4681 LOT 3	5.009	A52	N. KONA	B
3	7-3-049-001-0000	AD	003	000	AD	03379	STATE-HI DOA GL 4681 LOT 4	6.023	A52	N. KONA	B
3	7-3-049-001-0000	AD	004	000	AD	03379	STATE-HI DOA GL 4681 LOT 5	5.193	A52	N. KONA	B
3	7-3-049-001-0000	AD	005	000	AD	03379	STATE-HI DOA GL 4681 LOT 6	5.047	A52	N. KONA	B
3	7-3-049-001-0000	AD	006	000	AD	03379	STATE-HI DOA GL 4681 LOT 7	4.758	A52	N. KONA	B
3	7-3-049-001-0000	AD	007	000	AD	03379	STATE-HI DOA GL 4681 LOT 8	8.164	A52	N. KONA	B
3	7-3-049-001-0000	AD	008	000	AD	03379	STATE-HI DOA GL 4681 LOT 9	5.061	A52	N. KONA	B
3	7-3-049-001-0000	AD	009	000	AD	03379	STATE-HI DOA GL 4681 LOT 10				

LAND TITLE STATUS

Used Status This is a title code assigned to each parcel to indicate how the parcel was acquired by the state.

- A. State lands acquired under Section 5A of the Admissions Act, Public Law 86-3.
- B. State lands acquired under Section 5B of the Admissions Act.
- Z. State lands acquired under 5E of the Admissions Act.
- I. Submerged lands referred to under Section 5I of the Admissions Act.
- X. State lands acquired after Statehood, 8/21/59
- Y. State lands acquired through Federal Fee Surplus Property, Public Benefit Discount, Federal Property and Administrative Services Act of 1949, (67 Stat 377) and the Surplus Property Act of 1944 (58 Stat 765).
- S. State lands acquired under Public Law 88-233 77 Stat 472.

OHA revenue is-B, E, I, Z

Things to Remember

1. Not all ceded lands are Office of Hawaiian Affairs' revenue lands.
2. OHA revenue lands are designated as B, X, Z, and Y on the Land Inventory print-out under "ceded state column".
3. Lands designated "A" MAY be ceded, but not OHA revenue lands.
4. Lands acquired in exchange for other OHA revenue lands are categorized as "A".
5. Lands acquired after Statehood are categorized as "X" (except # 4. above) and are definitely NOT OHA revenue lands.
6. When disposition under one document involves multiple parcels having different categories, designate revenue in the category having the most acreage. If about 50/50 favor OHA revenue land designation.

RECEIVED FROM DLNR - LAND MANAGEMENT DIVISION

WESLEY R. SEGAWA & ASSOCIATES, INC.
CIVIL & STRUCTURAL ENGINEERS
73-5577 Kauhola Street, #4
Kailua-Kona, Hawaii 96740-2620

FAX TRANSMITTAL

This message is intended for the use of the addressee and may contain information that is privileged or confidential. If you are not the intended recipient, you are hereby notified that any use or dissemination of this communication is strictly prohibited. If you have received this communication in error, please notify Wesley R. Segawa & Associates, Inc. immediately by phone at (808) 329-4244.

Date: July 19, 2000 Number of Pages (including cover sheet): 3

To:	Maynard Young	From:	Dan Lanteman
Company:	University of Hawaii CC Facilities Planning Office	Tele. #:	(808) 329-8249
Fax #:	1-808-734-9430	Fax #:	(808) 329-7457

Subject: DAGS Comment to EIS
University of Hawaii Center at West Hawaii
PDR Project No. CC-88-9009

Maynard,

In response to your 7/18/00 fax, the proposed 0.5 MG reservoir (referred to by DAGS) is shown to be located on Parcel 10 of the "Subdivision of the Government Lands of Kailua 1-4 and Ooma 1" into Parcels 1 to 13, inclusive" in Figure C-6a of the Project Development Report. The aforementioned Subdivision specifically identifies a location for a "Proposed Reservoir Site". This is the site that WRSA references for the proposed 0.5 MG reservoir in the Project Development Report. The Reservoir Site is not located on the 500-acre Parcel 5, however the Reservoir Site is adjacent to the "Future Waena Road" (Parcel 13), which in turn is adjacent to the 500-acre Parcel 5.

From a hydraulic design standpoint, the Reservoir Site could probably be located on the eastern (mauka) boundary of the 500-acre Parcel 5. The final location for this reservoir would most likely be a topic for discussion with the County of Hawaii, Department of Water Supply in future design phases. I do not know if anyone is occupying or if there are any improvements that have been made to the "Proposed Reservoir Site" on Parcel 10.

I have attached a portion of the Subdivision map for your reference. I hope this information is helpful. Please feel free to call me with any questions.

Thanks,
Dan

If any part of this transmission is missing or poorly received, please call. If you do not call, we will assume you have received the designated number of pages satisfactorily.
WESLEYR@AOL.COM

PLANNING DEPARTMENT
COUNTY OF HAWAII

SUB. NO. 7159
REMARKS: 3/19/99 (REV.)
RECEIVED: 8/11/99

SUBDIVISION NUMBER 7159
APPROVED FOR RECORDATION with the Bureau of
Conveyances, State of Hawaii

[Signature]
Planning Director, County of Hawaii
DATE: 8/17/99

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
SURVEY DIVISION

RANDALL M. HASHIMOTO - STATE LAND SURVEYOR

**SUBDIVISION OF THE
GOVERNMENT LANDS OF
KALAOA 1-4 AND OOMA 1st
INTO PARCELS 1 TO 13, INCLUSIVE**

Kalaoa 1-4, Ooma 1st, North Kona, Island of Hawaii, Hawaii
Scale: 1 in. = 600 feet

FILE WITH
Job No.: S-19(95)
Tracing By: E. Taloaga
H.S.S. PLAT 319

with
orig. Parcel 11.
2N E D



DAGS
10/24/00
Page 2



WIL DEE - PLANNING, INC.

October 24, 2000

Mr. Gordon Matuszka, Public Works Administrator
State of Hawaii
Department of Accounting and General Services
P.O. Box 119
Honolulu, Hawaii 96816

Dear Mr. Matuszka:

Subject: Draft Environmental Impact Statement (DEIS) for
University of Hawaii Center at West Hawaii (UHCWH)

On behalf of the University of Hawaii Facilities Planning Office for Community Colleges, thank you for reviewing the DEIS for the subject project. Your comments (in italics) from Attachment A of your letter of 7/11/00 and our responses are listed below.

1. Page 6: Replace Department of Natural Resources with, Department of Land and Natural Resources.
2. The above referenced wording will be corrected in the Final EIS.
3. Section 2.3: Why isn't the Project Development Report (PDR) prepared by Kober/Hansen/Mitchell Architects, Inc. (dated February 2000) not referenced under the project scope?
The subject EIS assesses the Long Range Development Plan (LRDP) for UHCWH. The PDR was initiated after completion of the LRDP, and this EIS is not intended to assess the PDR as a separate document. Only those portions of the PDR that differ from the LRDP are referenced in the EIS. These include changes that were made to the project subsequent to completion of the LRDP, namely alteration of the access road, water supply system and wastewater system. These changes were made in the PDR after further discussions with relevant County of Hawaii agencies. In order to give a true picture of what the project will be when completed, only these changes and not the entire PDR document have been incorporated in the EIS.
Construction Phase 1: What about the site work and construction work within Phase 3's section?
Construction of the roadway, electrical, wastewater, and telecommunication lines in the Phase 3 area will be constructed during Phase 1 because this is necessary to connect Phase 1 to Kaimi Nani Drive. Parking, building construction and landscaping will be deferred in the Phase 3 area until after Phase 2 has been completed.

4. Explain why Sites 3 and 4 were not chosen during the site selection process by the Board of Regents.
Sites 3 and 4 lie north of the area that both the State and County of Hawaii have designated as urban expansion lands. The optimal location of the University site would be within the designated urban expansion area to take advantage of the expected economies of scale related to infrastructure. During the selection process three of the most important criteria the Board of Regents used were:
a. to relate the future UH Center site to Kailua-Kona
b. to have a site with unlimited expansion potential
c. to have a site that would require minimal expenditure for infrastructure

Lead Use Planner and Environmental Coordinator
WUSA Center - 1000 Kapiolani Street - Suite 4318 - Honolulu, Hawaii 96813 • Phone 808-955-4000 • Fax 808-942-1151 • E-Mail wcp@aloha.net

Only Site 2 (Kalaooa) satisfied all of these criteria.

Clearly what is meant by: Within a "reasonable" distance of water, roadway, and other infrastructure? (pg. 19)

A "reasonable" distance would be any distance within the urban expansion area that can be connected to existing infrastructure, thus minimizing the cost of new infrastructure.

4. What are the metes and bounds for the 500 acre site? Figure 23 (pg. 36A) of Figure 24 (pg. 35 B)? If Figure 24 is the correct representation of the site, how did we acquire the section of land in the southwest corner connecting to Kaimi Nani Drive?

Figure 24 is the correct delineation of the site. Figure 23 was intended as a more schematic presentation just to illustrate the University parcel on State Lands. The section of land in the southwest corner connecting to Kaimi Nani Drive was made part of the parcel in the subdivision map for state lands prepared by DAG's Survey Division. We assume it was included to give access to the 500-acre site from Kaimi Nani Drive which is the only existing roadway in near the site.

5. The long range development plan (LRDP, pg. 20) indicates that the 500 acre parcel is "ceded" lands. Is this correct? If so, was this taken into account during the site selection process by the Board of Regents? See Attachment B.

Yes, the 500-acre site is ceded lands. At the time the selection process was initiated in the late 80's and early 90's, ceded lands were not brought out as an issue.

6. The PDR shows the 0.5 MG reservoir to be outside of the 500 acre site. Is this correct? Is an easement required? We understand the state owns the land but who is occupying the site? Please attach a site plan illustrating the location of the reservoir.

We assume that the consultants (Wesley R. Segawa & Associates, Inc.) who prepared the civil engineering portion of the PDR placed the tank outside of the 500-acre site because of the subdivision map entitled "SUBDIVISION OF THE GOVERNMENT LANDS OF KALAOOA 1-4 AND OMOA 1" INTO PARCELS 1 TO 13, INCLUSIVE." This map, dated August 1999, indicates a "proposed reservoir site" in that location (Parcel 10). This parcel, immediately to the east of the 500-acre parcel, was designated for University of Hawaii Faculty Housing. But as stated in the LRDP and EIS, UHCWH is now planned as a "commuter" school and will not require faculty housing. Subsequent communication between the consultant and CCFPCO indicates that from a hydraulic design standpoint, the reservoir could be located within the 500-acre University site (Parcel 5) as shown in the LRDP. Final location of the tank will likely depend on discussions with the County of Hawaii Department of Water Supply and Department of Public Works during the design phase of the project. For the purposes of the EIS the location of the tank is as shown in the LRDP within the 500-acre site.

7. Provide a copy of the State Land Use Commission's - Decision and Order within the appendix of the report.

We will comply.

8. We understand that the Department of Land and Natural Resources (DLNR) is currently subdividing the 2,640 acre parcel into thirteen (13) parcels. What is the current status of the subdivision? (If Applicable) What is the status on Executive Order to the UH for the 500 acre parcel?

DAGS
10/24/00
Page 3

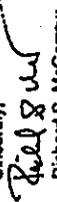
The subdivision of the Government Lands into 13 parcels has been approved for recordation with the Bureau of Conveyances, State of Hawaii, by County of Hawaii Planning Director, Virginia Goldstein on August 17, 1999.

9. Does UH have a list of possible uses for the balance of the 500-acre site?

Not at this time.

Thank you for your time and interest in the project.

Sincerely,


Richard S. McGerrow
Senior Planner

BENJAMIN J. CAVETANO
DIRECTOR



STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
236 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96815
TELEPHONE (808) 524-1100
FACSIMILE (808) 524-1100
July 20, 2000

GENEVIEVE SALLUMOREN
DIRECTOR

Maynard Young
July 20, 2000
Page 2

Maynard Young
UH Facilities Planning Office
103 Manele
4303 Diamond Head Road
Honolulu, HI 96816

Dear Mr. Young:

Subject: Draft environmental impact statement (EIS) for University of Hawaii
Center at West Hawaii

We have the following comments to offer:

1. **Title page signature:** The director or director-in-charge of the applicant agency is required to sign the environmental impact statement and indicate that it and all ancillary documents were prepared under the signatory's direction. This is required by § 11-200-20d of Hawaii Administrative Rules. Be sure this is included in the final EIS. Submit the FEIS copy with the original signature to this office.
2. **Cumulative impacts:** A full discussion of cumulative impacts for all geographically-related projects is required by law. This includes public, private, existing or planned projects in the region. The draft EIS states that an analysis of traffic impacts will be deferred to the final EIS, but this does not allow reviewers the opportunity to comment on your analysis. The analysis to be included in the FEIS must be thorough and complete, and include the following at a minimum:
 - a. Traffic and development of roads
 - b. Infrastructure (water, wastewater systems)
 - c. Housing development
 - d. Commercial/business/industrial development
 - e. Population shifts
 - f. Runoff patterns and drainage concerns
 - g. Noise; air quality

In your consultations be sure to include community groups and individuals (such as Kona Palisades Estate Community Association, local legislators, council members, journalists), who are in a position to identify other projects in the vicinity of region which must also be included in the analysis.

3. **Permits and approvals:**
 - a. Section 7.0 needs to indicate the status of each permit listed.
 - b. Is a permit from the Commission of Water Resources Management required?
4. Discussions on the following topics are required by law. Please provide them in the final EIS:
 - a. **Historic perspective:** In section 2, "Purpose and Need for Action" give a brief history of how this project evolved.
 - b. **Local and regional perspective:** In section 4, "Affected Environment," describe the region and locale in terms of historic, geographic, economic and social development.
 - c. **Secondary impacts:** This includes indirect effects on employment patterns, population shifts and growth. Be sure to include the basis you used for calculating population growth.
5. **Air quality:**

In comment letters both OEQC and the Office of Hawaiian Affairs requested inclusion of a windrose in the DEIS, but this was not done. There is a question about emissions from the HELCO generation station makai of the campus site and dust from quarry operations at the proposed Kaioko-Honokohau Business Park. Furthermore, the DEIS states the impacts to air quality would be the same as they are at Kealahou, but the distance between the two locations is more than 20 miles. The new campus will also draw a larger student body, with a concomitant increase in motor traffic and vehicular emissions.

In the final EIS enclose a windrose to show dispersion patterns and justify your claim regarding no additional impacts over the current campus site.
6. **Noise impacts:** Section 5.5 in the DEIS claims no additional impacts above those from the current UHCWH in Kealahou. Given the 20+ mile separation, please justify this claim.
7. **Ecological survey:**

The author of this study notes that there are limits to a one-time survey. Will a follow up survey be done to include any species that may have been missed during the initial survey?

The "Discussion" section references a study (Harrison 1990) which is missing from the "Literature Cited" list. Please correct this.



8. **Recycling:** Section 5.12.6, *Solid Waste Disposal*, states that use of recyclable products and a recycling program would reduce ... disposal requirements. What will UHWHC do to encourage or mandate such uses? What is the recycling/re-use policy of Hawaii county? As delineated in the Department of Health's letter of January 14th, 2000, will glassphalt be used for paving, and local compost and mulch for landscaping?
9. **Sustainable Building Design:** Please consider applying sustainable building techniques presented in the enclosed "Guidelines for Sustainable Building Design in Hawaii." In the final EA include a description of any of the techniques you will implement
10. **Alternative transportation modes:**
As pointed out in our comment letter of December 28th, 1998, state policy (HRS Chapters 26, 226, 264, 344) requires the *promotion* (emphasis added) of alternative forms of transportation systems that reduce reliance on the private automobile, conserve energy, and decrease pollution.
Section 5.4 on air quality states "Ultimately, it would be the responsibility of conscientious students, faculty, and staff to utilize carpools, public transportation, and other more environmentally friendly modes of travel as opposed to the personal automobile." You responded to our comment letter that "At the present time there is no public mass-transportation available in the West Hawaii region..." and that "this option [shuttle service] may be explored if there is a demonstrated demand for this service and funding can be found to support it." This does not *proactively* promote these alternate transportation modes. Those needing a shuttle service will take advantage of it if it is offered, but it must first be offered. And since there is currently no mass transportation, students cannot avail themselves of it. Given no other options, commuters will opt for private automobile use.
Likewise, those choosing to bicycle to UHWHC will be encouraged to do so if appropriate facilities (internal bike lanes, secure bicycle racks or bike lockers) are provided, whether a linking bike path system along the main highway is provided or not. In your response letter you say that "Pedestrian walkway and bicycle paths can be provided within the UHWHC site." However, neither appears on site plan, figure 5.
In the final EIS please describe how you will proactively promote non-motorized forms of transportation.
11. **Impacts to cave habitats:** Section 5.7.2 mentions minimizing destruction of cave habitats during grading. What mitigation measures are planned in the event such habitats are encountered?

12. **Figures:**
a. The following figures should have north arrows added: 1, 3, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 and 25.
b. The following misspellings should be corrected: "Waikola" on fig. 3; "Kialua-Kona" on fig. 18; "Kaiholo Bay" on fig. 21; "Kehole Pt." on fig. 22.

If you have any questions, please call Nancy Heinrich at 586-4185.

Sincerely,


GENEVEVE SALMONSON
Director

Enc.

- c: Richard McGerrow, Will Chee Planning
Lane Oist, CSWM (v/o enc.)



WPL OFFICE - PLANNING, INC.

October 24, 2000

Ms. Genevieve Salmonson, Director
Office of Environmental Quality Control (OEQC)
236 South Beretania Street Suite 702
Honolulu, Hawaii 96813

Dear Ms. Salmonson:

Subject: Draft Environmental Impact Statement (DEIS) for
University of Hawaii Center at West Hawaii (UHCWH)

On behalf of the University of Hawaii Facilities Planning Office for Community Colleges, thank you for reviewing the DEIS for the subject project. Your comments (in italics) from your letter of 7/20/00 and our responses are listed below.

1. *Title page signature: The director or director-in-charge of the applicant agency is required to sign the environmental impact statement and indicate that it and all ancillary documents were prepared under the signatory's direction. This is required by § 11-200-200 of Hawaii Administrative Rules. Be sure this is included in the final EIS. Submit the FEIS copy with the original signature to this office.*

Concur. The signature page will be signed by the Director and the original copy provided to OEQC.

2. *Cumulative impacts: A full discussion of cumulative impacts for all geographically related projects is required by law. This includes public, private, existing or planned projects in the region. The draft EIS states that an analysis of traffic impacts will be deferred to the final EIS, but this does not allow reviewers the opportunity to comment on your analysis. The analysis to be included in the FEIS must be thorough and complete, and include the following at a minimum:*

- Traffic and development of roads
- Infrastructure (water, wastewater systems)
- Housing development
- Commercial/business/industrial development
- Population shifts
- Runoff patterns and drainage concerns
- Noise; air quality

In your consultations be sure to include community groups and individuals (such as Kona Palisades Estate Community Association, local legislators, council members, and journalists), who are in a position to identify other projects in the vicinity or region which must also be included in the analysis.

Concur. This discussion will be provided.

OEQC
10/24/00
Page 2

3. *Permits and approvals: Section 7.0 needs to indicate the status of each permit listed.*

Do not concur. OEQC guidelines do not list "status of each permit listed" as an item on the Draft/Final EIS checklist.

Is a permit from the Commission of Water Resources Management required?

We have contacted the Commission of Water Resources Management regarding the requirement of a permit for the subject project. They indicated that permits are usually required for projects that require the drilling of new wells by the State or projects that impact surface water such as streams or ponds. Since neither case applies to the subject project, a permit will not be required.

4. *Discussions on the following topics are required by law. Please provide them in the final EIS:*

a. *Historical Perspectives: In section 2, "Purpose and Need for Action" give a brief history of how this project evolved.*

Concur. This discussion will be provided.

b. *Local and regional perspectives: In section 4, "Affected Environment," give a brief history of how this project evolved.*

Concur. This discussion will be provided.

c. *Secondary impacts: This includes indirect effects on employment patterns, population shifts and growth. Be sure to include the basis you used for calculating population growth.*

Concur. This discussion will be provided.

5.

Air Quality: In comment letters both OEQC and the Office of Hawaiian Affairs requested the inclusion of a windrose in the DEIS, but this was not done. There is a question about emissions from the HELCO generation station Malak of the campus site and dust from quarry operations at the proposed Kaloa-Honokohau Business Park. Furthermore, the DEIS states the impacts to air quality would be the same as they are at Kealahou, but the distance between the two locations is more than 20 miles. The new campus will also draw a larger student body, with a concomitant increase in motor traffic and vehicular emissions.

This comment should be separated into two distinct air quality issues. The first of which this EIS does intend to address, and one which it does not. Firstly, addressing the issue of air quality impacts to be generated by UHCWH activities at the Kaloa site would be substantively similar to the same improvements are situated at Kealahou. Planned program activities and uses anticipated for the UHCWH would not change regardless of site. Therefore, these same activities at either site would generally result in the same air quality impacts to their respective ambient environment. If the point being made in this question is that the UHCWH may be contributing an emission impact to the general ambient air environment of Kaloa and that this environment is already impacted by the HELCO plant and perhaps the Kaloa-Honokohau Park, then we concur. However, any contribution to emission levels by the UHCWH to the Kaloa area would not be anticipated to be significant, nor would this contribution be expected to incrementally place an added burden to the ambient air environment sufficient to cause a cumulatively significant impact.

Further enrollment increases are a programmatic goal for the UHCWH, and would then be seen to occur even at the Kealahou site.

Secondly, emissions generated at the HELCO plant and any dust generated from the Kaloko-Honokohau Park are air quality issues impacting the ambient environment from sources extraneous, unrelated and distant from the UHCWH. The proposed project has no role in the generation of impacts from these sources.

In the final EIS enclose a windrose to show dispersion patterns and justify your claim regarding no additional impacts over the current campus site.

A windrose will be included with a more detailed analysis of the existing wind patterns.

Noise impacts:

Section 5.5 in the DEIS claims no additional impacts above those from the current UHCWH in Kealahou. Given the 20-mile separation, please justify this claim.

The types of noise impacts generated at the present site are expected to be substantively similar to the types of impacts generated at the new site since the uses at both sites are similar. For example, both sites will have commuter traffic during similar hours of operation. There is background noise at both sites; the existing site may in fact have more background noise due to the presence of the shopping center, bar and grill, surrounding industrial uses, etc.

Faunal survey:

The author of this study notes that there are limits to a one-time survey. Will a follow up survey be done to include any species that may have been missed during the initial survey?

No follow-up surveys are proposed. It is unlikely that the site supports or will support any native avian species in the future. Additional surveys of the site will only record additional alien avian species, none of which are protected under the federal or State of Hawaii Endangered species Act (ESAs). With respect to native birds and other vertebrates, suitable habitat is not present. With respect to native invertebrates, much the same can be said, although to the extent that native vegetation is retained on the site, some possibility for observing native insects under conditions promoting plant growth and/or flowering (e.g., wetter conditions than prevailed during the survey) might result. Again, it is concluded that no listed species would be discovered by future surveys under different conditions; only that more alien species would be uncovered.

The "Discussion" section references a study (Hamison, 1990) which is missing from the "Literature Cited" list. Please correct this.

The missing reference is: Hamison, C.S. 1990. Seabirds of Hawaii: Natural History and Conservation. Cornell University Press, Ithaca, N.Y. 249 pp.

Recycling: Section 5.12.6, Solid Waste Disposal, states that the use of recyclable products and a recycling program would reduce disposal requirements. What will UHWHC do to encourage or mandate such uses?

The University of Hawaii does not currently have a solid waste management plan, however recycling facilities for certain types of materials such as glass, metal and paper are available through private companies on the island of Hawaii.

What is the recycling/trouse policy of Hawaii County?

An inquiry was made to the County of Hawaii, Department of Public Works, Solid Waste Division. They indicated that the county's recycling policy is currently being written and not available at this

time. Recycling of glass, paper and metal is offered to island businesses by private recycling companies. These services would also be available to UHCWH.

As delineated in the Department of Health's letter of January 24th, 2000, will glassphalt be used for paving, and local compost and mulch for landscaping.

Since "glassphalt" is mandated by statute for all State and County paving projects, it will in all likelihood be used on the subject project. Likewise, local compost and mulch will probably be used since contractors receive a 7% credit for using the local product rather than mainland imports. Both of these products would be specified during the design phase of UHCWH and is beyond the purview of this EIS document.

Sustainable Building Design: Please consider applying sustainable building techniques presented in the enclosed "Guidelines for Sustainable Building Design in Hawaii." In the final EA include a description of any of the techniques you will implement.

The Guidelines for Sustainable Building Design in Hawaii will be followed as closely as possible by the design professionals for the subject project during the upcoming design and construction phase. The techniques employed would be the choice of the design architects and engineers according to the needs of their specific design solution. Therefore, they cannot be specified in the EIS as you request. We will, however mention the "Guidelines" as a reference to be used by the project design professionals.

Alternative transportation modes:

As pointed out in our comment letter of December 28th, 1999, state policy (HRS Chapters 26, 226, 264, 314) requires the promotion (emphasis added) of alternative forms of transportation systems that reduce reliance on the private automobile, conserve energy, and decrease pollution.

Section 5.4 on air quality states "Ultimately, it would be the responsibility of conscientious students, faculty, and staff to utilize carpools, public transportation, and other more environmentally friendly modes of travel as opposed to the personal automobile." You respond to our comment letter that "At the present time there is no public mass-transportation available in the West Hawaii region..." and that "this option (shuttle service) may be explored if there is a demonstrated demand for this service and funding can be found to support it." This does not proactively promote these alternative transportation modes. Those needing a shuttle service will take advantage of it if it is offered, but it must first be offered. And since there is currently no mass transportation, students cannot avail themselves of it. Given no other options, commuters will opt for private automobile use.

We agree that promotion of alternative forms of transportation to lessen reliance on the personal automobile is a desirable environmental goal, but in the EIS we can only recommend that shuttle service be implemented. The University cannot "proactively" mandate shuttle service at this early stage of project development when the specific demand for such service is not yet known. Therefore, we stand by our assertion that this subject cannot be addressed until the Kalaoa Center is actually in operation. The unique geographic characteristic of West Hawaii and the University Center's position at the center of this region is that population and activity nodes are dispersed in a linear fashion along the entire western coast of the island, a distance of nearly 100 miles. Since the target population is so dispersed it would be difficult to plan a UHCWH shuttle service until the demand for such service is known.

Primary and secondary school students all have the same general schedule and arrival/departure time, and schools generally serve specific residential areas. Thus, school buses are feasible in this situation. UHCWH, on the other hand, serves students from the entire West Hawaii region from North Kohala to South Kona, and classes are conducted throughout the day and into the evening. Also, many of the students will have part-time or full-time jobs and will only come to

UHCWH for one or two classes per day. For all of these reasons it is difficult to forecast the minimum ridership that would be necessary to sustain a shuttle service. We also suspect that there was already a high demand for public transit in West Hawaii, that some form of service, whether it be public or private, would have been implemented by now or that a public movement would be active in lobbying the government to provide this service.

Likewise, those choosing to bicycle to UHCWH will be encouraged to do so if appropriate facilities (intermal bike lanes, secure bicycle racks or bike lockers) are provided, whether a linking bike path system along the main highway is provided or not. In your response letter you say that "pedestrian walkway and bicycle paths can be provided within the UHCWH site." However, neither appears on site plan, figure 5.

Although they are not shown, bike lanes along the central mall of UHCWH running north-south can be accommodated as well as storage facilities for students and staff wishing to keep bicycles at the Center. We maintain that lack of a linking bike path system along the main highway could create a dangerous traffic situation. The Public interest would not be served by the promotion of bicycling on a high-speed highway not designed for the safety of modes proposed. We would view the mix of Queen Kaahumanu Highway traffic with bicyclists to be a highly dangerous endeavor for both the average motorist, and the average-skilled bicyclist.

In the final EIS please describe how you will proactively promote non-motorized forms of transportation.

Bike lanes and pathways within the UHCWH would encourage the use of bicycles and pedestrian activity on-site.

Impacts to cave habitats: Section 5.7.2 mentions minimizing destruction of cave habitats during grading. What mitigation measures are planned in the event such habitats are encountered?

Cave habitats occur on the site in a variety of sizes from very small to quite large (comparable to a several room house). Although several were explored, especially those larger ones that offered some potential to harbor possible unique troglodytes (cave dwelling species), nothing was found. However, all of the larger caves have potential archaeological interest as well. These caves should be preserved and protected. Smaller caves may be retained as part of the landscape where this is practical, but there is no reason to attempt to leave openings in the ground where these would clearly cause difficulty in the placement of roads, buildings, or pedestrian use areas. We suspect that, due to the existing terrain, the process of land grading will uncover many more small openings. It would be impractical to show concern over these. However, should any cave large enough to easily enter be uncovered, an archaeologist and a biologist should check it. Large caves can yield potentially interesting archaeological, paleontological, or ecological finds, and should not be destroyed prior to some exploration of their contents.

Figures:

a. The following figures should have north arrows added:
1, 3, 6, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, and 25.

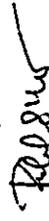
Concur. North arrows will be added.

b. The following misspellings should be corrected: "Walkhole" on fig. 3; "Kalus-Kone" on fig. 18; "Kaiholo Bay" on fig. 21; "kehole PL" On fig 22.

Concur. Errors will be corrected.

Thank you for your time and interest in the subject project.

Sincerely,



Richard S. McGerrow
Senior Planner



STATE OF HAWAII
 DEPARTMENT OF LAND AND NATURAL RESOURCES
 DIVISION OF FORESTRY AND WILDLIFE
 1151 PUNCHBOWL STREET
 HONOLULU, HAWAII 96813
 June 20, 2000

RECEIVED
 JUN 21 2000
 DIVISION OF FORESTRY AND WILDLIFE
 PUNCHBOWL
 THOMAS E. JONES
 CHIEF, DIVISION OF FORESTRY AND WILDLIFE
 JAMES E. BLANTON
 CHIEF, DIVISION OF LAND AND NATURAL RESOURCES
 DEPARTMENT OF LAND AND NATURAL RESOURCES
 DIVISION OF FORESTRY AND WILDLIFE
 1151 PUNCHBOWL STREET
 HONOLULU, HAWAII 96813

Mr. Maynard Young, Director
 UHCWH
 Manalo Building, Rm. 103
 4303 Diamond Head Road
 Honolulu, Hawaii 96816

Dear Mr. Young:

Subject: Response to Comments on Draft Environmental Impact Statement (DEIS), preparation notice for the University of Hawaii Center at West Hawaii, Island of Hawaii, North Kona, Hawaii. TMK: 7-3-10:33 (portion).

We have reviewed your response to our comments sent to you on December 23, 1999 regarding the DEIS preparation notice of the subject matter above. Except for a minor correction in acres that Mr. Herbst conducted his survey (should read 125 acres p-2 of survey, instead of 275 acres shown in your cover letter response to DOFAW's comments), the Department of Land and Natural Resources, Division of Forestry and Wildlife has no further objections to the proposed project. Thank you for the opportunity to comment on this draft EIS preparation notice for the University of Hawaii Center at West Hawaii. Should you have further questions, please call Ms. Vickie Caraway, DOFAW State Botanist at (808) 587-0165.

Sincerely yours,

Michael G. Buck
 for Michael G. Buck
 Administrator

Copy: DOFAW, Hawaii Branch
 Vickie Caraway, DOFAW Administration
 Ms. Genevieve Salmonson, OEQC



W1 CHEE - PLANNING, INC.

October 24, 2000

Mr. Michael G. Buck, Administrator
 Division of Forestry and Wildlife
 Department of Land and Natural Resources
 State of Hawaii
 1151 Punchbowl Street
 Honolulu, Hawaii 96813

Dear Mr. Buck:

Subject: Draft Environmental Impact Statement (FEIS) for University of Hawaii Center at West Hawaii (UHCWH) North Kona, Hawaii TMK: 7-3-10: por. 33

On behalf of the University of Hawaii Facilities Planning Office for Community Colleges, thank you for reviewing the Draft Environmental Impact Statement (DEIS) for the subject project.

The error in acreage cited for Mr. Herbst's survey in our response to DOFAW's comments on the EISPN is acknowledged.

Your time and interest in the project and participation in the EIS process are greatly appreciated.

Sincerely,
Richard S. McGerrow
 Richard S. McGerrow
 Senior Planner



STATE OF HAWAII
DEPARTMENT OF HEALTH
PO. BOX 3378
HONOLULU, HAWAII 96801

August 16, 2000

99-252A/epo

BRUCE E. ANDERSON, P.E., M.P.H.
DIRECTOR OF HEALTH

IN REPLY, PLEASE REFER TO
FILE NO.

Mr. Maynard Young, Director
August 16, 2000
Page 2

99-252A/epo

Underground Injection Control (UIC)

The use of UIC wells for sewage effluent disposal requires a UIC permit from the Department of Health's Safe Drinking Water Branch. New UIC wells for sewage effluent disposal can only be constructed below (makai) the UIC line. The UIC line depicted in Figure 6 on page 16A, "Overview of Utility Systems" appears approximate. The official Department of Health UIC maps should be used for injection well siting in relation to the UIC line. Application procedures for a UIC permit may be obtained from the UIC program at the Safe Drinking Water Branch. For additional information, please call the UIC Section at 586-4258 (Honolulu).

Sincerely,

THOMAS E. ARIZUMI, P.E., CHIEF
Environmental Management Division

- C: Hawaii District Health Office
- Steve Okoji, Clean Air Branch - Kona
- Clean Air Branch
- Safe Drinking Water Branch
- Office of Environmental Quality Control
- Wil Chee, Planning Inc.

Mr. Maynard Young, Director
University of Hawaii Facilities
Planning Office for Community Colleges
Manele Building, Room 103
4303 Diamond Head Road
Honolulu, Hawaii 96816

Dear Mr. Young:

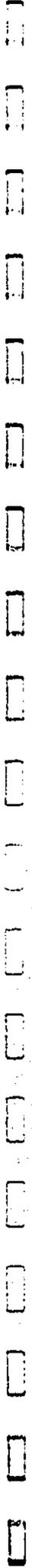
Subject: Draft Environmental Impact Statement (DEIS)
University of Hawaii Center at West Hawaii (UHCWH)
North Kona, Hawaii
TRK: 7-3-10: por. 33

Thank you for allowing us to review and comment on the subject project. We have the following comments to offer:

Air Quality Concerns

Although the DEIS does address the problem of volcanic emissions (vog) from Kilauea Volcano and air pollution from man-made stationary sources by the use of air-conditioned buildings, we are still concerned with the potential nuisance problems associated with mixed land uses and the siting of the UHCWH close to major industrial sources. The Department is currently reviewing the proposed expansion of the Keahole Generating Station, which is in close proximity to the proposed campus.

If you have any questions regarding these air quality issues, please contact Ms. Lisa Young of the Clean Air Branch at 586-4200.





WILCEE - PLANNING, INC.

October 24, 2000

Mr. Thomas E. Arizumi, P.E., CHIEF
Environmental Management Division
Department of Health, State of Hawaii
P.O. Box 3378
Honolulu, Hawaii 96801

Dear Mr. Arizumi:

Subject: Draft Environmental Impact Statement (FEIS) for
University of Hawaii Center at West Hawaii (UHCWH)
North Kona, Hawaii
TMK: 7-3-10; por. 33

On behalf of the University of Hawaii Facilities Planning Office for Community Colleges, thank you for reviewing the Draft Environmental Impact Statement (DEIS) for the subject project. Your comments (in italics) from your letter of 8/18/00, and our responses are listed below.

Air Quality Concerns

Although the DEIS does address the problem of volcanic emissions (vog) from Kilauea Volcano and air pollution from man-made stationary sources by the use of air-conditioned buildings, we are still concerned with the potential nuisance problems associated with mixed land uses and the siting of the UHCWH close to major industrial sources. The Department is currently reviewing the proposed expansion of the Keahole Generating Station, which is in close proximity to the proposed campus.

Your concern for potential nuisance problems associated with mixed land uses and the siting of the UHCWH close to major industrial sources is acknowledged. But, as we stated in the DEIS, both natural and man-made pollutant levels from off-site stationary sources are beyond the control of UHCWH.

Underground Injection Control (UIC)

The use of UIC wells for sewage effluent disposal requires a UIC permit from the Department of Health's Safe Drinking Water Branch. New UIC wells for sewage effluent disposal can only be constructed below (below) the UIC line. The UIC line depicted in Figure 6 on page 16A, "Overview of Utility Systems" appears approximate. The official Department of Health UIC maps should be used for injection well siting in relation to the UIC line. Application procedures for a UIC permit may be obtained from the UIC program at the Safe Drinking Water Branch.

During the design phase of the project, engineers and surveyors will conduct detailed topographic surveys of the areas to be developed. At that time, the official Department of Health UIC maps will be consulted to determine exact placement of the UIC line. Application for a UIC permit will be made when construction drawings have been adequately completed.

Thank you for your time and interest in the project.

Sincerely,


Richard S. McGerrow
Senior Planner



STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
KALANIANA'OLA BUILDING, ROOM 515
501 KALANIANA'OLA BLVD.
HONOLULU, HAWAII 96813

HONOLULU OFFICE
1000 SOUTH KING STREET, SUITE 200
HONOLULU, HAWAII 96813

JANET S. KUMUO

AQUATIC RESOURCES
BOTANICAL AND OCEAN RESEARCH
CONSERVATION AND RESEARCH
BIOGEOGRAPHY
CIVIL ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND
STATE PLANTS
WATER RESOURCE MANAGEMENT

May 25, 2000

Mr. Maynard Young, Director
Physical Facilities, Planning and Construction
Office of the Senior Vice President
University of Hawaii and Chancellor for Community Colleges
4303 Diamond Head Road, Manele Building
Honolulu, Hawaii 96816

LOG NO: 25446 ✓
DOC NO: 0005PM10

Dear Mr. Young:

SUBJECT: Draft Historic Preservation Plan for the Proposed
University of Hawaii Center at West Hawaii
Kalaheo, North Kona, Hawaii Island, TNK: 7-3-10; Por. 33

Thank you for your letter of April 18, 2000 and the opportunity to review and comment on the draft historic preservation plan (HPP) for the proposed University of Hawaii Center at West Hawaii.

The draft HPP, which was developed by Pacific Legacy, Inc., with input from the Kalaheo Advisory Council, calls for the creation of 5 historic preserves within the roughly 275 acre parcel that is under consideration for the University of Hawaii Center at West Hawaii. The total number of sites to be preserved in the 5 preserves is 16.

The draft HPP is good as far as it goes, but it is basically a conceptual plan and is not an acceptable preservation plan. The current plan presents the following information for each preserve: (1) a brief description of the sites to be included in the preserve; (2) the recommended form of site protection; (3) possible buffer zone (presented as a range rather than an absolute distance); (4) short-term site protection measures; (5) potential uses of the sites in the preserve; (6) revegetation plan, and (7) a discussion of access (e.g. trails) and general access issues.

A complete preservation plan must include the following:

- (1) Proposed, specific buffer zones for each preserve. A map of each preserve showing the locations of the constituent sites and buffer around the preserve should be included. Also, a map of each site needs to go along with the descriptions. There are no standard buffers for sites; they vary dependent on functional type of site and terrain.
- (2) Interim protection measures.

M. Young
2

(3) Long-range plan, including such elements as maintenance, public access if sites are interpreted or to be accessible (parking, trails), details of the appearance of trails, signs and trash cans (to ensure no adverse visual effects), signage text (to evaluate scientific accuracy). Maps can be used to convey much of this information.

Please have the plan revised to ensure that all these elements are included. The draft HPP is a good conceptual plan, but additional detailed information is required before we could approve it. There are two options: (1) have your consultant address all of our review comments and prepare a complete plan, or (2) have your consultant complete the plan, except for the development of an interpretive program (which would have a specified date for completion), which as suggested in the draft plan could be implemented sometime in the future. This phased approach is sometimes used, although we prefer to have the whole process completed in one step. In either case, final approval of the plan will require a decision by the Hawaii Island Burial Council concerning the burials in Preserve 2. This will entail the development and submittal of a Burial Treatment Plan to the Council.

If you or your consultant have any questions about our review comments please contact our Hawaii Island archaeologist, Patrick McCoy (692-8028).

Aloha,

DON HIBBARD, Administrator
State Historic Preservation Division

PM:amk

c. Paul Cleghorn, Pacific Legacy, Inc.

JUN 13 2000



UNIVERSITY OF HAWAII

Office of the Senior Vice President, University of Hawaii and Chancellor for Community Colleges
Physical Facilities, Planning and Construction

October 23, 2000

Mr. Don Hibbard, Administrator
State Historic Preservation Division
Department of Land and Natural Resources
State of Hawaii
Kakuhihewa Building, Room 555
501 Kamokila Boulevard
Kapolei, Hawaii 96707

Dear Mr. Hibbard:

Subject: Draft Historic Preservation Plan for the Proposed
University of Hawaii Center at West Hawaii (UHCWH)
Kalaoa, North Kona, Hawaii Island
TMK 7-3-10; Por. 33

Thank you for reviewing the subject draft historic preservation plan.

OPTIONS FOR COMPLETION OF THE HISTORIC PRESERVATION PLAN

In your letter of 5/25/00 you presented two options to complete the plan:

- (1) have your consultant address all of our review comments and prepare a complete plan
- (2) have your consultant complete the plan, except for the development of an interpretive program (which would have a specified date for completion), which as suggested in the draft plan could be implemented sometime in the future.

We wish to exercise option (2) above. As you may know, the draft historic preservation plan was compiled by project archaeologist, Dr. Paul Cleghorn, with the direct participation of a group of civic leaders and University staff known as the University of Hawaii Center at West Hawaii Advisory Council on Kalaoa Cultural Site Preservation (Kalaoa Advisory Council). The members of the council strongly feel that the existence of cultural sites on the University property presents a unique opportunity for students to become directly involved with the interpretation of their history and culture. This is especially true for students enrolled in Hawaiian studies courses. Their involvement will not be possible until Phase 1 construction is completed and the University Center has begun operation at Kalaoa. For this reason the Advisory Council wishes to postpone development of interpretive programs for sites on the University property until the University Center's students and staff can be fully included in the process. Interpretive programs for each site will be sent to your office for review and approval as they are completed.

4303 Diamond Head Road • Manalo Building • Honolulu, Hawaii 96816
Telephone: (808) 734-9771 • Facsimile: (808) 734-9430
An Equal Opportunity/Affirmative Action Institution

Mr. Don Hibbard, Administrator
October 23, 2000
Page 2

As to specifying a date for completion of the interpretive programs, an exact date would be difficult to determine at the present time. Although master planning has been completed, the project must still progress through design and construction phases. Considering the size of the project, the new UHCWH facility may not be able to begin operation until 2004-05 when Phase 1 construction is estimated to be complete.

BURIAL COUNCIL / TREATMENT PLAN

We acknowledge your statement that "...final approval of the [historic preservation] plan will require a decision by the Hawaii Island Burial Council concerning the burials in Preserve 2. This will entail the development and submittal of a Burial Treatment Plan to the Council." The current UHCWH Long Range Development Plan (LRDP) avoids all known burial areas on the overall 500-acre Kalaoa site, including those in Preserve 2. Therefore, by definition the LRDP treatment is to avoid burial areas. As with the interpretive program discussed above, a burial treatment plan for burial council determination (§ 13-300-33) would be similarly accomplished in conjunction with the completion of the HPP and in advance of any construction or improvement permits and approvals. It would follow that council determination would also be requested if any burials not presently known are discovered in the course of work under the current LRDP.

REVISIONS TO THE DOCUMENT

Your letter of 05/25/00 listed three specific areas that need to be added to complete the historic preservation plan.

- (1) Proposed specific buffer zones for each preserve. A map of each preserve showing the locations of the constituent sites and buffer around the preserve should be included. Also, a map of each site needs to go along with the descriptions. There are no standard buffers for sites; they vary dependent on functional type of site and terrain.
- (2) Interim protection measures.
- (3) Long range plan, including such elements as maintenance, public access if sites are interpreted or to be accessible (parking, trails), details of the appearance of tents, signs and trash cans (to ensure no adverse visual effects), signage text (to evaluate scientific accuracy). Maps can be used to convey much of this information.

After discussions with Mr. Patrick McCoy of your department, Paul Cleghorn has revised the document to include items (1) and (2) above. Item (3) includes the required elements of an interpretive program. As discussed previously, we wish to defer development of the interpretive program until Phase 1 of UHCWH has been completed.

Mr. Don Hibbard, Administrator
October 23, 2000
Page 3

A copy of the revised historic preservation plan dated July 2000 is enclosed for your review and approval. The title of the document has been changed to "Conceptual" historic preservation plan to indicate that the plan is incomplete and an interpretive program still needs to be developed.

We trust that the revised document will meet the requirements of the State Historic Preservation Division. Please be assured that we fully intend to cooperate with the division in completing the interpretive plans for UHCWH sites when this becomes possible. If you have any questions regarding the historic preservation plan, please feel free to contact myself at 734-9771, or project archaeologist Paul Cleghorn at 263-4800.

Thank you for your time and interest in the subject project.

Sincerely,



Maynard Young
Director

MY:ikt
Enclosure



BENJAMIN J. CANTIANO
GOVERNOR OF HAWAII



STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
KALAOA CENTER BUILDING, ROOM 539
KALAOA, HAWAII 96707

June 19, 2000

Maynard Young, Director
Physical Facilities, Planning and Construction
Office of the Senior Vice President
University of Hawai'i and Chancellor for Community Colleges
4303 Diamond Head Road, Mamele Building
Honolulu, Hawaii 96816

Dear Mr. Young:

**SUBJECT: Draft Environmental Impact Statement for University of Hawaii Center at
West Hawaii
Kalaola, North Kona, Hawaii Island
TMK: 7-3-10:Por. 33**

LOG NO: 25625
DOC NO: 0006PM14

EMMETT E. SALMONSON
COMMISSIONER
BOARD OF LAND AND NATURAL RESOURCES
JANET E. SALMONSON
SECRETARY

AQUATIC RESOURCES
POLYMER AND SOILS REGULATION
CONSERVATION AND ADVISORY
ENVIRONMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND USE PLANNING
STATE PARKS
WATER RESOURCE MANAGEMENT

RECEIVED
JUN 27 2000
COMMUNITY COLLEGE
PLANNING



WFLC - PLANNING, INC.

October 24, 2000

Mr. Don Hibbard, Administrator
State Historic Preservation Division
Department of Land and Natural Resources
State of Hawaii
Kakuhinewa Building, Room 555
501 Kamehaha Boulevard
Kapolei, Hawaii 96707

Dear Mr. Hibbard:

**Subject: Draft Environmental Impact Statement (DEIS) for the Proposed
University of Hawaii Center at West Hawaii (UHCWH)
Kalaola, North Kona, Hawaii Island
TMK: 7-3-10: Por. 33**

On behalf of the University of Hawaii Facilities Planning Office, thank you for reviewing the subject DEIS. This letter is in response to your letter of 8/19/00 commenting on the DEIS. We also reference your letter of 5/25/00 to Maynard Young concerning the Draft Historic Preservation Plan (HPP) prepared by Pacific Legacy, Inc. and the Kalaola Advisory Council.

In response to your letter of 5/25/00, Mr. Young stated that all of the deficiencies in the HPP that you cited, except for the development of interpretive programs, have been added to the document and a revised "Conceptual HPP" has been submitted for your review. He stated further that he wishes to exercise the second option you offered to complete the HPP that defers the development of interpretive programs to a later date. The reason for this phased approach is to allow the students and staff at UHCWH to become directly involved in the development of interpretive programs at their own school. The existence of cultural sites on University property provides the students with a unique opportunity to foster their understanding of traditional Hawaiian culture and history in an actual historical setting.

Thank you for your time and interest in the subject project

Sincerely,

Richard McGerrow
Senior Planner

Thank you for the opportunity to review and comment on Draft Environmental Assessment (EA) which was received in our office on June 6, 2000.

There are a number of significant historic sites in the proposed project area which have been recommended for preservation. Sections 4.8 and 5.8 of the Draft EA summarize the main elements of a draft historic preservation plan prepared by Pacific Legacy, Inc. with the assistance of the Kalaola Advisory Council. As indicated in our review letter of May 25, 2000 (Hibbard to Young), the draft is a good conceptual plan, but it is incomplete and thus unacceptable. In our review we have indicated what elements need to be added and how this might be accomplished.

A copy of this letter and our earlier review letter are being sent to the Office of Environmental Quality Control and WFLC Planning, Inc. per the request on the transmittal form that came with the Draft EA.

If you have any questions please contact our Hawaii Island archaeologist, Patrick McCoy (692-8029).

Aloha,

DON HIBBARD, Administrator
State Historic Preservation Division

PM:ah

c. Office of Environmental Quality Control
Genevieve Salmonson, WFLC Planning, Inc.



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
195 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-3007

July 25, 2000



KAZU HAYASHIDA
DIRECTOR
DEPUTY DIRECTOR
SHUNJI K. IZUMI
GLENNIA OROKOTO

IN REPLY REFER TO:
STP 8,9620

Mr. Maynard Young
Page 2
July 25, 2000

STP 8,9620

We appreciate the opportunity to provide comments.

Very truly yours,

Kazu Hayashida

KAZU HAYASHIDA
Director of Transportation

Mr. Maynard Young, Director
University of Hawaii
Facilities Planning Office for Community Colleges
Manele Building, Room 103
4303 Diamond Head Road
Honolulu, Hawaii 96816

c: Ms. Genevieve Salmonson, Office of Environmental Quality Control
Mr. Richard McGarrow, W1 Chice - Planning, Inc.

Dear Mr. Young:

Subject: University of Hawaii Center at West Hawaii (UHCWH)
Draft Environment Impact Statement (DEIS)
TMK: 7-3-10: 33 (portion)

Thank you for your transmittal requesting our comments on the subject draft.

Our comments are as follows:

1. The applicant has assumed that the State's improvements to Queen Kaahumanu Highway would be in place and will adequately mitigate the new UH campus's traffic impact on highway intersections with Kona International Airport access road and Kairai Nani Drive. As this is not the case, interim improvements to the existing roadway would be required. The Applicant should be responsible for providing the interim mitigation measures at no cost to the State.
2. The applicant should coordinate plans for intersection improvements and landscaping at Queen Kaahumanu Highway and Kona International Airport with our Airports Division.
3. All plans for construction in the State highway right-of-way must be submitted to our Hawaii District Office for review and approval.





WILCEE PLANNING, INC.

October 24, 2000

Mr. Kazu Hayashida, Director of Transportation
State of Hawaii
Department of Transportation
989 Punchbowl Street
Honolulu, Hawaii 96813-5097

Dear Mr. Hayashida:

Subject: Draft Environmental Impact Statement (FEIS) for
University of Hawaii Center at West Hawaii (UHCWH)

On behalf of the University of Hawaii Facilities Planning Office for Community Colleges, thank you for reviewing the Draft Environmental Impact Statement (DEIS) for the subject project. Your comments (in italics) from your letter of July 25, 2000, and our responses are listed below.

1. *The applicant has assumed that the State's improvements to Queen Kaahumanu Highway would be in place and will adequately mitigate the new UH campus's traffic impact on highway intersections with Kona International Airport access road and Kaimi Nani Drive. As this is not the case, interim improvements to the existing roadway would be required. The applicant should be responsible for providing the interim mitigation measures at no cost to the state.*

At the time the traffic in the DEIS was prepared, the status of planned improvements for Queen Kaahumanu Highway was discussed with HDO's consultants for Kona International Airport. UHCWH traffic consultant, Phillip Rowel, P.E., was advised that these improvements should be in place to be consistent with the master plan of the airport. Therefore, no interim mitigation measures were identified. However, since we are preparing a revision of the traffic report to include some additional planned projects in the area, interim improvements can be identified in the Final EIS.

2. *The applicant should coordinate plans for the intersection improvements and landscaping at Queen Kaahumanu Highway and Kona International Airport with our Airports Division.*

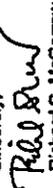
The design engineers for UHCWH will coordinate plans for the intersection improvements and landscaping at Queen Kaahumanu Highway and Kona International Airport with DOT's Airports Division during the design phase of the project.

3. *All plans for construction in the State highway right-of-way must be submitted to our Hawaii District Office for review and approval.*

UHCWH plans for construction in the State highway right-of-way will be submitted to your Hawaii District Office for review and approval.

Thank you for your time and interest in the project.

Sincerely,


Richard S. McGerrow
Senior Planner

University of Hawai'i at Mānoa

Environmental Center
A Unit of Water Resources Research Center
2450 Campus Road • Crawford 317 • Honolulu, Hawai'i 96822
Telephone: (808) 956-7361 • Telex: (808) 956-3350

Mr. Maynard Young
UH Facilities Planning Office for Community Colleges
Mazele Building, Room 103
4303 Diamond Head Road
Honolulu, Hawaii 96816

Dear Mr. Young:

University of Hawai'i Center at West Hawaii (UHCWH)
Draft Environmental Impact Statement
Kona Hawaii

The University of Hawai'i Physical Facilities Planning and Construction Offices for the Community Colleges proposes to construct a permanent facility in West Hawaii on a State-owned parcel in Kalaea. The facility would consist of an access road, parking lots, Food Service Building, Learning Resource Center/Library, various buildings for instructional purposes, and cultural site preservation. The purpose of the project is to provide permanent housing for programs which offer opportunities for the community to engage in higher education. Such programs are necessary to support the growing population and the educational needs of the local residents.

This review was conducted with the assistance of Grant Gerrish, Natural Sciences, UH Hilo; Michael Parsons, Natural Sciences, UH Hilo; Sara Peck, UH Sea Grant Extension Agent, West Hawaii; and Sherri Hiraoaka, Environmental Center.

General Comments

The intent of increasing the quality of educational opportunities in the West Hawaii area is commendable. However, in respect to this, we request clarification of several points that were not clear in the Draft Environmental Impact Statement (EIS). For example, the document does not comment on the curriculum, or the type and number of classes to be offered at the new University Center. Will the new UHCWH offer additional courses or services over the existing center? What is the projected floor area of the new University Center when all four phases are completed?

An Equal Opportunity/Affirmative Action Institution

Mr. Young
July 26, 2000
Page 2

The EIS could have benefited from the use of an additional map that displays the immediate surroundings of the proposed UHCWH. Local site maps and regional maps were adequate and helpful but a transitional map between the two would aid in describing the existing and planned roadways and land uses surrounding the site. All figures should also include a scale and a North arrow indicator.

In addition to our general comments, we have a number of specific comments listed in the following sections.

Proposed Action

The EIS indicates in several sections that air conditioning will be used to reduce the inconvenience of heat, air quality conditions, and noise. Air conditioning should actually be listed as a mitigation measure for these conditions, which should then be indicated as a disadvantage to using this particular site.

Buildings in the West Hawaii area do not necessarily need air conditioning. Energy-efficient building design, including such methods as orienting the buildings to maximize natural ventilation and breezes, extending eaves to increase shade, and the use of solar-generated power and natural sunlight, could reduce the facility's dependency on imported fuels. Ideas for such designs may be found in the *Guidelines for Sustainable Building Design: A Planner's Checklist*, which may be obtained from the State Office of Environmental Quality Control (OEQC), and from the *Guide to Resource-Efficient Building in Hawaii*, published by the Department of Business, Economic Development and Tourism.

Alternatives

It seems as though the discussion of alternate sites was done to support the selection of the Kalaea site. Noise and heat could be avoided through selection of an alternative site, yet this was not mentioned. Also, seven candidate sites were evaluated as potential locations for the UHCWH (page 18), with the three most desirable sites being sites 2 (Kalaea), 3 (Kaulana), and 4 (Awakee). Sites 1, 5, 6, and 7 were eliminated for various reasons. Why were sites 3 and 4 eliminated from consideration?

The discussion of alternative failed to include alternate means of service delivery. Could educational materials be delivered by satellite to distance learning centers from existing UH facilities? Could educational material be provided over the Internet? We believe that the use of distance learning centers and the Internet are alternatives that are both viable and within the means of the University to implement. These methods can be used to deliver a level of educational service that meets the needs of the people of West Hawaii. There are of course drawbacks and problems with these methods, but the point is they should be discussed in the EIS.

Alternative A: Revised Access Road

Alternative A attempts to re-route the access road to avoid archaeological sites included in preserve 4 and preserve 5. What is the nature of archaeological sites 15263 and 15265, and why were they not avoided in the realignment as well (figure 15)?

Geologic Conditions

The discussion on geologic conditions mentions that "numerous lava tubes and/or voids including several lava tube features have been discovered in the vicinity of the project site, and it is very likely that the project site contains lava tubes or void features" (page 25). What is the hazard potential for lava tube cave-ins on the project site? What types of precautions will be taken to prevent such events from occurring?

Topography and Soils

The statement at the top of page 42 that "the creation of impermeable surface area (i.e., paved surfaces) minimizes erosion and sediment transport" is not always true. The creation of impermeable surfaces such as paved roadways, parking lots or walkways sometimes channelize runoff, speeding it up as it heads downhill, picking up more sediments as it courses through open ground, down to the receiving waters. In this case, erosion and sedimentation may be enhanced not minimized. It may be prudent to develop sediment basins, swales or other means to slow down the flow of water from the UICWH to the surrounding open countryside.

Will soil for landscaping be brought in from other parts of the island to be used for those areas that have an absence of surface soil? If soil is brought in, how much will be brought in and from where might it come?

Natural Hazards

Rainfall at the project site is light, with average annual rainfall projected at less than 20 inches per year (page 26) and the risk of flood hazard being "slight" (page 34). Despite this, designs to accommodate a 50-year and 100-year flood should be included in the EA.

You say on page 48, that there is no mitigation with respect to earthquake hazard. Isn't strict adherence to the Uniform Building Code Requirements for Seismic Zone 3 a form of mitigation? Earthquake may not be preventable but building structures that can withstand an earthquake is a good way to mitigate the effect of the earthquake. Where earthquake damage has been massive, it is due in large part to poor building techniques.

Also mentioned in the same section dealing with mitigation that following "Oahu Civil Defense evacuation procedures... would minimize damage to public life and safety." Do you mean Hawaii County Civil Defense procedures?

Air Quality

In this section of the EIS, the authors discuss the potential for using alternatives to personal automobiles as the preferred mode of transportation. The conclusion stated in the second paragraph of page 43 is that it is up to the students, staff, and faculty to do the right thing. However, if you make improvements to the highway, surround the campus with parking lots, site the facility eight miles from the main population center on that side of the Big Island, and have no mass transit to offer as a substitute, it seems that there will be little disincentive to take one's automobile to campus. It would seem that if the University was serious about cutting down on the use of individuals driving their own car that their transportation planners should be working on developing alternate modes, and offering incentives for using these modes over personal automobiles. We would also like to reiterate the point made by the OEQC in their comment letter dated December 28, 1999, that "State policy (HRS Chapters 26, 226, 264, 344) requires the promotion of alternative forms of transportation systems that reduce reliance on the private automobile, conserve energy, decrease pollution and provide safe accommodation for their users."

Noise Quality

Long-term noise conditions are not expected to be significantly impacted by the project, especially considering that the facility will not house "athletic facilities, dormitories, and faculty housing" (page 44). Is the UHCWH expected to expand to include such facilities as were excluded in this phase of development? If so, these types of actions may warrant further consideration of alternative sites to weigh the possible future impacts of institutional growth.

Flora

The species *Capparis sandwicheana* and *Naihoecstrum breviflorum* were both found near the project site, albeit "some what distant" (page 29). Every precaution should be made to ensure that these plants are protected, even if there is an unlikely chance of harm. Flagging to ensure these plants are not inadvertently damaged during construction may be appropriate.

Roadways and Traffic

No mitigation is planned for traffic impacts that result from the project. A left turn lane from Kaiami Nami Drive to the UHCWH Access Road may be helpful in reducing congestion.

Electrical Power and Communications

"Telecommunication lines will connect to existing lines along Kaiami Nami Drive." (page 52) Are there plans to include fiber optic and cable connections, which will ensure that this facility remains technologically up-to-date?

Cumulative Impacts

We note in your section on Unresolved Issues (page 61), that the area of secondary and cumulative impacts has not yet been fully developed. The EIS rules require that cumulative impacts be identified and discussed in the document. Identifying secondary and cumulative impacts in the final EIS is not an acceptable substitution since it makes it difficult for reviewers to comment on those issues.

When fully developed, the University Center will act as a magnet for related development such as food concessions, gas stations, convenience markets, and others. This may change the characteristics of the area, however, it is not discussed in the EIS. There is also no mention of any other development in the area which taken together with the proposed project, may have more profound impacts. We strongly suggest that all pertinent information on other planned developments occurring in or near the proposed project be accumulated and discussed. Special consideration should be made as to how this project relates to these other projects.

In addition, plans for expanding this Center in the future should be disclosed. Population and economic growth in West Hawaii may support need for an expanded facility of higher education in the area. What is the ultimate expectation for this facility and what time scale and factors might be applied to determine the rate of expansion?

Conclusion

The proposed University of Hawaii Center at West Hawaii is a potentially large project whose full impacts cannot be completely assessed due to the lack of information excluded from the draft Environmental Impact Statement. Of particular concern is the lack of discussion on secondary and cumulative effects. Also, the treatment of design specifications as other than mitigation measures suggests a propensity towards minimizing the potential disadvantages of the selected site.

Thank you for the opportunity to comment of this Draft Environmental Impact Statement.

Sincerely,

Peter Rappa
Peter Rappa
Environmental Review Coordinator

- cc: Richard McGerrow, Wil Chee-Planning, Inc.
OEQC
James Moscur, WRRRC
Grant Gerrish, Natural Sciences, UH Hilo
Michael Parsons, Natural Sciences, UH Hilo
Sara Peck, UH Sea Grant Extension Agent, West Hawaii
Sherri Hiraoka, Environmental Center



WIL CHEE - PLANNING, INC.

October 4, 2000

Mr. Peter Rappa, Environmental Review Coordinator
University of Hawaii Environmental Center
2550 Campus Road, Crawford 317
Honolulu, Hawaii 96822

Dear Mr. Rappa:

Subject: Draft Environmental Impact Statement (DEIS) for
University of Hawaii Center at West Hawaii (UHCWH)

On behalf of the University of Hawaii Facilities Planning Office for Community Colleges, thank you for reviewing the DEIS for the subject project. Your comments (in *italics*) from your letter of 7/26/00 and our responses are listed below.

General Comments

The document does not comment on the curriculum, or the type and number of classes to be offered at the new University Center.

A description of the curriculum and academic programs will be added to the Final EIS. The exact number and type of classes to be offered by the University Center is still being developed by Hawaii Community College in Hilo which currently has administrative responsibility for the UHCWH academic programs.

Will the new UHCWH offer additional courses or services over the existing center?

Initially, the transitional objective of the Center will be to transfer the existing programs and courses from Kealahou to the new site at Kalaoa. But one of the main purposes of the new Center is to allow expansion of programs and course offerings that would not be possible at Kealahou due to the finite amount of floor area. This expansion will be accomplished as quickly as funding becomes available and demand for new educational services has been expressed by the residents of West Hawaii.

What is the projected floor area of the new University Center when all four phases are completed?

The ultimate projected floor area when all four phases are completed is 388,398 square feet.

The EIS could have benefited from the use of an additional map that displays the intermediate surroundings of the proposed UHCWH. Local site maps and regional maps were adequate and helpful but an transitional map between the two would aid in describing the existing and planned roadways and land uses surrounding the site.

Figure 12 Surrounding Land Use has been revised to include other major features in the vicinity of the Kalaoa site including Hina Lani Drive, Natural Energy Laboratory of Hawaii Authority (NELHA) and Hawaii Ocean and Technology Park (HOST).

Land Use Planning and Environmental Consultants

HUSA Center • 1000 Kapiolani Street • Suite # 320 • Honolulu, Hawaii 96816 • Phone 808-935-3100 • Fax 808-962-1031 • E-Mail wcp@hisa.com

All figures should include a scale and a North arrow indicator.

Concur. Scale and North Arrow will be shown on all figures. Some may indicate "no scale" or "not to scale."

Proposed Action

The EIS indicates in several sections that air conditioning will be used to reduce the inconvenience of heat, air quality conditions, and noise. Air conditioning should actually be listed as a mitigation measure for these conditions, which should then be indicated as a disadvantage to using this particular site.

Buildings in the West Hawaii area do not necessarily need air conditioning. Energy efficient building design, including such methods as orienting the building to maximize natural ventilation and breezes, extending eaves to increase shade, and the use of solar-generated power and natural sunlight, could reduce the facility's dependency on imported fuels. Ideas for such designs may be found in the Guidelines for Sustainable Building Design: A Planner's Checklist which may be obtained from the State Office of Environmental Quality Control (OEQC), and from the Guide to Resource-Efficient Building in Hawaii, published by the Department of Business, Economic Development and Tourism.

From the outset of this project, the Community Colleges has made air conditioning a design requirement for buildings. As mentioned in your comment, air conditioning can be used to mitigate heat, noise and air pollution. It is true that mitigation of these adverse conditions to achieve human comfort can also be accomplished through natural ventilation, shading and other design techniques described in "Guidelines for Sustainable Building Design: A Planner's Checklist" and "Guide to Resource-Efficient Building in Hawaii." These techniques are appropriate and have been shown to be effective especially in residential situations. But a more fundamental reason for requiring air conditioning, as in the case of the new UH/CWH facility, is the heavy utilization of computer and telecommunications equipment. This sensitive and costly equipment mandates controlled environments that provide temperature, humidity, and air quality control. The only means to control all of these variables using current technology is air conditioning. There may be limited opportunities for natural ventilation in student activity and lounge areas, but for the most part, air conditioning at UH/CWH is a necessity. Also, the Community Colleges have found from repeated experience that the cost of retrofitting a naturally ventilated building for air conditioning greatly surpasses the cost of including air conditioning as an initial building design feature.

Alternatives

It seems as though the discussion of alternate sites was done to support the selection of the Kalaoa site. Noise and heat could be avoided through selection of an alternate site, yet this was not mentioned. Also, seven candidate sites were evaluated as potential locations for the UH/CWH (page 16). With the three most desirable sites being sites 2 (Kalaoa), 3 (Kailua), and 4 (Awaiake). Sites 1, 5, 6, and 7 were eliminated for various reasons. Why were sites 3 and 4 eliminated from consideration?

Sites 3 and 4 are beyond both the State and County plans for urban expansion and were, therefore, eliminated.

The discussion of alternatives failed to include alternate means of service delivery. Could educational material be delivered by satellite to distance learning centers from existing UH facilities? Could educational material be provided over the internet? We believe that the use of distance learning centers and the internet are alternatives that are both viable and within the means of the University to implement. These methods can be used to deliver a level of educational service that meets the needs of the people of West Hawaii. There are of course drawbacks and problems with these methods, but the point is they should be discussed in the EIS.

Yes, satellite delivery to distant learning centers from existing UH facilities as well as internet access will be a major feature of education at UH/CWH. A discussion of this topic will be added to the Final EIS. It should be noted that the designation of the Kalaoa facility as a University Center rather than a college or university, implies that telecommunication and satellite technology will be used to deliver classes and programs from established campuses within the University of Hawaii system. In fact, degrees will be conferred by the originating campuses such as UH Hilo, Hawaii Community College in Hilo, and the Manoa campus on Oahu, rather than by UH/CWH itself.

Alternative A: Revised Access Road

Alternative A attempts to re-route the access road to avoid archaeological sites included in preserve 4 and preserve 5. What is the nature of archaeological sites 15263 and 15265, and why were they not avoided in the realignment as well (figure 15)?

Sites 15263 and 15265 have been fully surveyed and recorded. They were deemed not significant and no further archaeological work is required. On the other hand, Preserve 4 contains cultural deposits while Preserve 5 contains cultural deposits and petroglyphs, thus they are considered worthy of preservation.

Geologic Conditions

The discussion on geologic conditions mentions that "numerous lava tubes and/or voids including several lava tube features have been discovered in the vicinity of the project site, and it is very likely that the project site contains lava tubes or void features" (page 25). What is the hazard potential for lava tube cave-ins on the project site? What types of precautions will be taken to prevent such events from occurring?

During the design phase of the UH/CWH project a detailed geotechnical field exploration will be conducted to further evaluate the subsurface conditions throughout the site. After a detailed topographic survey has been completed on the site by licensed surveyors, the geotechnical field exploration will focus on the areas where buildings, roads and other infrastructure will be located. Once lava tubes and caves have been located, remedial action can be taken such as collapsing and backfilling of the exposed voids where required on a case by case basis.

Topography and Soils

The statement at the top of page 42 that "the creation of impermeable surface area (i.e., paved surfaces) minimizes erosion and sediment transport" is not always true. The creation of impermeable surfaces such as paved roadways, parking lots or walkways sometimes channelize runoff, speeding it up as it heads downhill, picking up more sediments as it courses through open ground, down to the receiving waters. In this case erosion and sedimentation may be enhanced not minimized. It may be prudent to develop sediment basins, swales or other means to slow down the flow of water from the UH/CWH to the surrounding countryside.

Under normal soil conditions, the effect of adding impermeable surfaces would tend to speed up water movement downhill and would contribute to erosion and sedimentation if not mitigated. However in the case of the Kalaoa site, development will take place entirely on lava rock which is very porous and absorbs precipitation quickly. Dry wells have been located around the site to absorb large amounts of water during infrequent periods of heavy rainfall, but for the most part design techniques such as sediment basins and swales are not as critical as they would be under normal soil conditions. Thus drainage improvements at UH/CWH will be minimal.

Will soil for landscaping be brought in from other parts of the island to be used for those areas that have an absence of surface soil? If soil is brought in, how much will be brought in and from where might it come?

Because of the unique lava rock environment that the LRDP seeks to preserve, soil required for landscaping will be minimal. Proposed planting for UHCWH was specifically chosen from native species suited to the dry rocky terrain. The site landscape plan does not include large expanses of grassed lawns usually associated with college campuses and playing fields. However, some topsoil will be needed for planting around trees and planting pockets around buildings. A Kona cedar and soil mix consisting of local cinders, compost and ash is available in the area, thus topsoil will not necessarily have to be imported from other parts of the island or off-island. However, during the construction bidding process, the contractor may elect to bring in topsoil from other areas if it is less costly than the topsoil available locally.

NATURAL HAZARDS

Rainfall at the project site is light, with an average annual rainfall projected at less than 20 inches per year (page 26) and the risk of flood hazard being "slight" (page 34). Despite this, designs to accommodate a 50-year and 100-year flood should be included in the EA.

Designing to the 50-year and 100-year flood event can be recognized in the EIS, but this is an item that will be specified by the project engineers during the design phase and is beyond the purview of this EIS.

You say on page 48, that there is no mitigation with respect to earthquake hazard. Isn't strict adherence to the Uniform Building Code Requirements for Seismic Zone 3 a form of mitigation? Earthquake may not be preventable but building structures that can withstand an earthquake is a good way to mitigate the effect of the earthquake. Where earthquake damage has been massive, it is due in large part to poor building techniques.

Yes, you are correct. Adherence to the Uniform Building Code requirements for Seismic Zone 3 can be viewed as a mitigation measure against earthquake damage.

Also mentioned in the same section dealing with mitigation that following "Oahu Civil Defense evacuation procedures....would minimize damage to public life and safety." Do you mean Hawaii County Civil Defense procedures?

You are correct. "Oahu" will be changed to "Hawaii Civil Defense."

Air Quality

In this section of the EIS, the authors discuss the potential for using alternatives to personal automobiles as the preferred mode of transportation. The conclusion stated in the second paragraph of page 43 is that it is up to the students, staff, and faculty to do the right thing. However, if you make improvements to the highway, surround the campus with parking lots, site the facility eight miles from the main population center on the side of the Big Island, and have no mass transit to offer as a substitute, it seems that there will be little disincentive to take one's automobile to campus. It would seem that if the University was serious about cutting down on the use of individuals driving their own car that their transportation planners should be working on developing alternate modes, and offering incentives for using these modes over personal automobiles. We would also like to reiterate the point made by the OEQC in their comment letter dated December 18, 1999, that "State policy (HRS Chapter 265.228, 344) requires the promotion of alternative forms of transportation systems that reduce reliance on the private automobile, conserve energy, decrease pollution and provide some accommodation for their users."

We agree that promotion of alternative forms of transportation to lessen reliance on the personal automobile is a desirable environmental goal, but in the EIS we can only recommend that shuttle service

be implemented. The University cannot "proactively" mandate shuttle service at this early stage of project development when the specific demand for such service is not yet known. Therefore, we stand by our assertion that this subject cannot be addressed until the Kalaea Center is actually in operation. We do not know exactly how many students there will be, where they will be traveling from, and what their class schedules will be. The unique geographic characteristics of West Hawaii and the University Center's position at the center of this region is that population and activity nodes are dispersed in a linear fashion along the entire western coast of the island, a distance of nearly 100 miles. Since the target population is so dispersed it would be difficult to plan a UHCWH shuttle service until the demand for such service is better understood.

Primary and secondary school students all have the same general schedule and arrival/departure time, and schools generally serve specific residential areas. Thus, school buses are feasible in this situation. UHCWH, on the other hand, serves students from the entire West Hawaii region from North Kohala to South Kona, and classes are conducted throughout the day and into the evening. Also, many of the students will have part-time or full-time jobs and will only come to UHCWH for one or two classes per day. For all of these reasons it is difficult to forecast the minimum ridership that would be necessary to sustain a shuttle service. We also suspect that if there was already a high demand for public transit in West Hawaii, that some form of service, whether it be public or private, would have been implemented by now or that a public movement would be active in lobbying the government to provide this service.

Although they are not shown, bike lanes along the central mall of UHCWH running north-south can be accommodated as well as storage facilities for students and staff wishing to keep bicycles at the Center. We maintain that lack of a linking bike path system along the main highway could create a dangerous traffic situation. The public interest would not be served by the promotion of bicycling on a high-speed highway not designed for the durability of modes proposed. We would view the mix of Queen Kaahumanu Highway traffic with bicyclists to be a highly dangerous endeavor for both the average motorist, and the average-skilled bicyclist.

Noise Quality

Long-term noise conditions are not expected to be significantly impacted by the project especially considering the facility will not house "athletic facilities, dormitories and faculty housing". Is the UHCWH expected to expand to include such facilities as were excluded in this phase of development? If so, these types of actions may warrant further consideration of alternative sites to weigh the possible future impacts of institutional growth.

The University administration currently has no plans to include athletic facilities, dormitories and faculty housing to the University Center's physical plant. If at some future date the need or demand for such facilities is mandated by the community and the University can fund this addition of facilities, then a new or supplemental EIS would need to be prepared at the appropriate juncture to assess the new "action." One of the major reasons for choosing the 500-acre site is so that future unforeseen needs of UHCWH can be physically accommodated. The present site at Kealahou allows no room for change or growth.

Flora

The species *Capparis sandwicensis* and *Nothocastrium brevifolium* were both found near the project site, albeit "somewhat distant" (page 29). Every precaution should be made to ensure that these plants are protected, even if there is an unlikely chance of harm. Flogging to ensure these plants are not inadvertently damaged during construction may be appropriate.

Only the variety of *Capparis sandwicensis* found on Oahu is considered to be of concern. The variety encountered at the project site is quite common in the Kona area, therefore, flagging of this species would be unnecessary. *Nothocastrium brevifolium*, on the other hand, is an endangered species, however, only one plant was encountered during the Char survey in 1992 and it was located some 2,000 feet northeast of the proposed project site. Access to this area due to the ruggedness of the terrain and the distance from UHCWH would make human contact with the plant unlikely. Also, it would be very difficult to locate

a single endangered plant almost a decade later if it had not been flagged. Thus, we do not feel that flagging would be an appropriate measure for the two species mentioned.

Reservoirs and Traffic

No mitigation is planned for traffic impacts that result from the project. A left turn lane from Keimi Nani Drive to UHCWH Access Road may be helpful in reducing congestion.

A separate left turn from Keimi Nani Drive at the UH project entrance is not needed for traffic capacity, but would improve operations if sufficient right-of-way is available. The project civil engineer will have to make this determination during the design phase.

Electrical Power and Communications

Telecommunication lines will connect to existing lines along Keimi Nani Drive. (page 52) Are there plans to include fiber optic and cable connections, which will ensure that this facility remains technologically up-to-date?

Yes, fiber optic cable will be installed with the telephone lines through existing overhead poles and underground ducts within the UHCWH site. Dedicated fiber is expected to run from the telecommunications center in the Learning Resource Center to each of the proposed buildings.

Cumulative Impacts

We note in your section on Unresolved Issues (page 61), that the area of secondary and cumulative impacts has not yet been fully developed. The EIS notes that cumulative impacts be identified and discussed in the document. Identifying secondary cumulative impacts in the final EIS is not an acceptable substitution since it makes it difficult for reviewers to comment on those issues.

When fully developed, the University Center will act as a magnet for related development such as food concessions, gas stations, convenience markets, and others. This may change the characteristics of the area, however, it is not discussed in the EIS. There is also no mention of any other development in the area which taken together with the proposed project, may have more profound impacts. We strongly suggest that all pertinent information on other planned developments occurring in or near the proposed project be accumulated and discussed. Special consideration should be made as to how this project relates to these other projects.

A discussion of cumulative impacts will be provided in the EIS. However, your assumption that "...the University Center will act as a magnet for related development such as food concessions, gas stations, convenience markets, and others" may not be a foreseeable scenario. The reason is that the surrounding land uses, within a one mile radius of the 500-acre site, consists entirely of private residential development and state-owned lands. This would preclude commercial development in the immediate vicinity of UHCWH. Another factor is that UHCWH is a "commuter school" rather than a residential campus. Students at a residential campus would need convenience outlets close by, but commuters are more likely to find these same services near their homes or workplaces.

In addition, plans for expanding this Center in the future should be discussed. Population and economic growth in West Hawaii may support need for an expanded facility of higher education in the area. What is the ultimate expectation for this facility and what time scale and factors might be applied to determine the rate of expansion?

The ultimate expectation for this facility is as described in the LRDP, a physical plant of approximately 30 acres (6% of the total 500 acres) for a maximum of 1500 students. No time factor has been applied to determine the rate of expansion. Expansion will depend on the demand for courses and programs expressed by the West Hawaii community. The use of long distance delivery systems for educational programs through telecommunications, internet, satellite and LITS programs will increase the flexibility of meeting educational demands. At the present time the University has no plans for the site beyond what is envisioned in the LRDP. As mentioned above, one of the major reasons for the Board of Regents

choosing the 500 -acre site is so that future unforeseen needs of UHCWH can be physically accommodated.

Conclusion

The proposed University of Hawaii Center at West Hawaii is a potentially large project whose full impacts cannot be completely assessed due to the lack of information excluded from the draft Environmental Impact Statement. Of particular concern is the treatment of design specifications as other than mitigation measures suggests a propensity towards minimizing the potential disadvantages of the selected site.

It should be recognized that the Board of Regents of the University of Hawaii has already chosen the Kalaoa site from seven candidate sites through a lengthy process as described in Section 3.3 of the DEIS. Many factors were considered including those that the reviewer considers "disadvantages" of the site (e.g. noise and heat). The purpose of this document is to assess the impacts of the project at the selected site and to propose mitigation measures for those impacts that are considered detrimental to the environment. We feel that the document has adequately accomplished this. It is not our intent to focus on the disadvantages of the Kalaoa site so that another location may be chosen instead.

Thank you for your time and interest in the project.

Sincerely,



Richard S. McGarow
Senior Planner



Kona Palisades Estates Community Association

Post Office Box 2223 Kailua-Kona, Hawaii 96745-2223

July 18, 2000

University of Hawaii
Facilities Planning Office for Community Colleges
Maneche Bldg. Room 103
4303 Diamond Head Road
Honolulu, Hawaii 96816

Attention: Mr. Maynard Young, Director

Dear Mr. Young:

Thank you for providing a copy to KPECA of the Draft Environmental Impact Statement for the Center at West Hawaii, prepared by Wil Chee Planning Inc..

As we had indicated in our previous correspondence dated December 20, 1999, the Kona Palisades Estates Community Association had identified three concerns, namely:

1. Sole access road to the West Hawaii campus connection at Kaiminani Drive.
2. Water supply to the West Hawaii Campus connected to the 8 inch water line on Kaiminani Drive.
3. A septic lagoon for sewage treatment.

The draft EIS has been thoroughly reviewed by the KPECA nine member Board of Directors. We note that the septic lagoon and the water supply connection to the 8 inch Kaiminani water main have been abandoned in favor of more acceptable alternatives. (EIS paragraph 3.7.3 sewage lagoon, and paragraph 3.6 alternative B water option). However, our concern about the access road connection at Kaiminani Drive has not been mitigated (EIS paragraph 3.5 Alternative A Revised Access Road).

Our objection to the Kaiminani Drive access road connection is primarily for safety reasons, as delineated in our December

Page 2

20, 1999 letter. We urge you to use the "unrestricted access corridor" which is an extension of the road to Keahole International Airport. That intersection at the Queen Kaabumalu highway is already equipped with a traffic light, making that route a far safer entry point. Furthermore, visitors arriving by air would have a more direct access route to the campus than the Kaiminani Drive access point offers.

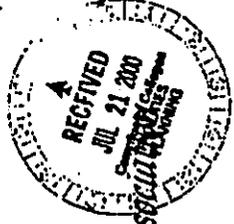
Finally, as the enclosed copy of a letter from Ms. Sandra Sakaguchi indicates, we will appreciate the accommodation in your plans of the 1/4 acre parking lot annex makai to the Crosson Pavilion. That annex provides safe overflow parking for Crosson Pavilion patrons as well as for voters during future elections, since the County plans to use the facility as a regional voting place.

The KPECA Board of Directors again strongly urge you to reconsider your plans regarding these important matters.

Sincerely,

Roy Mushrush

Roy Mushrush, Chairman
GOVERNMENT & COMMUNITY AFFAIRS



UNIVERSITY OF HAWAII

Office of the Senior Vice President, University of Hawaii and Chancellor for Community Colleges
Physical Facilities, Planning and Construction

October 23, 2000

Mr. Roy Mushrush, Chairman
Kona Palisades Estates Community Association (KPECA)
Post Office Box 2223
Kailua-Kona, Hawaii 96745-2223

Dear Mr. Mushrush:

Subject: Draft Environmental Impact Statement (DEIS) for
University of Hawaii Center at West Hawaii (UHCWH)

Thank you for reviewing the DEIS for the subject project. Your comments (in Italics) from your letter of July 18, 2000, and our responses are listed below.

1. *Sole access road to the west Hawaii campus connection at Kaiminani Drive. Our objection to the Kaiminani Drive access road connection is primarily for safety reasons, as delineated in our December 20, 1999 letter. We urge you to use the "unrestricted access corridor" which is an extension of the road to Keahole International Airport. That intersection at the Queen Kaahumanu highway is already equipped with a traffic light, making that route a far safer entry point. Furthermore, visitors arriving by air would have a more direct access route to the campus than the Kaiminani Drive access point offers.*

We appreciate KPECA's concerns regarding the UHCWH access road connecting the University Center to Kaiminani Drive. As stated in our March 13, 2000 letter to you on the same subject, your suggestion that an access corridor be provided directly from Queen Kaahumanu Highway at the Airport Road intersection is a logical solution and was considered early in the planning process. However, our analysis indicated that access from Kaiminani Drive would be a much shorter distance to the Center and, therefore, a less costly means of providing access in the initial phases of construction. When and if the County of Hawaii builds the proposed Mid-Level Road, the direct connection to the Center from Airport Road may yet become a reality. But initially access from Kaiminani Drive is more feasible for cost reasons.

As explained in the DEIS, in discussions between the project design engineers and the County of Hawaii's Department of Public Works subsequent to completion of the Long Range Development Plan (LRDP), the County expressed their preference for access to UHCWH to be provided within the Mid-Level Road right-of-way. This alteration to the access road design as shown in the LRDP was presented in the DEIS.

4303 Diamond Head Road • Muehle Building • Haeohulu, Hawaii 96816
Telephone: (808) 734-9771/Facsimile: (808) 734-9430
An Equal Opportunity/Affirmative Action Institution

Mr. Roy Mushrush, Chairman
October 23, 2000
Page 2

2. *We will appreciate the accommodation in your plans of the 1/2-acre parking lot annex mekal to the Crosson Pavilion. That annex provides safe overflow parking for Crosson Pavilion patrons as well as for voters during future elections, since the County plans to use the facility as a regional voting place.*

Thank you for apprising us of the revocable use permit recently granted your organization by the State for a 1/2-acre parking lot to be used for meetings and elections. In order to coordinate your requirements with the UHCWH site plan, we need to know the exact location and layout of the parking area. We would appreciate it if you would send us copies for our records of the State and County permits you received for the parking area. These permits should contain plans showing the boundaries and layout of the parking lot.

Thank you for your time and interest in the UHCWH. We look forward to hearing from you regarding the location of your 1/2-acre parking lot.

Sincerely,


Maynard Young
Director

MY:ikt



Kona Palisades Estates Community Association

Post Office Box 2223 Kailua-Kona, Hawaii 96745-2223

RECEIVED
JUL 7 2000
UNIVERSITY OF HAWAII
OFFICE OF THE PROVOST

University of Hawaii
HAWAII COMMUNITY COLLEGE
Office of the Provost

May 27, 2000

Ms. Sandra T. Sataguchi, Provost
Hawaii Community College,
University of Hawaii
200 W. Kawili Street,
Hilo, Hawaii 96720-4091

Dear Ms. Sataguchi:

After nine years of effort, the Kona Palisades Estates Community Association has finally succeeded in obtaining from the State, a revokable use permit for a one-half acre plot immediately makai of the Crosson Pavilion property. We plan to use this area to provide off-street parking for the people who use the Pavilion for meetings, parties, weddings, and as a voting place at election time. We have also obtained County approval for our intended usage of the property.

Our efforts were motivated by our desire to provide Pavilion users a far safer parking area instead of the current practice of parking along the shoulders of Kaiminani Drive.

We are advising you of this land usage plan so you can plan your West Hawaii Campus layout with a "live barrier" between the Campus property and our parking lot. Your cooperation on this matter will be appreciated.

Sincerely,

Roy S. Mushrush

Roy S. Mushrush, Chairman
Government & Community Affairs

HawCC
MAY 30 2000
Office Of Provost

July 5, 2000

Mr. Roy S. Mushrush
Chairman, Government and Community Affairs
Kona Palisades Estates Community Association
P.O. Box 2223
Kailua-Kona, HI 96745

Dear Mr. Mushrush:

Thank you for your letter of May 27, 2000 letting me know that the Kona Palisades Estates Community Association has obtained from the State a revokable use permit for a one-half acre plot immediately makai of the Crosson Pavilion property. In our previous discussions with your group, you had discussed with us the need for off-street parking for people attending functions at the Pavilion.

I will inform our planners about your permit, and we will proceed accordingly.

Sincerely,

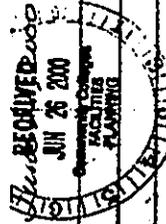
Sandra Sakaguchi

Sandra Sakaguchi, Provost

Michael Unebasami, UHCC Vice Chancellor for Administrative Services
Maynard Young, UHCC Director of Physical Facilities, Planning & Construction
Alan Subica, HawCC Director of Administrative Services

200 W. Kawili Street, Hilo, HI 96720-4091
Telephone: (808) 937-7822, Fax: (808) 937-7822
An Equal Opportunity/Affirmative Action Institution

University of Hawaii Planning Office



Dear Ladd's and Gentleman:

The plan of the West Hawaii Campus must be carried out as soon as possible.

The parents with willing - to - study children must build their future plans depending on the availability of college here where they are living, without so much expense of sending their children out to other states in HI, other cities in other states. What a waste!

If a college is here, many children attend here to save money, if they like to study more, then, their parents can go out to other cities, states, countries.

*1. If there is not a college here, there is no motivation if they see a college here they think, "Oh, I like to attend college here first, and then I will study in other states."

*2. Give the children a chance for further education for learning more, for being somebody in life, for their dreams, for their future plans.

*3. Allow Hawaii's college, training good students think, "Oh, I'll finish 2 years here, or, even 4 years here and then I'll go to other states."

*4. It is rather shame for Kailua-Kona, with over 52,000 population, to have no college. Give Kailua-Kona the better image.

UNIVERSITY OF HAWAII PLANNING OFFICE

Kailua-Kona beautiful city for everything, where everybody loves to live in, and where everybody is proud of living in. Profession, business, education, medical care, livable city. "Everything."

When we moved to Kailua in '76, there was a community college there then, but if there were a college like the Kailua Campus, we could have lived there and could have sent our son there.

There wasn't any good college, and therefore, we had to move out in '80, for the better education for our son. You see, the motivated parents must move where the better schools, colleges go. He didn't like to send out our son where it is a strange place. Girls may be able to manage better, but boys are not so good at cooking, for example, when they are hungry.

The whole family plans can be set right, if a college in the town. The young people stay and work there. We couldn't do that, and that was too bad.

*5. The college should be built first, and the residents can plan their future plans for their children.

*6. The college is not a super-market. It can't attract the numbers of customers. Enrollment: Building college comes first, and then, students + parents come.

3

* 7. After living in other states, our son's education was better enough to be independent now - well-paid, well-educated.
 But, if there was a better college in Hawaii, then we could have stayed there till he finished college there, and then we could have sent him to other colleges for upper schooling, when he was old enough for that.

* 8. After 25 years, now, we (my husband and I) came back to Hawaii Island for 4 years, we'll enjoy Hawaii again.
 I'm very upset to hear that the level of education has been still closer to the bottom next to Alabama or other Southern states! The young people, all those motivated ones must go out to Honolulu, Hilo, or other states! What a waste!

* 9. You can do much better without good education, the future of our children is very limited.
 Hotels, Golf courses, condos, may be important to send the employees' kids to college, HA! but, if there is a college here, the kids can study here, work here to help parents and learn other skills. Some can go out after that.

Go ahead for the children, the future generations!
 (I'm a published Journalist) 73-1289 Kaimihani Dr., Kailua, Hawaii

Richard S. McGerrow
 Senior Planner



WILCEE PLANNING, INC.

October 24, 2000
 Ms. Nakako O. Zak
 73-1289 Kaimihani Drive
 Kailua-Kona, Hawaii 96740

Dear Ms. Zack:

Subject: Draft Environmental Impact Statement (FEIS) for University of Hawaii Center at West Hawaii (UHCWH) North Kona, Hawaii
 TMK: 7-3-10: por. 33

On behalf of the University of Hawaii, Facilities Planning Office for Community Colleges, thank you for reviewing the Draft Environmental Impact Statement (DEIS) for the subject project.

Your letter of 6/21/00 is an indication of the strong support given to UHCWH by residents in the vicinity of the proposed new facility at Kaleoa. We are gratified that the new University of Hawaii Center will play an important role in the lives of West Hawaii's citizens.

Thank you very much for your comments and support for UHCWH. Your time and interest in the project and participation in the EIS process are greatly appreciated. Your letter will be appended to the Final EIS document.

Sincerely,

Richard S. McGerrow
 Senior Planner



Appendix B-2

EISPN Comment Letters and Responses

Stephen K. Yamashiro
Mayor



County of Hawaii

PLANNING DEPARTMENT
25 Arroyo Street, Suite 109 • Hilo, Hawaii 96720-0252
(808) 941-4288 • Fax: (808) 941-4742

Virginia Goldstein
Director
Russell Kolobian
Deputy Director



December 27, 1999

Mr. Maynard Young, Director
University of Hawaii's Facilities Planning
Office for Community Colleges
Manelle Building, Room 103
4303 Diamond Head Road
Honolulu, HI 96816

Dear Mr. Young:

Environmental Impact Statement Preparation Notice (EISP/N) for the
University of Hawaii Center at West Hawaii (UHCWH)
TMK: 7-3-10: Portion of 33-Kalaea, North Kona, Hawaii

We are in receipt of a letter dated December 6, 1999 from Mr. Richard McGerrow of
Willi Chee Planning, Inc., transmitting a copy of the above-described EISP/N for our
review and comment. As instructed within this letter, we are transmitting the following
comments to you for your consideration:

1. Section 3.10-Land Use, Hawaii County Zoning (Page 16) - This section incorrectly cites the issuance of Use Permits by the Planning Director. Use Permits are issued by the Hawaii County Planning Commission.
2. Secondly, it appears that a small portion of the project site is zoned Open (O) by the County of Hawaii Zoning Code (Chapter 25, HCC). This zoning encumbers lands situated along a portion of the project site's northern and western property boundaries at its northwestern corner. Improvements associated with the development of the proposed university complexes will not be permitted on lands designated Open. We are attaching a copy of a portion of the North Kona District Zone Map, which depicts the zone district boundaries in the vicinity of the project site.

Mr. Maynard Young, Director
University of Hawaii's Facilities Planning
Office for Community Colleges
Page 2
December 27, 1999

3. The State may wish to consider a change of zone of the Open-zoned lands in order to effectively utilize the entire project site. This option may be further explored by contacting this office.
4. The recommendations of the Keahole to Kailua Development Plan should be considered and addressed within the draft environmental impact statement (DEIS). Of major interest to this office is the ability of the project to accommodate the future construction of the mid-level roadway and the proposed University and Waena Drives.

Thank you for giving our office the opportunity to comment on the EISP/N. We look forward to receiving a copy of the DEIS for our review. If possible, we would like to request that 2 copies of the DEIS be submitted to this office to facilitate review by our Hilo and Kona offices.

If you have any questions, please do not hesitate to call Daryn Arai of this office at 961-8288.

Sincerely,

VIRGINIA GOLDSTEIN
Planning Director

DSA:gp
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Attachment



WIL CHEE - PLANNING, INC.

May 08, 2000

Ms. Virginia Goldstein, Planning Director
Planning Department
County of Hawaii
25 Aupuni Street, Room 109
Hilo, Hawaii 96720-4252

Subject: University of Hawai'i Center at West Hawai'i (UHCWH)
Response to Comments on the EIS Preparation Notice (EISPN)

Dear Ms. Goldstein:

On Behalf of the University of Hawai'i Facilities Planning Office for Community Colleges (CCFPCO), we thank you for your letter regarding the EISPN, dated December 27, 1999. Your comments help to establish the scope and content of the Draft Environmental Impact Statement (DEIS).

1. Your information that Use Permits are issued by the Hawaii County Planning Commission, not the Planning Director, is acknowledged and will be corrected in the DEIS.
2. Your information that a small portion of the project site may be zoned Open (O) by the County of Hawaii Zoning Code (Chapter 25, HCC) is acknowledged and will be noted in the EIS.
3. Your suggestion to consider a change of zone of the Open-zoned lands in order to effectively utilize the entire project site is acknowledged and will be further explored with your office.
4. The recommendations of the Keahole to Kailua Development Plan will be considered and addressed in the EIS, particularly the proposed mid-level roadway and Waiena Drive which border the 500-acre University site on the west and east respectively.

Planning Department
May 08, 2000
Page 2

We appreciate your agency's interest in the environmental review process and your response to the EISPN. The Planning Department will receive two (2) copies of the DEIS when it becomes available.

Sincerely,

Richard S. McGerrow
Senior Planner

Cc. Maynard Young, CCFPCO



Wayne G. Carvalho
Police Chief
James S. Correa
Deputy Police Chief



County of Hawaii
POLICE DEPARTMENT
249 Kapiolani Blvd. • Hahaione, Hawaii 96720-3998
(808) 535-3111 • Fax: (808) 941-2782

Stephen K. Yamashiro
Mayor

December 28, 1999

Mr. Richard S. McGerrow
Senior Planner
University of Hawaii Facilities Planning
Office for Community Colleges
Manele Building, Room 103
4303 Diamond Head Road
Honolulu, HI 96816

Attention: Maynard Young, Director

Dear Mr. McGerrow:

**SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE (EISP/N)
FOR UNIVERSITY OF HAWAII CENTER AT WEST HAWAII (UHCWH) AT
KALAOA, ISLAND OF HAWAII**

We have reviewed the Environmental Impact Statement Preparation Notice for the University of Hawaii Center at West Hawaii, Kalaoa.

We concur with your findings that the construction of the facility at this site will have a significant impact on the traffic levels along Keirni Nani Drive and also at the intersection of Keirni Nani and Queen Kaahumanu Highway.

We will reserve further comments until such time as the traffic impact analysis for this area is completed.

Thank you for the opportunity to comment.

Sincerely,

WAYNE G. CARVALHO
POLICE CHIEF

Thomas J. Hickcox
THOMAS J. HICKCOX
ASSISTANT POLICE CHIEF
FIELD OPERATIONS BUREAU

DAF:k

May 08, 2000

Chief Wayne G. Carvalho
Police Department
County of Hawaii
349 Kapiolani Street
Hilo, Hawaii 96720-3998

Subject: University of Hawaii Center at West Hawaii (UHCWH)
Response to Comments on the EIS Preparation Notice (EISP/N)

Dear Chief Carvalho:

On Behalf of the University of Hawaii Facilities Planning Office for Community Colleges (CCFPCO), we thank you for your letter regarding the EISP/N, dated December 29, 1999. Your comments help to establish the scope and content of the Draft Environmental Impact Statement (DEIS). Your comment regarding the project's impact on traffic is acknowledged and will be addressed in the traffic impact analysis report prepared for this EIS.

We appreciate your agency's interest in the environmental review process and your response to the EISP/N. The Police Department will receive a copy of the DEIS when it becomes available.

Sincerely,

Richard S. McGerrow

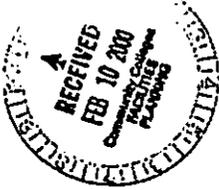
Richard S. McGerrow
Senior Planner

Cc. Maynard Young, CCFPCO



DEPARTMENT OF WATER SUPPLY • COUNTY OF HAWAII
 25 AUPUNI STREET • HILLO, HAWAII 96720
 TELEPHONE (808) 961-8888 • FAX (808) 961-8837

February 7, 2000



Maynard Young, Director
 University of Hawaii Facilities Planning Office
 for Community Colleges
 Manele Building, Room 103
 4505 Diamond Head Road
 Honolulu, HI 96816

ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE (EISPN)
 UNIVERSITY OF HAWAII CENTER AT WEST HAWAII (UHCWH)
 KALAOA, ISLAND OF HAWAII
 TAX MAP KEY 7-3-010:PORTION OF 033

We have reviewed the subject EISPN and have the following comments.

Please be informed that this also applies to the civil portion of the Plan Development Report (PDR).

For your information, the Department deferred comments to complete the evaluation of our existing water system facility capabilities to supply water at adequate pressure and volume under peak-flow and fire-flow conditions to the proposed project.

Water can be made available upon the completion of the construction of the influent and effluent waterlines and Keahole 1-million gallon (MG) reservoir pursuant to the North Kona Water Master Plan with the following conditions:

1. Construct necessary offsite water system improvements, which shall include, but not be limited to:
 - a. booster pumps located at the proposed Keahole 1-MG reservoir,
 - b. transmission waterlines capable of delivering water at adequate pressure and volume under peak-flow and fire-flow conditions from the intersection of the Queen Kaahumanu Highway and Hinalani Drive to the Keahole Reservoir, and thence to the UHCWH 0.5-MG Reservoir; minimum diameter of mains shall be 12 inches,

... *Water brings progress* ...

Maynard Young, Director
 Page 2
 February 7, 2000

- c. a distribution waterline capable of delivering water at adequate pressure and volume under peak-flow and fire-flow conditions; minimum diameter shall be 12 inches,
- d. a service lateral that will accommodate the appropriately sized meter, and
- e. a backflow preventer (reduced pressure type) approved by the Department of Water Supply.

2. Convey the water system improvements and necessary easements to the Water Commission of the County of Hawaii.

Should there be any questions, please call our Water Resources and Planning Branch at 961-8665.

Sincerely yours,

Milton D. Pavso, P.E.
 Manager

WA:gms

copy -- Will Chee - Planning, Inc.
 Wesley R. Segawa & Associates, Inc.



WIL CHIEF - PLANNING, INC.

May 08, 2000

Milton D. Pavao, P.E., Manager
Department of Water Supply
County of Hawaii
25 Aupuni Street
Hilo, Hawaii 96720

Subject: University of Hawai'i Center at West Hawai'i (UHCWH)
Response to Comments on the EIS Preparation Notice (EISPN)

Dear Mr. Pavao:

On behalf of the University of Hawai'i Facilities Planning Office for Community Colleges (CCFPCO), we thank you for your letter regarding the EISPN, dated February 07, 2000. Your comments help to establish the scope and content of the Draft Environmental Impact Statement (DEIS).

Your proposal that water can be made available from the Keahole 1-million gallon (MG) reservoir once it is completed, and your department's requirements and conditions for water supply to UHCWH is acknowledged. This information will be included in the DEIS.

We appreciate your agency's interest in the environmental review process and your response to the EISPN. The Department of Water Supply will receive a copy of the DEIS when it becomes available.

Sincerely,

Richard S. McGerrow
Senior Planner

Cc: Maynard Young, CCFPCO

Stephen K. Yamashiro
Mayor



County of Hawaii

25 August Street, Room 215 • Hilo, Hawaii 96720-4223 • (808) 941-9211 • Fax (808) 941-4333
KONA, 75-5706 Kuahouli Highway, Side 101 • Kailua-Kona, Hawaii 96740
(808) 325-5226 • Fax (808) 325-5463

William C. Davis
Managing Director
Henry Cho
Deputy Managing Director



WIL CHEE - PLANNING, INC.

May 08, 2000

The Honorable Stephen K. Yamashiro, Mayor
County of Hawaii
25 August Street, Room 215
Hilo, Hawaii 96740

Subject: University of Hawaii'i Center at West Hawaii'i (UHCWHI)
Response to Comments on the EIS Preparation Notice (EISPN)

Dear Mayor Yamashiro:

On behalf of the University of Hawaii'i Facilities Planning Office for Community Colleges (CCFPCO), we thank you for your letter regarding the EISPN, dated December 09, 1999. Your comments help to establish the scope and content of the Draft Environmental Impact Statement (DEIS).

The subject EIS addresses the immediate needs of the University and educational demands of the people of West Hawaii. This means that initially UHCWHI will be a commuter-based rather than residential-type campus. But certainly with a 500-acre parcel and only about 30 acres of it being used initially, there is definitely potential for expansion of University facilities in the future. In selecting the 500-acre Kalaoa site, it was the intent of the Board of Regents to allow for future growth of the University. However, it should be understood that any future development beyond what is proposed in this EIS would require a new planning effort and a separate EIS process.

We appreciate your interest in the environmental review process and your response to the EISPN. You will receive a copy of the DEIS when it becomes available.

Sincerely,

Richard S. McGerrow
Senior Planner

Cc. Maynard Young, CCFPCO

December 9, 1999

Mr. Richard S. McGerrow
Wil Chee Planning, Inc.
HMSA Center, 1400 Rycroft Street #928
Honolulu, HI 96814

Dear Mr. McGerrow:

Thank you for sending me a copy of the Environmental Impact Statement Preparation Notice for the University of Hawaii Center at West Hawaii.

I realize that your planning is for the immediate future to provide a more suitable location for the West Hawaii campus, but I would not firmly state that UHCWHI is only a commuter school. West Hawaii will grow as will the demand for expanded educational opportunities.

You are proposing a 500-acre location that at some point could certainly become a full-fledged university campus. I would ask that your plan include the flexibility to expand the educational opportunities.

Thank you for considering my suggestions.

Sincerely,

Stephen K. Yamashiro
MAYOR





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

BRUCE S. ANDERSON, P.D., M.P.H.
DIRECTOR OF HEALTH

IN REPLY, PLEASE REFER TO
FILE NO.

January 14, 2000

99-252/epo

Mr. Maynard Young
January 14, 2000
Page 2

99-252/epo

Discussions with the DOH should be held to effectively size and site wastewater treatment and disposal systems during project design planning. Do not wait until the building, parking lot, and landscape layouts are finalized before addressing wastewater disposal systems. A wastewater disposal system and related structures are essential, and their careful design and placement will directly affect successful long-term project operations.

Questions about UIC may be directed to Chauncey Hew of the Safe Drinking Water Branch at 586-4238.

Wastewater

The subject project is located in the non-critical wastewater disposal area (CWDA) as determined by the Hawaii County Wastewater Advisory Committee.

Although the project site is located in a non-CWDA, public facilities are not allowed to use cesspools for domestic wastewater treatment and disposal. Therefore, as there is no existing sewer service system in the area and none will be constructed in the near future, the Department of Health (DOH) concurs with the use of treatment individual wastewater systems, such as septic tank systems and leaching fields. Should connection to the County sewer service system become available and feasible, in the future, connection will be required.

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

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

Air Pollution Concerns

In the siting of the proposed campus, the air quality needs to be properly addressed. Currently, the DOH is reviewing the proposed expansion of the Keahole Generating Station, which is in close proximity to the proposed campus. Although the air modeling and monitoring results for the Keahole Generating Station expansion application are still under review, the DOH is concerned with the potential nuisance problems associated with mixed land use and the siting of the University of Hawaii Center close to major

Mr. Maynard Young
Director, Facilities Planning
Office for Community Colleges
University of Hawaii
Mancie Building, Room 103
4303 Diamond Head Road
Honolulu, Hawaii 96816

Dear Mr. Young:

Subject: Environmental Impact Statement Preparation Notice (EISP/N)
University of Hawaii Center at West Hawaii
Kalaoa, Hawaii
TMK: 7-3-10: 33 (por.)

Thank you for allowing us to review and comment on the subject project. We have the following comments to offer:

Underground Injection Control (UIC)

New sewage effluent injection wells can only be constructed below (makai) of the UIC line; however, leaching fields are not subject to this prohibition because the characteristics of a leaching field are different from those of an injection well. Seepage pits (a drainage structure having the dimensions of an injection well) may be exempt from UIC restrictions if the daily volume of sanitary wastewater is less than 1,000 gallons per building served by the seepage pit. Thus, although new sewage injection wells are prohibited above the UIC line, alternative wastewater disposal systems may be feasible.

industrial sources. The air quality report used for the preparation of this EISPN is dated and the impacts of volcanic emissions (vog) from the Kilauea volcano, present throughout most of the year in the West Hawaii area, should be expanded. The DOH does not fully agree with the conclusion in the EISPN, section 2.3.4 Environmental Characteristics on page 8 that environmental concerns are primarily related to construction activities.

Secondly, during the construction phase of the project, due to the characteristics of the soil in the area, there would be a significant potential for fugitive dust to be generated during grading, excavation and construction activities for this project. The arid climatic conditions and the close proximity of residential subdivisions only add to the potential dust problems. Construction activities would have to comply with provisions of Chapter 11-60.1, Hawaii Administrative Rules, section 11-60.1-33 on Fugitive Dust.

In summary, please address more fully in the Draft EIS potential air quality problems, especially from Keahole Generating Station and Kilauea Volcano.

If you have any questions regarding air quality issues please contact Ms. Lisa Young of the Clean Air Branch at 586-4200. For questions concerning fugitive dust, please contact Mr. Steven Okoji of the Clean Air Branch in Kona at 322-1507.

Solid Waste

We encourage the project developer to develop a solid waste management plan incorporating principles of waste reduction and diversion as embodied in the State Integrated Solid Waste Management Plan. The management plan should cover both the construction and operational phases of the project and should seek to minimize waste generation and maximize reuse and recycling opportunities.

The EIS Preparation Notice indicates that road and lot paving will be an improvement undertaken by the petitioner. Asphalt is mandated for all State and County paving projects by Hawaii Revised Statutes (HRS), Chapter 103D-407. We request that the petitioner also support the State and counties' efforts to promote the use of recyclable materials. Locally produced compost and mulch is available for landscaping purposes.

In addition to this, the developer shall ensure that all solid waste generated during the project's construction shall be directed to permitted solid waste disposal, processing or recycling facilities.

Please contact Mr. Lane Otsu of the Office of Solid Waste Management at 586-4240 with any questions regarding these comments.

Sincerely,



GARY GILL
Deputy Director for
Environmental Health

c: WWB
SDWB
CAB
OSWM
HDHO
OEQC



WIL CREE PLANNING, INC.

May 08, 2000

Mr. Gary Gill, Deputy Director for Environmental Health
Department of Health
State of Hawaii
P.O. Box 3378
Honolulu, Hawaii 96801

Subject: University of Hawai'i Center at West Hawai'i (UHCWII)
Response to Comments on the EIS Preparation Notice (EISPN)

Dear Mr. Gill:

On behalf of the University of Hawai'i Facilities Planning Office for Community Colleges (CCFPCO), we thank you for your letter regarding the EISPN, dated January 14, 2000. Your comments help to establish the scope and content of the Draft Environmental Impact Statement (DEIS).

Your department's concerns, recommendations and requirements concerning Underground Injection Control (UIC), Wastewater, Air Pollution, and Solid Waste are acknowledged and will be addressed in the EIS.

We appreciate your interest in the environmental review process and your response to the EISPN. You will receive a copy of the DEIS when it becomes available.

Sincerely,

Richard S. McGerrow
Senior Planner

Cc. Maynard Young, CCFPCO

BENJAMIN J. CAYETANO
DIRECTOR



STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

228 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4106
FACSIMILE (808) 586-4199

GENEVIEVE SALMONSON
DIRECTOR

Maynard Young
December 27, 1999
Page 2

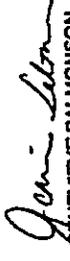
provisions are being made to create bicycle lanes or facilities, promote pedestrian safety and/or encourage other non-motorized modes of transportation, both within and around the proposed campus. Will there be shuttle transportation from Kailua?

6. **Contacts:** In the draft EIS indicate any contacts made during the consultation phase preceding the EIS preparation notice, and include copies of any correspondence. Be sure to indicate any public meetings held or contacts made with community groups.

7. **Table of contents:** Sections 7, 8 and 9 are not found on the indicated pages. In the draft EIS be sure the table of contents lists correct page entries.

If you have any questions, please call Nancy Heinrich at 588-4185.

Sincerely,


GENEVIEVE SALMONSON
Director

C Richard McGarow, W&A Chee Planning

Maynard Young
UH Facilities Planning Office
103 Manala
4303 Diamond Head Road
Honolulu, HI 96816

Dear Mr. Young:

Subject: Environmental Impact Statement (EIS) preparation notice for University of Hawaii Center at West Hawaii

Please include the following in the draft EIS:

1. **Two-sided pages:** In order to reduce bulk and conserve paper, we recommend printing on both sides of the pages in the draft and final EISs.
2. **Technical reports:** All technical reports referenced in the EIS preparation notice should be included in the draft EIS.
3. **Figures:** Indicate the proposed campus site on figures 11, 12, 14 and 16.
4. **Air quality impacts:** Section 3.5, *Air Quality*, mentions Keahole Generation Station, Kailua Landfill and Queen Kaahumanu Highway as sources of air pollution.
 - a. The landfill is not indicated on any of the figures. Please indicate its location in relation to the proposed campus.
 - b. In the draft EIS include a wind rose to show that emissions from these sources will not adversely impact the campus, or include the referenced air quality technical reports, or pertinent supporting text from them, that document the lack of adverse impact.
5. **Alternative transportation modes:** State policy (HRS Chapters 26, 228, 264, 344) requires the promotion of alternative forms of transportation systems that reduce reliance on the private automobile, conserve energy, decrease pollution and provide safe accommodation for their users. Pursuant to this policy, please discuss what



WA 001 - PLUMBING, INC.

May 08, 2000

Ms. Genevieve Salmonson, Director
Office of Environmental Quality Control
State of Hawaii
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Subject: University of Hawai'i Center at West Hawai'i (UHCWH)
Response to Comments on the EIS Preparation Notice (EISPN)

Dear Ms. Salmonson:

On behalf of the University of Hawai'i Facilities Planning Office for Community Colleges (CCFPCO), we thank you for your letter regarding the EISPN, dated December 28, 1999. Your comments help to establish the scope and content of the Draft Environmental Impact Statement (DEIS).

Our response to your comments (in italics) are listed below:

1. *Two-sided pages: In order to reduce bulk and conserve paper, we recommend printing on both sides of the pages in the draft and final EISs.*
2. *The DEIS and FEIS will be reproduced in double-sided copies.*
3. *Technical reports: All technical reports referenced in the EIS preparation notice should be included in the Draft EIS.*
4. *Technical reports will be appended to the Draft and Final EISs.*
5. *Figures: Indicate the proposed campus site on figures 11, 12, 14 and 16.*

The proposed campus site will be shown to scale on figures 11, 12, 14 and 16.

6. *Air Quality impacts: Section 3.5, "Air Quality", mentions Keahole Generation Station, Kailua Landfill and Queen Kaahumanu Highway as sources of air pollution.*
- a. *The landfill is not indicated on any of the figures. Please indicate its location in relation to the proposed campus.*

The landfill will be shown in figures relating to air quality.

b. *In the draft EIS include a wind rose to show that emissions from these sources will not adversely impact the campus, or include the referenced air quality technical reports, or pertinent supporting text from them, that document the lack of adverse impact.*

A windrose and supporting references will be provided in the air quality section.

5. *Alternative transportation modes: State policy (HRS Chapters 26, 226, 264, 344) requires the promotion of alternative forms of transportation systems that reduce reliance on the private automobile, conserve energy, decrease pollution and provide safe accommodation for their users. Pursuant to this policy, please discuss what provisions are being made to create bicycle lanes or facilities, promote pedestrian safety and/or encourage other non-motorized modes of transportation, both within and w/lfom the proposed campus. Will there be shuttle transportation from Kailua?*

At the present time there is no public mass-transportation available in the West Hawaii region, therefore, it is assumed that private automobiles, trucks and motorcycles will be the main means of transit to and from UHCWH in the immediate future. Pedestrian walkways and bicycle paths can be provided within the UHCWH site. However, the main link to the site is the 4-lane high speed Kaahumanu Highway. A bicycle or non-motorized vehicle system to and from the Center will only work if a bike path system is simultaneously provided along the highway. The University, at present, has no plans to provide shuttle service between UHCWH and Kailua, but this option may be explored if there is a demonstrated demand for this service and funding can be found to support it.

6. *Contacts: In the draft EIS indicate any contacts made during the consultation phase preceding the EIS preparation notice, and include copies of any correspondence. Be sure to indicate any public meetings held or contacts made with community groups.*

Documentation of project contacts preceding the EIS process will be appended to the EIS.

7. *Table of contents: Sections 7, 8 and 9 are not found on the indicated pages. In the draft EIS be sure the table of contents lists correct page entries.*

The table of contents and page numbers will be carefully coordinated in the DEIS.

Office of Environmental Quality Control
May 08, 2000
Page 3

We appreciate your interest in the environmental review process and your response to the FISPN. You will receive four (4) copies of the DEIS when it becomes available.

Sincerely,



Richard S. McGerrin
Senior Planner

Cc. Maynard Young, CCFFCO

PHONE (808) 594-1868



STATE OF HAWAII
OFFICE OF HAWAIIAN AFFAIRS
711 KAPOLANI BOULEVARD, SUITE 500
HONOLULU, HAWAII 96813

December 9, 1999

University of Hawai'i
Facilities Planning Office for Community Colleges
Manele Building, Room 103
4303 Diamond Head Road
Honolulu, Hawai'i 96816
Attn: Mr. Maynard Young, Director

EIS# 354

Subject: Environmental Impact Statement Preparation Notice (EISP/N) for
University of Hawai'i Center at West Hawai'i (UHCWH) at
Kalaheo, Island of Hawai'i

Dear Mr. Young,

Thank you for the opportunity to review the above-referenced EIS Preparation Notice.

At this time the Office of Hawaiian Affairs has several concerns regarding this project:

1. The proposed site lies directly upslope from the HELCO Power Generating Plant. While your notice states that the air quality meets both State and Federal air quality standards, it still appears that the exhaust from the Plant will travel directly into the school. (Figure 13) The last air quality report is almost 8 years old. The HELCO air quality monitoring station is located 0.8 miles southeast of the Plant. There were no directional guides showing North and South, but according to Figure 13, the University site is approximately 0.6 miles North of and within direct range of the Plant's emissions. Offshore winds could create an adverse affect on the school.
2. The proposed area has an abundance of archaeological sites. The proposed school is located right on an archaeological trail. This is a concern, as is the prospect of future expansion which may disrupt further archaeological and historic sites. (Figure 8, 9 and 15)
3. A cultural impact statement is not listed as a proposed action. (Page ii and iii)
4. Traffic and noise will increase as the proposed Waena Road, Mid-Level Road and neighboring residential projects are developed. (Figure 17)

FAX (808) 594-1865



Mr. Maynard Young, Director
December 9, 1999
Page 2

Please address these concerns in your forthcoming EIS. If you have any questions, please contact Ken R. Salva Cruz, Policy Analyst, at 594-1847.

Sincerely,

Colin C. Kippen, Jr.
Deputy Administrator

cc: Board of Trustees
Kona CAC
Wil Chee - Planning, Inc.
OEQC



WIL CHEE - PLANNING, INC.

May 08, 2000

Mr. Colin C. Kippen, Jr., Deputy Administrator
Office of Hawaiian Affairs
State of Hawaii
711 Kapi'olani Boulevard, Suite 500
Honolulu, Hawaii 96813

Subject: University of Hawaii'i Center at West Hawaii'i (UHCWH)
Response to Comments on the EIS Preparation Notice (EISPN)

Dear Mr. Kippen:

On behalf of the University of Hawaii'i Facilities Planning Office for Community Colleges (CCFPCO), we thank you for your letter regarding the EISPN, dated December 09, 1999. Your comments help to establish the scope and content of the Draft Environmental Impact Statement (DEIS).

Our response to your comments (in italics) are listed below:

1. *The proposed site lies directly upslope from the Helco Power Generating Plant. While your notice states that the air quality meets both State and Federal air quality standards, it still appears that the exhaust from the Plant will travel directly into the school. (Figure 13) The last air quality report is almost 8 years old. The HELCO air quality monitoring station is located 0.8 miles southeast of the Plant. There were no directional guides showing North and South, but according to Figure 13, the University site is approximately 0.6 miles North of and within direct range of the Plant's emissions. Offshore winds could create an adverse affect on the school.*

We are attempting to obtain more up-to-date data on air quality for the draft EIS. In addition, a windrose will be provided to illustrate the impact of winds on air quality in the project vicinity.
2. *the proposed area has an abundance of archaeological sites. The proposed school is located right on an archaeological trail. This is a concern, as is the prospect of future expansion, which may disrupt further archaeological and historic sites. (Figure 8, 9 and 15).*

In conjunction with the UHCWH Long Range Development Plan (LRDP), an archaeological survey of the proposed site was conducted in 1998. The full documentation of this survey by Paul L. Cleghorn, Ph.D. of Pacific Legacy, Inc.

will be appended to the DEIS. The survey recorded and described all of the archaeological sites encountered in the vicinity of the project site.

Subsequently, Dr. Cleghorn prepared a historic preservation plan for the project. This plan was prepared in partial fulfillment of State Historic Preservation Division requirements. To aid his efforts, the University formed the UHCWH Advisory Council on Kalaoa Cultural Site Preservation. This advisory body is composed of University personnel, civic leaders and leaders of the Hawaiian community in West Hawaii including OHA board member, Hannah Kihalani Springer. The advisory council is intended to be an on-going working body, which will be involved with cultural preservation at the UHCWH site during the planning, design, and construction phases of the project. Because the Kalaoa area is so rich in cultural resources, the council will continue to advise the University on cultural matters after construction is completed and the school is fully operational. The historic preservation plan will also be appended to the EIS document.

3. *A cultural impact statement is not listed as a proposed action. (Page ii and iii).*

Although the EIS does not contain a cultural impact statement per se, the above mentioned archaeological investigation and historic preservation plan are provided as background for the discussion of cultural impact in the EIS.

4. *Traffic and noise will increase as the proposed Waena Road, Mid-Level Road and neighboring residential projects are developed. (Figure 17).*

Traffic and noise quality will both be addressed as major topics in the EIS.

We appreciate your agency's interest in the environmental review process and your response to the EISPN. Your office will receive a copy of the DEIS when it becomes available.

Sincerely,

Richard S. McGerrow
Senior Planner

Cc. Maynard Young, CCFPCO



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
1131 PUNCHBOWL STREET
HONOLULU, HAWAII 96813
December 28, 1999

THOMAS E. JOHNS
COMMISSIONER
OFFICE OF LAND AND NATURAL RESOURCES
JANET E. SAIVELD
SECRETARY

EDUCATION/DEVELOPMENT
PLANNING
ADAPTATION
CONSERVATION/REHABILITATION
ENVIRONMENTAL ACTION
CONSTRUCTION AND
RECONSTRUCTION
PLANNING AND DESIGN
LAND MANAGEMENT
LAND ACQUISITION
LAND RESTORATION
LAND USE AND ZONING
LAND USE AND ZONING

University of Hawaii Facilities Planning
Office for Community Colleges
Attn: Maynard Young, Director
Manele Building, Room 103
4303 Diamond Head Road
Honolulu, Hawaii 96816

RE: Environmental Impact Statement Preparation Notice (EISP/N) for University of Hawaii Center at West Hawaii (UHCWH) at Kalaheo, Island of Hawaii.

Dear Mr. Young:

We provide the following comments to the EISP/N of your planned UH Center at West Hawaii, Kalaheo, Island of Hawaii.

1. The short section on the flora of the area mentions two plant surveys of the area, Char Associates (1992) and Derral Herbst (1998) but neither of the surveys are appended in the document as indicated on page 12. Please append documents.
2. On page 2, the project is identified as 500 acres but in other areas of the document a smaller area is identified for the campus project. The 1998 survey was more intensive but was not done for the entire 500-acre parcel but for a subset of that area (personal communication with D. Herbst). This subset (intensive survey by D. Herbst) should not be interpreted that the whole 500 acres of the proposed development was surveyed.
3. After reading the Char Associates survey and having discussions with D. Herbst, it appears that the fountain grass dominates this area below 400 feet elevation (the location of the campus) of which the area represents weedy introduced plant communities. Yet, on page 12 of the EIS, the discussion of the surrounding vegetation varies from grasslands to open/closed mixed shrub lands. These shrub lands were surveyed by Char 1992 and her findings revealed the presence of *Notthocastrium breviflorum*

Mr. Maynard Young
Page 2

plants which are endangered and the *Capparis sandwichiana* (species of concern), both noted in the EIS. Also found were *Reynoldsia sandwicensis* (species of concern) and *Bidens micrantha* spp. *stenophylla* which are candidate species for listing. Two other Endangered species, *Caesalpinia kavaiensis* and *Pleomele hawaiiensis* were found in the general area. Because the evidence shows endangered species in the mixed shrub land areas, we recommend that more intensive plant surveys be conducted in those areas should this development expand into the shrub land communities or above the 400 feet elevation.

4. We are not aware of endangered fauna in the general vicinity of this development. However, there may be the possibility that the Hawaiian hawk or that the Hawaiian bat may roost in the area. Please take the necessary precautions that these endangered species will not in any way be impacted upon during construction of this development.

Thank you for the opportunity to comment on this project.

Sincerely,

Michael G. Buck
Administrator

C: Richard S. McGerrow, WCP
DOFAW Hawaii Branch
Vickie Caraway, DOFAW Administration



UHCWH • PLANNING, INC.

May 08, 2000

Mr. Michael G. Buck, Administrator
Division of Forestry and Wildlife
Department of Land and Natural Resources, State of Hawaii
1151 Punchbowl Street
Honolulu, Hawaii 96813

Subject: University of Hawaii Center at West Hawaii (UHCWH)
Response to Comments on the EIS Preparation Notice (EISPN)

Dear Mr. Buck:

On behalf of the University of Hawaii's Facilities Planning Office for Community Colleges (CCFPCO), we thank you for your letter regarding the EISPN, dated December 28, 1999. Your comments help to establish the scope and content of the Draft Environmental Impact Statement (DEIS).

Your comments (in italics) and our responses are listed below:

1. *The short section on the flora of the area mentions two plant surveys of the area, Char Associates (1992) and Derral Herbst (1998) but neither of the surveys are appended in the document as indicated on page 12. Please append documents.*
The Herbst botanical survey report will be appended to the EIS document.
2. *On page 2, the project is identified as 500 acres but in other areas of the document a smaller area is identified for the campus project. The 1998 survey was more intensive but was not done for the entire 500-acre parcel but for a subset of that area (personal communication with D. Herbst). This subset (intensive survey by D. Herbst) should not be interpreted that the whole 500-acres of the proposed development was surveyed.*
The UHCWH will be located on the 500-acre State-owned land, which has been designated for University use. However, the actual development will only cover approximately 30 acres of land. At the time Herbst conducted his survey the exact location for the Center had not yet been determined, so his survey covered the southwestern portion of the 500-acre site (approximately 275 acres) where the Center was deemed most likely to be sited. Map 1 in Herbst's report shows the survey limits and transects covered. Herbst's survey does not purport to cover the entire 500-acre University property, only the land in the vicinity of the actual 30-acre development.

3. *After reading the Char Associates survey and having discussions with D. Herbst, it appears that the fountain grass dominates this area below 400 feet elevation (the location of the campus) of which the area represents weedy introduced plant communities. Yet, on page 12 of the EIS, the discussion of the surrounding vegetation varies from grasslands to open/closed mixed shrub lands. These shrub lands were surveyed by Char in 1992 and her findings revealed the presence of Nothocentrum breviflorum plants which are endangered and the Capparis sandwichiiana (species of concern), both noted in the EIS. Also found were Reynoldia sarawicensis (species of concern) and Bidens micrantha spp. etenophylla which are candidate species for listing. Two other Endangered species, Cacsalpinia kawaiensis and Pleomele hawaiiensis were found in the general area. Because the evidence shows endangered species in the mixed shrub land areas, we recommend that more intensive plant surveys be conducted in those areas should this development expand into the shrub land communities or above the 400 feet elevation.*

Except for Capparis sandwichiiana (species of concern), the endangered and listed species found by Char in the larger 500-acre site were not observed by Herbst in his survey of the area covered by the actual 30-acre development. It is understood that should future development be pursued in the areas where the endangered and listed species were observed above the 400-foot elevation line, additional botanical surveys will need to be conducted.

4. *We are not aware of endangered fauna in the general vicinity of this development. However, there may be the possibility that the Hawaiian hawk or that the Hawaiian bat may roost in the area. Please take the necessary precautions that these endangered species will not in any way be impacted upon during construction of the development.*

These concerns will be addressed in the faunal survey report conducted by Reginald E. David and Eric B. Guimther specifically for this project. Their report will be appended to the EIS. The faunal survey had not been completed at the time the EISPN was published.

Department of Land and Natural Resources
Division of Forestry and Wildlife
May 08, 2000
Page 3

We appreciate your agency's interest in the environmental review process and your response to the EISPN. Your office will receive a copy of the DEIS when it becomes available.

Sincerely,



Richard S. McGerrow
Senior Planner

Cc. Maynard Young, CCFFCO





WHL CHEE - PLANNERS, INC.

May 08, 2000

Mr. Kazu Hayashida, Director of Transportation
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Subject: University of Hawaii'i Center at West Hawaii'i (UHCWH)
Response to Comments on the EIS Preparation Notice (EISPN)

Dear Mr. Hayashida:

On behalf of the University of Hawaii'i Facilities Planning Office for Community Colleges (CCFPCO), we thank you for your letter regarding the EISPN, your reference STP 8.9367. Your comments help to establish the scope and content of the Draft Environmental Impact Statement (DEIS).

At your suggestion, we are attempting to acquire data on other planned developments in the area to analyze the cumulative effects of these new developments. We are also seeking information for the intersections of Mamalahoa Highway at Kaimi Nani Drive and Mamalahoa Highway at Ahikawa Street.

We appreciate your agency's interest in the environmental review process and your response to the EISPN. Your office will receive a copy of the DEIS when it becomes available.

Sincerely,

Richard S. McGerrow

Richard S. McGerrow
Senior Planner

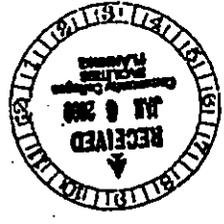
Cc. Maynard Young, CCFPCO

KAZU HAYASHIDA
DIRECTOR
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

BY MAIL/NOTED TO:
STP 8.9367



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



Mr. Richard S. McGerrow
Senior Planner
University of Hawaii Facilities Planning Office
For Community Colleges
Maale Building, Room 103
4303 Diamond Head Road
Honolulu, Hawaii 96816

Dear Mr. McGerrow:

Subject: Environmental Impact Statement Preparation Notice (EISPN) for
University of Hawaii Center at West Hawaii (UHCWH) at
Kalaheo, Island of Hawaii

Thank you for your transmittal requesting our review of the EIS preparation notice.

There are other planned development projects in the area and the cumulative effect of these projects, including the subject proposal, will adversely affect the roadway system.

The Traffic Impact Analysis Report (TIAR) should reflect the traffic generated from the cumulative developments planned for the area. Required mitigation measures should be identified, and those improvements attributable to the applicant should be specified. In addition to the intersections that will be addressed in the TIAR, we suggest the report also look at Mamalahoa Highway at Kaiminani Drive and Mamalahoa Highway at Ahikawa Street.

We will defer further comments until we have the opportunity to review the TIAR.

Very truly yours,

Kazu Hayashida

KAZU HAYASHIDA
Director of Transportation

University Of Hawaii Facilities Planning Office
January 7, 2000
Page 3 of 2

On-Site:
The on-site electrical system consists of a 12.47KV underground system to interconnect the 12,470 volt overhead lines to the UH Center's primary electrical switchgear. The customer is required to install the on-site distribution and primary switchgear. The distribution system is owned and maintained by the customer. The underground cables are owned and maintained by HELCO.

- HELCO recommends that energy efficient and conservation features suitable to reduce the peak electrical demand are part of the development's plans and requirements.

If you have any questions, please contact H. Karielgald at 969-0322.

Sincerely,

Hyde H. Karielgald
Hyde H. Karielgald, Manager
Engineering Department

WLSHK:3

CC: R. McDerrey (WU) Choe - Planning, Inc.)
H. Karielgald
M. Goublion

January 7, 2000

FAX LETTER

University Of Hawaii Facilities Planning Office
Masole Building, Room 103
4103 Diamond Head Road
Honolulu, HI 96816

Attention: Maynard Young, Director

Confidential:

Subject: EIS Preparation Notice - UH Center at West Hawaii
Kauaie, Island of Hawaii

Thank you for the opportunity to comment on the subject EIS/ENR. The following is Hawaii Electric Light Company Inc.'s (HELCO's) comments:

- The proposed UH Center in West Hawaii is adjacent to the North of our 69,000 volt transmission line segment. Two 69,000 volt overhead lines are currently installed within the transmission segment. Additional 69,000 volt lines may be added in the future to serve West Hawaii's electrical needs. A minimum of 15-foot lateral clearance must be maintained to each existing 69,000 volt transmission line. Therefore, trees or buildings should not be located close to the transmission line segment. In addition, the existing segment must remain accessible to HELCO's trucks in order to service and/or repair the electrical lines. The proposed UH Center is located approximately 3,000 feet East of our Kauaie Power Plant. Currently, HELCO has seven generating units at this site. The future plan is to retire six of its generating units and replace them with efficient base loaded (continuous operation) units.
- The proposed UH Center will require off-site and on-site electrical improvements to serve the anticipated loads.

Off-site:

The closest off-site substation is our Kauaie Airport substation which is just West of our Kauaie Power Plant. The Kauaie Airport substation transformer is 1.5 MVA which serves the Kauaie Airport and Kauaie Agricultural Park substation. This substation transformer's capacity is limited and is not adequate to serve the UH Center loads. Our HOBT Park and Hilo substations to the South and East of our Kauaie Airport substation may have adequate capacity but require installation of 12,470 volt distribution circuits to deliver electrical power to the proposed on-site development. A minimum of two 12,470 volt distribution circuits are required to serve the UH Center loads. Depending on the electrical demand, Phase 1 development of the UH Center may be initially served by one 12,470 volt circuit. Please have your electrical consultant submit the electrical demand and schedule for the various phases of the development so we may determine the specific off-site requirements.





WECEE - PLANNING, INC.

May 08, 2000

Mr. Clyde H. Nagata, Manager, Engineering Department
Hawaii Electric Light Company, Inc.
P.O. Box 1027
Hilo, Hawaii 96721

Subject: University of Hawaii'i Center at West Hawaii'i (UHCWH)
Response to Comments on the EIS Preparation Notice (EISPN)

Dear Mr. Nagata:

On behalf of the University of Hawaii'i Facilities Planning Office for Community Colleges (CCFPCO), we thank you for your letter regarding the EISPN, dated January 07, 2000. Your comments help to establish the scope and content of the Draft Environmental Impact Statement (DEIS).

Your comments regarding the provision of electrical power to UHCWH and the off-site and on-site improvements required to serve the anticipated loads are acknowledged.

We appreciate your agency's interest in the environmental review process and your response to the EISPN. Your office will receive a copy of the DEIS when it becomes available.

Sincerely,

Richard S. McGerrow
Senior Planner

Cc. Maynard Young, CCFPCO



Kona Palisades Estates Community Association

Post Office Box 2223 Kona, Hawaii 96745-2223

December 20, 1999

University of Hawaii's Facilities Planning Office for Community Colleges
Maneie Building, Room 103
4303 Diamond Head Road
Honolulu, HI 96816
Attention: Maynard Young, Director



Thank you for providing the Kona Palisades Estates Community Association with a copy of your EIS preparation notice. You may recall that about a year or so ago, your organization with your client gave a presentation to the KPECA, outlining your study results in connection with establishing a University of Hawaii, West Hawaii Campus.

At that time, we identified three major concerns, namely:

1. Access road connection to Kaiminani Drive.
2. A septic lagoon for sewage treatment.
3. Connection to the 8 inch water line on Kaiminani Drive.

Of those three concerns, you have mitigated only the second one listed above.

We strongly object to the Kaiminani access road connections because of safety reasons, and the fact that this road has over 4000 vehicles per day. The road was originally intended only as a residential access road not as a thoroughfare. Currently there are 170 driveways connecting directly to the Drive plus 36 inter-sections most of which are hazardous due to terrain or foliage interference with clear mauka or makai views of the road.

We note on your figure 20, an "unrestricted" access corridor that connects to the Queen Kaahumanu Highway at the Airport Road intersection, and thence to the University property, which, by the way, already has a traffic light. That entry point clearly would be far safer than the Kaiminani Drive entry point.

Apparently you are relying on the "K to K" plan, which as yet has not been officially approved by Hawaii County, and is therefore without legal status.

Regarding item 3 above, we object to the proposed water supply connection to the Kaiminani Drive water supply because we know that will reduce KPECA water pressure even further. Presently at the mauka third of the subdivision, low pressure is an existing problem, and adding to the drain on the feeder line will worsen the existing condition. There was one recent occasion where pressure in the entire system went to zero!

We suggested previously, that, as a benefit to two subdivisions North of KPECA, you and the U of H could work an arrangement to bring water to your project via a new pipeline running from the Mamalahoa Highway through those two subdivisions to your usage point. Such an arrangement would benefit residents who have totally inadequate water supply at present. The separate line would also satisfy the fire protection needs, not currently available to those subdivisions.

To repeat, we strongly urge you to reconsider those two very important matters.

Thank you for your consideration.

Roy Muehring

Roy Muehring, Chairman
GOVERNMENT AND COMMUNITY AFFAIRS



Kona Palisades Estates Community Association

Post Office Box 2223 Kailua-Kona, Hawaii 96745-2223

December 20, 1999

University of Hawaii's Facilities Planning Office for Community Colleges
Mancie Building, Room 103
4303 Diamond Head Road
Honolulu, HI 96816
Attention: Maynard Young, Director

Regarding your preliminary evaluation of air quality and noise levels, we believe your lack of local knowledge is why you are sanguine about these major environmental factors.

Residents in the area can attest to the fact that airport noise is extreme even at a distance of more than 3 miles from the runways. The primary noise sources are Hawaiian Airlines and Aloha Airlines planes which together have dozens of flights per day in and out of the Keahole Airport. Both airlines have noise level waivers for their aircraft. I suspect the referenced State Transportation Department report uses the FAA standards, not actual values that exist.

As regards air quality, the studies by the Keahole Defense Coalition has data showing marginal conditions exist as a result of the air eddy caused by the Hualalai mountain interception of the trade winds. The air contains volcanic emissions (Vog), and exhaust pollution from vehicles, aircraft and the power generators. The fact is, air quality in this region is not healthy. Unfortunately no one can control the Vog, and the other pollutants will increase as the population increases on this island.

We believe you should spend some time in this locale, so you can obtain facts, for the most accurate data to report.

Roy Mushrush

Roy Mushrush, Chairman
GOVERNMENT AND COMMUNITY AFFAIRS



UNIVERSITY OF HAWAII

Office of the Senior Vice President, University of Hawaii and Chancellor for Community Colleges
Physical Facilities, Planning and Construction

March 13, 2000

Mr. Roy Mushrush, Chairman
Government and Community Affairs
Kona Palisades Estates Community Association (KPECA)
P.O. Box 2223
Kailua-Kona, Hawaii 96745-2223

SUBJECT: University of Hawaii Center at West Hawaii (UHCWH)
Response to Comments on the EIS Preparation Notice (EISPN)

Dear Mr. Mushrush:

We thank you for your two comment letters regarding the EISPN, both dated December 20, 1999. It is important that we receive comments and concerns such as yours in order to establish the scope and content of the Draft Environmental Impact Statement (DEIS). In consultation with our consultant, WJ Chee Planning, Inc., our responses to your concerns are as follows:

Access and Traffic

Your concerns regarding the proposed UHCWH access road connecting to Kaimihani Drive and the Center's subsequent impact on traffic in the area are acknowledged. As stated in the EISPN, a traffic impact analysis report is being prepared which will examine these matters in greater detail. This report is nearing completion and will be included in the DEIS.

Your suggestion that an access corridor be provided directly from Queen Ka'ahumanu Highway at the Airport Road intersection is a logical solution and was considered early in the planning process. However, our analysis indicated that access from Kaimihani Drive would be a much shorter distance to the Center and, therefore, a less costly means of providing access in the initial phases of construction. When and if the County builds the proposed Mid-Lavel Road, the direct connection to the Center from Airport Road may yet become a reality. But initially access from Kaimihani Drive is more feasible for cost reasons.

Mr. Roy Mushrush
March 13, 2000
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Water Supply

Your concern regarding the impact on water pressure resulting from UHCWH's use of the existing water main running down Kaiminani Drive is acknowledged. However, we maintain that the impact on existing water pressure will be negligible. This is due to the use of a 500,000-gallon water tank, which will be constructed on University property at approximately the 580-foot elevation. The tank is required by State regulations to meet the water supply requirements for the Center's fire hydrant system. The initial filling of the tank will be accomplished over a period of time before the Center begins full operation, and water will be drawn down during non-peak hours. Once the tank has been filled, the water needs of the Center will be drawn from the water tank, and not directly from the Kaiminani main. As water is used from the tank, it can be set to automatically refill during non-peak hours to minimize impact on the Kona Palisades Estates (KPE) water supply system. The daily water needs of the Center are very small in relation to the total capacity of the water tank, and the Center will not contain student or faculty housing and athletic facilities that would normally increase the consumption of water. The University's water tank may also be a benefit to KPE. In the event of fire, its contents will be available through the existing hydrant system by gravity down feed for KPE residences located below the water tank.

Your suggestion to bring water to UHCWH via a new pipeline running from Mamelahoa Highway through other subdivisions is physically possible. However, as in the case of the access road, construction of a pipeline from Mamelahoa Highway to the Center would be prohibitively expensive across such great distance.

Air Quality and Noise Level

We are aware of the state of air quality and noise quality in the Kalaheo area and your concern is acknowledged. The topics of air quality and noise quality will be given due consideration in the DEIS. However, it should be understood that the "action" being considered in this EIS is the proposed UHCWH facilities and their impact on the surrounding environs. Existing conditions and sources of air and noise pollution such as aircraft and the HELCO plant west of the University site are not consequences of the UHCWH, and are beyond our control and ability to address in mitigation.

Mr. Roy Mushrush
March 13, 2000
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We appreciate your organization's interest in the environmental review process and response to the EISPN. Your organization will receive a copy of the DEIS when it becomes available.

Sincerely,



Maynard Young
Director

MY:kl

cc: Governor Benjamin Cayetano
President Kenneth P. Mortimer
Sr. VP Eugene Ima
Sr. VP/Chancellor Joyce S. Tsunoda
Vice Chancellor Michael Unehasami
Provost Sandra Sakaguchi
Director Kathleen Damon